

Advanced Radiation Service

271 PLAINFIELD ROAD

EDISON, NEW JERSEY 08820

ADMINISTRATIVE MANUAL

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ADMINISTRATIVE MANUAL

1) PURPOSE AND SCOPE

The purpose of the Administrative Manual is to provide a policy for internal administration of the radiographic facilities at Advanced Radiation Service. The policies set forth in this Administrative Manual must be strictly adhered to by all personnel at Advanced Radiation Service.

2) APPLICABLE DOCUMENTS

The following sections of Title 10, Chapter 1 of the Code of Federal Regulations, U.S. Nuclear Regulatory Commission, Rules and Regulations, are included as an integral part of this Administrative Manual:

- A. 10 CFR, Part 19 - "Notices, Instructions, and Reports to Workers; Inspections"
- B. 10 CFR, Part 20 - "Standards for Protection Against Radiation"
- C. 10 CFR, Part 21 - "Reporting of Defects and Noncompliance"
- D. 10 CFR, Part 30 - "Rules of General Applicability to Licensing of Byproduct Material"
- E. 10 CFR, Part 34 - "Licenses for Radiography and Radiation Safety Requirements for Radiographic Operations"
- F. 10 CFR, Part 40 - "Domestic Licensing of Source Material"
- G. 10 CFR, Part 71 - "Packaging of Radioactive Material for Transport"
- H. 10 CFR, Part 170 - "Fees and Facilities & Materials License"

Advanced Radiation Service~~Revised~~ ☐ ~~Revised~~ ☐ 283-3264ADMINISTRATIVE MANUAL3) DEFINITIONS - Used in this Administrative Manual for Advanced Radiation Service.

- A. "Controlled Area" or "Restricted Area":
Any area, access to which is restricted by Advanced Radiation Service to protect individuals from radiation or radioactive materials.
- B. "Dose":
The quantity of radiation absorbed, per unit of mass, by the body or any part of the body.
- C. "Dose Rate":
The dose per unit of time.
- D. "High Radiation Area":
Any area, accessible to personnel, in which there exists radiation originating in whole or in part within licensed material at such levels that a major portion of the body could receive in any one hour a dose in excess of 100 millirem.
- E. "Licensed Material":
Source material, special nuclear material or by-product material.
- F. "Radiography":
The examination of the structure of materials by nondestructive methods, utilizing sealed sources of by-product materials.
- G. "Radiation Area":
Any area accessible to personnel, in which there exists radiation, originating in whole or in part from licensed material, at such levels that a major portion of the body could receive in any 5 consecutive days a dose in excess of 100 millirem or in any one hour a dose in excess of 5 millirem.
- H. "Radiographer":
Any individual who performs or who, in attendance at the site where the sealed source or sources are being used, personally supervises radiographic operations and also is responsible to the licensee for assuring compliance with the requirements of the Commission's regulations and the conditions of the license.

...continued...

Advanced Radiation Service~~Winding Road~~ ☐ ~~Isolation~~ ☐ 283-3264ADMINISTRATIVE MANUAL3) DEFINITIONS (con't.)

- I. "Radiographer's Assistant":
Any individual who, under the personal supervision of the radiographer, uses radiographic exposure devices, sealed sources or related handling tools, or radiation survey instruments in radiography.
- J. "Radioactive Material":
Any material which produces Alpha rays, Beta rays, Gamma rays, x-rays, neutrons or other atomic particles.
- K. "Radiographic Exposure Device":
Any radiation-shielded instrument containing a sealed source fastened or contained therein in which the sealed source may be moved from a shielded to an unshielded position for the purpose of radiographic exposure.
- L. "Storage Container"/"Shipping Container"/"Source Changer":
The radiation shielded device in which sealed sources may be stored, transported or used for source changing.
- M. "Sealed Source":
Any by-product material that is encased in a capsule designed to prevent leakage or escape of the by-product material.

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4. DESCRIPTION OF RADIOGRAPHIC FACILITIES (Per 6 - a of NRC Form 313R)

The byproduct material will be used for radiography of materials at temporary job sites.

Exposure devices and source changers (shipping containers) are stored in a lockable vault at the following location:

271 Plainfield Road
Edison, NJ 08820

This vault is marked with the yellow/magenta sign which reads "Caution Radioactive Materials".

The key is in the possession of the radiographer and Mr. Anton Kurtz.

The maximum external radiation leakage on the surface of the storage vault must be less than 1 mr/hr.

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5. DESCRIPTION OF RADIATION DETECTION INSTRUMENTS: (per 6 - b on Form NRC-313R)

Advanced Radiation Service will use the following
Survey Meters:

A. EBERLINE MODEL E 130G SURVEY METER

RANGE: 0 - 1000 MR/HR

B. VICTOREEN TYPE 592B and/or TYPE 692 SURVEY METER

RANGE: 0 - 1000 MR/HR

PORTABLE GAMMA RADIOGRAPHIC SURVEY METER MODEL E-130G

MEETS U.S. AEC REGULATIONS
(10 CFR PART 34, PARA. 34.24)
FOR USE IN RADIOGRAPHIC INSTALLATIONS

UTILIZES INTEGRATED CIRCUITS
SMALL SIZE - LIGHT WEIGHT
LONG LIFE WITH TWO D-CELLS
STABLE OVER WIDE TEMPERATURES
EXCELLENT LINEARITY AND STABILITY
VARIABLE METER RESPONSE TIME
BATTERY CONDITION CHECK
3 RANGES - TO 1000 mr/hr
RUGGEDIZED METER
ENGRAVED SWITCH MARKING



SHOWN WITH SK-1 SPEAKER

PORTABLE GAMMA RADIOGRAPHIC SURVEY METER MODEL E-130G

GENERAL DESCRIPTION

The Model E-130G Portable Gamma Survey Meter combines the proven reliability of geiger detectors with new electronic circuits to provide an instrument with outstanding operational characteristics in a small, lightweight package at an economical price. The ruggedized meter provides exceptional linearity with continuously variable response time. Calibration stability results from temperature compensation and battery voltage regulation. High efficiency circuits extend the life-time of the two D-cell batteries. A rotary switch combines the functions of power switch, battery check and selection of one of three sensitivity ranges. The amplifier-driven phone output may be used with headset, speaker assembly, or external pulse counter.

Design features include: voltage amplifier, monolithic integrated circuit trigger, meter driver with variable response time, phone driver, regulated and feedback controlled high voltage supply and individual calibration controls for each range. A single etched board holds and interconnects all components resulting in a minimum number of solder joints which enhances reliability. The etched board connects to the die cast aluminum cover, forming a completely operational instrument with controls and test points exposed for ease of calibration or maintenance. An aluminum can covers the assembly, sealing against an O-ring, forming a rugged, weather-proof housing.

Standard factory calibration is to mr/hr from ^{60}Co sources having calibration traceable to the National Bureau of Standards. A cadmium shield surrounding the detector tube provides compensation for low energy gamma radiation. The instrument is furnished complete with C-Zn batteries, 8 microcurie ^{137}Cs check source, Calibration Certification, manual and carrying strap. Available accessories include headset and speaker assembly (SK-1).

SPECIFICATIONS

I. READOUT

RANGES: 3 Linear Ranges, switch controlled; 10, 100, 1000 mr/hr ^{60}Co full scale.

SCALE LENGTH: 1.76 inches.

LINEARITY: Within $\pm 5\%$ of full scale, $\pm 2\%$ typical.

RESPONSE TIME: Variable by panel control from 10 sec. to 2 sec. to 90% of final value.

PHONE: One pulse for each event counted. Negative pulse approximately 2.5 volts amplitude, length determined by range switch.

SATURATION LEVEL: Exceeds 1000 r/hr.

VOLTAGE COEFFICIENT: Reading changes less than 10% with battery voltage from 3.0 to 2.0 volts (New batteries to end point).

II. BATTERIES

Two "D" size cells held by internal captive holders. VOLTAGE REQUIREMENT: 1.6 max. to 1.0 min. volts per cell.

LIFE: Variable depending on cell type, age, temperature, etc. Nominal life with new cells at room temperature for each type is:

Carbon-Zinc	300 hours
Alkaline	500 hours
Mercury	700 hours
Nickel-Cadmium	200 hours
(Single Charge)	

III. DETECTOR

GM TUBE: Small, rugged, halogen quenched.

Cadmium shield surrounding tube for low energy compensation.

SENSITIVITY: Approximately 110 CPM per mr/hr for ^{60}Co .

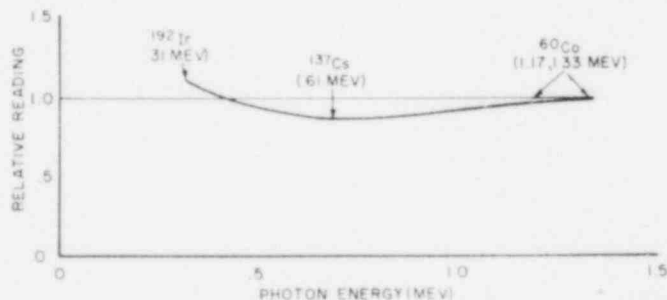
IV. MECHANICAL

DIMENSIONS: Approx. 6-3/4 in. L x 3-3/8 in. W x 3-5/8 in. + 2-3/8 in. handle H.

WEIGHT: 3 lb. with C-Zn batteries.

V. ENVIRONMENTAL

TEMPERATURE: Typical temperature coefficient of reading is -0.15% per $^{\circ}\text{F}$ from -40° to $+140^{\circ}\text{F}$. Maximum is -0.25% per $^{\circ}\text{F}$.



TYPICAL ENERGY RESPONSE OF E-130G

PICKER INDUSTRIAL

6 N. 21st ST.

KENILWORTH, N. J. 07033



EBERLINE Instrument Corporation

Advanced Radiation Service

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6. INSTRUMENT CALIBRATION PROCEDURES (Per 6 - c on NRC Form 313R)

All survey instruments at Advanced Radiation Service will be calibrated every three months or when necessary, such as after instrument servicing, by one of the following:

- A) The Manufacturer
- B) Technical Operations, Burlington, Mass.
- C) XID Corporation, Clifton, NJ

Instruments are calibrated against a radioactive source of known intensity (Cesium 137) at a minimum of two points on each scale. The highest and lowest points must be separated by at least 50% of the total scale.

Calibration tolerance is $\pm 10\%$ accuracy. A sample of the meter calibration certificate is attached. Records of instrument calibrations must be maintained in the office of Advanced Radiation Service for at least seven years.

Procedures for Calibration of Survey Meters are attached.

Advanced Radiation Service14 Winding Road ☐ Iselin, N.J. 08830 ☐ 283-3264ADMINISTRATIVE MANUAL6. PROCEDURES FOR INSTRUMENT CALIBRATION
(TECH OPS MODEL 773)TECHNICAL DATA

Size:	5 in.(12.7cm) wide; 5 in.(12.7cm deep; 8.5 in.(21.6cm) high	
Weight:	(with attenuators)	52 lbs.(24 kg)
	(without attenuators)	45 lbs.(20 kg)
Source:	Model 77302, Cesium ¹³⁷ , 150 millicuries	
Transport Status:	DOT Specification 7A Type A Package	
Shielding Material:	Lead Approx. 29 lbs. (13 kg)	

GENERAL

The Model 773 is a small, portable radiation survey instrument calibration device. The unit consists of a 150 millicurie Cesium 137 source permanently attached to a movable source rod which is installed in a lead shield casting. The source is exposed by raising the source rod which positions the source in a 36 x 20 collimated beam port.

The unit is equipped with three attenuators (Transmission of 0.25, 0.10 and 0.10) to allow a survey instrument with three ranges to be calibrated at 20% and 80% of each range without changing the position of the survey instrument. The Model 773 can be used to calibrate survey instruments with ranges up to 2000 milliroentgens per hour.

The unit is equipped with a carrying handle which also serves as a source locking bar to prevent unauthorized use of the calibrator. A shipping cover is also attached to provide an additional means of securing the source.

RECEIVING

Survey the device for excessive radiation levels. The device should have radiation levels less than 200 mr/hr at the surface and less than 10 mr/hr at three feet from the surface. Inspect the device for shipping damage and insure that the device is locked.

/continued....

ADMINISTRATIVE MANUALTECH/OPS MODEL 773
6. INSTRUMENT CALIBRATION DEVICE(continued)
SAFETY PRECAUTIONS

The Model 773 contains a 150 millicurie Cesium¹³⁷ source that emits gamma radiation which can cause injury if improperly used. Disassembly of the device or removal of the source requires special equipment. We recommend that any service requiring disassembly of the device or removal of the source be performed by the manufacturer.

INSTRUMENT DEVICES

Although the device has radiation levels which are well below the maximum radiation level permitted on storage containers, personnel should not stay close to the device any longer than necessary.

Precautions should be taken to store the instrument calibration device in an area that meets the requirements of Title 10 Code of Federal Regulations 20.202 (b) (2), 20.203(b) and 20.203(e).

It is recommended that personnel operating the equipment use a calibrated and operable survey instrument and wear appropriate personnel monitoring devices. The radiation level at the source rod when the source is in the "operate" position is approximately 50 milliroentgens per hour.

Movement of the source rod should be accomplished as expeditiously as practicable. An alternative method of raising the source rod would be the use of a string and pulley arrangement.

In no case should anyone enter the area of the radiation beam or expose any part of his body to the radiation beam.

PREPARATIONS FOR USE

Place the source shield in a restricted area so that the directional port is aimed horizontally. To minimize the effects of scattered radiation, the unit should be 16 feet from any wall in the direction of the primary beam.

Position a support horizontally from the device as shown in Figures 1 and 2.

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ADMINISTRATIVE MANUAL6. TECH/OPS MODEL 773
INSTRUMENT CALIBRATION DEVICE

(continued)

PREPARATIONS FOR USE (con't.)

Restrict access to the area where the radiation level is in excess of 2 milliroentgens per hour (See Figure 4).

OPERATION:

Note: To properly calibrate a survey instrument it is necessary to check the instruments response at two points on each of the instruments' ranges. These points must be separated by at least 50% of the full scale reading. The instrument reading should agree with the actual radiation intensity within 10% to be in proper calibration.

The following procedure is designed for a survey instrument with three scales and a range of 0-1000 mr/hr. For instruments with different ranges, the procedure will be similar but the points will differ.

- 1) Turn on the survey meter and allow it to "warm up" for approximately 10 minutes.
- 2) Determine the activity of the source on the date of calibration from the decay chart provided with the source.
- 3) Determine the distance from the source at which the radiation intensity would be 800 mr/hr (See Figure 3).
- 4) Using the tape measure attached to Model 773, place the survey meter such that the axis of the detector is located at the proper distance from the source as determined above.

Note: The survey meter should be located so that the center of the detector is at the correct distance and centered on the center line of the radiation beam. The axis of the detector should be perpendicular to the centerline of the radiation beam. Depending upon the physical size of your survey instrument, it may be necessary to mount it somewhat higher than the bench surface. When the proper geometry for your instrument has been established, use the same physical arrangement consistently in future calibration operations.

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ADMINISTRATIVE MANUAL6. TECH/OPS MODEL 773
INSTRUMENT CALIBRATION DEVICE

Note: con't.

At short distances, using survey instruments with large detector volumes, the radiation intensity will not be uniform across the detector. Consideration should be given to this effect when determining the radiation intensities to be checked.

5) Unlock the handle of Model 773. Remove the shipping plate. Remove all the attenuators from the radiation beam.

6) Standing away from the radiation beam, expose the source by manually raising the source rod. Note and record the survey meter reading, return the source to the "stored" position. The actual intensity is 800 mr/hr. If the reading is within + 10% of the actual intensity, continue checking the instrument. If the instrument reading is not within + 10% of the actual intensity, the instrument must be adjusted and recalibrated.

CAUTION: Do not enter the area of the radiation beam while the source is exposed.

7) Place the 0.25 attenuator in the beam. Repeat step 6; the actual intensity is 200 mr/hr.

8) Remove the 0.25 attenuator from the beam and place a 0.10 attenuator in the beam. Repeat step 6; the actual intensity is 80 mr/hr.

9) Place the 0.25 attenuator in the beam. Repeat step 6; the actual intensity is 20 mr/hr.

10) Remove the 0.25 attenuator from the beam and place the other 0.10 attenuator in the beam. Repeat step 6; the actual intensity is 8 mr/hr.

11) Place the 0.25 attenuator in the beam. Repeat step 6; the actual intensity is 2 mr/hr.

LEAK TESTING

The Tech/Ops Model 773 Meter Calibration Kit contains a Cesium¹³⁷ source which must be leak tested at intervals not to exceed 6 months. This may be accomplished using Tech/Ops Model 518 Leak Test Kit.

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ADMINISTRATIVE MANUAL

TECH/OPS MODEL 773
6. INSTRUMENT CALIBRATION DEVICE

LEAK TESTING (continued)

1. Place the Model 773 calibrator in a restricted area.
2. Remove the lock and rotate the handle from the top of the source rod. Remove the shipping cover.
3. Moisten the leak test swab with EDTA solution. Blot off the excess.
4. Wipe around the top of the source rod.
5. Standing away from the beam port, raise the source rod to the open position and wipe the exposed source rod thoroughly.
6. Place the leak test swab in the plastic envelope.
7. Set the survey meter on its most sensitive range and place the meter in a low background area. Move the swab, in its plastic envelope, to the meter, not the meter to the swab.
8. If the meter indication is less than 0.2 mr/hr above background, place the plastic envelope with the swab into the mailing box and mail to Technical Operations, Inc., Burlington, Massachusetts 01803. BE SURE TO FILL OUT AND RETURN THE IDENTIFICATION SHEET.
9. If the swab should show more than 0.2 mr/hr, DO NOT MAIL. Contact Technical Operations, Inc. for specific instructions.

NOTE: The wipe test swab will be subjected to a precise radio-assay when received by Tech/Ops and a leak test certificate will be mailed promptly. This certificate must be kept with your records as it is subject to N.R.C. inspection.

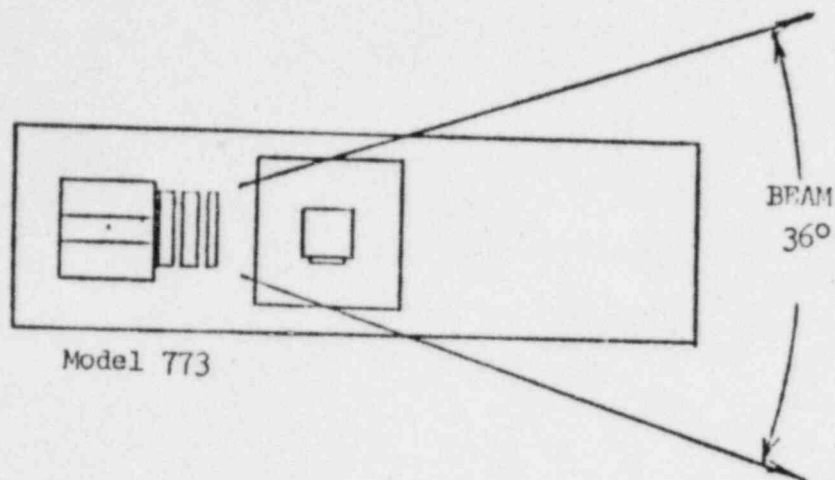


FIGURE 1

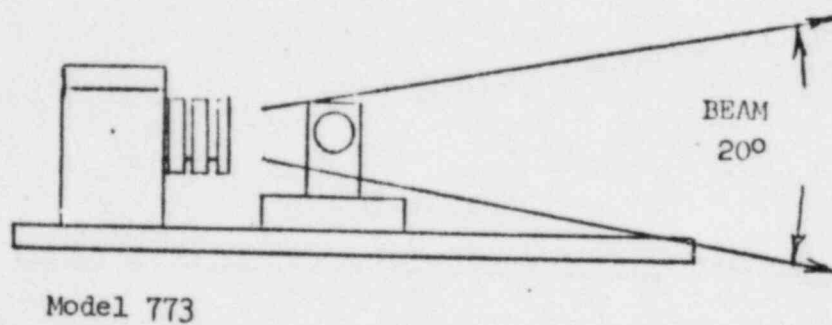


FIGURE 2

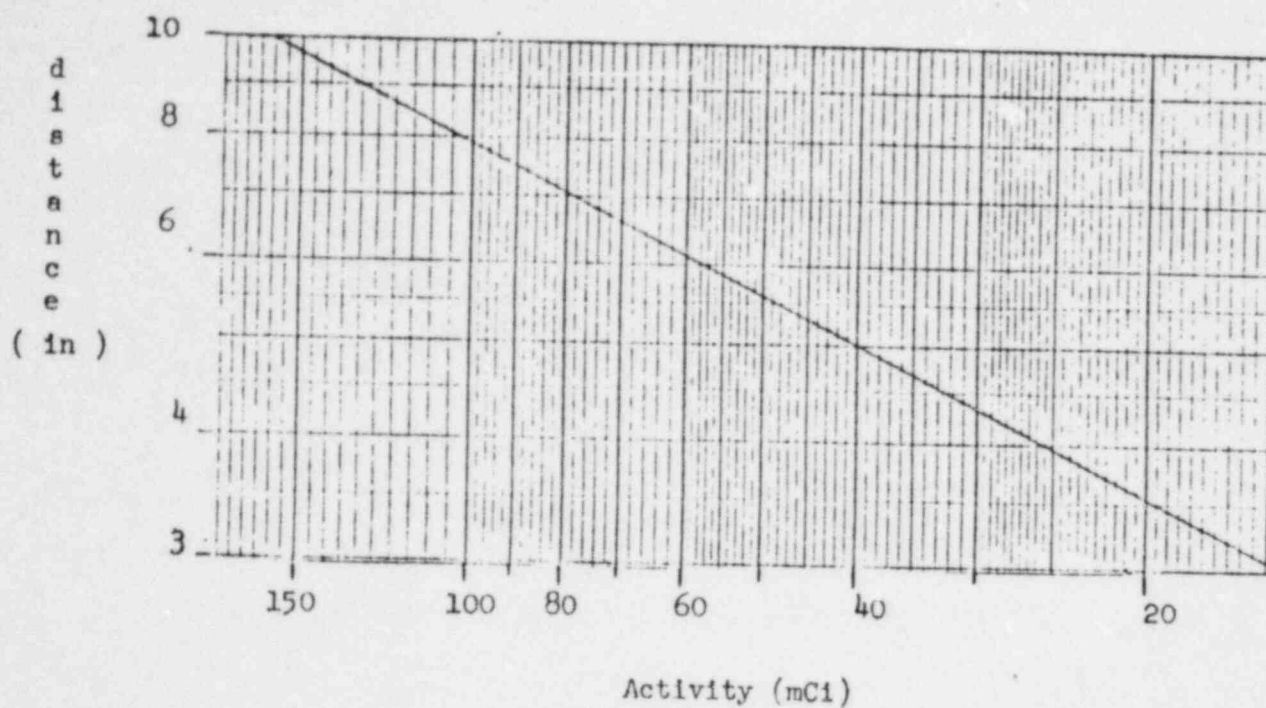
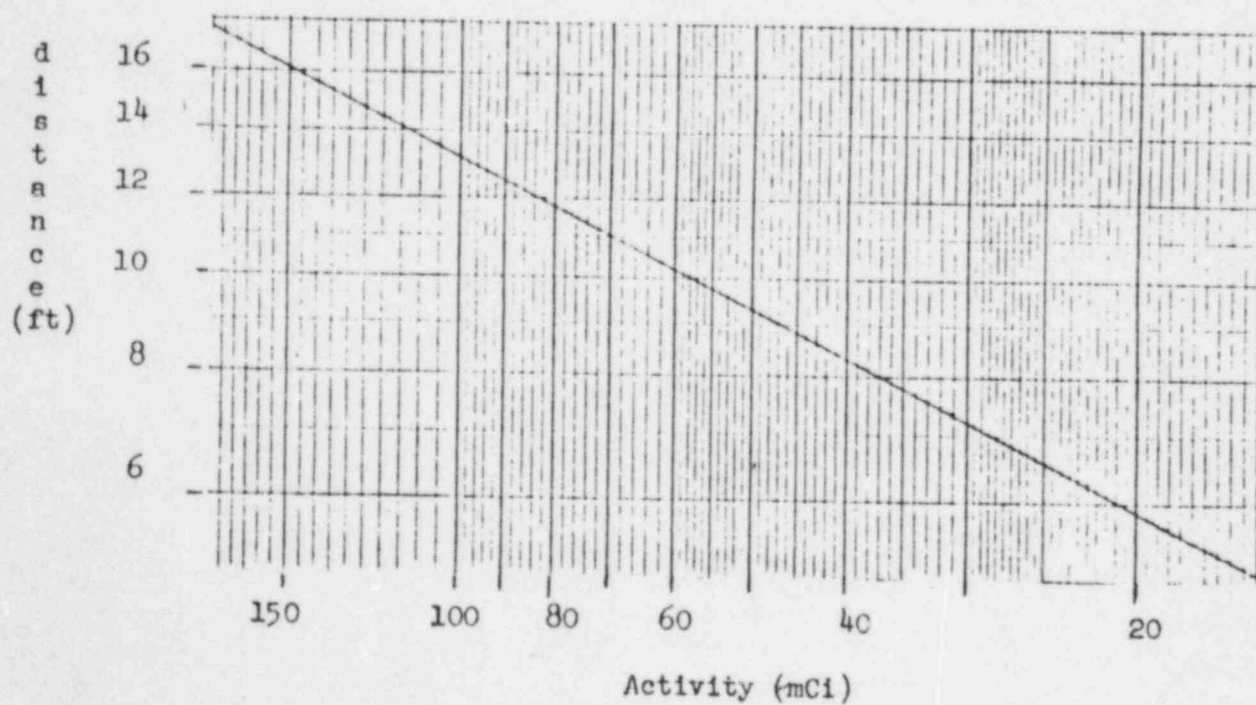


Figure 3

Distance to 800mR/hr isodose line as a Function of Activity



Distance to 2mR/hr isodose line as a Function of Activity

FIGURE 4

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7. PERSONNEL MONITORING EQUIPMENT (Per 6 - d of Form NRC 313R)

Monthly Film Badge Service by LANDAUER, Glenwood,
Illinois 60425

Pocket Dosimeters

Dosimeter Corporation of America, Model 200
Range: 0 - 200 MR

Landsverk, Model "L 50"
Range: 0 - 200 MR

Victoreen, Model 541A
Range: 0 - 200 MR

Dosimeter Charger

Victoreen, Model 2000A or equivalent

Dosimeter Calibrator

Dosimeter Corporation of America, Model 3060 (Cesium 137)

Pocket dosimeters must be calibrated and checked for leakage at intervals not exceeding three months with Model 3060, containing a source with activity less than 10 microcuries of Cesium 137. The dosimeter must be accurate to within $\pm 30\%$ of the actual radiation exposure.

Each radiographer at Advanced Radiation Service must carry a personal film badge and pocket dosimeter during all radiographic operations and must inspect the dosimeter frequently. If found to be offscale or shows a reading in excess of 10 mr/hr, all operations must stop immediately. Mr. Kurtz must be notified and will ship the wearer's film badge to Landauer to be processed. The wearer cannot perform radiography until the film badge report has been received and analyzed by Mr. Kurtz.

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8. DESCRIPTION OF TRAINING PROGRAM (Item 6-f) on Form 313R)

A. GENERAL. Advanced Radiation Service plans to have a personnel qualification and certification program for non-destructive testing, which is designed to assure the technical competence and knowledge of safety requirements necessary for the safe and efficient practice of isotope radiography. These radiation safety requirements for industrial radiography with sealed sources are specified in 10 CFR, Part 34, which is attached.

As a result of this training program being incorporated into Advanced Radiation Service's license, Mr. Anton S. Kurtz, the Radiation Safety Officer, will be authorized to train new employees to be either Radiographer's Assistants or Radiographers.

B. TRAINING OF PERSONS TO BE RADIOGRAPHER'S ASSISTANTS. Trainees will undergo the following training to become Radiographer's Assistants:

i. Initial Classroom Instruction. A minimum of 12 hours of formal classroom instruction, to be divided as below:

- * 1 hour - responsibilities, duties, limitations
- * 2 hours - introduction to basic principles of radiation safety
- * 1 hour - introduction to use of personnel monitoring equipment
- * 8 hours - the nature and importance of Operating & Emergency Procedures; introduction to Federal Regulations applicable to industrial radiography with sealed sources.

ii. On-the-Job Training. Trainees must witness the using of radiographic devices, survey meters, and related equipment for at least 1 week.

iii. Written Examination. In order to qualify as a Radiographer's Assistant, the individual must be given a written examination by Mr. Kurtz. This exam will concentrate on the content of classroom instruction and the extreme

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~~14-Winding Road~~ ☐ ~~10000-14-08239~~ ☐ 283-3264

ADMINISTRATIVE MANUAL

8. TRAINING PROGRAM (con't.)

B. importance of adhering strictly to the Operating & Emergency Procedures. There will be at least 25 questions, selected from the 100 questions attached to this training program by Mr. Kurtz as being appropriate for the Assistant Radiographer. A passing grade will be 75%. Any incorrect responses will be reviewed by Mr. Kurtz to be sure the Trainee fully understands the correct answers.

C. TRAINING OF RADIOGRAPHER'S ASSISTANTS TO BE RADIOGRAPHERS

Upon the successful completion of the above, the Assistant can train to become a Radiographer. This training will consist of the following:

i. Classroom Instruction. Prospective Radiographers must have a minimum of forty hours of classroom training composed of the following:

- * Principles of Radiation Safety
 Matter, atomic theory, isotopes
 Characteristics of gamma radiation
 Biological effects of gamma radiation; instructions on risks from occupational radiation exposure; case histories
 Units of measurement for radiation activity
 Control of radiation exposure - time/distance, shielding, inverse square law
 Significance of film badge reports, pocket dosimeter readings, survey instrument readings
- * Operating & Emergency Procedures-NRC Regulations
 Duties & responsibilities of Radiographer
 Radiation survey instruments - operating instructions; calibration requirements; survey techniques
 Use of personnel monitoring equipment
 Selecting sites for radiography & posting them
 Operating procedures for exposure devices
 Operating procedures for source changers
 Transportation procedures
 Storage & security procedures
 Leak testing procedures
 Internal inspection procedures
 Daily/quarterly maintenance procedures

/con't.

Advanced Radiation Service1 ~~XXXXXXXXXX~~ 283-3264ADMINISTRATIVE MANUAL8. TRAINING PROGRAM (con't.)C. i. Classroom Instruction (con't.)

- * Recordkeeping
Emergency Procedures - accidents involving sources or devices; exposure of unmonitored personnel; loss or theft of source; vehicular accidents

ii. On-the-Job Training. Prospective Radiographers must watch the operation of radiographic exposure devices and related equipment by Mr. Kurtz or a qualified Radiographer and then operate this equipment under their direct supervision. He must demonstrate proficiency in the following radiographic operations:

- * Radiation surveys and posting sites
- * Radiographic exposures-proper attachment of cables, proper use of plugs, locking devices and collimators
- * Use of personnel monitoring equipment
- * Leak testing and taking of swab samples.

The minimum time for this on-the-job training is three months. Mr. Kurtz should observe at least 20 separate radiographic operations performed by the Assistant Radiographer and he, in turn, should observe at least 40 radiographer operations performed by qualified radiographers.

iii. Written Examination and Practical Examination. After completing the above, the Assistant Radiographer is given a two-part examination as follows:

- * Practical. He will be directed to perform selected radiographic operations under the constant supervision of the Radiation Safety Officer.
- * Written. The written exam will consist of at least 50 questions selected from the attached list as being appropriate for the Radiographer's exam. The passing grade will be 80%. Emphasis will be on the importance of safety aspects. The R.S.O. will have the discretion of deciding whether certain key areas or questions must be answered correctly in order to pass the exam, regardless of whether the score is 80% or higher. All incorrect responses will be reviewed to be certain the candidate understands the correct answers.

/con't.

Advanced Radiation Service~~XXXXXXXXXX~~ ☐ ~~XXXXXXXXXX~~ ☐ 283-3264ADMINISTRATIVE MANUAL8. TRAINING PROGRAM (con't.)C. iv. Procedures for Testing New Employees at Advanced Radiation Service.

Mr. Kurtz will take the following measures before assigning new employees to radiographic operations:

- * Record work experience and substantiate by phone calls, certificates, etc.
- * Train them in the specific Operating & Emergency Procedures in effect at Advanced Radiation Service, as well as specific training in the equipment used there, such as exposure devices, survey instruments, source changers, etc.
- * A written and practical exam will be given to determine whether the employee is to be qualified as an Assistant Radiographer or Radiographer. The R.S.O. will determine the scope and extent of training that is needed for each new employee.

D. PERIODIC "UPDATING" TRAINING. Periodic training will be given to radiographic personnel every 12 months or sooner when any of the following occur:

- * Revisions of the Operating & Emergency Procedures at Advanced Radiation Service
- * Amendments to NRC Commission Regulations
- * Changes or additions to radiographic equipment or survey instruments or the instructions for using same.
- * Any other type of change which might result in accidental excessive exposure to any individual.

This training will be conducted by Mr. Kurtz to assure continued knowledge and proficiency in all areas of isotope radiography. This training will be followed by a written and oral quiz administered by Mr. Kurtz and created by him. Any incidents posing actual or threatened dangers that occur during this updating training must be discussed to help prevent their reoccurrence.

Advanced Radiation Service~~CONFIDENTIAL~~ ☐ ~~SECRET~~ ☐ 283-3264ADMINISTRATIVE MANUAL8E. SAMPLE QUESTIONS AND EXPECTED ANSWERS FOR TEST
TO BE RADIOGRAPHER/ ASSISTANT RADIOGRAPHER

1. What is the correct way to survey the projector after an exposure?
E.A. Approach projector observing the survey meter and extend instrument into the area which would represent the collimated radiation field.
2. Describe procedure to follow if source does not return into the "safe position".
E.A. Do not try to force return. Have someone notify the Radiation Safety Officer. Keep area under your personal surveillance and do not attempt to make any repairs yourself.
3. What safety equipment must each radiographer have in his possession before making an exposure?
E.A. Survey meter, pocket dosimeter, film badge
4. What do you do if your dosimeter goes off scale?
E.A. Discontinue all radiographic operations and notify the Radiation Safety Officer.
5. When is complete maintenance on your equipment required?
E.A. Every 3 months or earlier if operating difficulties are encountered.
6. What is your procedure if the survey meter does not operate properly?
E.A. Stop all efforts to proceed with exposures. Return instrument immediately to the Radiation Safety Officer. Take another instrument in good working condition with a valid calibration sticker and continue.
7. What is required to be posted during radiographic operations?
E.A. "High Radiation" warning signs for an area of 100 mr/hr or higher; "Caution, Radiation Area" signs for boundary of 2 mr/hr. The Radiation Area must be roped off and under constant surveillance by the Radiographer.
8. What do you record in your daily log?
E.A. All exposures and the time and length of each; survey meter reading before and after exposures; dosimeter readings.
9. What level of radiation is allowable at the perimeter of your exposure?
E.A. 2 mr/hr.
10. In case of an accident, whom do you notify?
E.A. Radiation Safety Officer

/con't.

ADMINISTRATIVE MANUAL8E. SAMPLE QUESTIONS AND EXPECTED ANSWERS

11. What are the maximum limits definint an unrestricted area?
E.A. Radiation levels below 2 mr/hr.
12. What levels of radiation constitute the following:
(a) Radiation area? (b) High Radiation area? (c) Restricted Area?
E.A. (a) Over 5 mr/hr (b) Over 100 mr/hr (c) Over 2 mr/hr
13. With the source in the enclosed position, what is the maximum level of radiation allowable from your equipment?
E.A. Iridium - less than 50 mr/hr at 6" distance from any exterior surface.
14. What storage precautions shall be taken with a locked exposure device?
E.A. The exposure device must be in a locked vault or cage and there must be signs posted reading "Caution-Radiation Area". The radiation level outside the cage must not exceed 1 mr/hr.
15. What requirements must be met before the licensee can permit anyone to act as a radiographer?
E.A. Theoretical and on-the-job training; proof that he(she) has a thorough knowledge of all safety aspects.
16. Why are calculated radiation shielding values not always in agreement with measured values?
E.A. Due to the presence of secondary radiation.
17. Under normal circumstances, do radioisotopes induce any radioactivity?
E.A. No.
18. Can a body exposure of 2 mr/hr continuously be considered safe?
E.A. No, becuae radiation in excess of natural background radiation can never be considered safe.
19. Does maximum permissible dose include medical exposures?
E.A. No.
20. May the walls of a thick steel tank be considered part of the necessary shielding?
E.A. Yes
21. Are calculated distances from a source considered completely accurate or must a radiation survey be performed before entering the area?
E.A. Yes, a survey meter must be used because of the presence of scatter and secondary radiation.

/con't.

ADMINISTRATIVE MANUAL8E. SAMPLE QUESTIONS AND EXPECTED ANSWERS

22. Give the explanation for rem and rad. Can these values be considered equivalent to roentgen?
E.A. A rem is equivalent to Roentgen Equivalent Man.
A rad is a unit meaning Roentgen Absorbed Dose.
For our purposes, they are equivalent to 1 Roentgen.
23. What is the reduction of radiation intensity if the distance from the source is doubled?
E.A. 1/4
24. Why do film badge exposure data have to be kept on file at all times?
E.A. An impartial report of accumulative radiation protection information must be kept for all employees over their lifetime. A yearly report to the USNRC is required.
25. Should film badge reports and pocket dosimeter log readings always correspond closely?
E.A. Yes, within 30%.
26. If you have qualified as a radiographer by the USNRC to work for one company, can you quit and legally operate a radioisotope projector for another company?
E.A. No, a letter to the NRC is required by the new employer, stating that the new employee has been trained and tested by the new employer per his license.
28. Which records must be maintained by the Radiographer?
E.A. The Log Book for daily dosimeter readings and daily utilization of projectors; the Monthly Inventory of Sources and Projectors; Survey Meter Calibration Log; Leak Test Reports.
29. What duties are performed by the Radiation Safety Officer and/or the Chief Radiographer?
E.A. Supervision of Radiographer's performance by personal inspection on the job site.
Inspection of equipment, dosimeters, survey meters, control of record keeping, film badge reports, and inventory.
Personnel instruction and training; updating training also.
Instituting changes required by potential safety hazards.
Communication with top management and the NRC and other legal authorities.
30. What are the radiation exposure limits to personnel in a restricted area?
E.A. 1.25 rem/quarter year to the whole body, head, trunk, active blood forming organs; lens of eyes; gonads. A person may receive up to 3 rem/quarter year provided his accumulated occupational exposure does not exceed 5 (N-18) rem where N is his age in years.

/con't.

ADMINISTRATIVE MANUAL8E. SAMPLE QUESTIONS AND EXPECTED ANSWERS

30. 18.75 rem/quarter year to the feet, ankles, forearms, hands.
con't. 7.7 rem/quarter year to the skin of the whole body.
31. A "Caution, High Radiation Area" sign indicates what radiation level?
E.A. An area of 100 mr/hr.
32. The NRC must be notified at which occasions and how soon?
E.A. Loss or theft of radioactive material
Exposure of personnel to:
5 rem whole body dose
30 rem skin dose
75 rem extremities

The above within 24 hours

Exposure to personnel in excess of:
25 rem whole body
150 rem skin dose
375 rem extremities

The above immediately
33. Which of the following isotopes has the longest half-life?
(a) Thulium 170; (b) Cobalt 60; (c) Iridium 192; (d) Cesium 137?
E.A. (d) Cesium 137
34. 1 rem = how many millirems
E.A. 1,000
35. Six inches of high density concrete offer twice the protection against Iridium 192 as which of the following:
(1) About 3"
(2) About 4"
(3) About 5"
E.A. (3) About 5"
36. Explain the inverse square law.
E.A. $I_a = \frac{D_b^2}{D_a^2}$ I_a = Intensity at distance D_a
 I_b D_b^2 I_b = Intensity at distance D_b

Explana: If the distance is tripled, the radiation should be 1/9, but due to scatter, the radiation level may be much higher when measured with a survey meter. Therefore, never enter a radiation area without first using a calibrated survey meter.
37. Two inches of lead offer twice the protection as one inch of lead for Cobalt 60. Why? True or False?
E.A. False; the half value layer is .5" of lead.

/con't.

ADMINISTRATIVE MANUAL8E. SAMPLE QUESTIONS AND EXPECTED ANSWERS

38. Three feet of concrete ordinarily will provide sufficient shielding for: 10 curie Cobalt 60; 100 curie Cobalt 60; 1000 curie Cobalt 60.
E.A. 1000 Cobalt 60
39. A bag of sand (18" diameter) will reduce Co^{60} radiation intensity by a factor of 1/3; 1/7; 1/13; 1/26
E.A. 1/13
40. A Radiographer working in a radiation area with a dose rate of 32 mr/hr. To reduce the dose rate to 2 mr/hr, he will have to increase his source distance by: 2 times; 3 times; 4 times; 8 times; 16 times.
E.A. 4 times
41. The radiation from 1 curie of Co^{60} is attenuated in air to approximately 5 mr/hr at a distance of: 30 feet, 50 feet, 100 ft.
E.A. 30 feet
42. The radiation from 10 curie of Co^{60} is attenuated in air to approximately 5 mr/hr at: 50 feet; 120 feet; 160 feet.
E.A. 120 feet
43. The calculated exposure rate at any distance is always equal to the measured rate, assuming all calculations and meter readings are correct. Is this true or false?
E.A. False
44. The walls of a steel tank may be considered part of the shielding in a panoramic exposure. Is this true or false?
E.A. True
45. One type of survey meter uses:
1) Ytterbium
2) Radium
3) Voltmeter
4) Ionization Chamber
E.A. 4) Ionization Chamber
46. Geiger counters respond to different energies of radiation:
1) In a fairly linear manner except where radiation is too weak to penetrate the probe.
2) In a manner similar to film.
3) In a manner proportional to the energy.
E.A. 2)

/con't.

ADMINISTRATIVE MANUAL8E. SAMPLE QUESTIONS & EXPECTED ANSWERS

47. A Geiger counter type instrument has often a metal cover over the probe. When the probe cover is removed, the instrument will measure:
- 1) Gamma radiation only
 - 2) Gamma plus x-radiation
 - 3) Gamma plus x-radiation plus beta radiation
 - 4) Beta radiation only
 - 5) Beta plus neutron radiation
- E.A. (3)
48. You can calibrate your survey meters:
- 1) If you use a NBS radium source
 - 2) If your procedure is approved by the NRC and part of your license
 - 3) Provided you have passed a level III examination by the ASNT
- E.A. (2)
49. In a field setup one must first calculate the radiation intensity at various distances and then check with a survey meter. The calculations and the meter readings must check exactly if everything is in working order. Is this true or false?
- E.A. False
50. In almost all types of remote operated equipment such as Tech Ops, various warning systems indicate the position of the source. The use of a survey instrument then becomes only an NRC requirement. Is this true or false?
- E.A. False.
51. Radiation intensity should be determined before approaching any radioisotope whether it is known the source is in the safe position or not. Is this true or false?
- E.A. True.
52. The film badge is usually used to measure the cumulative personal exposure to radiation. Is this true or false?
- E.A. True.
53. Film badge exposure data need be kept on file only if the MPD has been exceeded. Is this true or false?
- E.A. False
54. When you receive a report from the badge service that you received 500 mr for a period of 2 weeks, you should:
- 1) Inform the NRC
 - 2) Call a doctor immediately. This is LD/50.
 - 3) Check with your daily dosimeter records to eliminate mistakes.
 - 4) See that you do not exceed 1250 mr in the calendar quarter. Investigate your exposure procedures.
- E.A. (4)

/con't.

ADMINISTRATIVE MANUAL

8E. SAMPLE QUESTIONS AND EXPECTED ANSWERS

55. Pocket dosimeter and film badge readings should check closely. Is this true or false?
E.A. True
56. A sudden large increase in your pocket dosimeter reading can be disregarded if everything is known to be safe. True or false?
E.A. False
57. It has been a hot rainy day. Your pocket dosimeter reading goes off scale. You should:
1) Disregard it.
2) Get a blood test.
3) Send your film badge in for emergency reading.
E.A. (3)
58. Dosimeters record radiation in about the same proportion that the body is damaged. Is this true or false?
E.A. True
59. In the Tech Ops equipment, when the source becomes stuck, you should:
1) Call the NRC
2) Rope off the area.
3) Follow the emergency procedures of your license.
E.A. (3)
60. It is good procedure to leave your Tech Ops equipment unlocked, providing you are right there all the time such as when making exposures; changing film and so forth, in the normal course of radiographic work. Is this true or false?
E.A. False.
61. The primary purpose of collimation is to get better radiographic results. Is this true or false?
E.A. False.
62. Tech Ops equipment sources are interchangeable. You can put Iridium 192 in your Cobalt 60 equipment and vice versa. True or False?
E.A. False
63. It is all right to use your Tech Ops equipment even if the guide tube has become a little damaged, because it is a sturdy piece of equipment. Is this true or false?
E.A. False

/con't.

ADMINISTRATIVE MANUAL8E. SAMPLE QUESTIONS AND EXPECTED ANSWERS

64. If you are going to store your isotopes over the winter, you should:
- 1) Put them in a bank vault.
 - 2) Lock them in a storage room.
 - 3) Take your best possible precautions against fire, theft and tampering.
- E.A. (3)
65. The average weekly dose of 100 mr can be exceeded provided no more than 3 rems are received in any calendar quarter and 5R (age-18) is not exceeded but backed up by authenticated records. Is this true or false?
- E.A. True.
66. Most of the states in the United States have radiation control regulations which include all types of ionizing radiations. Is this true or false?
- E.A. True.
67. Radiation levels less than 2 mr/hr may be designated as a:
- 1) High Radiation Area
 - 2) Radiation Area
 - 3) Restricted Area
 - 4) Unrestricted Area
- E.A. (4)
68. The radiographer must determine, rope off, and post, the High Radiation Area in field radiography. True or False?
- E.A. True
69. The radiographer does not have to be concerned about the area beyond (less than 5 mr) the radiation area. True or False?
- E.A. False
70. It is necessary during each radiographic operation in field work to maintain direct surveillance of the operation in addition to roping off the radiation area and posting signs. True or False?
- E.A. True.
71. You can make anybody your radiographer's assistant providing you give him a film badge and dosimeter. True or False?
- E.A. False.
72. You are a radiographer qualified by the NRC to handle isotopes for your company. You quit and work for another company. You are still qualified by the NRC. True or False?
- E.A. False.

/con't.

ADMINISTRATIVE MANUAL8E. SAMPLE QUESTIONS AND EXPECTED ANSWERS

73. If your survey meter fails, you must discontinue your radiographic operations. True or False?
E.A. True.
74. You must notify the NRC within 24 hours upon whole body exposure to: 1) LD/50
2) 25 rems
3) 5 rems
4) Anything over 300 mr
E.A. (3)
75. You must notify the NRC immediately upon theft or loss of your source. True or False?
E.A. True
76. You have thirty days in which to report to the NRC:
1) An exposure of over 300 mr in one week.
2) The loss of one day or more in operation
3) Exceeding the exposure limit of the license provisions.
E.A. (3)
77. The employer is not required to report your film badge readings to you on request. True or False?
E.A. False
78. A radiographer, according to the NRC, is any individual who:
1) Supervises the radiographic operations personally.
2) Is in continuous attendance at the radiographic site.
3) Uses the radiographic exposure device.
4) Makes the surveys.
E.A. (1)
79. A radiographer's assistant:
1) Must have formal training in safety.
2) Must have on-the-job training.
3) Must understand and comply with the operating & emergency procedures.
4) Must stand guard.
E.A. (3)
80. Pocket dosimeters shall be capable of measuring a 50% LD. Is this true or False?
E.A. False
81. Wipe tests are necessary on sealed sources because of the induced radiation from gamma rays. True or False?
E.A. False

/con't.

ADMINISTRATIVE MANUAL8E. SAMPLE QUESTIONS AND EXPECTED ANSWERS

82. Leak tests must be performed:
1) With a Geiger counter on wipes.
2) Every three months.
3) Every six months.
E.A. (3)
83. It is necessary to keep a daily log in which is described each and every exposure made and all the safety precautions used.
True or False?
E.A. False
84. When you apply for the first time for your license, you must fill out form 313, submit operating and emergency procedures and otherwise comply with all provisions of part 30 of the NRC License Regulations. True or False?
E.A. True
85. An escort is required with off plant transportation of your source. True or False?
E.A. False
86. An accident involving a truck carrying a radiographic source would not cause a radiation hazard unless the source became separated from its shielding. True or False?
E.A. True
87. Records of each physical radiation survey shall be kept. True or False?
E.A. False.
88. The NRC may, upon its own initiative, change or impose additional requirements as it sees fit. True or False?
E.A. True
89. It is not necessary for everyone to wear film badges and dosimeters in a Restricted Area. True or False?
E.A. False.
90. "Management" will determine when the radiographer may safely work in a Radiation Area. True or False?
E.A. False
91. Lack of film badges, survey meters or dosimeters does not necessarily mean no radiographic exposures can be made if all the other equipment is working. True or False?
E.A. False.

/con't.

ADMINISTRATIVE MANUAL8E. SAMPLE QUESTIONS AND EXPECTED ANSWERS

92. It is the radiographer who is solely responsible for the safety and compliance with NRC regulations and who may be guilty of a crime if an accident occurs. True or False?
E.A. False
93. Pre-accident planning in radiation safety programs should be based primarily on analysis of past accident data. True or False?
E.A. False
94. The operating & emergency procedures must be posted in every radiation area. True or False?
E.A. False
95. A complete analysis of the radiation hazard and proposed means of overcoming it should be submitted to the NRC with Form 313. True or False?
E.A. True
96. The following is required to be posted in or near a radiographic laboratory:
1) Danger-Warning signs.
2) Form NRC 3.
3) Form NRC U235
4) Form 313A

E.A. (2)
97. The posting of radiation warning signs helps prevent people from violating the restricted zones. True or False?
E.A. True
98. When traveling with an NRC licensed gamma source to perform radiography in another state, is it necessary to inform the other state's authorities? Yes or No.
E.A. Yes.
99. Must the transport vehicle be placarded when transporting a source in a type B container? Yes or No.
E.A. No.
100. What is the subject matter of 10 CFR, Parts 19, 20, 21, 30, 34, 40 and 71?
E.A. Part 19 - notices, instructions and reports to workers; posting and access to above information.
Part 20 - standards for Radiation Protection
Part 21 - regulations for implementing section 206 of the Energy Reorganization Act of 1974 on reporting defects and non-compliance.

/con't.

ADMINISTRATIVE MANUAL

8E. SAMPLE QUESTIONS AND EXPECTED ANSWERS

100 (con't.)

- E.A. Part 30 - Licensing rules
Part 34 - Licenses for radiography and radiation safety requirements
Part 40 - Domestic Licensing of Source Material
Part 71 - Shipment and packaging of radioactive materials

Advanced Radiation Service1 ~~XXXXXXXXXX~~ ☐ ~~XXXXXXXXXX~~ ☐ 283-3264ADMINISTRATIVE MANUAL9. DESCRIPTION OF INTERNAL INSPECTION SYSTEM (Part 6-g)A. Nature and Frequency of Internal Inspections.

The Radiation Safety Officer will conduct announced as well as unannounced on-the-job inspections at intervals not to exceed three months. The R.S.O. will also inspect Advanced Radiation Service's log books and observe the performance of key personnel on a monthly basis.

The R.S.O. will make a written report of his findings from both announced and unannounced inspections. This report will include the following:

- a) The condition of all radiation equipment and survey instruments
- b) Safe handling of the equipment by radiographer.
- c) Personnel monitoring devices - are the proper personnel wearing them and are these devices in proper working order?
- d) All relevant logbooks and records pertaining to the shipping and receiving of sources; utilization logs; quarterly inventory records; personnel monitoring results and survey records.
- e) Inventory at the time of each inspection.

B. Procedures for Reporting Deficiencies

The results of the monthly and quarterly inspections at A.R.S. will be recorded in the log book as well as the report described in A. above. Deficiencies noted during the inspections shall be corrected immediately under the direct supervision of Mr. Kurtz. Additional training sessions will be held by Mr. Kurtz if deemed necessary. Followup unannounced inspections may be made at Mr. Kurtz's discretion to determine that all problems or potential problems have been eliminated.

C. Records to be Maintained by Radiographer.

As part of the Internal Inspection System at A.R.S., the following records must be maintained by the R.S.O. and/or Radiographer and reviewed periodically.

- a) Survey Meters used on each job - model and serial number.
- b) Results of all Surveys - done at the beginning and end of all exposures, including the nature, location and time of the survey.

ADMINISTRATIVE MANUAL

9. INTERNAL INSPECTION SYSTEM (con't.)

C. Records to be Maintained by Radiographer (con't.)

- c) Utilization Log - Information recorded daily in this log should include the date, location, number of exposures, time for each exposure, type and serial number of the source used.
- d) Source Activity - this is calculated from the age of source since the source was received at Advanced Radiation.
- e) Calibration Records - must be kept for all survey meters and dosimeters.
- f) Daily dosimeter readings - at beginning and end of radiographic operations.
- g) Daily Equipment Checks - noting any replacements or repairs (a form such as example is used).
- h) Quarterly Inspection and Maintenance - this should include the dates of the inspections, results, individuals involved in the inspection.

See pages 30-37 for sample forms used by Advanced Radiation Service.

Ultimate responsibility for the Advanced Radiation Service internal inspection system rests with Mr. Anton S. Kurtz, Radiation Safety Officer and Manager of Operations, as well as President and Chief Radiographer.

See the following attachments in support of Mr. Kurtz's qualifications.

Advanced Radiation Service~~1-11-64~~ ☐ ~~1-11-64~~ ☐ 283-3264ADMINISTRATION MANUAL10. OVERALL ORGANIZATIONAL STRUCTURE
(Part 6-h of 313R)

The Radiography Programs, Training and Radiation Safety Programs are under the direction of Mr. Anton S. Kurtz, President and Manager of Operations at Advanced Radiation Service.

The Radiographer is Gerald Muchanic, Sr. A description of their experience and qualifications can be found on pages 44-46 of the Operating & Emergency Procedures in the Recordkeeping Section.

Advanced Radiation Service~~Revised~~ ☐ ~~Revised~~ ☐ 283-3264ADMINISTRATIVE MANUAL11. LEAK TESTING PROCEDURES (6i)

Advanced Radiation Service will use Technical Operations Leak Testing Kit Model 518 for its leak testing procedures. Mr. Kurtz shall take a wipe test of the exposure devices every six months and send it to Technical Operations in Burlington, Massachusetts for the assay. The results will then be sent to Advanced Radiation Service where they will be kept on file in the office, along with Advanced Radiation Service's own Leak Test records.

Instructions for using Leak Test Kit Model 518 are as follows:

This kit is designed for use on Technical Operations Gamma Ray Projectors. It provides a convenient and safe method of performing leak tests of radiographic sources in accordance with NRC regulations, which require such tests at intervals of not more than six months.

CONTENTS

Flexible swab holder with swab
Vial of EDTA solution
Plastic Envelope
Mailing Box
Identification Sheet (sample attached)

Procedures

1. Be sure source is fully retracted into projector. Use a survey meter to be sure that radiation levels are at or below normal.
2. Wet the swab with EDTA solution. Shake off excess and insert the swab into the hole in the shield. Wipe the beam port thoroughly with swab in the holder.
3. Withdraw swab and place in plastic envelope.

...continued....

ADMINISTRATIVE MANUAL11. LEAK TESTING PROCEDURES (con't.)

4. The swab should now be monitored by turning the survey meter to its most sensitive range. Place the meter in a low background area and move the swab in its plastic envelope to the meter, not the meter to the swab.

5. If there is no indication on the meter, or if the indication is no more than 0.2 MR per hour above background, put the plastic envelope with the swab in the mailing box and mail to Technical Operations, Inc., Burlington, Mass. Be sure to fill out and return the identification sheet.

6. If the swab should show more than 0.2 MR per hour, do not mail. Mr. Kurtz will contact Technical Operations for specific instructions.

NOTE: If the survey meter available does not have the capability of detecting as little as 0.2 MR per hour, ship the wipe-test swab to Technical Operations via express. Do not ship if the radiation from the swab exceeds 2 MR per hour and contact Technical Operations for specific instructions. The wipe-test swab will be subjected to a precise radio assay when received by Technical Operations, and a leak test certificate will be mailed back to Advanced Radiation promptly. The NRC requires that this certificate be kept with your records and that it be available for inspection.

If the device is returned for a source change or for other reasons within six months, the test will be performed by Technical Operations.

6 I LEAK TESTING PROCEDURES (cont.)

LEAK TEST

FIRM NAME _____

ADDRESS _____

PURCHASE ORDER NO. _____ NRC LIC. NO. _____

Tech/Ops Gamma Ray Projector

MODEL NO. _____ SERIAL NO. _____

SOURCE MODEL NO. _____ SERIAL NO. _____

CURIES _____

Isotope Cobalt 60 _____

(Check Which) IR 192 _____

Tm 170 _____

Other _____ / _____

DATE _____ BY _____

RETAIN THIS PORTION FOR YOUR RECORDS

LEAK TEST

IDENTIFICATION SHEET

FIRM NAME _____

ADDRESS _____

PURCHASE ORDER NO. _____ NRC LIC. NO. _____

Tech/Ops Gamma Ray Projector

MODEL NO. _____ SERIAL NO. _____

SOURCE MODEL NO. _____ SERIAL NO. _____

CURIES _____

Isotope Cobalt 60, _____

(Check Which) IR 192 _____

Tm 170 _____

Other _____

DATE _____ BY _____

PLEASE FILL OUT AND RETURN THIS SHEET
TO TECH/OPS WITH TEST KIT FOR RADIO ASSAY

RADIOASSAY, MICROCURIES _____

TECHNICAL OPERATIONS

INCORPORATED

BURLINGTON MASSACHUSETTS · TELEPHONE 272-2000
RADIATION PRODUCTS DIVISION

Gentlemen:

Our records indicate that we performed a radio-assay of your leak test about five months ago.

Since the N.R.C. requires that leak tests be performed at six month intervals, another leak test kit is enclosed for your use.

Sincerely,

TECHNICAL OPERATIONS, INC.



N O T I C E

"Use of this Model 518 Leak Test Kit requires specific Nuclear Regulatory Comm. authorization. If your license does not have specific authorization you should submit an application for authorization. See Paragraph 6 of Section 30.24(g) of 10 CFR.

Use of this kit without specific authorization constitutes a violation of Nuclear Regulatory Commission regulations."

TECHNICAL OPERATIONS, INC.
BURLINGTON, MASSACHUSETTS

10-30-80

271 Plainfield Road
Edison, N.J. 08820

ADMINISTRATIVE MANUAL

UTILIZATION LOG

RADIOGRAPHER

[illegible]

SIGNATURE _____

TO BE SENT IN WITH
WEEKLY REPORTS.

TOTAL

Advanced Radiation Service

☐ 283-3264

ADMINISTRATIVE MANUAL
RADIOGRAPHIC DEVICE - DAILY MAINTENANCE & INSPECTION REPORT

EXPOSURE DEVICE S/N _____ CRANK S/N _____

ISOTOPE S/N _____ ISOTOPE ACTIVITY(Curies) _____

ISOTOPE TYPE _____

DATE _____ INSPECTED BY _____

INSPECTION	COMMENTS
1) Changes in operating characteristics of the device	
2) Proper operation of crank mechanism	
3) Proper operation of source position indicator	
4) Proper operation of locking mechanism	
5) Source and drive cable and guide tube damage	
6) Connector wear or damage of all mating components	
7) Rust, dirt or sludge build-up in the source guide tubes	
8) Shifting of shield and/or source in exposure device housing	
9) Cable drive gearbox damage or wear	
10) Proper labeling	
11) Miscellaneous (loose screws, safety caps, etc.)	

Any damage to the radiographic device which may impair its safe operation will be reported immediately to the Radiation Safety Officer.

ADVANCED RADIATION SERVICE

Periodic Inspection and Maintenance

Administrative Manual

Date Inspected _____ Next Inspection Due _____

Manufacturer _____ Model No. _____ Serial No. _____

Type of Isotope _____ Source S/N _____ Curie Strength _____

CHECK EACH ITEM BELOW

ITEM	ACCEPTABLE	CORRECTIVE ACTION TAKEN
<u>PROJECTOR</u>		
Safety Caps _____		
Lock Box _____		
Lock _____		
Handle _____		
Labels _____		
'S' Tube _____		
Outlet Nipple or Threads _____		
<u>SOURCE CONNECTOR</u>		
Snug Fit _____		
Straightness _____		
Excessive Wear _____		
<u>SOURCE POSITIONER</u>		
Handle _____		
Drive Gear _____		
Shaft Bushings _____		
Gear Box _____		
Screws _____		
Conduit Connections _____		
Cable Flexibility _____		
Straightness _____		
<u>SOURCE TUBE</u>		
Physical Damage _____		
End Cap _____		
Foreign Material _____		
Connections _____		
Kinks or Crimps _____		

 REMARKS _____

EXPOSURE DEVICE INSPECTED AND REPAIRED AS NOTED AND IS ACCEPTABLE FOR USE

Inspected By _____

Advanced Radiation Service

RADIATION SAFETY INTERNAL INSPECTION REPORT FOR _____ DIVISION

NOTE: This form is not to be filed before approvals from Division and Corporate

Division approval: _____

Corporate approval: _____

Date of Inspection: _____ By _____ Location _____

Radiographer _____ Dosimeter No. _____ Film Badge No. _____

Assistant _____ Dosimeter No. _____ Film Badge No. _____

Assistant _____ Dosimeter No. _____ Film Badge No. _____

Isotope _____ Source No. _____ Curies _____ Camera Model _____ Ser. No. _____

Survey Meter Model _____ Serial No. _____ Void Date _____

1. Is area restricted in accordance with (A.R.S.) (D&E) _____

2. Radiation Levels—At Controls _____ At Restricted Area _____

3. Exposure minutes for this date at time of inspection _____

4. Is continuous surveillance maintained of the restricted area? _____

5. Date of latest radiation report in Radiographer's book _____

6. Date last radiation reports mailed to Division Office _____

7. Dosimeter readings at time of inspection for Radiographer _____ Ass't _____ Ass't _____

8. Are dosimeter readings being logged? _____ Available at jobsite _____

9. Proper Labels—On Truck _____ On Storage Compartment _____

10. Is equipment operating properly? _____

11. Is lock on storage compartment and operating properly? _____

12. Does Radiographer have the following documents on the Unit? O & E _____ AEC License _____

Parts 19 and 30 _____

Parts 20 and 34 _____ AEC-3 _____ State License _____

13. Overnight security of source Good _____ Negligent _____ Corrected _____

Corrective action taken _____

R.S.O. signature: _____

Radiographer signature: _____

CORPORATE COPY

DOSIMETER CALIBRATION:

10 CFR 34.33(c)

DOSIMETER CALIBRATOR: MODEL 3060

RADIOISOTOPE: CESIUM 137

SERIAL No. 267

MFG: _____ CALIBRATION DATE: _____

MODEL No. _____ SCALE: 0 TO 200 MR.

SERIAL NO. _____ SCALE: 0 TO 500 MR

SIX (6) HOUR EXPOSURE: _____ ± _____

TWENTY-FOUR (24) HOUR EXPOSURE \pm

NEXT CALIBRATION DUE: _____

CALIBRATED BY: _____ R.P.O.

RADIOGRAPHER OR ASSISTANT: _____

ADMINISTRATIVE MANUALSOURCE CHANGER SURVEY REPORT

Date Ordered _____

By _____

Date Received _____

By _____

Source
changer Model _____ S/N. _____Source
S/N. _____Type
Source Model _____ S/N. _____

Curies _____

RADIATION SURVEY METER DATASurvey
Meter Model _____Survey
Meter S/N. _____

Date Calibrated _____ By _____

Due Date _____

Projector Model _____

Projector S/N. _____

Note: Technician must follow Operating Instructions Provided
by shipper.RADIATION LEVELS AT THE FOLLOWING AREAS

- 1). Contact of changer. _____ New Source.
- 2). At 1 Meter. _____ New Source.
- 3). Source Guide Tube. _____
- 4). Contact of changer. _____ Old Source.
- 5). At 1 Meter. _____ Old Source.
- 6). Source Guide Tube. _____

Carrier: Company Name _____

Carrier: Company Location _____

Technician Conducting Operation & Survey.

Name _____ Level _____ Date: _____

Advanced Radiation Service

271 PLAINFIELD ROAD

EDISON, NEW JERSEY 08820

ADMINISTRATIVE MANUALMETER CALIBRATION CERTIFICATE

CUSTOMER _____

ADDRESS _____

TELEPHONE NO. _____ CALIBRATION DATE _____

MODEL NO. _____ SERIAL NO. _____

	<u>TRUE FIELD</u>	<u>RESPONSE</u>	<u>% ERROR</u>
RANGE X1	2.0 mr/hr	_____	_____
	8.5 mr/hr	_____	_____
RANGE X10	20.0 mr/hr	_____	_____
	80.0 mr/hr	_____	_____
RANGE X100	200.0 mr/hr	_____	_____
	850.0 mr/hr	_____	_____

The above instrument was calibrated with a Cesium 137 source. NRC regulations require that it be recalibrated within three months.

By _____

1-800-451-1234 ☐ 1-800-451-1234 ☐ 283-3264

INVENTORY/SOURCE RECORD SHEET

[illegible]

**PART 19—NOTICES, INSTRUCTIONS
AND REPORTS TO WORKERS; IN-
SPECTIONS****Sec.**

- 19.1 Purpose.
- 19.2 Scope.
- 19.3 Definitions.
- 19.4 Interpretations.
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- 19.11 Posting of notices to workers.
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Sec.

- 19.15 Consultation with workers during inspections.
- 19.16 Requests by workers for inspections.
- 19.17 Inspections not warranted; informal review.
- 19.30 Violations.
- 19.31 Application for exemptions.
- 19.32 Discrimination prohibited.

AUTHORITY: Secs. 53, 63, 81, 103, 104, 161, Pub. L. 83-703, 68 Stat. 930, 933, 935, 936, 937, 948, as amended (42 U.S.C. 2073, 2093, 2111, 2133, 2134, 2201); sec. 401, Pub. L. 93-438, 88 Stat. 1254 (42 U.S.C. 5891), unless otherwise noted.

SOURCE: 38 FR 22217, Aug. 17, 1973, unless otherwise noted.

§ 19.1 Purpose.

The regulations in this part establish requirements for notices, instructions, and reports by licensees to individuals participating in licensed activities, and options available to such individuals in connection with Commission inspections of licensees to ascertain compliance with the provisions of the Atomic Energy Act of 1954, as amended, Title II of the Energy Reorganization Act of 1974, and regulations, orders, and licenses thereunder regarding radiological working conditions.

[40 FR 8783, Mar. 3, 1975]

§ 19.2 Scope.

The regulations in this part apply to all persons who receive, possess, use, or transfer material licensed by the Nuclear Regulatory Commission pursuant to the regulations in Parts 30 through 35, 40, or 70 of this chapter, including persons licensed to operate a production or utilization facility pursuant to Part 50 of this chapter.

[40 FR 8783, Mar. 3, 1975]

§ 19.3 Definitions.

As used in this part:

- (a) "Act" means the Atomic Energy Act of 1954, (68 Stat. 919) including any amendments thereto.
- (b) "Commission" means the United States Nuclear Regulatory Commission.
- (c) "Worker" means an individual engaged in activities licensed by the

Commission and controlled by a licensee, but does not include the licensee.

(d) "License" means a license issued under the regulations in Parts 30 through 35, 40, or 70 of this chapter, including licenses to operate a production or utilization facility pursuant to Part 50 of this chapter. "Licensee" means the holder of such a license.

(e) "Restricted area" means any area access to which is controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials. "Restricted area" shall not include any areas used as residential quarters, although a separate room or rooms in a residential building may be set apart as a restricted area.

[38 FR 22217, Aug. 17, 1973, as amended at 40 FR 8783, Mar. 3, 1975]

§ 19.4 Interpretations.

Except as specifically authorized by the Commission in writing, no interpretation of the meaning of the regulations in this part by any officer or employee of the Commission other than a written interpretation by the General Counsel will be recognized to be binding upon the Commission.

§ 19.5 Communications.

Except where otherwise specified in this part, all communications and reports concerning the regulations in this part should be addressed to the Director, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Communications, reports, and applications may be delivered in person at the Commission's offices at 1717 H Street, NW, Washington, D.C.; or at 7920 Norfolk Avenue, Bethesda, Maryland.

[40 FR 8783, Mar. 3, 1975]

§ 19.11 Posting of notices to workers.

(a) Each licensee shall post current copies of the following documents: (1) The regulations in this part and in Part 20 of this chapter; (2) the license, license conditions, or documents incorporated into a license by reference, and amendments thereto; (3) the operating procedures applicable to licensed activities; (4) any notice of violation involving radiological working condi-

tions, proposed imposition of civil penalty, or order issued pursuant to Subpart B of Part 2 of this chapter, and any response from the licensee.

(b) If posting of a document specified in paragraphs (a) (1), (2) or (3) of this section is not practicable, the licensee may post a notice which describes the document and states where it may be examined.

(c) Form NRC-3, "Notice to Employees", shall be posted by each licensee wherever individuals work in or frequent any portion of a restricted area.

NOTE: Copies of Form NRC-3 may be obtained by writing to the Director of the appropriate U.S. Nuclear Regulatory Commission Inspection and Enforcement Regional Office listed in Appendix "D", Part 20 of this chapter, or the Director, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

(d) Documents, notices, or forms posted pursuant to this section shall appear in a sufficient number of places to permit individuals engaged in licensed activities to observe them on the way to or from any particular licensed activity location to which the document applies, shall be conspicuous, and shall be replaced if defaced or altered.

(e) Commission documents posted pursuant to paragraph (a)(4) of this section shall be posted within 2 working days after receipt of the documents from the Commission; the licensee's response, if any, shall be posted within 2 working days after dispatch by the licensee. Such documents shall remain posted for a minimum of 5 working days or until action correcting the violation has been completed, whichever is later.

[38 FR 22217, Aug. 17, 1973, as amended at 40 FR 8783, Mar. 3, 1975]

§ 19.12 Instructions to workers.

All individuals working in or frequenting any portion of a restricted area shall be kept informed of the storage, transfer, or use of radioactive materials or of radiation in such portions of the restricted area; shall be instructed in the health protection problems associated with exposure to such radioactive materials or radiation, in

precautions or procedures to minimize exposure, and in the purposes and functions of protective devices employed; shall be instructed in, and instructed to observe, to the extent within the worker's control, the applicable provisions of Commission regulations and licenses for the protection of personnel from exposures to radiation or radioactive materials occurring in such areas; shall be instructed of their responsibility to report promptly to the licensee any condition which may lead to or cause a violation of Commission regulations and licenses or unnecessary exposure to radiation or to radioactive material; shall be instructed in the appropriate response to warnings made in the event of any unusual occurrence or malfunction that may involve exposure to radiation or radioactive material; and shall be advised as to the radiation exposure reports which workers may request pursuant to § 19.13. The extent of these instructions shall be commensurate with potential radiological health protection problems in the restricted area.

§ 19.13 Notifications and reports to individuals.

(a) Radiation exposure data for an individual, and the results of any measurements, analyses, and calculations of radioactive material deposited or retained in the body of an individual, shall be reported to the individual as specified in this section. The information reported shall include data and results obtained pursuant to Commission regulations, orders or license conditions, as shown in records maintained by the licensee pursuant to Commission regulations. Each notification and report shall be in writing; include appropriate identifying data such as the name of the licensee, the name of the individual, the individual's social security number; include the individual's exposure information; and contain the following statement:

This report is furnished to you under the provisions of the Nuclear Regulatory Commission regulation 10 CFR Part 19. You should preserve this report for further reference.

(b) At the request of any worker, each licensee shall advise such worker annually of the worker's exposure to

radiation or radioactive material as shown in records maintained by the licensee pursuant to § 20.401(a) and (c).

(c) At the request of a worker formerly engaged in licensed activities controlled by the licensee, each licensee shall furnish to the worker a report of the worker's exposure to radiation or radioactive material. Such report shall be furnished within 30 days from the time the request is made, or within 30 days after the exposure of the individual has been determined by the licensee, whichever is later; shall cover, within the period of time specified in the request, each calendar quarter in which the worker's activities involved exposure to radiation from radioactive materials licensed by the Commission; and shall include the dates and locations of licensed activities in which the worker participated during this period.

(d) When a licensee is required pursuant to § 20.405 or § 20.408 of this chapter to report to the Commission any exposure of an individual to radiation or radioactive material the licensee shall also provide the individual a report on his exposure data included therein. Such report shall be transmitted at a time not later than the transmittal to the Commission.

(e) At the request of a worker who is terminating employment in a given calendar quarter with the licensee in work involving radiation dose, or of a worker who, while employed by another person, is terminating assignment to work involving radiation dose in the licensee's facility in that calendar quarter, each licensee shall provide to each such worker, or to the worker's designee, at termination, a written report regarding the radiation dose received by that worker from operations of the licensee during that specifically identified calendar quarter or fraction thereof, or provide a written estimate of that dose if the finally determined personnel monitoring results are not available at that time. Estimated doses shall be clearly indicated as such.

(Sec. 161, Pub. Law 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, Pub. L. 93-430, 88 Stat. 1242 (42 U.S.C. 5841))

[38 FR 22217, Aug. 17, 1973, as amended at 40 FR 8783, Mar. 3, 1975, 44 FR 32352, June 6, 1979]

§ 19.14 Presence of representatives of licensees and workers during inspections.

(a) Each licensee shall afford to the Commission at all reasonable times opportunity to inspect materials, activities, facilities, premises, and records pursuant to the regulations in this chapter.

(b) During an inspection, Commission inspectors may consult privately with workers as specified in § 19.15. The licensee or licensee's representative may accompany Commission inspectors during other phases of an inspection.

(c) If, at the time of inspection, an individual has been authorized by the workers to represent them during Commission inspections, the licensee shall notify the inspectors of such authorization and shall give the workers' representative an opportunity to accompany the inspectors during the inspection of physical working conditions.

(d) Each workers' representative shall be routinely engaged in licensed activities under control of the licensee and shall have received instructions as specified in § 19.12.

(e) Different representatives of licensees and workers may accompany the inspectors during different phases of an inspection if there is no resulting interference with the conduct of the inspection. However, only one workers' representative at a time may accompany the inspectors.

(f) With the approval of the licensee and the workers' representative an individual who is not routinely engaged in licensed activities under control of the licensee, for example, a consultant to the licensee or to the workers' representative, shall be afforded the opportunity to accompany Commission inspectors during the inspection of physical working conditions.

(g) Notwithstanding the other provisions of this section, Commission inspectors are authorized to refuse to permit accompaniment by any individual who deliberately interferes with a fair and orderly inspection. With

regard to areas containing information classified by an agency of the U.S. Government in the interest of national security, an individual who accompanies an inspector may have access to such information only if authorized to do so. With regard to any area containing proprietary information, the workers' representative for that area shall be an individual previously authorized by the licensee to enter that area.

§ 19.15 Consultation with workers during inspections.

(a) Commission inspectors may consult privately with workers concerning matters of occupational radiation protection and other matters related to applicable provisions of Commission regulations and licenses to the extent the inspectors deem necessary for the conduct of an effective and thorough inspection.

(b) During the course of an inspection any worker may bring privately to the attention of the inspectors, either orally or in writing, any past or present condition which he has reason to believe may have contributed to or caused any violation of the act, the regulations in this chapter, or license condition, or any unnecessary exposure of an individual to radiation from licensed radioactive material under the licensee's control. Any such notice in writing shall comply with the requirements of § 19.16(a).

(c) The provisions of paragraph (b) of this section shall not be interpreted as authorization to disregard instructions pursuant to § 19.12.

§ 19.16 Requests by workers for inspections.

(a) Any worker or representative of workers who believes that a violation of the Act, the regulations in this chapter, or license conditions exists or has occurred in license activities with regard to radiological working conditions in which the worker is engaged, may request an inspection by giving notice of the alleged violation to the Director of Inspection and Enforcement, to the Director of the appropriate Commission Regional Office, or to Commission inspectors. Any such

notice shall be in writing, shall set forth the specific grounds for the notice, and shall be signed by the worker or representative of workers. A copy shall be provided the licensee by the Director of Inspection and Enforcement, Regional Office Director, or the inspector no later than at the time of inspection except that, upon the request of the worker giving such notice, his name and the name of individuals referred to therein shall not appear in such copy or on any record published, released or made available by the Commission, except for good cause shown.

(b) If, upon receipt of such notice, the Director of Inspection and Enforcement or Regional Office Director determines that the complaint meets the requirements set forth in paragraph (a) of this section, and that there are reasonable grounds to believe that the alleged violation exists or has occurred, he shall cause an inspection to be made as soon as practicable, to determine if such alleged violation exists or has occurred. Inspections pursuant to this section need not be limited to matters referred to in the complaint.

(c) No licensee shall discharge or in any manner discriminate against any worker because such worker has filed any complaint or instituted or caused to be instituted any proceeding under the regulations in this chapter or has testified or is about to testify in any such proceeding or because of the exercise by such worker on behalf of himself or others of any option afforded by this part.

[38 FR 22217, Aug. 17, 1973, as amended at 40 FR 8783, Mar. 3, 1975]

§ 19.17 Inspections not warranted, informal review.

(a) If the Director of Inspection and Enforcement or of the appropriate Regional Office determines, with respect to a complaint under § 19.16, that an inspection is not warranted because there are no reasonable grounds to believe that a violation exists or has occurred, he shall notify the complainant in writing of such determination. The complainant may obtain review of such determination by submitting a written statement of position with the

Executive Director for Operation, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, who will provide the licensee with a copy of such statement by certified mail, excluding, at the request of the complainant, the name of the complainant. The licensee may submit an opposing written statement of position with the Executive Director for Operations who will provide the complainant with a copy of such statement by certified mail. Upon the request of the complainant, the Executive Director for Operations or his designee may hold an informal conference in which the complainant and the licensee may orally present their views. An informal conference may also be held at the request of the licensee, but disclosure of the identity of the complainant will be made only following receipt of written authorization from the complainant. After considering all written and oral views presented, the Executive Director for Operations shall affirm, modifying, or reverse the determination of the Director of Inspection and Enforcement or of the appropriate Regional Office and furnish the complainant and the licensee a written notification of his decision and the reason therefor.

(b) If the Director of Inspection and Enforcement or of the appropriate Regional Office determines that an inspection is not warranted because the requirements of § 19.16(a) have not been met, he shall notify the complainant in writing of such determination. Such determination shall be without prejudice to the filing of a new complaint meeting the requirements of § 19.16(a).

[38 FR 22217, Aug. 17, 1973, as amended at 40 FR 8783, Mar. 3, 1975]

§ 19.30 Violations.

An injunction or other court order may be obtained prohibiting any violation of any provision of the Act or Title II of the Energy Reorganization Act of 1974, or any regulation or order issued thereunder. A court order may be obtained for the payment of a civil penalty imposed pursuant to section 234 of the Act for violation of sections 53, 57, 62, 63, 81, 82, 101, 103, 104, 107, or 109 of the Act or any rule, regula-

tion, or order issued thereunder, or any term, condition or limitation of any license issued thereunder, or for any violation for which a license may be revoked under section 186 of the Act. Any person who willfully violates any provision of the Act or any regulation or order issued thereunder may be guilty of a crime and, upon conviction, may be punished by fine or imprisonment or both, as provided by law.

(38 FR 22217, Aug. 17, 1973, as amended at 40 FR 8783, Mar. 3, 1975)

§ 19.31 Application for exemptions.

The Commission may upon application by any licensee or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines are authorized by law and will not result in undue hazard to life or property.

§ 19.32 Discrimination prohibited.

No person shall on the ground of sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity licensed by the Nuclear Regulatory Commission. This provision will be enforced through agency provisions and rules similar to those already established, with respect to racial and other discrimination, under title VI of the Civil Rights Act of 1964. This remedy is not exclusive, however, and will not prejudice or cut off any other legal remedies available to a discriminatee.

(40 FR 8783, Mar. 3, 1975)

PART 20—STANDARDS FOR PROTECTION AGAINST RADIATION

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- 20.2 Scope.
- 20.3 Definitions.
- 20.4 Units of radiation dose.
- 20.5 Units of radioactivity.
- 20.6 Interpretations.
- 20.7 Communications.

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APPENDIX B—CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

APPENDIX C

APPENDIX D—UNITED STATES NUCLEAR REGULATORY COMMISSION INSPECTION AND ENFORCEMENT REGIONAL OFFICES

AUTHORITY: Secs. 53, 63, 65, 81, 103, 104, 161, 68 Stat. 930, 933, 935, 936, 937, 948, as amended, 42 U.S.C. 2073, 2093, 2095, 2111, 2133, 2134, 2201. For the purposes of sec. 223, 68 Stat. 958, as amended, 42 U.S.C. 2273, §§ 20.401-20.408, issued under sec. 1610, 68 Stat. 950, as amended, 42 U.S.C. 2201(c) Secs. 202, 206, Pub. L. 93-438, 88 Stat. 1244, 1246 (42 U.S.C. 5842, 5846), unless otherwise noted.

SOURCE: 25 FR 10914, Nov. 17, 1960, unless otherwise noted.

NOMENCLATURE CHANGES: 40 FR 8783, Mar. 3, 1975; 45 FR 14200, Mar. 5, 1980.

GENERAL PROVISIONS

§ 20.1 Purpose.

(a) The regulations in this part establish standards for protection against radiation hazards arising out of activities under licenses issued by the Nuclear Regulatory Commission and are issued pursuant to the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974.

(b) The use of radioactive material or other sources of radiation not licensed by the Commission is not subject to the regulations in this part. However, it is the purpose of the regulations in this part to control the possession, use, and transfer of licensed material by any licensee in such a manner that the total dose to an individual (including exposures to licensed and unlicensed radioactive material and to other unlicensed sources of radiation, whether in the possession of the licensee or any other person, but not including exposures to radiation from natural background sources or medical diagnosis and therapy) does not exceed the standards of radiation protection prescribed in the regulations in this part.

(c) In accordance with recommendations of the Federal Radiation Council, approved by the President, persons engaged in activities under licenses issued by the Nuclear Regulatory Commission pursuant to the Atomic

Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974 should, in addition to complying with the requirements set forth in this part, make every reasonable effort to maintain radiation exposures, and releases of radioactive materials in effluents to unrestricted areas, as low as is reasonably achievable. The term "as low as is reasonably achievable" means as low as is reasonably achievable taking into account the state of technology, and the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to the utilization of atomic energy in the public interest.

(Sec. 161, Pub. Law 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, Pub. Law 93-430, 88 Stat. 1242 (42 U.S.C. 5841))

(25 FR 10914, Nov. 17, 1960, as amended at 40 FR 8783, Mar. 3, 1975; 40 FR 58847, Dec. 19, 1975; 44 FR 32352, June 5, 1979)

§ 20.2 Scope.

The regulations in this part apply to all persons who receive, possess, use, or transfer material licensed pursuant to the regulations in Parts 30 through 35, 40, or 70 of this chapter, including persons licensed to operate a production or utilization facility pursuant to Part 50 of this chapter.

(40 FR 8783, Mar. 3, 1975)

§ 20.3 Definitions.

(a) As used in this part:

(1) "Act" means the Atomic Energy Act of 1954 (68 Stat. 919) including any amendments thereto.

(2) "Airborne radioactive material" means any radioactive material dispersed in the air in the form of dusts, fumes, mists, vapors, or gases.

(3) "Byproduct material" means any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material.

(4) "Calendar quarter" means not less than 12 consecutive weeks nor more than 14 consecutive weeks. The first calendar quarter of each year shall begin in January and subsequent

calendar quarters shall be such that no day is included in more than one calendar quarter or omitted from inclusion within a calendar quarter. No licensee shall change the method observed by him of determining calendar quarters except at the beginning of a calendar year.

(5) "Commission" means the Nuclear Regulatory Commission or its duly authorized representatives.

(6) "Government agency" means any executive department, commission, independent establishment, corporation, wholly or partly owned by the United States of America which is an instrumentality of the United States, or any board, bureau, division, service, office, officer, authority, administration, or other establishment in the executive branch of the Government.

(7) "Individual" means any human being.

(8) "Licensed material" means source material, special nuclear material, or by-product material received, possessed, used, or transferred under a general or specific license issued by the Commission pursuant to the regulations in this chapter.

(9) "License" means a license issued under the regulations in Part 30, 40, or 70 of this chapter. "Licensee" means the holder of such license.

(10) "Occupational dose" includes exposure of an individual to radiation (i) in a restricted area; or (ii) in the course of employment in which the individual's duties involve exposure to radiation, provided, that "occupational dose" shall not be deemed to include any exposure of an individual to radiation for the purpose of medical diagnosis or medical therapy of such individual.

(11) "Person" means: (i) Any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, Government agency other than the Commission or the Department (except that the Department shall be considered a person within the meaning of the regulations in this part to the extent that its facilities and activities are subject to the licensing and related regulatory authority of the Commission pursuant to section 202 of the Energy Reorganization Act of 1974 (88 Stat. 1244)), any State,

any foreign government or nation or any political subdivision of any such government or nation, or other entity; and (ii) any legal successor, representative, agent, or agency of the foregoing.

(12) "Radiation" means any or all of the following: alpha rays, beta rays, gamma rays, X-rays, neutrons, high-speed electrons, high-speed protons, and other atomic particles; but not sound or radio waves, or visible, infrared, or ultraviolet light.

(13) "Radioactive material" includes any such material whether or not subject to licensing control by the Commission.

(14) "Restricted area" means any area access to which is controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials. "Restricted area" shall not include any areas used as residential quarters, although a separate room or rooms in a residential building may be set apart as a restricted area.

(15) "Source material" means: (i) Uranium or thorium, or any combination thereof, in any physical or chemical form; or (ii) ores which contain by weight one-twentieth of one percent (0.05%) or more of (a) uranium, (b) thorium or (c) any combination thereof. Source material does not include special nuclear material.

(16) "Special nuclear material" means: (i) Plutonium, uranium 233, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Commission, pursuant to the provisions of section 51 of the act, determines to be special nuclear material, but does not include source material; or (ii) any material artificially enriched by any of the foregoing but does not include source material.

(17) "Unrestricted area" means any area access to which is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials, and any area used for residential quarters.

(18) "Department" means the Department of Energy established by the Department of Energy Organization Act (Pub. L. 95-91, 91 Stat. 565, 42 U.S.C. 7101 *et seq.*) to the extent that

the Department, or its duly authorized representatives, exercises functions formerly vested in the U.S. Atomic Energy Commission, its Chairman, members, officers and components and transferred to the U.S. Energy Research and Development Administration and to the Administrator thereof pursuant to sections 104 (b), (c) and (d) of the Energy Reorganization Act of 1974 (Pub. L. 93-438, 88 Stat. 1233 at 1237, 42 U.S.C. 5814) and retransferred to the Secretary of Energy pursuant to section 301(a) of the Department of Energy Organization Act (Pub. L. 95-91, 91 Stat. 565 at 577-578, 42 U.S.C. 7151).

(19) "Termination" means the end of employment with the licensee or, in the case of individuals not employed by the licensee, the end of a work assignment in the licensee's restricted areas in a given calendar quarter, without expectation or specific scheduling of reentry into the licensee's restricted areas during the remainder of that calendar quarter.

(b) Definitions of certain other words and phrases as used in this part are set forth in other sections, including:

(1) "Airborne radioactivity area" defined in § 20.203;

(2) "Radiation area" and "high radiation area" defined in § 20.202;

(3) "Personnel monitoring equipment" defined in § 20.202;

(4) "Survey" defined in § 20.201;

(5) Units of measurement of dose (rad, rem) defined in § 20.4;

(6) Units of measurement of radioactivity defined in § 20.5.

(Sec. 161 Pub. Law 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, Pub. Law 93-430, 88 Stat. 1242 (42 U.S.C. 5841))

(25 FR 10914, Nov. 17, 1960, as amended at 25 FR 13953, Dec. 30, 1960, 27 FR 5905, June 22, 1962, 38 FR 22467, Aug. 21, 1973, 40 FR 8783, Mar. 3, 1975, 40 FR 42558, Sept. 15, 1975, 44 FR 32352, June 6, 1979, 45 FR 14200, Mar. 5, 1980)

§ 20.4 Units of radiation dose.

(a) "Dose," as used in this part, is the quantity of radiation absorbed, per unit of mass, by the body or by any portion of the body. When the regulations in this part specify a dose during a period of time, the dose means the

total quantity of radiation absorbed, per unit of mass, by the body or by any portion of the body during such period of time. Several different units of dose are in current use. Definitions of units as used in this part are set forth in paragraphs (b) and (c) of this section.

(b) The rad, as used in this part, is a measure of the dose of any ionizing radiation to body tissues in terms of the energy absorbed per unit mass of the tissue. One rad is the dose corresponding to the absorption of 100 ergs per gram of tissue. (One millirad (mrad)=0.001 rad.)

(c) The rem, as used in this part, is a measure of the dose of any ionizing radiation to body tissues in terms of its estimated biological effect relative to a dose of one roentgen (r) of X-rays. (One millirem (mrem)=0.001 rem.) The relation of the rem to other dose units depends upon the biological effect under consideration and upon the conditions of irradiation. For the purpose of the regulations in this part, any of the following is considered to be equivalent to a dose of one rem:

(1) A dose of 1 r due to X- or gamma radiation;

(2) A dose of 1 rad due to X-, gamma, or beta radiation;

(3) A dose of 0.1 rad due to neutrons or high energy protons;

(4) A dose of 0.05 rad due to particles heavier than protons and with sufficient energy to reach the lens of the eye; If it is more convenient to measure the neutron flux, or equivalent, than to determine the neutron dose in rads, as provided in paragraph (c)(3) of this section, one rem of neutron radiation may, for purposes of the regulations in this part, be assumed to be equivalent to 14 million neutrons per square centimeter incident upon the body; or, if there exists sufficient information to estimate with reasonable accuracy the approximate distribution in energy of the neutrons, the incident number of neutrons per square centimeter equivalent to one rem may be estimated from the following table:

NEUTRON FLUX DOSE EQUIVALENTS

Neutron energy (Mev.)	Number of neutrons per square centimeter equivalent to a dose of 1 rem (neutrons/cm ²)	Average flux to deliver 100 mrem in 40 hours (neutrons/cm ² sec.)
Thermal	970 × 10 ⁴	670
0.0001	720 × 10 ⁴	500
0.005	620 × 10 ⁴	570
0.02	400 × 10 ⁴	280
0.1	120 × 10 ⁴	80
0.5	43 × 10 ⁴	30
1.0	26 × 10 ⁴	18
2.5	29 × 10 ⁴	20
5.0	26 × 10 ⁴	18
7.5	24 × 10 ⁴	17
10	24 × 10 ⁴	17
10 to 30	14 × 10 ⁴	10

(d) For determining exposures to X or gamma rays up to 3 Mev, the dose limits specified in §§ 20.101 to 20.104, inclusive, may be assumed to be equivalent to the "air dose". For the purpose of this part "air dose" means that the dose is measured by a properly calibrated appropriate instrument in air at or near the body surface in the region of highest dosage rate.

§ 20.5 Units of radioactivity.

(a) Radioactivity is commonly, and for purposes of the regulations in this part shall be, measured in terms of disintegrations per unit time or in curies. One curie = 3.7×10^{10} disintegrations per second (dps) = 2.2×10^{12} disintegrations per minute (dpm). Commonly used submultiples of the curie are the millicurie and the microcurie:

(1) One millicurie (mCi) = 0.001 curie (Ci) = 3.7×10^7 dps.

(2) One microcurie (μCi) = 0.000001 curie = 3.7×10^4 dps.

125 FR 10914, Nov. 17, 1960, as amended at 36 FR 29314, Oct. 24, 1973; 39 FR 23990, June 28, 1974; 40 FR 50705, Oct. 31, 1975]

§ 20.6 Interpretations.

Except as specifically authorized by the Commission in writing, no interpretation of the meaning of the regulations in this part by any officer or employee of the Commission other than a written interpretation by the General Counsel will be recognized to be binding upon the Commission.

§ 20.7 Communications.

Except where otherwise specified in this part, all communications and reports concerning the regulations in this part should be addressed to the Executive Director for Operations, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Communications, reports, and applications may be delivered in person at the Commission's offices at 1717 H Street NW., Washington, D.C., or at 7920 Norfolk Avenue, Bethesda, Maryland.

[40 FR 8783, Mar. 3, 1975]

PERMISSIBLE DOSES, LEVELS, AND CONCENTRATIONS

§ 20.101 Radiation dose standards for individuals in restricted areas.

(a) In accordance with the provisions of § 20.102(a), and except as provided in paragraph (b) of this section, no licensee shall possess, use, or transfer licensed material in such a manner as to cause any individual in a restricted area to receive in any period of one calendar quarter from radioactive material and other sources of radiation a total occupational dose in excess of the standards specified in the following table:

REMS PER CALENDAR QUARTER

1. Whole body, head and trunk, active blood-forming organs, lens of eyes, or gonads	1%
2. Hands and forearms, feet and ankles	18%
3. Skin of whole body	7%

(b) A licensee may permit an individual in a restricted area to receive a total occupational dose to the whole body greater than that permitted under paragraph (a) of this section, provided:

(1) During any calendar quarter the total occupational dose to the whole body shall not exceed 3 rems; and

(2) The dose to the whole body, when added to the accumulated occupational dose to the whole body, shall not exceed 5 (N-18) rems where "N" equals the individual's age in years at his last birthday; and

(3) The licensee has determined the individual's accumulated occupational dose to the whole body on Form NRC-

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4, or on a clear and legible record containing all the information required in that form; and has otherwise complied with the requirements of § 20.102. As used in paragraph (b), "Dose to the whole body" shall be deemed to include any dose to the whole body, gonads, active blood-forming organs, head and trunk, or lens of eye.

(Sec. 161, Pub. Law 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, Pub. Law 93-430, 88 Stat. 1242 (42 U.S.C. 5841))

[25 FR 10914, Nov. 17, 1960, as amended at 44 FR 32352, June 6, 1979]

§ 20.102 Determination of prior dose.

(a) Each licensee shall require any individual, prior to first entry of the individual into the licensee's restricted area during each employment or work assignment under such circumstances that the individual will receive or is likely to receive in any period of one calendar quarter an occupational dose in excess of 25 percent of the applicable standards specified in § 20.101(a) and § 20.104(a), to disclose in a written, signed statement, either: (1) That the individual had no prior occupational dose during the current calendar quarter, or (2) the nature and amount of any occupational dose which the individual may have received during that specifically identified current calendar quarter from sources of radiation possessed or controlled by other persons. Each licensee shall maintain records of such statements until the Commission authorizes their disposition.

(b) Before permitting, pursuant to § 20.101(b), any individual in a restricted area to receive an occupational radiation dose in excess of the standards specified in § 20.101(a), each licensee shall:

(1) Obtain a certificate on Form NRC-4, or on a clear and legible record containing all the information required in that form, signed by the individual showing each period of time after the individual attained the age of 18 in which the individual received an occupational dose of radiation; and

(2) Calculate on Form NRC-4 in accordance with the instructions appearing therein, or on a clear and legible record containing all the information required in that form, the previously accumulated occupational dose re-

ceived by the individual and the additional dose allowed for that individual under § 20.101(b).

(c)(1) In the preparation of Form NRC-4, or a clear and legible record containing all the information required in that form, the licensee shall make a reasonable effort to obtain reports of the individual's previously accumulated occupational dose. For each period for which the licensee obtains such reports, the licensee shall use the dose shown in the report in preparing the form. In any case where a licensee is unable to obtain reports of the individual's occupational dose for a previous complete calendar quarter, it shall be assumed that the individual has received the occupational dose specified in whichever of the following columns apply:

Part of body	Column 1—Assumed exposure in rems for calendar quarters prior to Jan. 1, 1961	Column 2—Assumed exposure in rems for calendar quarters beginning on or after Jan. 1, 1961
Whole body, gonads, active blood-forming organs, head and trunk, lens of eye	3%	1%

(2) The licensee shall retain and preserve records used in preparing Form NRC-4 until the Commission authorizes their disposition.

If calculation of the individual's accumulated occupational dose for all periods prior to January 1, 1961 yields a result higher than the applicable accumulated dose value for the individual as of that date, as specified in paragraph (b) of § 20.101, the excess may be disregarded.

(Sec. 161, Pub. Law 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, Pub. Law 93-430, 88 Stat. 1242 (42 U.S.C. 5841))

[25 FR 10914, Nov. 17, 1960, as amended at 41 FR 18301, May 3, 1976; 44 FR 32352, June 6, 1979]

§ 20.103 Exposure of individuals to concentrations of radioactive materials in air in restricted areas.

(a)(1) No licensee shall possess, use, or transfer licensed material in such a manner as to permit any individual in a restricted area to inhale a quantity of radioactive material in any period of one calendar quarter greater than the quantity which would result from inhalation for 40 hours per week for 13 weeks at uniform concentrations of radioactive material in air specified in Appendix B, Table I, Column 1.^{1,2} If the radioactive material is of such form that intake by absorption through the skin is likely, individual exposures to radioactive material shall be controlled so that the uptake of radioactive material by any organ from either inhalation or absorption or both routes of intake³ in any calendar

¹Since the concentration specified for tritium oxide vapor assumes equal intakes by skin absorption and inhalation, the total intake permitted is twice that which would result from inhalation alone at the concentration specified for H 3 S in Appendix B, Table I, Column 1 for 40 hours per week for 13 weeks.

²For radon-222, the limiting quantity is that inhaled in a period of one calendar year. For radioactive materials designated "Sub" in the "Isotope" column of the table, the concentration value specified is based upon exposure to the material as an external radiation source. Individual exposures to these materials may be accounted for as part of the limitation on individual dose in § 20.101. These nuclides shall be subject to the precautionary procedures required by § 20.103(b)(1).

³Multiply the concentration values specified in Appendix B, Table I, Column 1, by 6.3×10^4 ml to obtain the quarterly quantity limit. Multiply the concentration value specified in Appendix B, Table I, Column 1, by 2.5×10^4 ml to obtain the annual quantity limit for Rn-222.

⁴Significant intake by ingestion or injection is presumed to occur only as a result of circumstances such as accident, inadvertence, poor procedure, or similar special conditions. Such intakes must be evaluated and accounted for by techniques and procedures as may be appropriate to the circumstances of the occurrence. Exposures so evaluated shall be included in determining whether the limitation on individual exposures in § 20.103(a)(1) has been exceeded.

⁵Regulatory guidance on assessment of individual intakes of radioactive material is

given in Regulatory Guide 8.9, "Acceptable Concepts, Models, Equations and Assumptions for a Bioassay Program," single copies of which are available from the Office of Standards Development, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, upon written request.

dar quarter does not exceed that which would result from inhaling such radioactive material for 40 hours per week for 13 weeks at uniform concentrations specified in Appendix B, Table I, Column 1.

(2) No licensee shall possess, use, or transfer mixtures of U-234, U-235, and U-238 in soluble form in such a manner as to permit any individual in a restricted area to inhale a quantity of such material in excess of the intake limits specified in Appendix B, Table I, Column 1 of this part. If such soluble uranium is of a form such that absorption through the skin is likely, individual exposures to such material shall be controlled so that the uptake of such material by any organ from either inhalation or absorption or both routes of intake⁴ does not exceed that which would result from inhaling such material at the limits specified in Appendix B, Table I, Column 1 and footnote 4 thereto.

(3) For purposes of determining compliance with the requirements of this section the licensee shall use suitable measurements of concentrations of radioactive materials in air for detecting and evaluating airborne radioactivity in restricted areas and in addition, as appropriate, shall use measurements of radioactivity in the body, measurements of radioactivity excreted from the body, or any combination of such measurements as may be necessary for timely detection and assessment of individual intakes of radioactivity by exposed individuals. It is assumed that an individual inhales radioactive material at the airborne concentration in which he is present unless he uses respiratory protective equipment pursuant to paragraph (c) of this section. When assessment of a particular individual's intake of radioactive material is necessary, intakes less than those which would result from inhalation for 2 hours in any one day or for 10 hours in any one week at

given in Regulatory Guide 8.9, "Acceptable Concepts, Models, Equations and Assumptions for a Bioassay Program," single copies of which are available from the Office of Standards Development, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, upon written request.

uniform concentrations specified in Appendix B, Table I, Column 1 need not be included in such assessment, provided that for any assessment in excess of these amounts the entire amount is included.

(b)(1) The licensee shall, as a precautionary procedure, use process or other engineering controls, to the extent practicable, to limit concentrations of radioactive materials in air to levels below those which delimit an airborne radioactivity area as defined in § 20.203(d)(1)(ii).

(2) When it is impracticable to apply process or other engineering controls to limit concentrations of radioactive material in air below those defined in § 20.203(d)(1)(ii), other precautionary procedures, such as increased surveillance, limitation of working times, or provision of respiratory protective equipment, shall be used to maintain intake of radioactive material by any individual within any period of seven consecutive days as far below that intake of radioactive material which would result from inhalation of such material for 40 hours at the uniform concentrations specified in Appendix B, Table I, Column 1 as is reasonably achievable. Whenever the intake of radioactive material by any individual exceeds this 40-hour control measure, the licensee shall make such evaluations and take such actions as are necessary to assure against recurrence. The licensee shall maintain records of such occurrences, evaluations, and actions taken in a clear and readily identifiable form suitable for summary review and evaluation.

(c) When respiratory protective equipment is used to limit the inhalation of airborne radioactive material pursuant to paragraph (b)(2) of this section, the licensee may make allowance for such use in estimating exposures of individuals to such materials provided that such equipment is used as stipulated in Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection."⁵

⁵This incorporation by reference provision was approved by the Director of the Federal Register on October 19, 1976. Single copies of Regulatory Guide 8.15 are available from the Office of Standards Development, U.S. Nuclear Regulatory Commission,

(d) Notwithstanding the provisions of paragraphs (b) and (c) of this section, the Commission may impose further restrictions:

(1) On the extent to which a licensee may make allowance for use of respirators in lieu of provision of process, containment, ventilation, or other engineering controls, if application of such controls is found to be practicable; and

(2) As might be necessary to assure that the respiratory protective program of the licensee is adequate in limiting exposures of personnel to airborne radioactive materials.

(e) The licensee shall notify, in writing, the Director of the appropriate Nuclear Regulatory Commission Inspection and Enforcement Regional Office listed in Appendix D at least 30 days before the date that respiratory protective equipment is first used under the provisions of this section.

(f) A licensee who was authorized to make allowance for use of respiratory protective equipment prior to December 29, 1976 shall bring his respiratory protective program into conformance with the requirements of paragraph (c) of this section within one year of that date, and is exempt from the requirement of paragraph (e) of this section.

(Sec. 161, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

[41 FR 52301, Nov. 29, 1976, as amended at 43 FR 29270, July 7, 1978]

§ 20.104 Exposure of minors.

(a) No licensee shall possess, use, or transfer licensed material in such a manner as to cause any individual within a restricted area who is under 18 years of age, to receive in any period of one calendar quarter from radioactive material and other sources of radiation in the licensee's possession a dose in excess of 10 percent of the limits specified in the table in paragraph (a) of § 20.101.

(b) No licensee shall possess, use or transfer licensed material in such a manner as to cause any individual

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within a restricted area, who is under 18 years of age to be exposed to airborne radioactive material possessed by the licensee in an average concentration in excess of the limits specified in Appendix B, Table II of this part. For purposes of this paragraph, concentrations may be averaged over periods not greater than a week.

(c) The provisions of §§ 20.103(b)(2) and 20.103(c) shall apply to exposures subject to paragraph (b) of this section except that the references in §§ 20.103(b)(2) and 20.103(c) to Appendix B, Table I, Column 1 shall be deemed to be references to Appendix B, Table II, Column 1.

[25 FR 10914, Nov. 17, 1960, as amended at 41 FR 52302, Nov. 29, 1976]

§ 20.105 Permissible levels of radiation in unrestricted areas.

(a) There may be included in any application for a license or for amendment of a license proposed limits upon levels of radiation in unrestricted areas resulting from the applicant's possession or use of radioactive material and other sources of radiation. Such applications should include information as to anticipated average radiation levels and anticipated occupancy times for each unrestricted area involved. The Commission will approve the proposed limits if the applicant demonstrates that the proposed limits are not likely to cause any individual to receive a dose to the whole body in any period of one calendar year in excess of 0.5 rem.

(b) Except as authorized by the Commission pursuant to paragraph (a) of this section, no licensee shall possess, use or transfer licensed material in such a manner as to create in any unrestricted area from radioactive material and other sources of radiation in his possession:

(1) Radiation levels which, if an individual were continuously present in the area, could result in his receiving a dose in excess of two millirems in any one hour, or

(2) Radiation levels which, if an individual were continuously present in the area, could result in his receiving a dose in excess of 100 millirems in any seven consecutive days.

§ 20.106 Radioactivity in effluents to unrestricted areas.

(a) A licensee shall not possess, use, or transfer licensed material so as to release to an unrestricted area radioactive material in concentrations which exceed the limits specified in Appendix B, Table II of this part, except as authorized pursuant to § 20.302 or paragraph (b) of this section. For purposes of this section concentrations may be averaged over a period not greater than one year.

(b) An application for a license or amendment may include proposed limits higher than those specified in paragraph (a) of this section. The Commission will approve the proposed limits if the applicant demonstrates:

(1) That the applicant has made a reasonable effort to minimize the radioactivity contained in effluents to unrestricted areas; and

(2) That it is not likely that radioactive material discharged in the effluent would result in the exposure of an individual to concentrations of radioactive material in air or water exceeding the limits specified in Appendix B, Table II of this part.

(c) An application for higher limits pursuant to paragraph (b) of this section shall include information demonstrating that the applicant has made a reasonable effort to minimize the radioactivity discharged in effluents to unrestricted areas, and shall include, as pertinent:

(1) Information as to flow rates, total volume of effluent, peak concentration of each radionuclide in the effluent, and concentration of each radionuclide in the effluent averaged over a period of one year at the point where the effluent leaves a stack, tube, pipe, or similar conduit;

(2) A description of the properties of the effluents, including:

(i) Chemical composition;

(ii) Physical characteristics, including suspended solids content in liquid effluents, and nature of gas or aerosol for air effluents;

(iii) The hydrogen ion concentrations (pH) of liquid effluents; and

(iv) The size range of particulates in effluents released into air.

(3) A description of the anticipated human occupancy in the unrestricted area where the highest concentration of radioactive material from the effluent is expected, and, in the case of a river or stream, a description of water uses downstream from the point of release of the effluent.

(4) Information as to the highest concentration of each radionuclide in an unrestricted area, including anticipated concentrations averaged over a period of one year:

(i) In air at any point of human occupancy; or

(ii) In water at points of use downstream from the point of release of the effluent.

(5) The background concentration of radionuclides in the receiving river or stream prior to the release of liquid effluent.

(6) A description of the environmental monitoring equipment, including sensitivity of the system, and procedures and calculations to determine concentrations of radionuclides in the unrestricted area and possible reconcentrations of radionuclides.

(7) A description of the waste treatment facilities and procedures used to reduce the concentration of radionuclides in effluents prior to their release.

(d) For the purposes of this section the concentration limits in Appendix B, Table II of this part shall apply at the boundary of the restricted area. The concentration of radioactive material discharged through a stack, pipe or similar conduit may be determined with respect to the point where the material leaves the conduit. If the conduit discharges within the restricted area, the concentration at the boundary may be determined by applying appropriate factors for dilution, dispersion, or decay between the point of discharge and the boundary.

(e) In addition to limiting concentrations in effluent streams, the Commission may limit quantities of radioactive materials released in air or water during a specified period of time if it appears that the daily intake of radioactive material from air, water, or food by a suitable sample of an exposed population group, averaged over a period not exceeding one year, would

otherwise exceed the daily intake resulting from continuous exposure to air or water containing one-third the concentration of radioactive materials specified in Appendix B, Table II of this part.

(f) The provisions of this section do not apply to disposal of radioactive material into sanitary sewerage systems, which is governed by § 20.303.

[29 FR 14434, Oct. 21, 1964]

§ 20.107 Medical diagnosis and therapy.

Nothing in the regulations in this part shall be interpreted as limiting the intentional exposure of patients to radiation for the purpose of medical diagnosis or medical therapy.

§ 20.108 Orders requiring furnishing of bio-assay services.

Where necessary or desirable in order to aid in determining the extent of an individual's exposure to concentrations of radioactive material, the Commission may incorporate appropriate provisions in any license, directing the licensee to make available to the individual appropriate bio-assay services and to furnish a copy of the reports of such services to the Commission.

PRECAUTIONARY PROCEDURES

§ 20.201 Surveys.

(a) As used in the regulations in this part, "survey" means an evaluation of the radiation hazards incident to the production, use, release, disposal, or presence of radioactive materials or other sources of radiation under a specific set of conditions. When appropriate, such evaluation includes a physical survey of the location of materials and equipment, and measurements of levels of radiation or concentrations of radioactive material present.

(b) Each licensee shall make or cause to be made such surveys as may be necessary for him to comply with the regulations in this part.

§ 20.202 Personnel monitoring

(a) Each licensee shall supply appropriate personnel monitoring equipment to, and shall require the use of such equipment by:

(1) Each individual who enters a restricted area under such circumstances that he receives, or is likely to receive, a dose in any calendar quarter in excess of 25 percent of the applicable value specified in paragraph (a) of § 20.101.

(2) Each individual under 18 years of age who enters a restricted area under such circumstances that he receives, or is likely to receive, a dose in any calendar quarter in excess of 5 percent of the applicable value specified in paragraph (a) of § 20.101.

(3) Each individual who enters a high radiation area.

(b) As used in this part,

(1) "Personnel monitoring equipment" means devices designed to be worn or carried by an individual for the purpose of measuring the dose received (e.g., film badges, pocket chambers, pocket dosimeters, film rings, etc.);

(2) "Radiation area" means any area, accessible to personnel, in which there exists radiation, originating in whole or in part within licensed material, at such levels that a major portion of the body could receive in any one hour a dose in excess of 5 millirem, or in any 5 consecutive days a dose in excess of 100 millirems;

(3) "High radiation area" means any area, accessible to personnel, in which there exists radiation originating in whole or in part within licensed material at such levels that a major portion of the body could receive in any one hour a dose in excess of 100 millirem.

§ 20.203 Caution signs, labels, signals and controls.

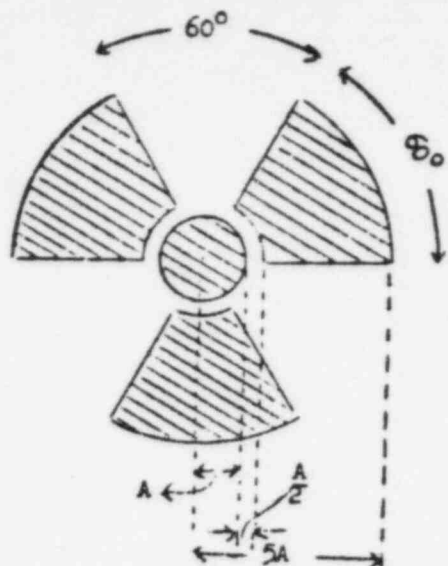
(a) *General.* (1) Except as otherwise authorized by the Commission, symbols prescribed by this section shall use the conventional radiation caution colors (magenta or purple on yellow background). The symbol prescribed by this section is the conventional three-bladed design:

RADIATION SYMBOL

1. Cross-hatched area is to be magenta or purple.

2. Background is to be yellow.

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(2) In addition to the contents of signs and labels prescribed in this section, licensees may provide on or near such signs and labels any additional information which may be appropriate in aiding individuals to minimize exposure to radiation or to radioactive material.

(b) *Radiation areas.* Each radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

"CAUTION"

RADIATION AREA

(c) *High radiation areas.* (1) Each high radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION

HIGH RADIATION AREA

(2) Each entrance or access point to a high radiation area shall be:

(i) Equipped with a control device which shall cause the level of radi-

"Or "Danger".

ation to be reduced below that at which an individual might receive a dose of 100 millirems in 1 hour upon entry into the area; or

(ii) Equipped with a control device which shall energize a conspicuous visible or audible alarm signal in such a manner that the individual entering the high radiation area and the licensee or a supervisor of the activity are made aware of the entry; or

(iii) Maintained locked except during periods when access to the area is required, with positive control over each individual entry.

(3) The controls required by paragraph (c)(2) of this section shall be established in such a way that no individual will be prevented from leaving a high radiation area.

(4) In the case of a high radiation area established for a period of 30 days or less, direct surveillance to prevent unauthorized entry may be substituted for the controls required by paragraph (c)(2) of this section.

(5) Any licensee, or applicant for a license, may apply to the Commission for approval of methods not included in paragraphs (c)(2) and (4) of this section for controlling access to high radiation areas. The Commission will approve the proposed alternatives if the licensee or applicant demonstrates that the alternative methods of control will prevent unauthorized entry into a high radiation area, and that the requirement of paragraph (c)(3) of this section is met.

(6) Each area in which there may exist radiation levels in excess of 500 rems in one hour at one meter from a sealed radioactive source¹ that is used to irradiate materials shall:

¹This paragraph (c)(6) does not apply to radioactive sources that are used in teletherapy, in radiography, or in completely self-shielded irradiators in which the source is both stored and operated within the same shielding radiation barrier and, in the designed configuration of the irradiator, is always physically inaccessible to any individual and cannot create high levels of radiation in an area that is accessible to any individual. This paragraph (c)(6) also does not apply to sources from which the radiation is incidental to some other use nor to nuclear reactor generated radiation other than radiation from byproduct, source, or special nu-

(i) Have each entrance or access point equipped with entry control devices which shall function automatically to prevent any individual from inadvertently entering the area when such radiation levels exist; permit deliberate entry into the area only after a control device is actuated that shall cause the radiation level within the area, from the sealed source, to be reduced below that at which it would be possible for an individual to receive a dose in excess of 100 mrem in one hour; and prevent operation of the source if the source would produce radiation levels in the area that could result in a dose to an individual in excess of 100 mrem in one hour. The entry control devices required by this paragraph (c)(6) shall be established in such a way that no individual will be prevented from leaving the area.

(ii) Be equipped with additional control devices such that upon failure of the entry control devices to function as required by paragraph (c)(6)(i) of this section the radiation level within the area, from the sealed source, shall be reduced below that at which it would be possible for an individual to receive a dose in excess of 100 mrem in one hour; and visible and audible alarm signals shall be generated to make an individual attempting to enter the area aware of the hazard and the licensee or at least one other individual, who is familiar with the activity and prepared to render or summon assistance, aware of such failure of the entry control devices.

clear materials that are used in sealed sources in non-self-shielded irradiators.

²These requirements apply after Mar. 14, 1978. Each person licensed to conduct activities to which this paragraph (c)(6) applies and who is not in compliance with the provisions of this paragraph on Mar. 14, 1978, shall file with the Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, on or before June 14, 1978, information describing in detail the actions taken or to be taken to achieve compliance with this paragraph by Dec. 14, 1978, and may continue activities in conformance with present license conditions and the provisions of the previously effective § 20.2034 until such compliance is achieved. For such persons compliance must be achieved not later than Dec. 14, 1978.

(iii) Be equipped with control devices such that upon failure or removal of physical radiation barriers other than the source's shielded storage container the radiation level from the source shall be reduced below that at which it would be possible for an individual to receive a dose in excess of 100 mrem in one hour, and visible and audible alarm signals shall be generated to make potentially affected individuals aware of the hazard and the licensee or at least one other individual, who is familiar with the activity and prepared to render or summon assistance, aware of the failure or removal of the physical barrier. When the shield for the stored source is a liquid, means shall be provided to monitor the integrity of the shield and to signal, automatically, loss of adequate shielding. Physical radiation barriers that comprise permanent structural components, such as walls, that have no credible probability of failure or removal in ordinary circumstances need not meet the requirements of this paragraph (c)(6)(iii).

(iv) Be equipped with devices that will automatically generate visible and audible alarm signals to alert personnel in the area before the source can be put into operation and in sufficient time for any individual in the area to operate a clearly identified control device which shall be installed in the area and which can prevent the source from being put into operation.

(v) Be controlled by use of such administrative procedure and such devices as are necessary to assure that the area is cleared of personnel prior to each use of the source preceding which use it might have been possible for an individual to have entered the area.

(vi) Be checked by a physical radiation measurement to assure that prior to the first individual's entry into the area after any use of the source, the radiation level from the source in the area is below that at which it would be possible for an individual to receive a dose in excess of 100 mrem in one hour.

(vii) Have entry control devices required in paragraph (c)(6)(i) of this section which have been tested for proper functioning prior to initial op-

eration with such source of radiation on any day that operations are not uninterruptedly continued from the previous day or before resuming operations after any unintended interruption, and for which records are kept of the dates, times, and results of such tests of function. No operations other than those necessary to place the source in safe condition or to effect repairs on controls shall be conducted with such source unless control devices are functioning properly. The licensee shall submit an acceptable schedule for more complete periodic tests of the entry control and warning systems to be established and adhered to as a condition of the license.

(viii) Have those entry and exit portals that are used in transporting materials to and from the irradiation area, and that are not intended for use by individuals, controlled by such devices and administrative procedures as are necessary to physically protect and warn against inadvertent entry by any individual through such portals. Exit portals for processed materials shall be equipped to detect and signal the presence of loose radiation sources that are carried toward such an exit and to automatically prevent such loose sources from being carried out of the area.

(7) Licensees with, or applicants for, licenses for radiation sources that are within the purview of paragraph (c)(6) of this section, and that must be used in a variety of positions or in peculiar locations, such as open fields or forests, that make it impracticable to comply with certain requirements of paragraph (c)(6) of this section, such as those for the automatic control of radiation levels, may apply to the Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, for approval, prior to use of safety measures that are alternative to those specified in paragraph (c)(6) of this section, and that will provide at least an equivalent degree of personnel protection in the use of such sources. At least one of the alternative measures must include an entry-preventing interlock control based on a physical measurement of radiation that assures the absence of high radi-

ation levels before an individual can gain access to an area where such sources are used.

(d) *Airborne radioactivity areas.* (1) As used in the regulations in this part "airborne radioactivity area" means (i) any room, enclosure, or operating area in which airborne radioactive materials composed wholly or partly of licensed material, exist in concentrations in excess of the amounts specified in Appendix B, Table I, Column 1 of this part; or (ii) any room, enclosure, or operating area in which airborne radioactive material composed wholly or partly of licensed material exists in concentrations which, averaged over the number of hours in any week during which individuals are in the area, exceed 25 percent of the amounts specified in Appendix B Table I, Column 1 of this part.

(2) Each airborne radioactivity area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION¹

AIRBORNE RADIOACTIVITY AREA

(e) *Additional requirements.* (1) Each area or room in which licensed material is used or stored and which contains any radioactive material (other than natural uranium or thorium) in an amount exceeding 10 times the quantity of such material specified in Appendix C of this part shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION¹

RADIOACTIVE MATERIAL(S)

(2) Each area or room in which natural uranium or thorium is used or stored in any amount exceeding one hundred times the quantity specified in Appendix C of this part shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION¹

RADIOACTIVE MATERIAL(S)

(f) *Containers.* (1) Except as provided in paragraph (f)(3) of this section, each container of licensed material shall bear a durable, clearly visible label identifying the radioactive contents.

(2) A label required pursuant to paragraph (f)(1) of this section shall bear the radiation caution symbol and the words "CAUTION, RADIOACTIVE MATERIAL" or "DANGER, RADIOACTIVE MATERIAL". It shall also provide sufficient information² to permit individuals handling or using the containers, or working in the vicinity thereof, to take precautions to avoid or minimize exposures.

(3) Notwithstanding the provisions of paragraph (f)(1) of this section labeling is not required:

(i) For containers that do not contain licensed materials in quantities greater than the applicable quantities listed in Appendix C of this part.

(ii) For containers containing only natural uranium or thorium in quantities no greater than 10 times the applicable quantities listed in Appendix C of this part.

(iii) For containers that do not contain licensed materials in concentrations greater than the applicable concentrations listed in Appendix B, Table I, Column 2, of this part.

(iv) For containers when they are attended by an individual who takes the precautions necessary to prevent the exposure of any individual to radiation or radioactive materials in excess of the limits established by the regulations in this part.

(v) For containers when they are in transport and packaged and labeled in accordance with regulations of the Department of Transportation.

(vi) For containers which are accessible³ only to individuals authorized to

¹As appropriate, the information will include radiation levels, kinds of material, estimate of activity, date for which activity is estimated, mass enrichment, etc.

²For example, containers in locations such as water-filled canals, storage vaults, or hot cells.

³Or "Danger".

handle or use them, or to work in the vicinity thereof, provided that the contents are identified to such individuals by a readily available written record.

(vii) For manufacturing or process equipment, such as nuclear reactors, reactor components, piping, and tanks.

(4) Each licensee shall, prior to disposal of an empty uncontaminated container to unrestricted areas, remove or deface the radioactive material label or otherwise clearly indicate that the container no longer contains radioactive materials.

(Sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

[25 FR 10914, Nov. 17, 1960, as amended at 31 FR 10515, Aug. 5, 1966; 34 FR 19546, Dec. 11, 1969; 35 FR 5033, Mar. 25, 1970; 42 FR 64520, Dec. 27, 1977; 43 FR 2167, Jan. 16, 1978; 43 FR 22172, May 24, 1978]

§ 20.204 Same: exceptions.

Notwithstanding the provisions of § 20.203,

(a) A room or area is not required to be posted with a caution sign because of the presence of a sealed source provided the radiation level twelve inches from the surface of the source container or housing does not exceed five millirem per hour.

(b) Rooms or other areas in hospitals are not required to be posted with caution signs, and control of entrance or access thereto pursuant to § 20.203(c) is not required, because of the presence of patients containing by-product material provided that there are personnel in attendance who will take the precautions necessary to prevent the exposure of any individual to radiation or radioactive material in excess of the limits established in the regulations in this part.

(c) Caution signs are not required to be posted at areas or rooms containing radioactive materials for periods of less than eight hours provided that (1) the materials are constantly attended during such periods by an individual who shall take the precautions necessary to prevent the exposure of any individual to radiation or radioactive materials in excess of the limits established in the regulations in this part and; (2) such area or room is subject to the licensee's control.

(d) A room or other area is not required to be posted with a caution sign, and control is not required for each entrance or access point to a room or other area which is a high radiation area solely because of the presence of radioactive materials prepared for transport and packaged and labeled in accordance with regulations of the Department of Transportation.

[25 FR 10914, Nov. 17, 1960, as amended at 35 FR 5033, Mar. 25, 1970]

§ 20.205 Procedures for picking up, receiving, and opening packages.

(a)(1) Each licensee who expects to receive a package containing quantities of radioactive material in excess of the Type A quantities specified in paragraph (b) of this section shall:

(i) If the package is to be delivered to the licensee's facility by the carrier, make arrangements to receive the package when it is offered for delivery by the carrier; or

(ii) If the package is to be picked up by the licensee at the carrier's terminal, make arrangements to receive notification from the carrier of the arrival of the package, at the time of arrival.

(2) Each licensee who picks up a package of radioactive material from a carrier's terminal shall pick up the package expeditiously upon receipt of notification from the carrier of its arrival.

(b)(1) Each licensee, upon receipt of a package of radioactive material, shall monitor the external surfaces of the package for radioactive contamination caused by leakage of the radioactive contents, except:

(i) Packages containing no more than the exempt quantity specified in the table in this paragraph;

(ii) Packages containing no more than 10 millicuries of radioactive material consisting solely of tritium, carbon-14, sulfur-35, or iodine-125;

(iii) Packages containing only radioactive material as gases or in special form;

(iv) Packages containing only radioactive material in other than liquid form (including Mo-99/Tc-99m generators) and not exceeding the Type A

quantity limit specified in the table in this paragraph; and

(v) Packages containing only radionuclides with half-lives of less than 30 days and a total quantity of no more than 100 millicuries.

The monitoring shall be performed as soon as practicable after receipt, but no later than three hours after the package is received at the licensee's facility if received during the licensee's normal working hours, or eighteen hours if received after normal working hours.

(2) If removable radioactive contamination in excess of 0.01 microcuries (22,000 disintegrations per minute) per 100 square centimeters of package surface is found on the external surfaces of the package, the licensee shall immediately notify the final delivering carrier and, by telephone and telegraph, mailgram or facsimile, the appropriate Nuclear Regulatory Commission Inspection and Enforcement Regional Office shown in Appendix D of this part.

TABLE OF EXEMPT AND TYPE A QUANTITIES

Transport group ¹	Exempt quantity limit (in millicuries)	Type A quantity limit (in curies)
I	0.1	0.001
II	0.1	0.050
III	1	3
IV	1	20
V	1	20
VI	1	1000
VII	25,000	1000
Special Form	1	20

¹The definitions of "transport group" and "special form" are specified in § 71.4 of this chapter.

(c)(1) Each licensee, upon receipt of a package containing quantities of radioactive material in excess of the Type A quantities specified in paragraph (b) of this section, other than those transported by exclusive use vehicle, shall monitor the radiation levels external to the package. The package shall be monitored as soon as practicable after receipt, but no later than three hours after the package is received at the licensee's facility if received during the licensee's normal

¹The reporting requirements in § 20.205 have been approved by GAO under number B-180 225 (R 0054).

working hours, or 18 hours if received after normal working hours.

(2) If radiation levels are found on the external surface of the package in excess of 200 millirem per hour, or at three feet from the external surface of the package in excess of 10 millirem per hour, the licensee shall immediately notify by telephone and telegraph mailgram, or facsimile, the director of the appropriate NRC Regional Office listed in Appendix D, and the final delivering carrier.

(d) Each licensee shall establish and maintain procedures for safely opening packages in which licensed material is received, and shall assure that such procedures are followed and that due consideration is given to special instructions for the type of package being opened.

[39 FR 17974, May 22, 1974, as amended at 41 FR 16445, Apr. 19, 1976]

§ 20.206 Instruction of personnel.

Instructions required for individuals working in or frequenting any portion of a restricted area are specified in § 19.12 of this chapter.

[38 FR 22220, Aug. 17, 1973]

§ 20.207 Storage and control of licensed materials in unrestricted areas.

(a) Licensed materials stored in an unrestricted area shall be secured from unauthorized removal from the place of storage.

(b) Licensed materials in an unrestricted area and not in storage shall be tended under the constant surveillance and immediate control of the licensee.

[40 FR 26679, June 25, 1975]

WASTE DISPOSAL

§ 20.301 General requirement.*

No licensee shall dispose of licensed material except:

(a) By transfer to an authorized recipient as provided in the regulations in Part 30, 40, or 70 of this chapter, whichever may be applicable; or

(b) As authorized pursuant to § 20.302; or

(c) As provided in § 20.303, applicable to the disposal of licensed material by

release into sanitary sewerage systems, or in § 20.106 (Radioactivity in effluents to unrestricted areas).

(25 FR 10914, Nov. 17, 1960, as amended at 45 FR 71763, Oct. 30, 1980)

EFFECTIVE DATE NOTE: At 45 FR 71763, Oct. 30, 1980, § 20.301(c) was revised, effective Jan. 28, 1981. For the convenience of the user, the superseded text is set out below.

§ 20.301 General requirement.

* * *

(c) As provided in § 20.303 or § 20.304, applicable respectively to the disposal of licensed material by release into sanitary sewerage systems or burial in soil, or in § 20.106 (Radioactivity in effluents to unrestricted areas).

§ 20.302 Method for obtaining approval of proposed disposal procedures.

(a) Any licensee or applicant for a license may apply to the Commission for approval of proposed procedures to dispose of licensed material in a manner not otherwise authorized in the regulations in this chapter. Each application should include a description of the licensed material and any other radioactive material involved, including the quantities and kinds of such material and the levels of radioactivity involved, and the proposed manner and conditions of disposal. The application should also include an analysis and evaluation of pertinent information as to the nature of the environment, including topographical, geological, meteorological, and hydrological characteristics; usage of ground and surface waters in the general area; the nature and location of other potentially affected facilities; and procedures to be observed to minimize the risk of unexpected or hazardous exposures.

(b) The Commission will not approve any application for a license to receive licensed material from other persons for disposal on land not owned by the Federal government or by a State government.

(c) The Commission will not approve any application for a license for disposal of licensed material at sea unless the applicant shows that sea disposal offers less harm to man or the envi-

ronment than other practical alternative methods of disposal.

(25 FR 10914, Nov. 17, 1960, as amended at 26 FR 352, Jan. 18, 1961; 36 FR 23138, Dec. 4, 1971)

§ 20.303 Disposal by release into sanitary sewerage systems.

No licensee shall discharge licensed material into a sanitary sewerage system unless:

(a) It is readily soluble or dispersible in water; and

(b) The quantity of any licensed or other radioactive material released into the system by the licensee in any one day does not exceed the larger of paragraphs (b)(1) or (2) of this section.

(1) The quantity which, if diluted by the average daily quantity of sewage released into the sewer by the licensee, will result in an average concentration equal to the limits specified in Appendix B, Table I, Column 2 of this part; or

(2) Ten times the quantity of such material specified in Appendix C of this part; and

(c) The quantity of any licensed or other radioactive material released in any one month, if diluted by the average monthly quantity of water released by the licensee, will not result in an average concentration exceeding the limits specified in Appendix B, Table I, Column 2 of this part; and

(d) The gross quantity of licensed and other radioactive material released into the sewerage system by the licensee does not exceed one curie per year. Excreta from individuals undergoing medical diagnosis or therapy with radioactive material shall be exempt from any limitations contained in this section.

§ 20.304 Disposal by burial in soil.

No licensee shall dispose of licensed material by burial in soil unless:

(a) The total quantity of licensed and other radioactive materials buried at any one location and time does not exceed, at the time of burial, 1,000 times the amount specified in Appendix C of this part; and

(b) Burial is at a minimum depth of four feet; and

(c) Successive burials are separated by distances of at least six feet and not more than 12 burials are made in any year.

EFFECTIVE DATE NOTE: At 45 FR 71762, Oct. 30, 1980, § 20.304 was removed, effective January 28, 1981.

§ 20.305 Treatment or disposal by incineration.

No licensee shall treat or dispose of licensed material by incineration except as specifically approved by the Commission pursuant to §§ 20.106(b) and 20.302.

(29 FR 14435, Oct. 21, 1964)

RECORDS, REPORTS, AND NOTIFICATION

§ 20.401 Records of surveys, radiation monitoring, and disposal.

(a) Each licensee shall maintain records showing the radiation exposures of all individuals for whom personnel monitoring is required under § 20.202 of the regulations in this part. Such records shall be kept on Form NRC-5, in accordance with the instructions contained in that form or on clear and legible records containing all the information required by Form NRC-5. The doses entered on the forms or records shall be for periods of time not exceeding one calendar quarter.

(b) Each licensee shall maintain records in the same units used in this part, showing the results of surveys required by § 20.201(b), monitoring required by §§ 20.205(b) and 20.205(c), and disposals made under §§ 20.302, 20.303, and deleted § 20.304.¹

(c)(1) Records of individual exposure to radiation and to radioactive material which must be maintained pursuant to the provisions of paragraph (a) of this section and records of bioassays, including results of whole body counting examinations, made pursuant to § 20.108, shall be preserved until the Commission authorizes disposition.

(2) Records of the results of surveys and monitoring which must be maintained pursuant to paragraph (b) of this section shall be preserved for two

¹Section 20.304 provided for burial of small quantities of licensed materials in soil. Notice of its deletion appears in the *FEDERAL REGISTER* of October 30, 1980 (45 FR 71762).

years after completion of the survey except that the following records shall be maintained until the Commission authorizes their disposition: (i) Records of the results of surveys to determine compliance with § 20.103(a); (ii) in the absence of personnel monitoring data, records of the results of surveys to determine external radiation dose; and (iii) records of the results of surveys used to evaluate the release of radioactive effluents to the environment.

(3) Records of disposal of licensed material made pursuant to §§ 20.302, 20.303, and deleted § 20.304¹ are to be maintained until the Commission authorizes their disposition.

(4) Records which must be maintained pursuant to this part may be the original or a reproduced copy or microform if such reproduced copy or microform is duly authenticated by authorized personnel and the microform is capable of producing a clear and legible copy after storage for the period specified by Commission regulations.

(5) If there is a conflict between the Commission's regulations in this part, license condition, or technical specification, or other written Commission approval or authorization pertaining to the retention period for the same type of record, the retention period specified in the regulations in this part for such records shall apply unless the Commission pursuant to § 20.501, has granted a specific exemption from the record retention requirements specified in the regulations in this part.

(Sec. 161 b. and i., Pub. L. 83-703, 68 Stat. 948; sec. 201, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 2201, 5841))

(25 FR 10914, Nov. 17, 1960, as amended at 41 FR 18301, May 3, 1976; 45 FR 71763, Oct. 30, 1980)

EFFECTIVE DATE NOTE: At 45 FR 71763, Oct. 30, 1980, paragraphs (b) and (c)(3) of § 20.401 were revised effective Jan. 28, 1981. For the convenience of the user, the superseded text is set out below.

§ 20.401 Records of surveys, radiation monitoring, and disposal.

* * *

(b) Each licensee shall maintain records in the same units used in this part, showing the results of surveys required by § 20.201(b), monitoring required by §§ 20.205(b) and 20.205(c), and disposals made under §§ 20.302, 20.303, and 20.304.

(c) * * *

(3) Records of disposal of licensed material made pursuant to §§ 20.302, 20.303, or 20.304 shall be maintained until the Commission authorizes their disposition.

§ 20.402 Reports of theft or loss of licensed material.

(a) Each licensee shall report by telephone to the Director of the appropriate Nuclear Regulatory Commission Inspection and Enforcement Regional Office listed in Appendix D of this part, immediately after its occurrence becomes known to the licensee, any loss or theft of licensed material in such quantities and under such circumstances that it appears to the licensee that a substantial hazard may result to persons in unrestricted areas.

(b) Each licensee who is required to make a report pursuant to paragraph (a) of this section shall, within thirty (30) days after he learns of the loss or theft, make a report in writing to the appropriate NRC Regional Office listed in Appendix D of this part with copies to the Director of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, setting forth the following information:

(1) A description of the licensed material involved, including kind, quantity, chemical, and physical form;

(2) A description of the circumstances under which the loss or theft occurred;

(3) A statement of disposition or probable disposition of the licensed material involved;

(4) Radiation exposures to individuals, circumstances under which the exposures occurred, and the extent of possible hazard to persons in unrestricted areas;

(5) Actions which have been taken, or will be taken, to recover the material; and

(6) Procedures or measures which have been or will be adopted to prevent a recurrence of the loss or theft of licensed material.

(c) Subsequent to filing the written report the licensee shall also report any substantive additional information on the loss or theft which becomes available to the licensee, within 30 days after he learns of such information.

(d) Any report filed with the Commission pursuant to this section shall be so prepared that names of individuals who may have received exposure to radiation are stated in a separate part of the report.

(Sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

[34 FR 7500, May 9, 1969, as amended at 38 FR 1271, Jan. 11, 1973, 41 FR 16445, Apr. 17, 1976, 42 FR 43965, Sept. 1, 1977]

§ 20.403 Notifications of incidents.

(a) *Immediate notification.* Each licensee shall immediately notify by telephone and telegraph, mailgram, or facsimile, the Director of the appropriate NRC Regional Office listed in Appendix D of this part of any incident involving byproduct, source, or special nuclear material possessed by him and which may have caused or threatens to cause:

(1) Exposure of the whole body of any individual to 25 rems or more of radiation; exposure of the skin of the whole body of any individual of 150 rems or more of radiation; or exposure of the feet, ankles, hands or forearms of any individual to 375 rems or more of radiation; or

(2) The release of radioactive material in concentrations which, if averaged over a period of 24 hours, would exceed 5,000 times the limits specified for such materials in Appendix B, Table II of this part; or

(3) A loss of one working week or more of the operation of any facilities affected; or

(4) Damage to property in excess of \$200,000.

(b) *Twenty-four hour notification.* Each licensee shall within 24 hours notify by telephone and telegraph, mailgram, or facsimile, the Director of the appropriate NRC Regional Office

listed in Appendix D of this part of any incident involving licensed material possessed by him and which may have caused or threatens to cause:

(1) Exposure of the whole body of any individual to 5 rems or more of radiation; exposure of the skin of the whole body of any individual to 30 rems or more of radiation; or exposure of the feet, ankles, hands, or forearms to 75 rems or more of radiation; or

(2) The release of radioactive material in concentrations which, if averaged over a period of 24 hours, would exceed 500 times the limits specified for such materials in Appendix B, Table II of this part; or

(3) A loss of one day or more of the operation of any facilities affected; or

(4) Damage to property in excess of \$2,000.

(c) Any report filed with the Commission pursuant to this section shall be prepared so that names of individuals who have received exposure to radiation will be stated in a separate part of the report.

(d) For nuclear power reactors licensed under § 50.21 or § 50.22, the incidents included in paragraph (a) and paragraph (b) in this section shall in addition be reported pursuant to § 50.72.

(Sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841); secs. 161b and c., Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201))

[27 FR 5905, June 22, 1962, as amended at 28 FR 6823, July 3, 1963, 41 FR 16445, Apr. 19, 1976, 42 FR 43965, Sept. 1, 1977, 43 FR 2719, Jan. 19, 1978, 45 FR 13435, Feb. 29, 1980]

§ 20.404 [Reserved]

§ 20.405 Reports of overexposures and excessive levels and concentrations.

(a) In addition to any notification required by § 20.403, each licensee shall make a report in writing within 30 days to the Regional Office listed in Appendix D of this part, with a copy to the Director of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, of: (1) Each exposure of an individual to radiation in excess of the applicable limits in §§ 20.101 or 20.104(a) or the license; (2) each exposure of an individual to radioactive material in excess of

the applicable limits in §§ 20.103(a)(1), 20.103(a)(2), 20.104(b) or the license; (3) levels of radiation or concentrations of radioactive material in a restricted area in excess of any other applicable limit in the license; (4) any incident for which notification is required by § 20.403; and (5) levels of radiation or concentrations of radioactive material (whether or not involving excessive exposure of any individual) in an unrestricted area in excess of ten times any applicable limit set forth in this part or in the license.

Each report required under this paragraph shall describe the extent of exposure of individuals to radiation or to radioactive material, including estimates of each individual's exposure as required by paragraph (b) of this section; levels of radiation and concentrations of radioactive material involved; the cause of the exposure, levels or concentrations; and corrective steps taken or planned to assure against a recurrence.

(b) Any report filed with the Commission pursuant to this section shall include for each individual exposed the name, social security number, and date of birth, and an estimate of the individual's exposure. The report shall be prepared so that this information is stated in a separate part of the report.

(Sec. 161, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, Pub. L. 93-438, 88 Stat. 1212 (42 U.S.C. 5841))

[25 FR 10914, Nov. 17, 1960, as amended at 28 FR 6823, July 3, 1963, 35 FR 15068, Sept. 29, 1970, 41 FR 52302, Nov. 29, 1976, 42 FR 20138, Apr. 18, 1977, 43 FR 29270, July 7, 1978]

§ 20.406 [Reserved]

§ 20.407 Personnel monitoring reports.

Each person described in § 20.408 of this part shall, within the first quarter of each calendar year, submit to the Director of Management and Program Analysis, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, the reports specified in paragraphs (a) and (b) of this section covering the preceding calendar year.¹ All other

¹ A licensee whose license expires or terminates prior to, or on the last day of the calendar year, shall submit reports at the expi-

persons specifically licensed by the Commission shall, within the first quarter of calendar years 1979 and 1980, submit to the Director of Management and Program Analysis, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, the reports specified in paragraphs (a) and (b) of this section covering the preceding calendar years 1978 and 1979.¹⁷

(a) A report of either (1) the total number of individuals for whom personnel monitoring was required under § 20.202(a) or § 34.33(a) of this chapter during the calendar year, or (2) the total number of individuals for whom personnel monitoring was provided during the calendar year. *Provided, however,* That such total includes at least the number of individuals required to be reported under paragraph (a)(1) of this section. The report shall indicate whether it is submitted in accordance with paragraph (a)(1) or (a)(2) of this section. If personnel monitoring was not required to be provided to any individual by the licensee under §§ 20.202(a) or 34.33(a) of this chapter during the calendar year, the licensee shall submit a negative report indicating that such personnel monitoring was not required.

(b) A statistical summary report of the personnel monitoring information recorded by the licensee for individuals for whom personnel monitoring was either required or provided, as described in paragraph (a) of this section, indicating the number of individuals whose total whole body exposure recorded during the previous calendar year was in each of the following estimated exposure ranges:

Estimated whole body exposure range (rems)	Number of individuals in each range
No measurable exposure	
Measurable exposure less than 0.1	
0.1 to 0.25	
0.25 to 0.5	
0.5 to 0.75	
0.75 to 1	
1 to 2	
2 to 3	
3 to 4	
4 to 5	
5 to 6	
6 to 7	
7 to 8	
8 to 9	
9 to 10	
10 to 11	
11 to 12	
12 +	

¹⁷Individual values exactly equal to the values separating exposure ranges shall be reported in the higher range.

The low exposure range data are required in order to obtain better information about the exposures actually recorded. This section does not require improved measurements.

(Sec. 161, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))
[43 FR 44829, Sept. 29, 1978]

§ 20.408 Reports of personnel monitoring on termination of employment or work.

(a) This section applies to each person licensed by the Commission to:

(1) Operate a nuclear reactor designed to produce electrical or heat energy pursuant to § 50.21(b) or § 50.22 of this chapter or a testing facility as defined in § 50.2(r) of this chapter;

(2) Possess or use byproduct material for purposes of radiography pursuant to Parts 30 and 34 of this chapter;

(3) Process or use at any one time, for purposes of fuel processing, fabrication, or reprocessing, special nuclear material in a quantity exceeding 5,000 grams of contained uranium-235, uranium-233, or plutonium or any combination thereof pursuant to Part 70 of this chapter; or

(4) Possess or use at any one time, for processing or manufacturing for distribution pursuant to part 30, 32, or 33 of this chapter, byproduct material in quantities exceeding any one of the following quantities:

Radionuclide	Quantity in curies
Cesium-137	1
Cobalt-60	1
Gold-198	100
Iodine-131	1
Iridium-192	10
Krypton-85	1,000
Promethium-147	10
Technetium-99m	1,000

¹⁸The Commission may require, as a license condition, or by rule, regulation or order pursuant to § 20.502, reports from licensees who are licensed to use radionuclides not on this list in quantities sufficient to cause comparable radiation levels.

(b) When an individual terminates employment with a licensee describe in paragraph (a) of this section, or an individual assigned to work in such a licensee's facility but not employed by the licensee, completes the work assignment in the licensee's facility, the licensee shall furnish to the Director of Management and Program Analysis, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, a report of the individual's exposures to radiation and radioactive material, incurred during the period of employment or work assignment in the licensee's facility, containing information recorded by the licensee pursuant to §§ 20.401(a) and 20.108. Such report shall be furnished within 30 days after the exposure of the individual has been determined by the licensee or 90 days after the date of termination of employment or work assignment, whichever is earlier.

(Sec. 161, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))
[43 FR 44829, Sept. 29, 1978]

§ 20.409 Notifications and reports to individuals.

(a) Requirements for notifications and reports to individuals of exposure to radiation or radioactive material are specified in § 19.13 of this chapter.

(b) When a licensee is required pursuant to §§ 20.405 or 20.408 to report to the Commission any exposure of an individual to radiation or radioactive material, the licensee shall also notify the individual. Such notice shall be transmitted at a time not later than the transmittal to the Commission, and shall comply with the provisions of § 19.13(a) of this chapter.

[38 FR 22220, Aug. 17, 1973]

EXCEPTIONS AND ADDITIONAL REQUIREMENTS

§ 20.501 Applications for exemptions.

The Commission may, upon application by any licensee or upon its own initiative, grant such exemptions from the requirements of the regulations in this part, as it determines are authorized by law and will not result in undue hazard to life or property.

§ 20.502 Additional requirements.

The Commission may, by rule, regulation, or order, impose upon any licensee such requirements, in addition to those established in the regulations in this part, as it deems appropriate or necessary to protect health or to minimize danger to life or property.

ENFORCEMENT

§ 20.601 Violations.

An injunction or other court order may be obtained prohibiting any violation of any provision of the Atomic Energy Act of 1954, as amended, or Title II of the Energy Reorganization Act of 1974, or any regulation or order issued thereunder. A court order may be obtained for the payment of a civil penalty imposed pursuant to section 234 of the Act for violation of section 53, 57, 62, 63, 81, 82, 101, 103, 104, 107, or 109 of the Act, or section 206 of the Energy Reorganization Act of 1974, or any rule, regulation, or order issued thereunder, or any term, condition, or limitation of any license issued thereunder, or for any violation for which a license may be revoked under section 186 of the Act. Any person who willfully violates any provision of the Act or any regulation or order issued thereunder may be guilty of a crime and, upon conviction, may be punished by fine or imprisonment or both, as provided by law.

(Sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

[40 FR 8784, Mar. 3, 1975, as amended at 42 FR 25721, May 19, 1977]

NOTE: The reporting and record keeping requirements contained in this part have been approved by the General Accounting

ration or termination of the license, covering that part of the year during which the license was in effect.

¹⁷The Commission will evaluate the data obtained for 1978 and 1979 pursuant to this paragraph, and the benefits derived therefrom and may take action, including publication of notice of proposed rulemaking, to extend or otherwise modify this reporting requirement.

$(100,000\mu\text{Ci})$ $\text{Au}^{199}/(100,000\mu\text{Ci}) +$
 $(100,000\mu\text{Ci})^{137}/(100,000\mu\text{Ci}) +$
 $(100\mu\text{Ci})^{131}/(1,000\mu\text{Ci}) = 1$

The denominator in each of the above ratios was obtained by multiplying the figure in the table by 1,000 as provided in § 20.304.

[39 FR 8425, Apr. 22, 1970, as amended at 36 FR 16698, Aug. 26, 1971; 38 FR 29314, Oct. 31, 1973; 39 FR 23991, June 28, 1974; 45 FR 71763, Oct. 30, 1980]

EFFECTIVE DATE NOTE: At 45 FR 71763, Oct. 30, 1980, Part 20, Appendix C was amended, effective Jan. 28, 1981. For the convenience of the user, the superseded text is set out below.

APPENDIX C

NOTE: For purposes of §§ 20.203 and 20.304, where there is involved a combination of isotopes in known amounts the limit for the combination should be derived as follows: Determine, for each isotope in the combination, the ratio between the quantity present in the combination and the limit otherwise established for the specific isotope when not in combination. The sum of such ratios for all the isotopes in the combination may not exceed "1" (i.e., "unity").***

APPENDIX D—UNITED STATES NUCLEAR REGULATORY COMMISSION INSPECTION AND ENFORCEMENT REGIONAL OFFICES

	Address	Telephone	
		Daytime	Nights and holidays
Region I: Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont	Region I USNRC, Office of Inspection and Enforcement, 831 Park Ave., King of Prussia, Pa. 19406	(215) 337-5000	(215) 337-5000
Region II: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, Puerto Rico, South Carolina, Tennessee, Virginia, Virgin Islands, and West Virginia	Region II USNRC, Office of Inspection and Enforcement, 101 Marietta Street, Suite 3100, Atlanta, Ga. 30303	(404) 221-4500	(404) 221-4500
Region III: Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin	Region III USNRC, Office of Inspection and Enforcement, 799 Roosevelt Rd., Glen Ellyn, Ill. 60137	(312) 932-2500	(312) 932-2500
Region IV: Arkansas, Colorado, Idaho, Kansas, Louisiana, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Wyoming	Region IV USNRC, Office of Inspection and Enforcement, 811 Ryan Plaza Dr., Suite 1000, Arlington, Tex. 76012	(817) 334-2641	(817) 334-2641
Region V: Alaska, Arizona, California, Hawaii, Nevada, Oregon, Washington, and U.S. territories and possessions in the Pacific	Region V USNRC, Office of Inspection and Enforcement, 1990 North California Blvd., Suite 202, Walnut Creek, Calif. 94596	(415) 943-3700	(415) 943-3700

(Sec. 301, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

[40 FR 42558, Sept. 15, 1975, as amended at 41 FR 55851, Dec. 23, 1976; 42 FR 25721, May 19, 1977; 43 FR 32741, July 28, 1978; 43 FR 52202, Nov. 9, 1978; 44 FR 63515, Nov. 5, 1979; 45 FR 18905, Mar. 24, 1980]

PART 21—REPORTING OF DEFECTS AND NONCOMPLIANCE

NOTIFICATION

Sec.
21.21 Notification of failure to comply or existence of a defect.

GENERAL PROVISIONS

Sec.
21.1 Purpose.
21.2 Scope.
21.3 Definitions.
21.4 Interpretations.
21.5 Communications.
21.6 Posting requirements.
21.7 Exemptions.

PROCUREMENT DOCUMENTS

21.31 Procurement documents.

INSPECTIONS, RECORDS

21.41 Inspections.
21.51 Maintenance of records.

ENFORCEMENT

Sec.
21.61 Failure to notify.

AUTHORITY: Sec. 161, Pub. L. 83-703, 68 Stat. 948; sec. 234, Pub. L. 91-161, 83 Stat. 444; sec. 206, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 2201, 2282, 5846), unless otherwise noted.

SOURCE: 42 FR 28893, June 6, 1977, unless otherwise noted.

GENERAL PROVISIONS

§ 21.1 Purpose.

The regulations in this part establish procedures and requirements for implementation of section 206 of the Energy Reorganization Act of 1974. That section requires any individual director or responsible officer of a firm constructing, owning, operating or supplying the components of any facility or activity which is licensed or otherwise regulated pursuant to the Atomic Energy Act of 1954, as amended, or the Energy Reorganization Act of 1974,

that the facility or basic component supplied to such facility

the Commission relating to

safety

the Commission

immediately notify

the Commission of such failure to comply or such defect, unless he has actual knowledge that the Commission has been adequately informed of such defect or failure to comply.

§ 21.2 Scope.

The regulations in this part apply, except as specifically provided otherwise in Parts 31, 34, 35, 40, or 70 of this chapter, to each individual, partnership, corporation, or other entity licensed pursuant to the regulations in this chapter to possess, use, and/or transfer within the United States source, byproduct and/or special nuclear materials, or to construct, manufacture, possess, own, operate and/or transfer within the United States, any

production or utilization facility, and to each director (see § 21.3(f)) and responsible officer (see § 21.3(j)) of such a licensee. The regulations in this part apply also to each individual, corporation, partnership or other entity doing business within the United States, and each director and responsible officer of such organization, that constructs (see § 21.3(c)) a production or utilization facility licensed for manufacture, construction or operation (see § 21.3(h)) pursuant to Part 50 of this chapter or supplies (see § 21.3(i)) basic components (see 21.3(a)) for a facility or activity licensed, other than for export, under Parts 30, 40, 50, 70, or 71 of this chapter. Nothing in these regulations should be deemed to preclude either an individual or a manufacturer/supplier of a commercial grade item (see § 21.3(a-1)) not subject to the regulations in this part from reporting to the Commission a known or suspected defect or failure to comply and, as authorized by law, the identity of anyone so reporting will be withheld from disclosure.

(Sec. 161, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201), sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

[42 FR 28893, June 6, 1977, as amended at 43 FR 48621, Oct. 19, 1978; 43 FR 52202, Nov. 9, 1978; 44 FR 63515, Nov. 5, 1979]

§ 21.3 Definitions.

As used in this part, (a) "Basic component," when applied to nuclear power reactors means a plant structure, system, component or part thereof necessary to assure (1) the integrity of the reactor coolant pressure boundary, (2) the capability to shut down the reactor and maintain it in a safe shut down condition, or (3) the capa-

NRC Regional Offices will accept collect telephone calls from individuals who wish to speak to NRC representatives concerning nuclear safety-related problems. The location and telephone numbers (for nights and holidays as well as regular hours) are listed below:

Region	
I (Philadelphia)	(215) 337-5000
II (Atlanta)	(404) 221-4500
III (Chicago)	(312) 932-2500
IV (Dallas)	(817) 334-2641
V (San Francisco)	(415) 943-3700

bility to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in § 100.11 of this chapter. "Basic component," when applied to other facilities and when applied to other activities licensed pursuant to Parts 30, 40, 50, 70 or 71 of this chapter, means a component, structure, system, or part thereof that is directly procured by the licensee of a facility or activity subject to the regulations in this part and in which a defect (see § 21.3(d)) or failure to comply with any applicable regulation in this chapter, order, or license issued by the Commission could create a substantial safety hazard (see § 21.3(k)). In all cases "basic component" includes design, inspection, testing, or consulting services important to safety that are associated with the component hardware, whether these services are performed by the component supplier or others. A commercial grade item is not a part of a basic component until after dedication (see § 21.3(c-1)).

(a-1) "Commercial grade item" means an item that is (1) not subject to design or specification requirements that are unique to facilities or activities licensed pursuant to Parts 30, 40, 50, 70, or 71 of this chapter and (2) used in applications other than facilities or activities licensed pursuant to Parts 30, 40, 50, 70, or 71 of this chapter and (3) to be ordered from the manufacturer/supplier on the basis of specifications set forth in the manufacturer's published product description (for example a catalog).

(b) "Commission" means the Nuclear Regulatory Commission or its duly authorized representatives.

(c) "Constructing" or "construction" means the design, manufacture, fabrication, placement, erection, installation, modification, inspection, or testing of a facility or activity which is subject to the regulations in this part and consulting services related to the facility or activity that are important to safety.

(c-1) "Dedication" of a commercial grade item occurs after receipt when that item is designated for use as a basic component.

(d) "Defect" means:

(1) A deviation (see § 21.3(e)) in a basic component delivered to a purchaser for use in a facility or an activity subject to the regulations in this part if, on the basis of an evaluation (see § 21.3(g)), the deviation could create a substantial safety hazard; or

(2) The installation, use, or operation of a basic component containing a defect as defined in paragraph (d)(1) of this section; or

(3) A deviation in a portion of a facility subject to the construction permit or manufacturing licensing requirements of Part 50 of this chapter provided the deviation could, on the basis of an evaluation, create a substantial safety hazard and the portion of the facility containing the deviation has been offered to the purchaser for acceptance; or

(4) A condition or circumstance involving a basic component that could contribute to the exceeding of a safety limit, as defined in the technical specifications of a license for operation issued pursuant to Part 50 of this chapter.

(e) "Deviation" means a departure from the technical requirements included in a procurement document (see § 21.3(l)).

(f) "Director" means an individual, appointed or elected according to law, who is authorized to manage and direct the affairs of a corporation, partnership or other entity. In the case of an individual proprietorship, "director" means the individual.

(g) "Evaluation" means the process accomplished by or for a licensee to determine whether a particular deviation could create a substantial safety hazard.

(h) "Operating" or "operation" means the operation of a facility or the conduct of a licensed activity which is subject to the regulations in this part and consulting services related to operations that are important to safety.

(i) "Procurement document" means a contract that defines the requirements which facilities or basic components must meet in order to be considered acceptable by the purchaser.

(j) "Responsible officer" means the president, vice-president or other individual in the organization of a corpo-

ration, partnership, or other entity who is vested with executive authority over activities subject to this part.

(k) "Substantial safety hazard" means a loss of safety function to the extent that there is a major reduction in the degree of protection provided to public health and safety for any facility or activity licensed, other than for export, pursuant to Parts 30, 40, 50, 70 and 71 of this chapter.

(l) "Supplying" or "supplies" means contractually responsible for a basic component used or to be used in a facility or activity which is subject to the regulations in this part.

[42 FR 28893, June 6, 1977; 42 FR 36803, July 18, 1977, as amended at 43 FR 48622, Oct. 19, 1978]

§ 21.4 Interpretations.

Except as specifically authorized by the Commission in writing, no interpretation of the meaning of the regulations in this part by any officer or employee of the Commission other than a written interpretation by the General Counsel will be recognized to be binding upon the Commission.

§ 21.5 Communications.

Except where otherwise specified in this part, all communications and reports concerning the regulations in this part should be addressed to the Director, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, or to the Director of a Regional Office at the address specified in Appendix D of Part 20 of this chapter. Communications and reports also may be delivered in person at the Commission's offices at 1717 H Street NW., Washington, D.C.; at 7920 Norfolk Avenue, Bethesda, Md.; or at a Regional Office at the location specified in Appendix D of Part 20 of this chapter.

§ 21.6 Posting requirements.

(a) Each individual, partnership, corporation or other entity subject to the regulations in this part, shall post current copies of the following documents in a conspicuous position on any premises, within the United States where the activities subject to this part are conducted (1) the regulations in this part, (2) section 206 of the Energy Re-

organization Act of 1974, and (3) procedures adopted pursuant to the regulations in this part.

(b) If posting of the regulations in this part or the procedures adopted pursuant to the regulations in this part is not practicable, the licensee or firm subject to the regulations in this part may, in addition to posting section 206, post a notice which describes the regulations/procedures, including the name of the individual to whom reports may be made, and states where they may be examined.

(c) The effective date of this section has been deferred until January 6, 1978.

§ 21.7 Exemptions.

The Commission may, upon application of any interested person or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest. Suppliers of commercial grade items are exempt from the provisions of this part to the extent that they supply commercial grade items.

[42 FR 28893, June 6, 1977, as amended at 43 FR 48622, Oct. 19, 1978]

NOTIFICATION

§ 21.21 Notification of failure to comply or existence of a defect.

(a) Each individual, corporation, partnership or other entity subject to the regulations in this part shall adopt appropriate procedures to:

(1) Provide for: (i) Evaluating deviations or (ii) Informing the licensee or purchaser of the deviation in order that the licensee or purchaser may cause the deviation to be evaluated unless the deviation has been corrected; and

(2) Assure that a director or responsible officer is informed if the construction or operation of a facility, or activity, or a basic component supplied for such facility or activity:

(i) Fails to comply with the Atomic Energy Act of 1954, as amended, or any applicable rule, regulation, order

or license of the Commission relating to a substantial safety hazard, or

(ii) Contains a defect. The effective date of this paragraph has been deferred until January 6, 1978.

(b)(1) A director or responsible officer subject to the regulations of this part or a designated person shall notify the Commission when he obtains information reasonably indicating a failure to comply or a defect affecting: (i) The construction or operation of a facility or an activity within the United States that is subject to the licensing requirements under Parts 30, 40, 50, 70 or 71 of this chapter and that is within his organization's responsibility or (ii) a basic component that is within his organization's responsibility and is supplied for a facility or an activity within the United States that is subject to the licensing requirements under Parts 30, 40, 50, 70 or 71. The above notification is not required if such individual has actual knowledge that the Commission has been adequately informed of such defect or such failure to comply.

(2) Initial notification required by this paragraph shall be made within two days following receipt of the information. Notification shall be made to the Director, Office of Inspection and Enforcement, or to the Director of a Regional Office. If initial notification is by means other than written communication, a written report shall be submitted to the appropriate Office within 5 days after the information is obtained. Three copies of each report shall be submitted to the Director, Office of Inspection and Enforcement.

(3) The written report required by this paragraph shall include, but need not be limited to, the following information, to the extent known:

(i) Name and address of the individual or individuals informing the Commission.

(ii) Identification of the facility, the activity, or the basic component supplied for such facility or such activity within the United States which fails to comply or contains a defect.

(iii) Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains a defect.

(iv) Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.

(v) The date on which the information of such defect or failure to comply was obtained.

(vi) In the case of a basic component which contains a defect or fails to comply, the number and location of all such components in use at, supplied for, or being supplied for one or more facilities or activities subject to the regulations in this part.

(vii) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.

(viii) Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.

(4) The director or responsible officer may authorize an individual to provide the notification required by this paragraph, provided that, this shall not relieve the director or responsible officer of his or her responsibility under this paragraph.

(c) Individuals subject to paragraph (b) of this section may be required by the Commission to supply additional information related to the defect or failure to comply.

PROCUREMENT DOCUMENTS

§ 21.51 Procurement documents.

Each individual, corporation, partnership or other entity subject to the regulations in this part shall assure that each procurement document for a facility, or a basic component issued by him, her or it on or after January 6, 1978 specifies, when applicable, that the provisions of 10 CFR Part 21 apply.

INSPECTIONS, RECORDS

§ 21.41 Inspections.

Each individual, corporation, partnership or other entity subject to the regulations in this part shall have duly authorized representatives of the Commission, to inspect its records,

premises, activities, and basic components as necessary to effectuate the purposes of this part.

§ 21.51 Maintenance of records.

(a) Each licensee of a facility or activity subject to the regulations in this part shall maintain such records in connection with the licensed facility or activity as may be required to assure compliance with the regulations in this part.

(b) Each individual, corporation, partnership, or other entity subject to the regulations in this part shall prepare records in connection with the designs, manufacture, fabrication, placement, erection, installation, modification, inspection, or testing of any facility, basic component supplied for any licensed facility or to be used in any licensed activity sufficient to assure compliance with the regulations in this part. After delivery of the facility or component and prior to the destruction of the records relating to evaluations (see § 21.3(g)) or notifications to the Commission (see § 21.21), such records shall be offered to the purchaser of the facility or component. If such purchaser determines any such records:

(1) Are not related to the creation of a substantial safety hazard, he may authorize such records to be destroyed, or

(2) Are related to the creation of a substantial safety hazard, he shall cause such records to be offered to the organization to which he supplies basic components or for which he constructs a facility or activity.

If such purchaser is unable to make the determination as required above then the responsibility for making the determination shall be transferred to the individual, corporation, partnership, or other entity subject to the regulations in this part that issued the procurement document to the purchaser. In the event that the determination cannot be made at that level then the responsibility shall be transferred in a similar manner to another individual, corporation, partnership, or other entity subject to the regulations in this part, until, if necessary, the licensee shall make the determination.

(c) Records that are prepared only for the purpose of assuring compliance with the regulations in this part and are not related to evaluations or notifications to the Commission may be destroyed after delivery of the facility or component.

(d) The effective date of the section has been deferred until January 6, 1978.

ENFORCEMENT

§ 21.61 Failure to notify.

Any director or responsible officer subject to the regulations in this part who knowingly and consciously fails to provide the notice required by § 21.21 shall be subject to a civil penalty in an amount not to exceed \$5,000 for each failure to provide such notice and a total amount not to exceed \$25,000 for all failures to provide such notice occurring within any period of thirty consecutive days. Each day of failure to provide the notice required by § 21.21 shall constitute a separate failure for the purpose of computing the applicable civil penalty.

NOTE: The reporting and record keeping requirements contained in this part have been approved by the General Accounting Office under B 180225 (RO 446).

PART 25—ACCESS AUTHORIZATION FOR LICENSEE PERSONNEL

GENERAL PROVISIONS

Sec.	
25.1	Purpose.
25.3	Scope.
25.5	Definitions.
25.7	Interpretations.
25.9	Communications.
25.11	Specific exemptions.
25.13	Records maintenance.

ACCESS AUTHORIZATIONS

25.15	Access permitted under "Q" or "L" access authorization.
25.17	Approval for processing applicants for access authorization.
25.19	Processing applications.
25.21	Determination of initial and continued eligibility for access authorization.
25.23	Notification of grant of access authorization.
25.25	Cancellation of requests for access authorization.

§ 25.33 Termination of access authorizations.

(a) Access authorizations will be terminated when:

(1) Access authorization is no longer required, or

(2) An individual is separated from the employment or the activity for which he obtained an access authorization for a period of 90 days or more, or

(3) An individual, pursuant to 10 CFR Part 10, is no longer eligible for access authorization.

(b) A representative of the licensee or other organization which employs the individual whose access authorization will be terminated shall immediately notify the NRC Division of Security when the circumstances noted in paragraphs (a)(1) or (a)(2) of this section exist; inform the individual that his access authorization is being terminated, and the reason; and that he will be considered for reinstatement of access authorization if he resumes work requiring it.

(c) When an access authorization is to be terminated, a representative of the licensee or other organization shall conduct a security termination briefing of the individual involved, explain the Security Termination Statement (NRC Form 136) and have the individual execute the form. The official shall notify the NRC Division of Security promptly in writing that a briefing was conducted and forward the original copy of the executed Security Termination Statement to the Division of Security.

VIOLATIONS

§ 25.35 Violations.

An injunction or other court order may be obtained prohibiting any violation of any provision of the Act or any regulation or order issued thereunder. Additionally, National Security Information is protected pursuant to the requirements and sanctions of E.O. 12065. In addition any person who willfully violates these provisions may be guilty of a crime, and upon conviction, may be punished by fine or imprisonment or both, as provided by law.

CLASSIFIED VISITS

§ 25.37 Classified visits.

Visits to NRC, NRC contractor, licensee or licensed related facilities, or other government agencies and their contractors involving access to classified information by individuals covered by this part require advance certification of "need-to-know" and verification of NRC access authorization. Individuals planning such visits shall complete NRC Form 277, "Request for Visit or Access Approval," with the "need-to-know" certified by the appropriate Commission Office exercising licensing or regulatory authority. This Commission office shall then forward the request to the NRC Division of Security at least 15 days in advance of the date of the visit for appropriate verification of NRC access authorization. The Division of Security shall forward the form to the facility to be visited.

APPENDIX A TO PART 25—FEES FOR NRC ACCESS AUTHORIZATION

Category	Fee
Initial "L" Access Authorization.....	\$15
Reinstatement of "L" Access Authorization.....	*15
Extension or Transfer of "L" Access Authorization.....	*15
Initial "Q" Access Authorization.....	1,095
Reinstatement of "Q" Access Authorization.....	*1,095
Extension or Transfer of "Q".....	*1,095

*Full fee will only be charged if investigation is required.

(31 U.S.C. 483a (65 Stat. 290))

(45 FR 45256, July 3, 1980)

PART 30—RULES OF GENERAL APPLICABILITY TO DOMESTIC LICENSING OF BYPRODUCT MATERIAL

GENERAL PROVISIONS

- Sec.
30.1 Purpose and scope.
30.2 Resolution of conflict.
30.3 Activities requiring license.
30.4 Definitions.
30.5 Interpretations.
30.6 Communications.

EXEMPTIONS

- 30.11 Specific exemptions.

Title 10—Energy

SOURCE: 30 FR 8185, June 26, 1965, unless otherwise noted.

NOMENCLATURE CHANGES: 40 FR 8784-8785, Mar. 3, 1975 and 45 FR 14200, Mar. 5, 1980.

GENERAL PROVISIONS

§ 30.1 Purpose and scope.

This part prescribes rules applicable to all persons in the United States governing domestic licensing of byproduct material under the Atomic Energy Act of 1954, as amended (68 Stat. 919), and under Title II of the Energy Reorganization Act of 1974 (88 Stat. 1242), and exemptions from the domestic licensing requirements permitted by section 81 of the Act.

[40 FR 8784, Mar. 3, 1975, as amended at 43 FR 6921, Feb. 17, 1978]

§ 30.2 Resolution of conflict.

The requirements of this part are in addition to, and not in substitution for, other requirements of this chapter. In any conflict between the requirements in this part of a specific requirement in another part of the regulations in this chapter, the specific requirement governs.

§ 30.3 Activities requiring license.

Except for persons exempt as provided in this part and Part 150 of this chapter, no person shall manufacture, produce, transfer, receive, acquire, own, possess, or use byproduct material except as authorized in a specific or general license issued pursuant to the regulations in this chapter.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[30 FR 8185, June 26, 1965, as amended at 43 FR 6921, Feb. 17, 1978]

§ 30.4 Definitions.

As used in this part and Parts 31 through 35 of this chapter.

(a) "Act" means the Atomic Energy Act of 1954 (68 Stat. 919), including any amendments thereto:

(a-1) "Department" and "Department of Energy" means the Department of Energy established by the Department of Energy Organization Act (Pub. L. 95-91, 91 Stat. 565, 42 U.S.C.

- Sec.
30.12 Persons using byproduct material under certain Department of Energy and Nuclear Regulatory Commission contracts.
30.13 Carriers.
30.14 Exempt concentrations.
30.15 Certain items containing byproduct material.
30.16 Resins containing scandium 46 and designed for sand-consolidation in oil wells.
30.18 Exempt quantities.
30.19 Self-luminous products containing tritium, krypton-85, or promethium-147.
30.20 Gas and aerosol detectors containing byproduct material.

LICENSES

- 30.31 Types of licenses.
30.32 Application for specific licenses.
30.33 General requirements for issuance of specific licenses.
30.34 Terms and conditions of licenses.
30.36 Expiration of licenses.
30.37 Applications for renewal of licenses.
30.38 Applications for amendment of licenses.
30.39 Commission action on applications to renew or amend.
30.41 Transfer of byproduct material.

RECORDS, INSPECTIONS, TESTS, PROCEDURES, AND REPORTS

- 30.51 Records.
30.52 Inspections.
30.53 Tests.
30.54 Control and accounting procedures for tritium.
30.55 Tritium reports.

ENFORCEMENT

- 30.61 Modification and revocation of licenses.
30.62 Right to cause the withholding or recall of byproduct material.
30.63 Violations.

SCHEDULES

- 30.70 Schedule A—Exempt concentrations.
30.71 Schedule B.

AUTHORITY: Secs. 81, 82, 161, 162, 163, 68 Stat. 935, 948, 953, 954, as amended (42 U.S.C. 2111, 2112, 2201, 2232, 2233); secs. 202, 206, 88 Stat. 1244, 1246 (42 U.S.C. 5842 and 5846), unless otherwise noted.

Section 30.34(b) also issued under sec. 164, 68 Stat. 954, as amended (42 U.S.C. 2234). For the purposes of sec. 223, 68 Stat. 958, as amended, 42 U.S.C. 2273, § 30.34(c) issued under sec. 161b., 68 Stat. 948 (42 U.S.C. 2201(b)) and §§ 30.51 and 30.52 issued under sec. 161, 68 Stat. 950, as amended (42 U.S.C. 2201(c)).

7101 *et seq.*) to the extent that the Department, or its duly authorized representatives, exercises functions formerly vested in the U.S. Atomic Energy Commission, its Chairman, members, officers and components and transferred to the U.S. Energy Research and Development Administration and to the Administrator thereof pursuant to sections 104 (b), (c) and (d) of the Energy Reorganization Act of 1974 (Pub. L. 93-438, 88 Stat. 1233 at 1237, 42 U.S.C. 5814) and retransferred to the Secretary of Energy pursuant to section 301(a) of the Department of Energy Organization Act (Pub. L. 95-91, 91 Stat. 565 at 577-578, 42 U.S.C. 7151).

(b) Terms defined in section 11 of the Act shall have the same meaning when used in the regulations in this part and Parts 31 through 35 to the extent such terms are not specifically defined in this part.

(c) "Agreement State" means any state with which the Atomic Energy Commission or the Nuclear Regulatory Commission has entered into an effective agreement under subsection 274b. of the Act. "Non-agreement State" means any other State;

(d) "Byproduct material" means any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material;

(e) "Commission" means the Nuclear Regulatory Commission and its duly authorized representatives;

(f) "Curie" means that amount of radioactive material which disintegrates at the rate of 37 billion atoms per second;

(g) "Government agency" means any executive department, commission, independent establishment, corporation, wholly or partly owned by the United States of America which is an instrumentality of the United States, or any board, bureau, division, service, office, officer, authority, administration, or other establishment in the executive branch of the Government;

(h) "Human use" means the internal or external administration of byproduct material, or the radiation therefrom, to human beings;

(i) "License", except where otherwise specified means a license for byproduct material issued pursuant to the regulations in this part and Parts 31 through 35 of this chapter;

(j)(1) "Microcurie" means that amount of radioactive material which disintegrates at the rate of 37 thousand atoms per second;

(2) "Millicurie" means that amount of radioactive material which disintegrates at the rate of 37 million atoms per second;

(k) "Person" means: (1) Any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, Government agency other than the Commission or the Department, except that the Department shall be considered a person within the meaning of the regulations in this part to the extent that its facilities and activities are subject to the licensing and related regulatory authority of the Commission pursuant to section 202 of the Energy Reorganization Act of 1974 (88 Stat. 1244), any State or any political subdivision of or any political entity within a State, any foreign government or nation or any political subdivision of any such government or nation, or other entity; and

"The Department facilities and activities identified in section 202 are:

(1) Demonstration Liquid Metal Fast Breeder reactors when operated as part of the power generation facilities of an electric utility system, or when operated in any other manner for the purpose of demonstrating the suitability for commercial application of such a reactor.

(2) Other demonstration nuclear reactors, except those in existence on January 19, 1975, when operated as part of the power generation facilities of an electric utility system, or when operated in any other manner for the purpose of demonstrating the suitability for commercial application of such a reactor.

(3) Facilities used primarily for the receipt and storage of high-level radioactive wastes resulting from licensed activities.

(4) Retrievable Surface Storage Facilities and other facilities authorized for the express purpose of subsequent long-term storage of high-level radioactive waste generated by the Department, which are not used for, or are part of, research and development activities.

(2) any legal successor, representative, agent, or agency of the foregoing;

(l) "Physician" means an individual licensed by a State or territory of the United States, the District of Columbia or the Commonwealth of Puerto Rico to dispense drugs in the practice of medicine;

(m) "Production facility" means production facility as defined in the regulations contained in Part 50 of this chapter;

(n) "Radiographer" means any individual who performs or who, in attendance at the site where the sealed source or sources are being used, personally supervises radiographic operations and who is responsible to the licensee for assuring compliance with the requirements of the Commission's regulations and the conditions of the license;

(o) "Radiographer's assistant" means any individual who, under the personal supervision of a radiographer, uses radiographic exposure devices, sealed sources or related handling tools, or radiation survey instruments in radiography;

(p) "Radiography" means the examination of the structure of materials by nondestructive methods, utilizing sealed sources of byproduct materials;

(q) "Research and development" means: (1) Theoretical analysis, exploration, or experimentation; or (2) the extension of investigative findings and theories of a scientific or technical nature into practical application for experimental and demonstration purposes, including the experimental production and testing of models, devices, equipment, materials and processes. "Research and development" as used in this part and Parts 31 through 35 does not include the internal or external administration of byproduct material, or the radiation therefrom, to human beings;

(r) "Sealed source" means any byproduct material that is encased in a capsule designed to prevent leakage or escape of the byproduct material;

(s) "Source material" means source material as defined in the regulations contained in Part 40 of this chapter;

(t) "Special nuclear material" means special nuclear material as defined in

the regulations contained in Part 70 of this chapter;

(u) "United States", when used in a geographical sense, includes Puerto Rico and all territories and possessions of the United States;

(v) "Utilization facility" means a utilization facility as defined in the regulations contained in Part 50 of this chapter;

(w) "Commencement of construction" means any clearing of land, excavation, or other substantial action that would adversely affect the natural environment of a site but does not include changes desirable for the temporary use of the land for public recreational uses, necessary borings to determine site characteristics or other preconstruction monitoring to establish background information related to the suitability of a site or to the protection of environmental values.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[30 FR 8185, June 26, 1965, as amended at 36 FR 1466, Jan. 30, 1971; 37 FR 5746, Mar. 21, 1972; 38 FR 29314, Oct. 24, 1973; 40 FR 8784, Mar. 3, 1975; 43 FR 6921, Feb. 17, 1978; 45 FR 14200, Mar. 5, 1980; 45 FR 18905, Mar. 24, 1980]

§ 30.5 Interpretations.

Except as specifically authorized by the Commission in writing, no interpretation of the meaning of the regulations in this part and Parts 31 through 35 by any officer or employee of the Commission other than a written interpretation by the General Counsel will be recognized to be binding upon the Commission.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[30 FR 8185, June 26, 1965, as amended at 43 FR 6921, Feb. 17, 1978]

§ 30.6 Communications.

Except where otherwise specified, all communications and reports concerning the regulations in this part and Parts 31 through 35 and applications filed under them, should be addressed to the Director of Nuclear Material

Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Communications, reports and applications may be delivered in person at the Commission's offices at 1717 H Street NW., Washington, D.C.; at 7920 Norfolk Avenue, Bethesda, Md.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[30 FR 8185, June 26, 1965, as amended at 34 FR 19546, Dec. 11, 1969; 40 FR 8784, Mar. 3, 1975, 43 FR 6921, Feb. 21, 1978]

EXEMPTIONS

§ 30.11 Specific exemptions.

(a) The Commission may, upon application of any interested person or upon its own initiative, grant such exemptions from the requirements of the regulations in this part and Parts 31 through 35 of this chapter as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841); secs. 11 e(2), 81, 83, 84, 161b, 161c, 161x, 274, Pub. L. 83-703 as amended by Title II of Pub. L. 95-604, 68 Stat. 919 et seq. 92 Stat. 3021 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2201x, 2021))

[37 FR 5746, Mar. 21, 1972, as amended at 39 FR 26279, July 18, 1974; 40 FR 8784, Mar. 3, 1975, 43 FR 6921, Feb. 21, 1978; 45 FR 65530, Oct. 3, 1980]

§ 30.12 Persons using byproduct material under certain Department of Energy and Nuclear Regulatory Commission contracts.

Except to the extent that Department facilities or activities of the types subject to licensing pursuant to section 202 of the Energy Reorganization Act of 1974 are involved, any prime contractor of the Department is exempt from the requirements for a license set forth in sections 81 and 82 of the Act and from the regulations in this part to the extent that such contractor, under his prime contract with the Department manufactures, produces, transfers, receives, acquires, owns, possesses, or uses byproduct ma-

terial for: (a) The performance of work for the Department at a United States Government-owned or controlled site, including the transportation of by-product material to or from such site and the performance of contract services during temporary interruptions of such transportation; (b) research in, or development, manufacture, storage, testing or transportation of, atomic weapons or components thereof; or (c) the use or operation of nuclear reactors or other nuclear devices in a United States Government-owned vehicle or vessel. In addition to the foregoing exemptions and subject to the requirement for licensing of Department facilities and activities pursuant to section 202 of the Energy Reorganization Act of 1974, any prime contractor or subcontractor of the Department or the Commission is exempt from the requirements for a license set forth in sections 81 and 82 of the Act and from the regulations in this part to the extent that such prime contractor or subcontractor manufacturers, produces, transfers, receives, acquires, owns, possesses, or uses byproduct material under his prime contract or subcontract when the Commission determines that the exemption of the prime contractor or subcontractor is authorized by law; and that, under the terms of the contract or subcontract, there is adequate assurance that the work thereunder can be accomplished without undue risk to the public health and safety.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[40 FR 8784, Mar. 3, 1975, as amended at 43 FR 6921, Feb. 17, 1978]

§ 30.13 Carriers.

Common and contract carriers, freight forwarders, warehousemen, and the U.S. Postal Service are exempt from the regulations in this part and Parts 31 through 35 of this chapter and the requirements for a license set forth in section 81 of the Act to the extent that they transport or store byproduct material in the regular course of carriage for another or storage incident thereto.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[37 FR 3985, Feb. 25, 1972, as amended at 43 FR 6921, Feb. 17, 1978]

§ 30.14 Exempt concentrations.

(a) Except as provided in paragraphs (c) and (d) of this section, any person is exempt from the requirements for a license set forth in section 81 of the Act and from the regulations in this part and Parts 31 through 35 of this chapter to the extent that such person receives, possesses, uses, transfers, owns or acquires products or materials containing byproduct material in concentrations not in excess of those listed in § 30.70.

(b) This section shall not be deemed to authorize the import of byproduct material or products containing byproduct material.

(c) A manufacturer, processor, or producer of a product or material in an agreement State is exempt from the requirements for a license set forth in section 81 of the Act and from the regulations in this part and Parts 31, 32, 33, and 34 of this chapter to the extent that he transfers byproduct material contained in a product or material in concentrations not in excess of those specified in § 30.70 and introduced into the product or material by a licensee holding a specific license issued by an agreement State, the Commission, or the Atomic Energy Commission expressly authorizing such introduction. This exemption does not apply to the transfer of byproduct material contained in any food, beverage, cosmetic, drug, or other commodity or product designed for ingestion or inhalation by, or application to, a human being.

(d) No person may introduce byproduct material into a product or material knowing or having reason to believe that it will be transferred to persons exempt under this section or equivalent regulations of an Agreement State, except in accordance with a license issued pursuant to § 32.11 of this chapter or the general license provided in § 150.20 of this chapter.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as

amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[30 FR 8185, June 26, 1965, as amended at 40 FR 8785, Mar. 3, 1975, 43 FR 6921, Feb. 17, 1978]

§ 30.15 Certain items containing byproduct material.

(a) Except for persons who apply byproduct material to, or persons who incorporate byproduct material into, the following products, or persons who initially transfer for sale or distribution the following products containing byproduct material, any person is exempt from the requirements for a license set forth in section 81 of the Act and from the regulations in Parts 20 and 30 through 35 of this chapter to the extent that such person receives, possesses, uses, transfers, owns, or acquires the following products:

(1) Timepieces or hands or dials containing not more than the following specified quantities of byproduct material and not exceeding the following specified levels of radiation:

(i) 25 millicuries of tritium per timepiece,

(ii) 5 millicuries of tritium per hand,

(iii) 15 millicuries of tritium per dial (bezels when used shall be considered as part of the dial),

(iv) 100 microcuries of promethium 147 per watch or 200 microcuries of promethium 147 per any other timepiece,

(v) 20 microcuries of promethium 147 per watch hand or 40 microcuries of promethium 147 per other timepiece hand,

(vi) 60 microcuries of promethium 147 per watch dial or 120 microcuries of promethium 147 per other timepiece dial (bezels when used shall be considered as part of the dial),

(vii) The levels of radiation from hands and dials containing promethium 147 will not exceed, when measured through 50 milligrams per square centimeter of absorber:

(a) For wrist watches, 0.1 millirad per hour at 10 centimeters from any surface,

(b) For pocket watches, 0.1 millirad per hour at 1 centimeter from any surface,

(c) For any other timepiece, 0.2 millirad per hour at 10 centimeters from any surface.

(2) Lock illuminators containing not more than 15 millicuries of tritium or not more than 2 millicuries of promethium 147 installed in automobile locks. The levels of radiation from each lock illuminator containing promethium 147 will not exceed 1 millirad per hour at 1 centimeter from any surface when measured through 50 milligrams per square centimeter of absorber.

(3) Balances of precision containing not more than 1 millicurie of tritium per balance or not more than 0.5 millicurie of tritium per balance part.

(4) Automobile shift quadrants containing not more than 25 millicuries of tritium.

(5) Marine compasses containing not more than 750 millicuries of tritium gas and other marine navigational instruments containing not more than 250 millicuries of tritium gas.

(6) Thermostat dials and pointers containing not more than 25 millicuries of tritium per thermostat.

(7) (Reserved)

(8) Electron tubes: *Provided*, That each tube does not contain more than one of the following specified quantities of byproduct material:

(i) 150 millicuries of tritium per microwave receiver protector tube or 10 millicuries of tritium per any other electron tube;

(ii) 1 microcurie of cobalt-60;

(iii) 5 microcuries of nickel-63;

(iv) 30 microcuries of krypton-85;

(v) 5 microcuries of cesium-137;

(vi) 30 microcuries of promethium-147;

And provided further, That the levels of radiation from each electron tube containing byproduct material do not exceed 1 millirad per hour at 1 centimeter from any surface when measured through 7 milligrams per square centimeter of absorber.¹

¹For purposes of this paragraph "electron tubes" include spark gap tubes, power tubes, gas tubes including glow lamps, receiving tubes, microwave tubes, indicator tubes, pickup tubes, radiation detection tubes, and any other completely sealed tube that is designed to conduct or control electrical currents.

(9) Ionizing radiation measuring instruments containing, for purposes of internal calibration of standardization, a source of byproduct material not exceeding the applicable quantity set forth in § 30.71, Schedule B.

(10) Spark gap irradiators containing not more than 1 microcurie of cobalt-60 per spark gap irradiator for use in electrically ignited fuel oil burners having a firing rate of at least 3 gallons per hour (11.4 liters per hour).

(b) Any person who desires to apply byproduct material to, or to incorporate byproduct material into, the products exempted in paragraph (a) of this section, or who desires to initially transfer for sale or distribution such products containing byproduct material, should apply for a specific license pursuant to § 32.14 of this chapter, which license states that the product may be distributed by the licensee to persons exempt from the regulations pursuant to paragraph (a) of this section.

(Secs. 81, 161, Pub. L. 83-703, 68 Stat. 935, 948 (42 U.S.C. 2201); sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

[31 FR 5316, Apr. 2, 1966, as amended at 31 FR 14349, Nov. 8, 1966; 32 FR 785, Jan. 24, 1967; 32 FR 6434, Apr. 26, 1967; 32 FR 13921, Oct. 6, 1967; 34 FR 6651, Apr. 18, 1969; 34 FR 19546, Dec. 11, 1969; 35 FR 6427, Apr. 22, 1970; 35 FR 8820, June 6, 1970; 43 FR 2387, Jan. 17, 1978; 43 FR 6921, Feb. 17, 1978]

§ 30.16 Resins containing scandium 46 and designed for sand-consolidation in oil wells.

Any person is exempt from the requirements for a license set forth in section 81 of the Act and from the regulations in Parts 20 and 30 through 35 of this chapter to the extent that such person receives, possesses, uses, transfers, owns, or acquires synthetic plastic resins containing scandium 46 which are designed for sand-consolidation in oil wells, and which have been manufactured or initially transferred for sale or distribution, in accordance with a specific license issued pursuant to § 32.17 of this chapter or equivalent regulations of an Agreement State. The exemption in this section does not authorize the manufacture or initial

transfer for sale or distribution of any resins containing scandium 46.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[32 FR 4241, Mar. 18, 1967, as amended at 43 FR 6921, Feb. 21, 1978]

§ 30.18 Exempt quantities.

(a) Except as provided in paragraphs (c) and (d) of this section, any person is exempt from the requirements for a license set forth in section 81 of the Act and from the regulations in Parts 30 through 34 of this chapter to the extent that such person receives, possesses, uses, transfers, owns, or acquires byproduct material in individual quantities each of which does not exceed the applicable quantity set forth in § 30.71, Schedule B.

(b) Any person who possesses byproduct material received or acquired prior to September 25, 1971 under the general license then provided in § 31.4 of this chapter is exempt from the requirements for a license set forth in section 81 of the Act and from the regulations in Parts 30 through 34 of this chapter to the extent that such person possesses, uses, transfers, or owns such byproduct material.

(c) This section does not authorize for purposes of commercial distribution the production, packaging, repackaging, or transfer of byproduct material or the incorporation of byproduct material into products intended for commercial distribution.

(d) No person may, for purposes of commercial distribution, transfer byproduct material in the individual quantities set forth in § 30.71 Schedule B, knowing or having reason to believe that such quantities of byproduct material will be transferred to persons exempt under this section or equivalent regulations of an Agreement State, except in accordance with a license issued under § 32.18 of this chapter, which license states that the byproduct material may be transferred by the licensee to persons exempt under this section or the equivalent regulations of an Agreement State.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as

amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[35 FR 6427, Apr. 22, 1970, as amended at 36 FR 16898, Aug. 26, 1971; 43 FR 6921, Feb. 17, 1978]

§ 30.19 Self-luminous products containing tritium, krypton-85, or promethium-147.

(a) Except for persons who manufacture, process, produce or initially transfer for sale or distribution self-luminous products containing tritium, krypton-85, or promethium-147, and except as provided in paragraph (c) of this section, any person is exempt from the requirements for a license set forth in section 81 of the Act and from the regulations in Parts 20 and 30 through 35 of this chapter to the extent that such person receives, possesses, uses, transfers, owns, or acquires tritium, krypton-85, or promethium-147 in self-luminous products manufactured, processed, produced, or initially transferred in accordance with a specific license issued pursuant to § 32.22 of this chapter, which license authorizes the initial transfer of the product for use under this section.

(b) Any person who desires to manufacture, process, or produce self-luminous products containing tritium, krypton-85, or promethium-147, or to transfer such products for use pursuant to paragraph (a) of this section, should apply for a license pursuant to § 32.22 of this chapter, which license states that the product may be transferred by the licensee to persons exempt from the regulations pursuant to paragraph (a) of this section or equivalent regulations of an Agreement State.

(c) The exemption in paragraph (a) of this section does not apply to tritium, krypton-85, or promethium-147 used in products primarily for frivolous purposes or in toys or adornments.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[34 FR 9026, June 6, 1969, as amended at 40 FR 8785, Mar. 3, 1975; 43 FR 6921, Feb. 17, 1978]

§ 30.20 Gas and aerosol detectors containing byproduct material.

(a) Except for persons who manufacture, process, produce or initially transfer for sale or distribution gas and aerosol detectors containing byproduct material any person is exempt from the requirements for a license set forth in section 81 of the Act and from the regulations in Parts 20 and 30 through 35 of this chapter to the extent that such person receives, possesses, uses, transfers, owns, or acquires byproduct material, in gas and aerosol detectors designed to protect life or property from fires and airborne hazards, and manufactured, processed, produced, or initially transferred in accordance with a specific license issued pursuant to § 32.26 of this chapter, which license authorizes the initial transfer of the product for use under this section.

(b) Any person who desires to manufacture, process, or produce gas and aerosol detectors containing byproduct material, or to initially transfer such products for use pursuant to paragraph (a) of this section, should apply for a license pursuant to § 32.26 of this chapter, which license states that the product may be initially transferred by the licensee to persons exempt from the regulations pursuant to paragraph (a) of this section or equivalent regulations of an Agreement State.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

(34 FR 6553, Apr. 18, 1969, as amended at 40 FR 8785, Mar. 3, 1975, 43 FR 6921, Feb. 17, 1978)

LICENSES

§ 30.31 Types of licenses.

Licenses for byproduct material are of two types: General and specific. Specific licenses are issued to named persons upon applications filed pursuant to the regulations in this part and Parts 32 through 35 of this chapter. General licenses are effective without the filing of applications with the Commission or the issuance of licensing documents to particular persons.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

(30 FR 8185, June 26, 1965, as amended at 43 FR 6922, Feb. 17, 1978)

§ 30.32 Application for specific licenses.

(a) Applications for specific licenses should be filed in duplicate on Form NRC-313, "Application for Byproduct Material License," with the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Applications may be filed in person at the Commission's offices at 1717 H Street, N.W., Washington, D.C., at 7920 Norfolk Avenue, Bethesda, Maryland. Information contained in previous applications, statements or reports filed with the Commission or the Atomic Energy Commission may be incorporated by reference, provided that such references are clear and specific.

(b) The Commission may at any time after the filing of the original application, and before the expiration of the license, require further statements in order to enable the Commission to determine whether the application should be granted or denied or whether a license should be modified or revoked.

(c) Each application shall be signed by the applicant or licensee or a person duly authorized to act for and on his behalf.

(d) An application for license filed pursuant to the regulations in this part and Parts 32 through 35 of this chapter will be considered also as an application for licenses authorizing other activities for which licenses are required by the Act, provided that the application specifies the additional activities for which licenses are requested and complies with regulations of the Commission as to applications for such licenses.

(e) Each application for a byproduct material license, other than a license exempted from Part 170 of this chapter, shall be accompanied by the fee prescribed in § 170.31 of this chapter. No fee will be required to accompany an application for renewal or amendment of a license, except as provided in § 170.31 of this chapter.

§ 30.33

(f) An application for a license to receive and possess byproduct material for commercial waste disposal by land burial or for the conduct of any other activity which the Commission determines will significantly affect the quality of the environment shall be filed at least 9 months prior to commencement of construction of the plant or facility in which the activity will be conducted and shall be accompanied by any Environmental Report required pursuant to Part 51 of this chapter.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

(30 FR 8185, June 26, 1965, as amended at 36 FR 145, Jan. 6, 1971, 37 FR 5747, Mar. 21, 1972, 39 FR 26279, July 18, 1974, 40 FR 8785, Mar. 3, 1975, 40 FR 50704, Oct. 31, 1975, 43 FR 6922, Feb. 17, 1978)

§ 30.33 General requirements for issuance of specific licenses.

(a) An application for a specific license will be approved if:

(1) The application is for a purpose authorized by the Act;

(2) The applicant's proposed equipment and facilities are adequate to protect health and minimize danger to life or property;

(3) The applicant is qualified by training and experience to use the material for the purpose requested in such manner as to protect health and minimize danger to life or property;

(4) The applicant satisfies any special requirements contained in Parts 32 through 35; and

(5) In the case of an application for a license to receive and possess byproduct material for commercial waste disposal by land burial or for the conduct of any other activity which the Commission determines will significantly affect the quality of the environment, the Director of Nuclear Material Safety and Safeguards or his designee, before commencement of construction of the plant or facility in which the activity will be conducted, on the basis of information filed and evaluations made pursuant to Part 51 of this chapter, has concluded, after weighing the environmental, economic, technical, and other benefits

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against environmental costs and considering available alternatives, that the action called for is the issuance of the proposed license, with any appropriate conditions to protect environmental values. Commencement of construction prior to such conclusion shall be grounds for denial of a license to receive and possess byproduct material in such plant or facility. As used in this paragraph the term "commencement of construction" means any clearing of land, excavation, or other substantial action that would adversely affect the environment of a site. The term does not mean site exploration, necessary roads for site exploration, borings to determine foundation conditions, or other preconstruction monitoring or testing to establish background information related to the suitability of the site or the protection of environmental values.

(b) Upon a determination that an application meets the requirements of the Act, and the regulations of the Commission, the Commission will issue a specific license authorizing the possession and use of byproduct material (Form NRC 374, "Byproduct Material License").

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841); secs. 11(e)(2), 81, 83, 84, 161b, 161c, 161x, 274; Pub. L. 83-703 as amended by Title II of Pub. L. 95-604, 68 Stat. 919 et seq. 92 Stat. 3021 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2201x, 2021))

(30 FR 8185, June 26, 1965, as amended at 36 FR 12731, July 7, 1971, 37 FR 5747, Mar. 21, 1972, 39 FR 26279, July 18, 1974, 43 FR 6922, Feb. 17, 1978, 45 FR 65530, Oct. 3, 1980)

§ 30.34 Terms and conditions of licenses.

(a) Each license issued pursuant to the regulations in this part and the regulations in Parts 31 through 35 of this chapter shall be subject to all the provisions of the Act, now or hereafter in effect, and to all valid rules, regulations and orders of the Commission.

(b) No license issued or granted pursuant to the regulations in this part and Parts 31 through 35, nor any right under a license shall be transferred, assigned or in any manner disposed of, either voluntarily or involuntarily, di-

rectly or indirectly, through transfer of control of any license to any person, unless the Commission, shall, after securing full information, find that the transfer is in accordance with the provisions of the Act and shall give its consent in writing.

(c) Each person licensed by the Commission pursuant to the regulations in this part and Parts 31 through 35 shall confine his possession and use of the byproduct material to the locations and purposes authorized in the license. Except as otherwise provided in the license, a license issued pursuant to the regulations in this part and Parts 31 through 35 of this chapter shall carry with it the right to receive, acquire, own, and possess byproduct material. Preparation for shipment and transport of byproduct material shall be in accordance with the provisions of Part 71 of this chapter.

(d) Each license issued pursuant to the regulations in this part and Parts 31 through 35 shall be deemed to contain the provisions set forth in section 183b.-d., inclusive, of the Act, whether or not these provisions are expressly set forth in the license.

(e) The Commission may incorporate, in any license issued pursuant to the regulations in this part and Parts 31 through 35, at the time of issuance, or thereafter by appropriate rule, regulation or order, such additional requirements and conditions with respect to the licensee's receipt, possession, use and transfer of byproduct material as it deems appropriate or necessary in order to:

- (1) Promote the common defense and security;
- (2) Protect health or to minimize danger to life or property;
- (3) Protect restricted data;
- (4) Require such reports and the keeping of such records, and to provide for such inspections of activities under the license as may be necessary or appropriate to effectuate the purposes of the Act and regulations thereunder.

(f) Each licensee shall notify the Commission in writing when the licensee decides to permanently discontinue all activities involving materials authorized under the license. This notification requirement applies to all

specific licenses issued under this part and Parts 32 through 35 of this chapter.

(g) Each licensee preparing technetium-99m radiopharmaceuticals from molybdenum-99/technetium-99m generators shall test the generator eluates for molybdenum-99 breakthrough in accordance with § 35.14(b)(4) (i) through (iv) of this chapter.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201), sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841); secs. 81, 161b, Pub. L. 83-703, 68 Stat. 935-948 (42 U.S.C. 2111, 2201); sec. 201 as amended, Pub. L. 93-438, 88 Stat. 1242 as amended by Pub. L. 94-79, 89 Stat. 413 (42 U.S.C. 5841))

[30 FR 8185, June 26, 1965, as amended at 38 FR 33969, Dec. 10, 1973; 43 FR 6922, Feb. 17, 1978; 44 FR 17480, Mar. 22, 1979; 45 FR 41394, June 19, 1980]

§ 30.36 Expiration of licenses.

Except as provided in § 30.37(b), each specific license shall expire at the end of the day, in the month and year stated therein.

§ 30.37 Applications for renewal of licenses.

(a) Applications for renewal of a specific license shall be filed in accordance with § 30.32.

(b) In any case in which a licensee, not less than thirty (30) days prior to the expiration of his existing license, has filed an application in proper form for renewal or for a new license, such existing license shall not expire until the application has been finally determined by the Commission.

§ 30.38 Applications for amendment of licenses.

Applications for amendment of a license shall be filed in accordance with § 30.32 and shall specify the respects in which the licensee desires his license to be amended and the grounds for such amendment.

§ 30.39 Commission action on applications to renew or amend.

In considering an application by a licensee to renew or amend his license the Commission will apply the applicable criteria set forth in § 30.33 and Parts 32 through 35 of this chapter.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201), sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[30 FR 8185, June 26, 1965, as amended at 43 FR 6922, Feb. 17, 1978]

§ 30.41 Transfer of byproduct material.

(a) No licensee shall transfer byproduct material except as authorized pursuant to this section.

(b) Except as otherwise provided in his license and subject to the provisions of paragraphs (c) and (d) of this section, any licensee may transfer byproduct material:

- (1) To the Department;
- (2) To the agency in any Agreement State which regulates radioactive material pursuant to an agreement under section 274 of the Act;

(3) To any person exempt from the licensing requirements of the Act and regulations in this part, to the extent permitted under such exemption;

(4) To any person in an Agreement State, subject to the jurisdiction of that State, who has been exempted from the licensing requirements and regulations of that State, to the extent permitted under such exemption;

(5) To any person authorized to receive such byproduct material under terms of a specific license or a general license or their equivalents issued by the Atomic Energy Commission, the Commission, or an Agreement State;

(6) To a person abroad pursuant to an export license issued under Part 110 of this chapter; or

(7) As otherwise authorized by the Commission in writing.

(c) Before transferring byproduct material to a specific licensee of the Commission or an Agreement State or to a general licensee who is required to register with the Commission or with an Agreement State prior to receipt of the byproduct material, the licensee transferring the material shall verify that the transferee's license authorizes the receipt of the type, form, and quantity of byproduct material to be transferred.

(d) The following methods for the verification required by paragraph (c) of this section are acceptable:

- (1) The transferor may have in his possession, and read, a current copy of

the transferee's specific license or registration certificate;

(2) The transferor may have in his possession a written certification by the transferee that he is authorized by license or registration certificate to receive the type, form, and quantity of byproduct material to be transferred, specifying the license or registration certificate number, issuing agency and expiration date;

(3) For emergency shipments the transferor may accept oral certification by the transferee that he is authorized by license or registration certificate to receive the type, form, and quantity of byproduct material to be transferred, specifying the license or registration certificate number, issuing agency and expiration date: *Provided*, That the oral certification is confirmed in writing within 10 days;

(4) The transferor may obtain other sources of information compiled by a reporting service from official records of the Commission or the licensing agency of an Agreement State as to the identity of licensees and the scope and expiration dates of licenses and registration; or

(5) When none of the methods of verification described in paragraphs (d)(1) to (4) of this section are readily available or when a transferor desires to verify that information received by one of such methods is correct or up-to-date, the transferor may obtain and record confirmation from the Commission or the licensing agency of an Agreement State that the transferee is licensed to receive the byproduct material.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201), sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[38 FR 33969, Dec. 10, 1973, as amended at 40 FR 8785, Mar. 3, 1975; 43 FR 6922, Feb. 17, 1978]

RECORDS, INSPECTIONS, TESTS, PROCEDURES, AND REPORTS

§ 30.51 Records.

(a) Each person who receives byproduct material pursuant to a license issued pursuant to the regulations in this part and Parts 31 through 35 of this chapter shall keep records show-

ing the receipt, transfer, and disposal of such byproduct material.

(b) Records which are required by the regulations in this part and Parts 31 through 35 of this chapter or by license condition shall be maintained for the period specified by the appropriate regulation or license condition. If a retention period is not otherwise specified by regulation or license condition, such records shall be maintained until the Commission authorizes their disposition.

(c)(1) Records of receipt of byproduct material which must be maintained pursuant to paragraph (a) of this section shall be maintained as long as the licensee retains possession of the byproduct material and for two years following transfer, or disposal of the byproduct material.

(2) [Reserved]

(3) Records of transfer of byproduct material shall be maintained by the licensee who transferred the material for five years after such transfer.

(4) Records of disposal of byproduct material shall be maintained in accordance with § 20.401(c) of this chapter.

(d)(1) Records which must be maintained pursuant to this part and Parts 31 through 35 of this chapter may be the original or a reproduced copy or microform if such reproduced copy or microform is duly authenticated by authorized personnel and the microform is capable of producing a clear and legible copy after storage for the period specified by Commission regulations.

(2) If there is a conflict between the Commission's regulations in this part and Parts 31 through 35 of this chapter, license condition, or other written Commission approval or authorization pertaining to the retention period for the same type of record, the retention period specified in the regulations in this part and Parts 31 through 35 of this chapter for such records shall apply unless the Commission, pursuant to § 30.11, has granted a specific exemption from the record retention requirements specified in the regulations in this part or Parts 31 through 35 of this chapter.

(Sec. 161, as amended, Pub. L. 83-703, 88 Stat. 948 (42 U.S.C. 2201); sec. 201, as

amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[41 FR 18301, May 5, 1976, as amended at 43 FR 6922, Feb. 17, 1978]

§ 30.52 Inspections.

(a) Each licensee shall afford to the Commission at all reasonable times opportunity to inspect by product material and the premises and facilities wherein byproduct material is used or stored.

(b) Each licensee shall make available to the Commission for inspection, upon reasonable notice, records kept by him pursuant to the regulations in this chapter.

§ 30.53 Tests.

Each licensee shall perform, or permit the Commission to perform, such tests as the Commission deems appropriate or necessary for the administration of the regulations in this part and Parts 31 through 35 of this chapter, including tests of:

(a) Byproduct material;

(b) Facilities wherein byproduct material is utilized or stored;

(c) Radiation detection and monitoring instruments; and

(d) Other equipment and devices used in connection with the utilization or storage of byproduct material.

(Sec. 161, as amended, Pub. L. 83-703, 88 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[30 FR 8185, June 26, 1965, as amended by 43 FR 6922, Feb. 17, 1978]

§ 30.54 Control and accounting procedures for tritium.

(a) Except as specified in paragraph (b) of this section, each licensee who is authorized to possess at any one time and location more than 10,000 curies of tritium shall establish and maintain written material control and accounting procedures that are sufficient to enable the licensee to account for the tritium in his possession under specific license. The written material control and accounting procedures shall be maintained as long as the licensee retains possession of the tritium and for two years following transfer of the tritium.

(b) Written material control and accounting procedures are not required for: (1) Tritium produced or possessed within a production or utilization facility incidental to the operation of the facility; and (2) tritium contained in spent fuel, other than tritium intentionally produced in or recovered from a production or utilization facility for any subsequent use.

(Sec. 161, as amended, Pub. L. 83-703, 88 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[37 FR 9208, May 6, 1972, as amended at 41 FR 18302, May 3, 1976, 43 FR 6922, Feb. 17, 1978]

§ 30.55 Tritium reports.

(a) Except as specified in paragraph (d) of this section, each licensee who transfers or receives at any one time 1,000 curies or more of tritium shall complete and distribute a Nuclear Material Transaction Report on Form NRC-741, in accordance with the printed instructions for completing the form. Each licensee who transfers such material shall submit a completed copy of Form NRC-741 to the Commission and three copies to the receiver of the material promptly after the transfer takes place. Each licensee who receives such material shall submit a completed copy of Form NRC-741 to the Commission and to the shipper of the material within ten (10) days after the material is received. The Commission's copies of the reports shall be submitted to the Department of Energy, Post Office Box E, Oak Ridge, TN 37830.

(b) Except as specified in paragraph (d) and (e) of this section, each licensee who is authorized to possess at any one time and location more than 10,000 curies of tritium shall submit to the Commission within thirty (30) days after March 31 and September 30 of each year a statement of his tritium inventory to the nearest hundredth of a gram calculated at 10,000 curies per gram. The reports shall be submitted to the Department of Energy, Post Office Box E, Oak Ridge, TN 37830, and shall include the Reporting Identification Symbol (RIS) assigned by the Commission to the licensee.

(c) Except as specified in paragraph (d) of this section, each licensee who is authorized to possess tritium shall report promptly to the appropriate NRC Regional Office listed in Appendix D of Part 20 of this chapter by telephone and telegraph, mailgram, or facsimile any incident in which an attempt has been made or is believed to have been made to commit a theft or unlawful diversion of more than 10 curies of such material at any one time or more than 100 curies of such material in any one calendar year. The initial report shall be followed within a period of fifteen (15) days by a written report submitted to the appropriate NRC Regional Office which sets forth the details of the incident and its consequences. Copies of such written report shall be sent to the Director of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Subsequent to the submission of the written report required by this paragraph, the licensee shall promptly inform the Office of Inspection and Enforcement by means of a written report of any substantive additional information, which becomes available to the licensee, concerning an attempted or apparent theft or unlawful diversion of tritium.

(d) The reports described in this section are not required for tritium possessed pursuant to a general license provided in Part 31 of this chapter or for tritium contained in spent fuel.

(e) The reports described in paragraph (b) of this section are not required for (1) tritium produced or possessed within a production or utilization facility incidental to the operation of the facility, other than tritium intentionally produced by or recovered from a production or utilization facility for any subsequent use.

(Sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

[37 FR 9208, May 6, 1972, as amended at 38 FR 1271, Jan. 11, 1973, 38 FR 2330, Jan. 24, 1973, 40 FR 8785, Mar. 3, 1975, 41 FR 16446, Apr. 19, 1976, 42 FR 33266, June 30, 1977, 43 FR 6922, Feb. 17, 1978]

ENFORCEMENT

§ 30.61 Modification and revocation of licenses.

(a) The terms and conditions of each license issued pursuant to the regulations in this part and Parts 31 through 35 of this chapter shall be subject to amendment, revision or modification by reason of amendments to the Act, or by reason of rules, regulations and orders issued in accordance with the terms of the Act.

(b) Any license may be revoked, suspended or modified, in whole or in part, for any material false statement in the application or any statement of fact required under section 182 of the Act, or because of conditions revealed by such application or statement of fact or any report, record or inspection or other means which would warrant the Commission to refuse to grant a license on an original application, or for violation of, or failure to observe any of the terms and provisions of the Act or of any rule, regulation or order of the Commission.

(c) Except in cases of willfulness or those in which the public health, interest or safety requires otherwise, no license shall be modified, suspended or revoked unless, prior to the institution of proceedings therefor, facts or conduct which may warrant such action shall have been called to the attention of the licensee in writing and the licensee shall have been accorded an opportunity to demonstrate or achieve compliance with all lawful requirements.

(Secs. 186, 187, 68 Stat. 955; 42 U.S.C. 2236, 2237, sec. 181, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[30 FR 8185, June 26, 1965, as amended at 35 FR 11460, July 17, 1970; 43 FR 6922, Feb. 17, 1978]

§ 30.62 Right to cause the withholding or recall of byproduct material.

The Commission may cause the withholding or recall of byproduct material from any licensee who is not equipped to observe or fails to observe such safety standards to protect health as may be established by the Commission, or who uses such materials in violation of law or regulation of the Commission, or in a manner other than as disclosed in the application therefor or approved by the Commission.

[30 FR 8185, June 26, 1965, as amended at 40 FR 8785, Mar. 3, 1975]

§ 30.63 Violations.

An injunction or other court order may be obtained prohibiting any violation of any provision of the Atomic Energy Act of 1954, as amended, or Title II of the Energy Reorganization Act of 1974, or any regulation or order issued thereunder. A court order may be obtained for the payment of a civil penalty imposed pursuant to section 234 of the Act for violation of section 53, 57, 62, 63, 81, 82, 101, 103, 104, 107, or 109 of the Act, or section 206 of the Energy Reorganization Act of 1974, or any rule, regulation, or order issued thereunder, or any term, condition, or limitation of any license issued thereunder, or for any violation for which a license may be revoked under section 186 of the Act. Any person who willfully violates any provision of the Act or any regulation or order issued thereunder may be guilty of a crime and, upon conviction, may be punished by fine or imprisonment or both, as provided by law.

[40 FR 8785, Mar. 3, 1975]

RULES and REGULATIONS

TITLE 10, CHAPTER 1, CODE OF FEDERAL REGULATIONS—ENERGY

**PART
34****LICENSES FOR RADIOGRAPHY AND RADIATION SAFETY
REQUIREMENTS FOR RADIOGRAPHIC OPERATIONS**

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34.2 Definitions.
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- 34.11 Issuance of specific licenses for use of sealed sources in radiography.

Subpart B—Radiation Safety Requirements**EQUIPMENT CONTROL**

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**PERSONAL RADIATION SAFETY REQUIREMENTS
FOR RADIOGRAPHERS AND RADIOGRAPHERS'
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- 34.31 Limitations.
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EXEMPTIONS

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Appendix A.

§ 34.1 Purpose and scope.

This part prescribes requirements for the issuance of licenses for the use of sealed sources containing byproduct material and radiation safety requirements for persons using such sealed sources in radiography. The provisions and requirements of this part are in addition to, and not in substitution for, other requirements of this chapter. In particular, the provisions of Part 30 of this chapter apply to applications and licenses

subject to this part. Nothing in this part shall apply to uses of byproduct material for medical diagnosis or therapy.

§ 34.2 Definitions.

As used in this part:

(a) "Radiography" means the examination of the structure of materials by nondestructive methods, utilizing sealed sources of byproduct materials;

(b) "Radiographer" means any individual who performs or who, in attendance at the site where the sealed source or sources are being used, personally supervises radiographic operations and who is responsible to the licensee for assuring compliance with the requirements of the Commission's regulations and the conditions of the license;

(c) "Radiographer's assistant" means any individual who, under the personal supervision of a radiographer, uses radiographic exposure devices, sealed sources or related handling tools, or radiation survey instruments in radiography;

(d) "Radiographic exposure device" means any instrument containing a sealed source fastened or contained therein, in which the sealed source or shielding thereof may be moved, or otherwise changed, from a shielded to unshielded position for purposes of making a radiographic exposure;

(e) "Sealed source" means any byproduct material that is encased in a capsule designed to prevent leakage or escape of the byproduct material;

(f) "Storage container" means a device in which sealed sources are transported or stored.

§ 34.3 Applications for specific licenses.

Applications for specific licenses for use of sealed sources in radiography shall be filed on Form NRC-313R, "Application for Byproduct Material License—Use of Sealed Sources in Radiography."

**Subpart A—Specific Licensing
Requirements****§ 34.11 Issuance of specific licenses for
use of sealed sources in radiography.**

An application for a specific license for use of sealed sources in radiography will be approved if:

(a) The applicant satisfies the general requirements specified in § 30.33 of this chapter;

(b) The applicant will have an adequate program for training radiographers and radiographers' assistants and submits to the Commission a schedule or description of such program which specifies the:

- (1) Initial training;
- (2) Periodic training;

(3) On-the-job training;

(4) Means to be used by the licensee to determine the radiographer's knowledge and understanding of and ability to comply with Commission regulations and licensing requirements, and the operating and emergency procedures of the applicant; and

(5) Means to be used by the licensee to determine the radiographer's assistant's knowledge and understanding of and ability to comply with the operating and emergency procedures of the applicant;

(c) The applicant has established and submits to the Commission satisfactory written operating and emergency procedures as described in § 34.32;

(d) The applicant will have an adequate internal inspection system, or other management control, to assure that Commission license provisions, Commission regulations, and the applicant's operating and emergency procedures are followed by radiographers and radiographers' assistants;

(e) The applicant submits a description of its over-all organizational structure pertaining to the radiography program, including specified delegations of authority and responsibility for operation of the program; and

(f) The applicant who desires to conduct his own leak tests has established adequate procedures to be followed in leak testing sealed sources, for possible leakage and contamination and submits to the Commission a description of such procedures including:

(1) Instrumentation to be used.

(2) Method of performing test, e.g., points on equipment to be smeared and method of taking smear; and

(3) Pertinent experience of the person who will perform the test.

Subpart B—Radiation Safety Requirements

EQUIPMENT CONTROL

§ 34.21 Limits on levels of radiation for radiographic exposure devices and storage containers.

Radiographic exposure devices measuring less than four (4) inches from the sealed source storage position to any exterior surface of the device shall have no radiation level in excess of 50 milliroentgens per hour at six (6) inches from any exterior surface of the device. Radiographic exposure devices measuring a minimum of four (4) inches from the sealed source storage position to any exterior surface of the device, and all storage containers for sealed sources or for radiographic exposure devices, shall have no radiation level in excess of 200 milliroentgens per hour at any exterior surface, and ten (10) milliroentgens per hour at one meter from any exterior surface. The radiation levels specified are with the sealed source in the shielded (i.e., "off") position.

§ 34.22 Locking of radiographic exposure devices and storage containers.

Each radiographic exposure device shall be provided with a lock or outer locked container designed to prevent unauthorized or accidental removal or exposure of a sealed source and shall be kept locked at all times except when under the direct surveillance of a radiographer or radiographer's assistant, or as may be otherwise authorized pursuant to § 34.41. Each storage container likewise shall be provided with a lock and kept locked when containing sealed sources except when the container is under the direct surveillance of a radiographer or radiographer's assistant.

§ 34.23 Storage precautions.

Locked radiographic exposure devices and storage containers shall be physically secured to prevent tampering or removal by unauthorized personnel.

§ 34.24 Radiation survey instruments.

The licensee shall maintain sufficient calibrated and operable radiation survey instruments to make physical radiation surveys as required by this part and Part 20 of this chapter.

Each radiation survey instrument shall be calibrated at intervals not to exceed three months and after each instrument servicing and a record shall be maintained of the results of each instrument calibration and date thereof for two years after the date of calibration.

Instrumentation required by this section shall have a range such that two milliroentgens per hour through one roentgen per hour can be measured.

§ 34.25 Leak testing, repair, tagging, opening, modification and replacement of sealed sources.

(a) The replacement of any sealed source fastened to or contained in a radiographic exposure device and leak testing, repair, tagging, opening or any

other modification of any sealed source shall be performed only by persons specifically authorized by the Commission to do so.

(b) Each sealed source shall be tested for leakage at intervals not to exceed 6 months. In the absence of a certificate from a transferor that a test has been made within the 6 months prior to the transfer, the sealed source shall not be put into use until tested.

(c) The leak test shall be capable of detecting the presence of 0.005 microcurie of removable contamination on the sealed source. An acceptable leak test for sealed sources in the possession of a radiography licensee would be to test at the nearest accessible point to the sealed source storage position, or other appropriate measuring point, by a procedure to be approved pursuant to § 34.11 (f).

Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission for six months after the next required leak test is performed or until the sealed source is transferred or disposed of.

(d) Any test conducted pursuant to paragraphs (b) and (c) of this section which reveals the presence of 0.005 microcurie or more of removable radioactive material shall be considered evidence that the sealed source is leaking. The licensee shall immediately withdraw the equipment involved from use and shall cause it to be decontaminated and repaired or to be disposed of, in accordance with Commission regulations. A report shall be filed, within 5 days of the test, with the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, describing the equipment involved, the test results, and the corrective action taken. A copy of such report shall be sent to the Director of the appropriate Nuclear Regulatory Commission's Inspection and Enforcement Regional Office listed in Appendix D of Part 20 of this chapter "Standards for Protection Against Radiation."

(e) A sealed source which is not fastened to or contained in a radiographic exposure device shall have permanently attached to it a durable tag at least one (1) inch square bearing the prescribed radiation caution symbol in conventional colors, magenta or purple on a yellow background, and at least the instructions: "Danger—Radioactive Material—Do Not Handle—Notify Civil Authorities if Found."

§ 34.26 Quarterly inventory.

Each licensee shall conduct a quarterly physical inventory to account for all sealed sources received and possessed under his license. The records of the inventories shall be maintained for two years from the date of the inventory for inspection by the Commission, and shall include the quantities and kinds of by-product material, location of sealed sources, and the date of the inventory.

§ 34.27 Utilization logs.

Each licensee shall maintain current

logs, which shall be kept available for two years from the date of the recorded event, for inspection by the Commission at the address specified in the license showing for each sealed source the following information:

- (a) A description (or make and model number) of the radiographic exposure device or storage container in which the sealed source is located;
- (b) The identity of the radiographer to whom assigned; and
- (c) The plant or site where used and dates of use.

§ 34.28 Inspection and maintenance of radiographic exposure devices and storage containers.

The licensee shall conduct a program for inspection and maintenance of radiographic exposure devices and storage containers to assure proper functioning of components important to safety.

PERSONAL RADIATION SAFETY REQUIREMENTS FOR RADIOGRAPHERS AND RADIOGRAPHERS' ASSISTANTS

§ 34.31 Limitations.

(a) The licensee shall not permit any person to act as a radiographer until such person:

(1) Has been instructed in the subjects outlined in Appendix A of this part and shall have demonstrated understanding thereof;

(2) Has received copies of and instruction in the regulations contained in this part and in the applicable sections of Parts 19, 20, and 21* of this chapter, NRC licensees, and the licensee's operating and emergency procedures, and shall have demonstrated understanding thereof; and

(3) Has demonstrated competence to use the radiographic exposure devices, sealed sources, related handling tools and survey instruments which will be employed in his assignment.

(b) The licensee shall not permit any person to act as a radiographer's assistant until such person:

(1) Has received copies of and instructions in the licensee's operating and emergency procedures, and shall have demonstrated understanding thereof; and

(2) Has demonstrated competence to use under the personal supervision of the radiographer the radiographic exposure devices, sealed sources, related handling tools and radiation survey instruments which will be employed in his assignment.

§ 34.32 Operating and emergency procedures.

The licensee's operating and emergency procedures shall include instructions in at least the following:

(a) The handling and use of licensee sealed sources and radiographic exposure devices to be employed such that no person is likely to be exposed to radiation doses in excess of the limits established in Part 20 of this chapter "Standards for Protection Against Radiation";

(b) Methods and occasions for con-

*Amended 42 FR 28891.

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ducting radiation surveys;

(c) Methods for controlling access to radiographic areas;

(d) Methods and occasions for locking and securing radiographic exposure devices, storage containers and sealed sources;

(e) Personnel monitoring and the use of personnel monitoring equipment;

(f) Transporting sealed sources to field locations, including packing of radiographic exposure devices and storage containers in the vehicles, posting of vehicles and control of the sealed sources during transportation;

(g) Minimizing exposure of persons in the event of an accident;

(h) The procedure for notifying proper persons in the event of an accident; and

(i) Maintenance of records.

(j) The inspection and maintenance of radiographic exposure devices and storage containers.

processed if his pocket dosimeter is discharged beyond its range. Reports received from the badge or dosimeter processor and records of the pocket dosimeter readings shall be maintained for inspection by the Commission until it authorizes their disposal.

PRECAUTIONARY PROCEDURES IN RADIOGRAPHIC OPERATIONS

§ 34.41 Security.

During each radiographic operation the radiographer or radiographer's assistant shall maintain a direct surveillance of the operation to protect against unauthorized entry into a high radiation area, as defined in Part 20 of this chapter, except (a) where the high radiation area is equipped with a control device or an alarm system as described in § 20.203(c)(2) of this chapter, or (b) where the high radiation area is locked to protect against unauthorized or accidental entry.

§ 34.42 Posting.

Notwithstanding any provisions in § 20.204(c) of this chapter, areas in which radiography is being performed shall be conspicuously posted as required by § 20.203 (b) and (c) (1) of this chapter.

§ 34.43 Radiation surveys and survey records.

(a) No radiographic operation shall be conducted unless calibrated and operable radiation survey instrumentation as described in § 34.24 is available and used at each site where radiographic exposures are made.

(b) A physical radiation survey shall be made after each radiographic exposure during a radiographic operation to determine that the sealed source has been returned to its shielded condition.

(c) A physical radiation survey shall be made to determine that each sealed source is in its shielded condition prior to securing the radiographic exposure device and storage container as specified in § 34.22.

(d) Records shall be kept of the surveys required by paragraph (c) of this section. Such records shall be maintained for inspection by the Commission for two years after completion of the survey. If the survey was used to determine an individual's exposure, however, the records of the survey shall be maintained until the Commission authorizes their disposition.

EXEMPTIONS

§ 34.51 Applications for exemptions.

The Commission may, upon application by any licensee or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines are authorized by law and will not result in undue hazard to life or property.

APPENDIX A

- I. Fundamentals of radiation safety.
 - A. Characteristics of gamma radiation.
 - B. Units of radiation dose (mrem) and quantity of radioactivity (curie).
 - C. Hazards of excessive exposure of radiation.

D. Levels of radiation from licensed material.

E. Methods of controlling radiation dose.

1. Working time.

2. Working distances.

3. Shielding.

II. Radiation detection instrumentation to be used.

A. Use of radiation survey instruments.

1. Operation.

2. Calibration.

3. Limitations.

B. Survey techniques.

C. Use of personnel monitoring equipment.

1. Film badges.

2. Pocket dosimeters.

3. Pocket chambers.

III. Radiographic equipment to be used.

A. Remote handling equipment.

B. Radiographic exposure devices.

C. Storage containers.

IV. The requirements of pertinent Federal Regulations.

V. The licensee's written operating and emergency procedures.

§ 34.33 Personnel monitoring.

(a) The licensee shall not permit any individual to act as a radiographer or as a radiographer's assistant unless, at all times during radiographic operations, each such individual wears a direct-reading pocket dosimeter and either a film badge or a thermoluminescence dosimeter. Pocket dosimeters shall have a range from zero to at least 200 milliroentgens and shall be recharged daily or at the start of each shift. Each film badge and thermoluminescence dosimeter shall be assigned to and worn by only one individual.

(b) Pocket dosimeters shall be read and exposures recorded daily. An individual's film badge or thermoluminescence dosimeter shall be immediately

NOTE—The reporting and record keeping requirements contained in this part have been approved by the General Accounting Office under B-180225 (R0052), (R0335).

PART 40—DOMESTIC LICENSING OF SOURCE MATERIAL

GENERAL PROVISIONS

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- 40.1 Purpose.
- 40.2 Scope.
- 40.2a Coverage of inactive tailings sites.
- 40.3 License requirements.
- 40.4 Definitions.
- 40.5 Communications.
- 40.6 Interpretations.

EXEMPTIONS

- 40.11 Persons using source material under certain Department of Energy and Nuclear Regulatory Commission contracts.
- 40.12 Carriers.
- 40.13 Unimportant quantities of source material.
- 40.14 Specific exemptions.

GENERAL LICENSES

- 40.20 Types of licenses.
- 40.21 General license to receive title to source or byproduct material.
- 40.22 Small quantities of source material.
- 40.23—40.24 (Reserved)
- 40.25 General license for use of certain industrial products or devices.
- 40.26 General license for possession and storage of byproduct material as defined in this part.

LICENSE APPLICATIONS

- 40.31 Applications for specific licenses.
- 40.32 General requirements for issuance of specific licenses.
- 40.33 (Reserved)
- 40.34 Special requirements for issuance of specific licenses.
- 40.35 Conditions of specific licenses issued pursuant to § 40.34.

LICENSES

- Sec.
- 40.41 Terms and conditions of licenses.
- 40.42 Expiration.
- 40.43 Renewal of licenses.
- 40.44 Amendment of licenses at request of licensee.
- 40.45 Commission action on applications to renew or amend.
- 40.46 Inalienability of licenses.

TRANSFER OF SOURCE MATERIAL

- 40.51 Transfer of source or byproduct material.

RECORDS, REPORTS, AND INSPECTIONS

- 40.61 Records.
- 40.62 Inspections.
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MODIFICATION AND REVOCATION OF LICENSES

- 40.71 Modification, revocation and termination of licenses.

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- 40.81 Violations.

APPENDIX A

AUTHORITY: Secs. 62, 63, 64, 65, 161, 182, 183, 68 Stat. 932, 933, 948, 953, 954, as amended (42 U.S.C. 2092, 2093, 2094, 2095, 2201, 2232, 2233), secs. 202, 206, 88 Stat. 1244, 1246 (42 U.S.C. 5842, 5846), unless otherwise noted.

Section 40.46 also issued under sec. 184, 68 Stat. 954, as amended; 42 U.S.C. 2234. For the purposes of sec. 223, 68 Stat. 958, as amended; 42 U.S.C. 2273, § 40.41(c) issued under sec. 161b, 68 Stat. 948, 42 U.S.C. 2201 (b) and § 40.23(c)(3), 40.61 and 40.62 issued under sec. 161a, 68 Stat. 950, as amended; 42 U.S.C. 2201(a).

Section 40.31(g) also issued under sec. 122, 68 Stat. 939, 42 U.S.C. 2152.

SOURCE: 26 FR 284, Jan. 14, 1961, unless otherwise noted.

NOMENCLATURE CHANGES: 40 FR 8786, Mar. 3, 1975 and 45 FR 14200, Mar. 5, 1980.

GENERAL PROVISIONS

§ 40.1 Purpose.

(a) The regulations in this part establish procedures and criteria for the issuance of licenses to receive title to, receive, possess, use, transfer, or deliver source and byproduct materials, as defined in this part, and establish and provide for the terms and conditions upon which the Commission will issue

such licenses. The regulations in this part do not establish procedures and criteria for the issuance of licenses for materials covered under Title I of the Uranium Mill Tailings Radiation Control Act of 1978 (92 Stat. 3021).

(b) The regulations contained in this part are issued pursuant to the Atomic Energy Act of 1954, as amended (68 Stat. 919), Title II of the Energy Reorganization Act of 1974 (88 Stat. 1242), and Title II of the Uranium Mill Tailings Radiation Control Act of 1978 (42 U.S.C. 7901).

(Secs. 11e(2), 81, 83, 84, 161b, 161c, 161x, 274; Pub. L. 83-703 as amended by Title II, of Pub. L. 95-604, 68 Stat. 919 et seq., 92 Stat. 3021 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2201x, 2021))

[44 FR 50013, Aug. 24, 1979, as amended at 45 FR 65530, July 31, 1980]

§ 40.2 Scope.

Except as provided in §§ 40.11 to 40.14 of this part, inclusive, the regulations in this part apply to all persons in the United States.

§ 40.2a Coverage of inactive tailings sites.

(a) Prior to the completion of the remedial action, the Commission will not require a license pursuant to this part for possession of byproduct material as defined in this part that is located at a site where milling operations are no longer active, if the site is designated a processing site covered by the remedial action program of Title I of the Uranium Mill Tailings Radiation Control Act of 1978. The Commission will exert its regulatory role in remedial actions primarily through concurrence and consultation in the execution of the remedial action pursuant to Title I of the Uranium Mill Tailings Radiation Control Act of 1978.

(b) The Commission will regulate byproduct material as defined in this part that is located at a site where milling operations are no longer active, if such site is not covered by the remedial action program of Title I of the Uranium Mill Tailings Radiation Control Act of 1978. The criteria in Appendix A of this part will be applied to such sites.

(Secs. 11e(2), 81, 83, 84, 161b, 161c, 161x, 274; Pub. L. 83-703 as amended by Title II

of Pub. L. 95-604, 68 Stat. 919 et seq., 92 Stat. 3021 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2201x, 2021))

[45 FR 65531, Oct. 3, 1980]

§ 40.3 License requirements.

No person subject to the regulations in this part shall receive title to, own, receive, possess, use, transfer, or deliver byproduct material as defined in this part or any source material after removal from its place of deposit in nature, except as authorized in a specific or general license issued by the Commission pursuant to the regulations in this part.

(Secs. 11e(2), 81, 83, 84, 161b, 161c, 161x, 274; Pub. L. 83-703 as amended by Title II of Pub. L. 95-604, 68 Stat. 919 et seq., 92 Stat. 3021 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2201x, 2021))

[45 FR 65531, Oct. 3, 1980]

§ 40.4 Definitions.

As used in this part:

(a) "Act" means the Atomic Energy Act of 1954 (68 Stat. 919), including any amendments thereto;

(a-1) "Byproduct Material" means the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes. Underground ore bodies depleted by such solution extraction operations do not constitute "byproduct material" within this definition.

(b) "Commission" means the Nuclear Regulatory Commission or its duly authorized representatives.

(b-1) "Department" and "Department of Energy" means the Department of Energy established by the Department of Energy Organization Act (Pub. L. 95-91, 91 Stat. 565, 42 U.S.C. 7101 et seq.) to the extent that the Department, or its duly authorized representatives, exercises functions formerly vested in the U.S. Atomic Energy Commission, its Chairman, members, officers and components and transferred to the U.S. Energy Research and Development Administration and to the Administrator thereof pursuant to sections 104 (b), (c) and (d) of the Energy Reorganization Act of 1974 (Pub. L. 93-438, 88 Stat. 1233 at 1237,

42 U.S.C. 5814) and retransferred to the Secretary of Energy pursuant to section 301(a) of the Department of Energy Organization Act (Pub. L. 95-91, 91 Stat. 565 at 577-578, 42 U.S.C. 7151).

(c) "Government agency" means any executive department, commission, independent establishment, corporation, wholly or partly owned by the United States of America which is an instrumentality of the United States, or any board, bureau, division, service, office, officer, authority, administration, or other establishment in the executive branch of the Government.

(d) "License", except where otherwise specified, means a license issued pursuant to the regulations in this part.

(e) "Persons" means: (1) Any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, Government agency other than the Commission or the Department of Energy except that the Department of Energy shall be considered a person within the meaning of the regulations in this part to the extent that its facilities and activities are subject to the licensing and related regulatory authority of the Commission pursuant to section 202 of the Energy Reorganization Act of 1974 (88 Stat. 1244) and the Uranium Mill

¹The Department of Energy facilities and activities identified in section 202 are:

(1) Demonstration Liquid Metal Fast Breeder reactors when operated as part of the power generation facilities of an electric utility system, or when operated in any other manner for the purpose of demonstrating the suitability for commercial application of such a reactor.

(2) Other demonstration nuclear reactors, except those in existence on January 19, 1975, when operated as part of the power generation facilities of an electric utility system, or when operated in any other manner for the purpose of demonstrating the suitability for commercial application of such a reactor.

(3) Facilities used primarily for the receipt and storage of high-level radioactive wastes resulting from licensed activities.

(4) Retrievable Surface Storage Facilities and other facilities authorized for the express purpose of subsequent long-term storage of high-level radioactive waste generated by the Department of Energy, which are

Tailings Radiation Control Act of 1978 (92 Stat. 3021), any State or any political subdivision of, or any political entity within a State, any foreign government or nation or any subdivision of any such government or nation, or other entity; and (2) Any legal successor, representative, agent or agency of the foregoing.

(f) "Pharmacist" means an individual registered by a state or territory of the United States, the District of Columbia or the Commonwealth of Puerto Rico to compound and dispense drugs, prescriptions and poisons.

(g) "Physician" means an individual licensed by a state or territory of the United States, the District of Columbia or the Commonwealth of Puerto Rico to dispense drugs in the practice of medicine.

(h) "Source Material" means: (1) Uranium or thorium, or any combination thereof, in any physical or chemical form or (2) ores which contain by weight one-twentieth of one percent (0.05%) or more of: (i) Uranium, (ii) thorium or (iii) any combination thereof. Source material does not include special nuclear material.

(i) "Special nuclear material" means: (1) Plutonium, uranium 233, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Commission, pursuant to the provisions of section 51 of the Act, determines to be special nuclear material; or (2) any material artificially enriched by any of the foregoing.

(j) "United States", when used in a geographical sense, includes Puerto Rico and all territories and possessions of the United States.

(k) "Unrefined and unprocessed ore" means ore in its natural form prior to any processing, such as grinding, roasting or beneficiating, or refining.

(l) With the exception of "byproduct material" as defined in section 11e. of the Act, other terms defined in section 11 of the Act shall have the same meaning when used in the regulations in this part.

(m) "Agreement State" means any State with which the Atomic Energy Commission or the Nuclear Regula-

not used for, or are part of, research and development activities.

tory Commission has entered into an effective agreement under subsection 274b. of the Atomic Energy Act of 1954, as amended.

(n) "Commencement of construction" means any clearing of land, excavation, or other substantial action that would adversely affect the natural environment of a site but does not include changes desirable for the temporary use of the land for public recreational uses, necessary borings to determine site characteristics or other preconstruction monitoring to establish background information related to the suitability of a site or to the protection of environmental values.

(o) "Depleted uranium" means the source material uranium in which the isotope uranium-235 is less than 0.711 weight percent of the total uranium present. Depleted uranium does not include special nuclear material.

(p) "Uranium Milling" means any activity that results in the production of byproduct material as defined in this part.

(q) "Effective kilogram" means (1) for the source material uranium in which the uranium isotope uranium-235 is greater than 0.005 (0.5 weight percent) of the total uranium present: 10,000 kilograms, and (2) for any other source material: 20,000 kilograms.

(Secs. 11e(2), 81, 83, 84, 161b, 161o, 174; Pub. L. 83-703, 68 Stat. 948 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2021); sec. 161, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

[26 FR 284, Jan. 14, 1961, as amended at 30 FR 15285, Dec. 10, 1965, 31 FR 15145, Dec. 2, 1966, 37 FR 5747, Mar. 21, 1972, 40 FR 8787, Mar. 3, 1975, 41 FR 53331, Dec. 6, 1976, 44 FR 50013, Aug. 24, 1979, 44 FR 55327, Sept. 26, 1979, 45 FR 14206, Mar. 5, 1980, 45 FR 18905, Mar. 24, 1980, 45 FR 50710, July 31, 1980]

§ 40.5 Communications.

Except where otherwise specified in this part, all communications and reports concerning the regulations in this part, and applications filed under them, should be addressed to the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Communications, reports, and applica-

tions may be delivered in person at the Commission's offices at 1717 H Street NW., Washington, D.C.; at 7920 Norfolk Avenue, Bethesda, Md.

[31 FR 4669, Mar. 19, 1966, as amended at 34 FR 19546, Dec. 11, 1969, 38 FR 1272, Jan. 11, 1973]

§ 40.6 Interpretations.

Except as specifically authorized by the Commission in writing, no interpretation of the meaning of the regulations in this part by any officer or employee of the Commission other than a written interpretation by the General Counsel will be recognized to be binding upon the Commission.

EXEMPTIONS

§ 40.11 Persons using source material under certain Department of Energy and Nuclear Regulatory Commission contracts.

Except to the extent that Department facilities or activities of the types subject to licensing pursuant to section 202 of the Energy Reorganization Act of 1974 or the Uranium Mill Tailings Radiation Control Act of 1978 are involved, any prime contractor of the Department is exempt from the requirements for a license set forth in sections 62, 63, and 64 of the Act and from the regulations in this part to the extent that such contractor, under his prime contract with the Department, receives, possesses, uses, transfers or delivers source material for: (a) The performance of work for the Department at a United States Government-owned or controlled site, including the transportation of source material to or from such site and the performance of contract services during temporary interruptions of such transportation; (b) research in, or development, manufacture, storage, testing or transportation of, atomic weapons or components thereof; or (c) the use or operation of nuclear reactors or other nuclear devices in a United States Government-owned vehicle or vessel. In addition to the foregoing exemptions, and subject to the requirement for licensing of Department facilities and activities pursuant to section 202 of the Energy Reorganization Act of 1974 or the Uranium Mill Tailings Ra-

diation Control Act of 1980, any prime contractor or subcontractor of the Department or the Commission is exempt from the requirements for a license set forth in sections 62, 63, and 64 of the Act and from the regulations in this part to the extent that such prime contractor or subcontractor receives, possesses, uses, transfers or delivers source material under his prime contract or subcontract when the Commission determines that the exemption of the prime contractor or subcontractor is authorized by law; and that, under the terms of the contract or subcontract, there is adequate assurance that the work thereunder can be accomplished without undue risk to the public health and safety.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841); secs. 11e(2), 81, 83, 84, 161b, 161o, 161x, 174; Pub. L. 83-703 as amended by Title II of Pub. L. 95-604, 68 Stat. 919 et seq., 92 Stat. 3021 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2201x, 2021))

[40 FR 8787, Mar. 3, 1975, as amended at 43 FR 6923, Feb. 17, 1978, 45 FR 65531, Oct. 3, 1980]

§ 40.12 Carriers.

Common and contract carriers, freight forwarders, warehousemen, and the U.S. Postal Service are exempt from the regulations in this part and the requirements for a license set forth in section 62 of the Act to the extent that they transport or store source material in the regular course of carriage for another or storage incident thereto.

[37 FR 3985, Feb. 25, 1972]

§ 40.13 Unimportant quantities of source material.

(a) Any person is exempt from the regulations in this part and from the requirements for a license set forth in section 62 of the Act to the extent that such person receives, possesses, uses, transfers or delivers source material in any chemical mixture, compound, solution, or alloy in which the source material is by weight less than one-twentieth of 1 percent (0.05 percent) of the mixture, compound, solution or alloy. The exemption con-

tained in this paragraph does not include byproduct material as defined in this part.

(b) Any person is exempt from the regulations in this part and from the requirements for a license set forth in section 62 of the act to the extent that such person receives, possesses, uses, or transfers unrefined and unprocessed ore containing source material; provided, that, except as authorized in a specific license, such person shall not refine or process such ore.

(c) Any person is exempt from the regulation in this part and from the requirements for a license set forth in section 62 of the Act to the extent that such person receives, possesses, uses, or transfers:

(1) Any quantities of thorium contained in (i) incandescent gas mantles, (ii) vacuum tubes, (iii) welding rods, (iv) electric lamps for illuminating purposes: *Provided*, That each lamp does not contain more than 50 milligrams of thorium, (v) germicidal lamps, sunlamps, and lamps for outdoor or industrial lighting: *Provided*, That each lamp does not contain more than 2 grams of thorium, (vi) rare earth metals and compounds, mixtures, and products containing not more than 0.25 percent by weight thorium, uranium, or any combination of these, or (vii) personnel neutron dosimeters: *Provided*, That each dosimeter does not contain more than 50 milligrams of thorium.

(2) Source material contained in the following products: (i) Glazed ceramic tableware, provided that the glaze contains not more than 20 percent by weight source material; (ii) piezoelectric ceramic containing not more than 2 percent by weight source material; (iii) glassware, glass enamel, and glass enamel frit containing not more than 10 percent by weight source material; but not including commercially manufactured glass brick, pane glass, ceramic tile, or other glass, glass enamel or ceramic used in construction;

(3) Photographic film, negatives, and prints containing uranium or thorium;

(4) Any finished product or part fabricated of, or containing tungsten or magnesium-thorium alloys, provided that the thorium content of the alloy does not exceed 4 percent by weight

and that the exemption contained in this subparagraph shall not be deemed to authorize the chemical, physical or metallurgical treatment or processing of any such product or part; and

(5) Uranium contained in counterweights installed in aircraft, rockets, projectiles, and missiles, or stored or handled in connection with installation or removal of such counterweights: *Provided*, That:

(i) The counterweights are manufactured in accordance with a specific license issued by the Commission or the Atomic Energy Commission authorizing distribution by the licensee pursuant to this paragraph;

(ii) Each counterweight has been impressed with the following legend clearly legible through any plating or other covering: "Depleted Uranium";

(iii) Each counterweight is durably and legibly labeled or marked with the identification of the manufacturer, and the statement: "Unauthorized Alterations Prohibited"; and

(iv) The exemption contained in this paragraph shall not be deemed to authorize the chemical, physical, or metallurgical treatment or processing of any such counterweights other than repair or restoration of any plating or other covering.

(6) Uranium used as shielding constituting part of any shipping container which is conspicuously and legibly impressed with the legend "CAUTION—RADIOACTIVE SHIELDING—URANIUM" and which meets the specifications for containers for radioactive materials prescribed by § 178.250, Specification 55, Part 178 of the regulations of the Department of Transportation (49 CFR 178.250).

(7) Thorium contained in finished optical lenses, provided that each lens does not contain more than 30 percent by weight of thorium; and that the exemption contained in this subpara-

¹The requirements specified in paragraphs (c)(5) (ii) and (iii) of this section need not be met by counterweights manufactured prior to Dec. 31, 1969. *Provided*, That such counterweights were manufactured under a specific license issued by the Atomic Energy Commission and were impressed with the legend required by § 40.13(c)(5)(ii) in effect on June 30, 1969.

graph shall not be deemed to authorize either:

(i) The shaping, grinding or polishing of such lens or manufacturing processes other than the assembly of such lens into optical systems and devices without any alteration of the lens; or

(ii) The receipt, possession, use, transfer, or of thorium contained in contact lenses, or in spectacles, or in eyepieces in binoculars or other optical instruments.

(8) Thorium contained in any finished aircraft engine part containing nickel-thoria alloy. *Provided*, That:

(i) The thorium is dispersed in the nickel-thoria alloy in the form of finely divided thoria (thorium dioxide); and

(ii) The thorium content in the nickel-thoria alloy does not exceed 4 percent by weight.

(9) The exemptions in this paragraph (c) do not authorize the manufacture of any of the products described.

(d) Any person is exempt from the regulations in this part and from the requirements for a license set forth in section 62 of the Act to the extent that such person receives, possesses, uses, or transfers uranium contained in detector heads for use in fire detection units, provided that each detector head contains not more than 0.005 microcurie of uranium. The exemption in this paragraph does not authorize the manufacture of any detector head containing uranium.

(Sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841); secs. 11e(2), 81, 83, 84, 161b, 161c, 161x, 274, Pub. L. 83-703 as amended by Title II of Pub. L. 95-604, 68 Stat. 919 et seq., 92 Stat. 3021 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2201x, 2021))

(26 FR 284, Jan. 14, 1961, as amended at 26 FR 10929, Nov. 22, 1961; 28 FR 8021, Aug. 7, 1963; 28 FR 14309, Dec. 27, 1963; 30 FR 15802, Dec. 22, 1965; 32 FR 15873, Nov. 18, 1967; 34 FR 14067, Sept. 5, 1969; 34 FR 19546, Dec. 11, 1969; 35 FR 6313, Apr. 18, 1970; 42 FR 6580, Feb. 3, 1977; 43 FR 6923, Feb. 17, 1978; 45 FR 65531, Oct. 3, 1980)

§ 40.14 Specific exemptions.

(a) The Commission may, upon application of any interested person or upon its own initiative, grant such exemptions from the requirements of

the regulation in this part as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest.

(Secs. 11e(2), 81, 83, 84, 161b, 161c, 161x, 274, Pub. L. 83-703 as amended by Title II of Pub. L. 95-604, 68 Stat. 919 et seq., 92 Stat. 3021 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2201x, 2021))

[37 FR 5747, Mar. 21, 1972, as amended at 39 FR 26279, July 18, 1974; 40 FR 8787, Mar. 3, 1975; 45 FR 65531, Oct. 3, 1980]

GENERAL LICENSES

§ 40.20 Types of licenses.

Licenses for source material are of two types: general and specific. The general licenses provided in this part are effective without the filing of applications with the Commission or the issuance of licensing documents to particular persons. Specific licenses are issued to named persons upon applications filed pursuant to the regulations in this part.

§ 40.21 General license to receive title to source or byproduct material.

A general license is hereby issued authorizing the receipt of title to source or byproduct material, as defined in this part, without regard to quantity. This general license does not authorize any person to receive, possess, deliver, use, or transfer source or byproduct material.

(Secs. 11e(2), 81, 83, 84, 161b, 161c, 161x, 274, Pub. L. 83-703 as amended by Title II of Pub. L. 95-604, 68 Stat. 919 et seq., 92 Stat. 3021 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2201x, 2021))

[45 FR 65531, Oct. 3, 1980]

§ 40.22 Small quantities of source material.

(a) A general license is hereby issued authorizing commercial and industrial firms, research, educational and medical institutions and Federal, State and local government agencies to use and transfer not more than fifteen (15) pounds of source material at any one time for research, development, educational, commercial or operational purposes. A person authorized to use or transfer source material, pursuant to this general license, may not receive

more than a total of 150 pounds of source material in any one calendar year.

(b) Persons who receive, possess, use, or transfer source material pursuant to the general license issued in paragraph (a) of this section are exempt from the provisions of Parts 19, 20, and 21 of this chapter to the extent that such receipt, possession, use or transfer are within the terms of such general license: *Provided, however*, That this exemption shall not be deemed to apply to any such person who is also in possession of source material under a specific license issued pursuant to this part.

(c) Persons who receive, possess, use or transfer source material pursuant to the general license in paragraph (a) of this section are prohibited from administering source material, or the radiation therefrom, either externally or internally, to human beings except as may be authorized by NRC in a specific license.

(Secs. 62, 63, 161b, Pub. L. 83-703, 68 Stat. 932, 933, 948b (42 U.S.C. 2092, 2093, 2201b.), sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1242, Pub. L. 94-92, 89 Stat. 413 (42 U.S.C. 5841))

(26 FR 284, Jan. 14, 1961, as amended at 38 FR 22221, Aug. 17, 1973; 42 FR 28896, June 6, 1977, 45 FR 55420, Aug. 20, 1980)

§§ 40.23—40.24 [Reserved]

§ 40.25. General license for use of certain industrial products or devices.

(a) A general license is hereby issued to receive, acquire, possess, use, or transfer, in accordance with the provisions of paragraphs (b), (c), (d), and (e) of this section, depleted uranium contained in industrial products or devices for the purpose of providing a concentrated mass in a small volume of the product or device.

(b) The general license in paragraph (a) of this section applies only to industrial products or devices which have been manufactured or initially transferred in accordance with a specific license issued pursuant to § 40.34 (a) of this part or in accordance with a specific license issued by an Agreement State which authorizes manufacture of the products or devices for dis-

tribution to persons generally licensed by the Agreement State.

(c)(1) Persons who receive, acquire, possess, or use depleted uranium pursuant to the general license established by paragraph (a) of this section shall file Form NRC 244, "Registration Certificate—Use of Depleted Uranium Under General License," with the Director of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. The form shall be submitted within 30 days after the first receipt or acquisition of such depleted uranium. The registrant shall furnish on Form NRC 244 the following information and such other information as may be required by that form:

(i) Name and address of the registrant;

(ii) A statement that the registrant has developed and will maintain procedures designed to establish physical control over the depleted uranium described in paragraph (a) of this section and designed to prevent transfer of such depleted uranium in any form, including metal scrap, to persons not authorized to receive the depleted uranium; and

(iii) Name and/or title, address, and telephone number of the individual duly authorized to act for and on behalf of the registrant in supervising the procedures identified in paragraph (c)(1)(ii) of this section.

(2) The registrant possessing or using depleted uranium under the general license established by paragraph (a) of this section shall report in writing to the Director of Inspection and Enforcement, any changes in information furnished by him in the Form NRC 244 "Registration Certificate—Use of Depleted Uranium Under General License." The report shall be submitted within 30 days after the effective date of such change.

(d) A person who receives, acquires, possesses, or uses depleted uranium pursuant to the general license established by paragraph (a) of this section:

(1) Shall not introduce such depleted uranium, in any form, into a chemical, physical, or metallurgical treatment or process, except a treatment or process for repair or restoration of any

plating or other covering of the depleted uranium.

(2) Shall not abandon such depleted uranium.

(3) Shall transfer or dispose of such depleted uranium only by transfer in accordance with the provisions of § 40.51 of this part. In the case where the transferee receives the depleted uranium pursuant to the general license established by paragraph (a) of this section, the transferor shall furnish the transferee a copy of this section and a copy of Form NRC 244. In the case where the transferee receives the depleted uranium pursuant to a general license contained in an Agreement State's regulation equivalent to this section, the transferor shall furnish the transferee a copy of this section and a copy of Form NRC 244 accompanied by a note explaining that use of the product or device is regulated by the Agreement State under requirements substantially the same as those in this section.

(4) Within 30 days of any transfer, shall report in writing to the Director of Inspection and Enforcement the name and address of the person receiving the source material pursuant to such transfer.

(e) Any person receiving, acquiring, possessing, using, or transferring depleted uranium pursuant to the general license established by paragraph (a) of this section is exempt from the requirements of Parts 19, 20 and 21 of this chapter with respect to the depleted uranium covered by that general license.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

(41 FR 53331, Dec. 6, 1976, as amended at 42 FR 28896, June 6, 1977, 43 FR 6923, Feb. 17, 1978, 43 FR 52202, Nov. 9, 1978)

§ 40.26. General license for possession and storage of byproduct material as defined in this part.

(a) A general license is hereby issued to receive title to, own, or possess byproduct material as defined in this part without regard to form or quantity.

(b) The general license in paragraph (a) of this section applies only: In the

case of licensees of the Commission, where activities that result in the production of byproduct material are authorized under a specific license issued by the Commission pursuant to this part, to byproduct material possessed or stored at an authorized disposal containment area or transported incident to such authorized activity: *Provided*, That authority to receive title to, own, or possess byproduct material under this general license shall terminate when the specific license for source material expires, is renewed, or is amended to include a specific license for byproduct material as defined in this part.

(c) The general license in paragraph (a) of this section is subject to:

(1) The provisions of Parts 19, 20, 21, and §§ 40.1, 40.2, 40.2a, 40.3, 40.4, 40.5, 40.6, 40.41, 40.46, 40.61, 40.62, 40.63, 40.65, 40.71, and 40.81 of Part 40 of this chapter; and

(2) The documentation of daily inspections of tailings or waste retention systems and the immediate notification of the appropriate NRC regional office as indicated in Appendix D of 10 CFR Part 20, or the Director, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, of any failure in a tailings or waste retention system which results in a release of tailings or waste into unrestricted areas, and/or of any unusual conditions (conditions not contemplated in the design of the retention system) which if not corrected could lead to failure of the system and result in a release of tailings or waste into unrestricted areas; and any additional requirements the Commission may by order deem necessary.

(d) The general license in paragraph (a) of this section shall expire nine months from the effective date of this subparagraph unless an applicable licensee has submitted, pursuant to the provisions of § 40.31 of this part, an application for license renewal or amendment which includes a detailed program for meeting the technical and financial criteria contained in Appendix A of this part.

(Secs. 11e(2), 81, 83, 84, 161b, 274, Pub. L. 83-703, 68 Stat. 948 et seq. (42 U.S.C. 2011e(2), 2111, 2113, 2114, 2201b, 2021); sec.

22, Pub. L. 95-604, sec. 11e(2), 81, 83, 84, 161b, 161c, 161x, 274; Pub. L. 83-703 as amended by Title II of Pub. L. 95-604, 68 Stat. 919 et seq., 92 Stat. 3021 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2201x, 2021))

[44 FR 50014, Aug. 24, 1979, as amended at 45 FR 12377, Feb. 26, 1980, 45 FR 65531, Oct. 3, 1980] *

EFFECTIVE DATE NOTE: At 45 FR 79409, Dec. 1, 1980, the effective date of the reporting and recordkeeping requirements in § 40.31(d) was extended to January 5, 1981.

LICENSE APPLICATIONS

§ 40.31 Applications for specific licenses.

(a) Applications for specific licenses should be filed in quadruplicate on Form NRC-2, "Application for Source Material License," with the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Applications may be filed in person at the Commission's offices at 1717 H Street NW., Washington, D.C.; at 7920 Norfolk Avenue, Bethesda, Md. Information contained in previous applications, statements or reports filed with the Commission may be incorporated by references, provided that such references are clear and specific.

(b) The Commission may at any time after the filing of the original application, and before the expiration of the license, require further statements in order to enable the Commission to determine whether the application should be granted or denied or whether a license should be modified or revoked. All applications and statements shall be signed by the applicant or licensee or a person duly authorized to act for and on his behalf.

(c) Applications and documents submitted to the Commission in connection with applications will be made available for public inspection in accordance with the provisions of the regulations contained in Parts 2 and 9 of this chapter.

(d) An application for a license filed pursuant to the regulations in this part will be considered also as an application for licenses authorizing other activities for which licenses are required by the Act. *Provided*, That the application specifies the additional activities for which licenses are request-

ed and complies with regulations of the Commission as to applications for such licenses.

(e) Each application for a source material license, other than a license exempted from Part 170 of this chapter, shall be accompanied by the fee prescribed in § 170.31 of this chapter. No fee will be required to accompany an application for renewal or amendment of a license, except as provided in § 170.31 of this chapter.

(f) An application for a license to possess and use source material for uranium milling, production of uranium hexafluoride, commercial waste disposal by land burial or for the conduct of any other activity which the Commission determines will significantly affect the quality of the environment shall be filed at least 9 months prior to commencement of construction of the plant or facility in which the activity will be conducted and shall be accompanied by any Environmental Report required pursuant to Part 51 of this chapter.

(g) An applicant for a license to possess and use source material in a uranium hexafluoride production plant or a fuel fabrication plant and any other applicant for a license to possess and use more than one effective kilogram of source material (except for ore processing, as defined in § 75.4 (c) of this chapter) should file with the Commission the installation information described in § 75.11 of this chapter, and the applicant shall permit verification thereof by the International Atomic Energy Agency and take such other action as may be necessary to implement the US/IAEA Safeguards Agreement, in the manner set forth in §§ 75.6, 75.11 through 75.14 of this chapter. The Commission will grant an exemption from the requirements of this section, upon application, if it determines that the installation will not be included on the United States eligible list. The installation information should be filed at least 9 months prior to the date when the applicant desires to receive the source material (or earlier upon request by the Commission). Applicants who desire to receive the source material within 9 months after the effective date of this

paragraph should submit the installation information as soon as possible.

(h) An application for a license to receive, possess, and use source material for uranium or thorium milling or byproduct material, as defined in this part, at sites formerly associated with such milling shall contain proposed written specifications relating to milling operations and the disposition of the byproduct material to achieve the requirements and objectives set forth in Appendix A of this part. Each application must clearly demonstrate how the requirements and objectives set forth in Appendix A of this part have been addressed. Failure to clearly demonstrate how the requirements and objectives in Appendix A have been addressed shall be grounds for refusing to accept an application.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841); sec. 11e(2), 81, 83, 84, 161b, 161c, 161x, 274; Pub. L. 83-703 as amended by Title II of Pub. L. 95-604, 68 Stat. 919 et seq., 92 Stat. 3021 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2201x, 2021))

[26 FR 284, Jan. 14, 1961, as amended at 31 FR 4669, Mar. 19, 1966; 34 FR 19546, Dec. 11, 1969; 36 FR 145, Jan. 6, 1971; 37 FR 5748, Mar. 21, 1972; 38 FR 1272, Jan. 11, 1973; 39 FR 26279, July 18, 1974; 43 FR 6924, Feb. 17, 1978; 45 FR 50710, July 31, 1980; 45 FR 65531, Oct. 3, 1980; 46 FR 11237, Feb. 6, 1981]

EFFECTIVE DATE NOTE: At 45 FR 79409, Dec. 1, 1980, the effective date of the reporting and recordkeeping requirements in § 40.31(h) was extended to January 5, 1981.

§ 40.32 General requirements for issuance of specific licenses.

An application for a specific license will be approved if:

(a) The application is for a purpose authorized by the Act, and

(b) The applicant is qualified by reason of training and experience to use the source material for the purpose requested in such manner as to protect health and minimize danger to life or property; and

(c) The applicant's proposed equipment, facilities and procedures are adequate to protect health and minimize danger to life or property; and

(d) The issuance of the license will not be inimical to the common defense

and security or to the health and safety of the public; and

(e) In the case of an application for a license to possess and use source and byproduct material for uranium milling, production of uranium hexafluoride, commercial waste disposal by land burial or for the conduct of any other activity which the Commission determines will significantly affect the quality of the environment, the Director of Nuclear Material Safety and Safeguards or his designee, before commencement of construction of the plant or facility in which the activity will be conducted, on the basis of information filed and evaluations made pursuant to Part 51 of this chapter, has concluded, after weighing the environmental, economic, technical and other benefits against environmental costs and considering available alternatives, that the action called for is the issuance of the proposed license, with any appropriate conditions to protect environmental values. Commencement of construction prior to such a conclusion shall be grounds for denial of a license to possess and use source and byproduct material in such plant or facility. As used in this paragraph the term "commencement of construction" means any clearing of land, excavation, or other substantial action that would adversely affect the environment of a site. The term does not mean site exploration, necessary roads for site exploration, borings to determine foundation conditions, or other preconstruction monitoring or testing to establish background information related to the suitability of the site or the protection of environmental values.

(f) The applicant satisfies any applicable special requirements contained in § 40.34.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841); sec. 11e(2), 81, 83, 84, 161b, 161c, 161x, 274; Pub. L. 83-703 as amended by Title II of Pub. L. 95-604, 68 Stat. 919 et seq., 92 Stat. 3021 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2201x, 2021))

[26 FR 284, Jan. 14, 1961, as amended at 36 FR 12731, July 7, 1971; 40 FR 8787, Mar. 3, 1975; 41 FR 53332, Dec. 6, 1976; 43 FR 6924, Feb. 17, 1978; 45 FR 65531, Oct. 3, 1980]

§ 40.33 [Reserved]

§ 40.34 Special requirements for issuance of specific licenses.

(a) An application for a specific license to manufacture industrial products and devices containing depleted uranium, or to initially transfer such products or devices, for use pursuant to § 40.25 of this part or equivalent regulations of an Agreement State, will be approved if:

(1) The applicant satisfies the general requirements specified in § 40.32;

(2) The applicant submits sufficient information relating to the design, manufacture, prototype testing, quality control procedures, labeling or marking, proposed uses, and potential hazards of the industrial product or device to provide reasonable assurance that possession, use, or transfer of the depleted uranium in the product or device is not likely to cause any individual to receive in any period of one calendar quarter a radiation dose in excess of 10 percent of the limits specified in § 20.101(a) of this chapter; and

(3) The applicant submits sufficient information regarding the industrial product or device and the presence of depleted uranium for a mass-volume application in the product or device to provide reasonable assurance that unique benefits will accrue to the public because of the usefulness of the product or device.

(b) In the case of an industrial product or device whose unique benefits are questionable, the Commission will approve an application for a specific license under this paragraph only if the product or device is found to combine a high degree of utility and low probability of uncontrolled disposal and dispersal of significant quantities of depleted uranium into the environment.

(c) The Commission may deny an applicant for a specific license under this paragraph if the end uses of the industrial product or device cannot be reasonably foreseen.

(Sec. 161, as amended, Pub. L. 83-703, 88 Stat. 948 (42 U.S.C. 2201), sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[41 FR 53332, Dec. 6, 1976, as amended at 43 FR 6924, Feb. 17, 1978]

§ 40.35 Conditions of specific licenses issued pursuant to § 40.34.

Each person licensed pursuant to § 40.34 shall:

(a) Maintain the level of quality control required by the license in the manufacture of the industrial product or device, and in the installation of the depleted uranium into the product or device;

(b) Label or mark each unit to: (1) Identify the manufacturer or initial transferor of the product or device and the number of the license under which the product or device was manufactured or initially transferred, the fact that the product or device contains depleted uranium, and the quantity of depleted uranium in each product or device; and (2) state that the receipt, possession, use, and transfer of the product or device are subject to a general license or the equivalent and the regulations of the U.S. NRC or of an Agreement State;

(c) Assure that the depleted uranium before being installed in each product or device has been impressed with the following legend clearly legible through any plating or other covering: "Depleted Uranium";

(d)(1) Furnish a copy of the general license contained in § 40.25 and a copy of Form NRC 244 to each person to whom he transfers source material in a product or device for use pursuant to the general license contained in § 40.25; or

(2) Furnish a copy of the general license contained in the Agreement State's regulation equivalent to § 40.25 and a copy of the Agreement State's certificate, or alternately, furnish a copy of the general license contained in § 40.25 and a copy of Form NRC 244 to each person to whom he transfers source material in a product or device for use pursuant to the general license of an Agreement State. If a copy of the general license in § 40.25 and a copy of Form NRC 244 are furnished to such person, they shall be accompanied by a note explaining that use of the product or device is regulated by the Agreement State under requirements substantially the same as those in § 40.25; and

(e)(1) Report to the Director of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, all transfers of industrial products or devices to persons for use under the general license in § 40.25. Such report shall identify each general licensee by name and address, an individual by name and/or position who may constitute a point of contact between the Commission and the general licensee, the type and model number of device transferred, and the quantity of depleted uranium contained in the product or device. The report shall be submitted within 30 days after the end of each calendar quarter in which such a product or device is transferred to the generally licensed person. If no transfers have been made to persons generally licensed under § 40.25 during the reporting period, the report shall so indicate;

(2) Report to the responsible Agreement State Agency all transfers of industrial products or devices to persons for use under the general license in the Agreement State's regulation equivalent to § 40.25. Such report shall identify each general licensee by name and address, an individual by name and/or position who may constitute a point of contact between the Agency and the general licensee, the type and model number of device transferred, and the quantity of depleted uranium contained in the product or device. The report shall be submitted within 30 days after the end of each calendar quarter in which such product or device is transferred to the generally licensed person. If no transfers have been made to a particular Agreement State during the reporting period, this information shall be reported to the responsible Agreement State Agency;

(3) Keep records showing the name, address, and a point of contact for each general licensee to whom he transfers depleted uranium in industrial products or devices for use pursuant to the general license provided in § 40.25 or equivalent regulations of an Agreement State. The records shall be maintained for a period of two years and shall show the date of each transfer, the quantity of depleted uranium in each product or device transferred,

and compliance with the report requirements of this section.

(Sec. 161, as amended, Pub. L. 83-703, 88 Stat. 948 (42 U.S.C. 2201), sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[41 FR 53332, Dec. 6, 1976, as amended at 43 FR 6924, Feb. 17, 1978]

LICENSES

§ 40.41 Terms and conditions of licenses.

(a) Each license issued pursuant to the regulations in this part shall be subject to all the provisions of the act, now or hereafter in effect, and to all rules, regulations and orders of the Commission.

(b) Neither the license nor any right under the license shall be assigned or otherwise transferred in violation of the provisions of the Act.

(c) Each person licensed by the Commission pursuant to the regulations in this part shall confine his possession and use of source or byproduct material to the locations and purposes authorized in the license. Except as otherwise provided in the license, a license issued pursuant to the regulations in this part shall carry with it the right to receive, possess, and use source or byproduct material. Preparation for shipment and transport of source or byproduct material shall be in accordance with the provisions of Part 71 of this chapter.

(d) Each license issued pursuant to the regulations in this part shall be deemed to contain the provisions set forth in sections 183b-d, of the Act, whether or not said provisions are expressly set forth in the license.

(e) The Commission may incorporate in any license at the time of issuance, or thereafter, by appropriate rule, regulation or order, such additional requirements and conditions with respect to the licensee's receipt, possession, use, and transfer of source or byproduct material as it deems appropriate or necessary in order to:

(1) Promote the common defense and security;

(2) Protect health or to minimize danger of life or property;

(3) Protect restricted data;

(4) Require such reports and the keeping of such records, and to pro-

vide for such inspections of activities under the license as may be necessary or appropriate to effectuate the purposes of the act and regulations thereunder.

(f) Each licensee shall notify the Commission in writing when the licensee decides to permanently discontinue all activities involving materials authorized under the license. This notification requirement applies to all specific licenses issued under this Part.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201), sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841), sec. 11e(2), 81, 83, 84, 161b, 161c, 161x, 274, Pub. L. 83-703 as amended by Title II of Pub. L. 95-604, 68 Stat. 919 et seq., 92 Stat. 3021 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2201x, 2021))

(26 FR 284, Jan. 14, 1961, as amended at 31 FR 15145, Dec. 2, 1966; 44 FR 17480, Mar. 22, 1979; 45 FR 65531, Oct. 3, 1980)

§ 40.42 Expiration.

Except as provided in § 40.43(b), each specific license shall expire at the end of the day, in the month and year stated therein.

(32 FR 7172, May 12, 1967)

§ 40.43 Renewal of licenses.

(a) Applications for renewal of a specific license shall be filed in accordance with § 40.31 of this part.

(b) In any case in which a licensee, not less than thirty (30) days prior to expiration of his existing license, has filed an application in proper form for renewal or for a new license, such existing license shall not expire until the application for renewal or for a new license has been finally determined by the Commission.

§ 40.44 Amendment of licenses at request of licensee.

Applications for amendment of a license shall be filed in accordance with § 40.31 and shall specify the respects in which the licensee desires his license to be amended and the grounds for such amendment.

§ 40.45 Commission action on applications to renew or amend.

In considering an application by a licensee to renew or amend his license

the Commission will apply the applicable criteria set forth in § 40.32.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201), sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

(26 FR 284, Jan. 14, 1961, as amended at 43 FR 6924, Feb. 17, 1978)

§ 40.46 Inalienability of licenses.

No license issued or granted pursuant to the regulations in this part shall be transferred, assigned or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of any license to any person, unless the Commission shall after securing full information, find that the transfer is in accordance with the provisions of this act, and shall give its consent in writing.

TRANSFER OF SOURCE MATERIAL

§ 40.51 Transfer of source or byproduct material.

(a) No licensee shall transfer source or byproduct material except as authorized pursuant to this section.

(b) Except as otherwise provided in his license and subject to the provisions of paragraphs (c) and (d) of this section, any licensee may transfer source or byproduct material:

(1) To the Department of Energy

(2) To the agency in any Agreement State which regulates radioactive materials pursuant to an agreement with the Commission or the Atomic Energy Commission under section 274 of the Act;

(3) To any person exempt from the licensing requirements of the Act and regulations in this part, to the extent permitted under such exemption;

(4) To any person in an Agreement State subject to the jurisdiction of that State who has been exempted from the licensing requirements and regulations of that State, to the extent permitted under such exemptions;

(5) To any person authorized to receive such source or byproduct material under terms of a specific license or a general license or their equivalents

issued by the Commission or an Agreement State;

(6) To any person abroad pursuant to an export license issued under Part 110 of this chapter; or

(7) As otherwise authorized by the commission in writing.

(c) Before transferring source or byproduct material to a specific licensee of the Commission or an Agreement State or to a general licensee who is required to register with the Commission or with an Agreement State prior to receipt of the source or byproduct material, the licensee transferring the material shall verify that the transferee's license authorizes receipt of the type, form, and quantity of source or byproduct material to be transferred.

(d) The following methods for the verification required by paragraph (c) of this section are acceptable:

(1) The transferor may have in his possession, and read, a current copy of the transferee's specific license or registration certificate;

(2) The transferor may have in his possession a written certification by the transferee that he is authorized by license or registration certificate to receive the type, form, and quantity of source or byproduct material to be transferred, specifying the license or registration certification number, issuing agency and expiration date;

(3) For emergency shipments the transferor may accept oral certification by the transferee that he is authorized by license or registration certificate to receive the type, form, and quantity of source or byproduct material to be transferred, specifying the license or registration certification number, issuing agency and expiration date: *Provided*, That the oral certification is confirmed in writing within 10 days;

(4) The transferor may obtain other sources of information compiled by a reporting service from official records of the Commission or the licensing agency of an Agreement State as to the identity of licensees and the scope and expiration dates of licenses and registrations; or

(5) When none of the methods of verification described in paragraphs (d)(1) to (4) of this section are readily available or when a transferor desires to verify that information received by

one of such methods is correct or up-to-date, the transferor may obtain and record confirmation from the Commission or the licensing agency of an Agreement State that the transferee is licensed to receive the source or byproduct material.

(Secs. 11e(2), 81, 83, 84, 161b, 161c, 161x, 274, Pub. L. 83-703 as amended by Title II of Pub. L. 95-604, 68 Stat. 919 et seq., 92 Stat. 3021 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2201x, 2021))

(45 FR 65532, Oct. 3, 1980)

EFFECTIVE DATE NOTE: At 45 FR 79409, Dec. 1, 1980, the effective date of the reporting and recordkeeping requirements in § 40.51 was extended to January 5, 1981.

RECORDS, REPORTS, AND INSPECTIONS

§ 40.61 Records.

(a) Each person who receives source or byproduct material pursuant to a license issued pursuant to the regulations in this part shall keep records showing the receipt, transfer, and disposal of such source or byproduct material.

(b) Records which are required by the regulations in this part or by license condition shall be maintained for the period specified by the appropriate regulation or license condition. If a retention period is not otherwise specified by regulation or license condition, such records shall be maintained until the Commission authorizes their disposition.

(c)(1) Records of receipt of source or byproduct material which must be maintained pursuant to paragraph (a) of this section shall be maintained as long as the licensee retains possession of the source or byproduct material and for five years following transfer, or disposition of the source of byproduct material.

(2) [Reserved]

(3) Records of transfer of source or byproduct material shall be maintained by the licensee who transferred the material until the Commission authorizes their disposition.

(4) Records of disposal of source or byproduct material shall be maintained in accordance with § 20.401(c) of this chapter.

(5) If source or byproduct material is combined or mixed with other licensed

material and subsequently treated in a manner which makes direct correlation of a receipt record with a transfer, export, or disposition record impossible, evaluative techniques such as first-in-first-out may be used for purposes of the records retention requirements of this paragraph.

(d)(1) Records which must be maintained pursuant to this part may be the original or reproduced copy or microform if such reproduced copy or microform is duly authenticated by authorized personnel and the microform is capable of producing a clear and legible copy after storage for the period specified by Commission regulations.

(2) If there is a conflict between the Commission's regulations in this part, license condition, or other written Commission approval or authorization pertaining to the retention period for the same type of record, the retention period specified in the regulations in this part for such records shall apply unless the Commission, pursuant to § 40.14 of this part, has granted a specific exemption from the record retention requirements specified in the regulations in this part.

(Secs. 11e(2), 81, 83, 84, 161b, 161c, 161x, 274, Pub. L. 83-703 as amended by Title II of Pub. L. 95-604, 68 Stat. 919 et seq., 92 Stat. 3021 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2201x, 2021))

[45 FR 65532, Oct. 3, 1980]

§ 40.62 Inspections.

(a) Each licensee shall afford to the Commission at all reasonable times opportunity to inspect source or byproduct material and the premises and facilities wherein source or byproduct material is used or stored.

(b) Each licensee shall make available to the Commission for inspection, upon reasonable notice, records kept by him pursuant to the regulations in this chapter.

(Secs. 11e(2), 81, 83, 84, 161b, 161c, 161x, 274, Pub. L. 83-703 as amended by Title II of Pub. L. 95-604, 68 Stat. 919 et seq., 92 Stat. 3021 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2201x, 2021))

[45 FR 65532, Oct. 3, 1980]

§ 40.63 Tests.

Each licensee shall perform, or permit the Commission to perform, such tests as the Commission deems appropriate or necessary for the administration of the regulations in this part, including tests of:

- (a) Source or byproduct material;
- (b) Facilities wherein source or byproduct material is utilized or stored;
- (c) Radiation detection and monitoring instruments; and
- (d) Other equipment and devices used in connection with the utilization and storage of source or byproduct material.

(Secs. 11e(2), 81, 83, 84, 161b, 161c, 161x, 274, Pub. L. 83-703 as amended by Title II of Pub. L. 95-604, 68 Stat. 919 et seq., 92 Stat. 3021 et seq. (42 U.S.C. 2014e(2), 2111, 2113, 2114, 2201b, 2201x, 2021))

[45 FR 65533, Oct. 3, 1980]

§ 40.64 Reports.

(a) Except as specified in paragraphs (d) and (e) of this section, each licensee who transfers or receives at any one time 1,000 kilograms or more of uranium or thorium, or any combination thereof, shall complete and distribute a Nuclear Material Transaction Report on Form NRC-741, in accordance with the printed instructions for completing the form. Each licensee who transfers such material shall submit a completed copy of Form NRC-741 to the Commission and three copies to the receiver of the material promptly after the transfer takes place. Each licensee who receives such material shall submit a completed copy of Form NRC-741 to the Commission and to the shipper of the material within ten (10) days after the material is received. The Commission's copies of the reports shall be submitted to the U.S. Energy Research and Development Administration, Post Office Box E, Oak Ridge, TN 37830.

(b) Except as specified in paragraphs (d) and (e) of this section, each licensee who is authorized to possess at any one time and location more than 1,000 kilograms of uranium or thorium, or any combination thereof shall submit to the Commission within 30 days after September 30 of each year a statement of his source material in-

ventory. The reports shall be submitted to the U.S. Energy Research and Development Administration, Post Office Box E, Oak Ridge, Tenn. 37830, and shall include the Reporting Identification Symbol (RIS) assigned by the Commission to the licensee.

(c) Except as specified in paragraph (d) of this section, each licensee who is authorized to possess uranium or thorium pursuant to a specific license shall report promptly to the appropriate NRC Regional Office listed in Appendix D of Part 20 of this chapter by telephone and telegraph, mailgram, or facsimile any incident in which an attempt has been made or is believed to have been made to commit a theft or unlawful diversion of more than 15 pounds of such material at any one time or more than 150 pounds of such material in any one calendar year. The initial report shall be followed within a period of fifteen (15) days by a written report submitted to the appropriate NRC Regional Office which sets forth the details of the incident and its consequences. A copy of such written report shall be sent to the Director of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Subsequent to the submission of the written report required by this paragraph, the licensee shall promptly inform the Director of Inspection and Enforcement by means of a written report of any substantive additional information, which becomes available to the licensee, concerning an attempted or apparent theft or unlawful diversion of source material.

(d) The reports described in paragraphs (a), (b), and (c) of this section are not required for:

(1) Processed ores containing less than five (5) percent of uranium or thorium, or any combination thereof, by dry weight;

(2) Thorium contained in magnesium-thorium and tungsten-thorium alloys, provided that the thorium content in the alloys does not exceed 4 percent by weight; or

(3) Chemical catalysts containing uranium depleted in the U^{235} isotope to 0.4 percent or less, provided that the uranium content of the catalyst does not exceed 15 percent by weight.

(e) Any licensee who is required to submit inventory change reports and material status reports pursuant to Part 75 of this chapter (pertaining to implementation of the US/IAEA Safeguards Agreement) shall prepare and submit such reports only as provided in §§ 75.34 and 75.35 of this chapter (instead of as provided in paragraphs (a) and (b) of this section).

(Sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

[35 FR 12195, July 30, 1970, as amended at 36 FR 10938, June 5, 1971; 38 FR 1272, Jan. 11, 1973; 38 FR 2330, Jan. 24, 1973; 40 FR 8787, Mar. 3, 1975; 41 FR 16446, Apr. 19, 1976; 42 FR 33266, June 30, 1977; 43 FR 6924, Feb. 17, 1978; 45 FR 50710, July 31, 1980]

§ 40.65 Effluent monitoring reporting requirements.

(a) Each licensee authorized to possess and use source material in uranium milling or production of uranium hexafluoride, shall:

(1) Submit a report to the appropriate NRC Regional Office shown in Appendix D of Part 20 of this chapter, with copies to the Director of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, within 60 days after January 1, 1976 and July 1, 1976, and within 60 days after January 1 and July 1 of each year thereafter, specifying the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in gaseous effluents during the previous six months of operation, and such other information the Commission may require to estimate maximum potential annual radiation doses to the public resulting from effluent releases. If quantities of radioactive materials released during the reporting period are significantly above the licensee's design objectives previously reviewed as part of the licensing action, the report shall cover this specifically. On the basis of such reports and any additional information the Commission may obtain from the licensee or others, the Commission may from time to time require the licensee to take such action as the Commission deems appropriate.

§ 40.71

(Sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

[40 FR 53230, Nov. 17, 1975, as amended at 41 FR 21627, May 27, 1976; 42 FR 25721, May 19, 1977]

MODIFICATION AND REVOCATION OF LICENSES

§ 40.71 Modification, revocation and termination of licenses.

(a) The terms and conditions of each license shall be subject to amendment, revision, or modification by reason of amendments to the act, or by reason of rules, regulations, or orders issued in accordance with the act.

(b) Any license may be revoked, suspended, or modified, in whole or in part, for any material false statement in the application or any statement of fact required under section 182 of the Act, or because of conditions revealed by such application or statement of fact or any report, record, or inspection or other means which would warrant the Commission to refuse to grant a license on an original application, or for violation of, or failure to observe any of, the terms and conditions of the Act, or the license, or of any rule, regulation or order of the Commission.

(c) Except in cases of willfulness or those in which the public health, interest or safety requires otherwise, no license shall be modified, suspended, or revoked unless, prior to the institution of proceedings therefor, facts or conduct which may warrant such action shall have been called to the attention of the licensee in writing and the licensee shall have been accorded opportunity to demonstrate or achieve compliance with all lawful requirements.

(d) The Commission may terminate a specific license upon request submitted by the licensee to the Commission in writing.

(Secs. 186, 187, 88 Stat. 955; 42 U.S.C. 2236, 2237)

[26 FR 284, Jan. 14, 1961, as amended at 35 FR 11460, July 17, 1970]

Title 10—Energy

ENFORCEMENT

§ 40.81 Violations.

An injunction or other court order may be obtained prohibiting any violation of any provision of the Atomic Energy Act of 1954, as amended, or Title II of the Energy Reorganization Act of 1974, or any regulation or order issued thereunder. A court order may be obtained for the payment of a civil penalty imposed pursuant to section 234 of the Act for violation of section 53, 57, 62, 63, 81, 82, 101, 103, 104, 107, or 109 of the Act, or section 206 of the Energy Reorganization Act of 1974, or any rule, regulation, or order issued thereunder, or any term, condition, or limitation of any license issued thereunder, or for any violation for which a license may be revoked under section 186 of the Act. Any person who willfully violates any provision of the Act or any regulation or order issued thereunder may be guilty of a crime and, upon conviction, may be punished by fine or imprisonment or both, as provided by law.

[40 FR 8787, Mar. 3, 1975]

Title 10—Energy

Subpart C—Package Standards

- Sec.
- 71.31 General standards for all packaging.
 - 71.32 Structural standards for type B and large quantity packaging.
 - 71.33 Criticality standards for fissile material packages.
 - 71.34 Evaluation of a single package.
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 - 71.38 Specific standards for a Fissile Class I package.
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 - 71.40 Specific standards for a Fissile Class III shipment.
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PART 71—PACKAGING OF RADIOACTIVE MATERIAL FOR TRANSPORT AND TRANSPORTATION OF RADIOACTIVE MATERIAL UNDER CERTAIN CONDITIONS

Subpart A—General Provisions

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APPENDIX A—NORMAL CONDITIONS OF TRANSPORT

APPENDIX B—HYPOTHETICAL ACCIDENT CONDITIONS

APPENDIX C—TRANSPORT GROUPING OF RADIONUCLIDES

APPENDIX D—TESTS FOR SPECIAL FORM LICENSED MATERIAL

APPENDIX E—QUALITY ASSURANCE CRITERIA FOR SHIPPING PACKAGES FOR RADIOACTIVE MATERIAL

AUTHORITY: Secs. 53, 63, 81, 161, 182, 183, 68 Stat. 930, 933, 935, 948, 953, 954, as amended; 42 U.S.C. 2073, 2093, 2111, 2201, 2232, 2233, unless otherwise noted. For the purposes of sec. 223, 68 Stat. 958, as amended; 42 U.S.C. 2273, §§ 71.61-71.63 issued under sec. 1610, 68 Stat. 950, as amended; 42 U.S.C. 2201(c). Secs. 202, 206, Pub. L. 93-438, 88 Stat. 1244, 1246; 42 U.S.C. 5842, 5846, unless otherwise noted.

SOURCE: 31 FR 9941, July 22, 1966, unless otherwise noted.

Subpart A—General Provisions

§ 71.1 Purpose.

(a) This part establishes requirements for transportation and for preparation for shipment of licensed material and prescribes procedures and standards for approval by the Nuclear Regulatory Commission of packaging and shipping procedures for licensed materials and prescribes certain requirements governing such packaging and shipping.

(b) The packaging and transport of these materials are also subject to other parts of this chapter and to the regulations of other agencies having jurisdiction over means of transport. The requirements of this part are in addition to, and not in substitution for, other requirements.

[37 FR 3985, Feb. 25, 1972, as amended at 44 FR 63084, Nov. 2, 1979]

§ 71.2 Scope.

The regulations in this part apply to each person authorized by specific license issued by the Commission to receive, possess, use, or transfer licensed materials, if he delivers such materials to a carrier for transport or transports such material outside the confines of his plant or other place of use.

[37 FR 3986, Feb. 25, 1972]

§ 71.3 Requirement for license.

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

[37 FR 3986, Feb. 25, 1972]

§ 71.4 Definitions.

As used in this part:

(a) "Carrier" means any person engaged in the transportation of passengers or property, as common, contract, or private carrier, or freight forwarder, as those terms are used in the Interstate Commerce Act, as amended, or the U.S. Post Office;

(b) "Close reflection by water" means immediate contact by water of

sufficient thickness to reflect a maximum number of neutrons;

(c) "Containment vessel" means the receptacle on which principal reliance is placed to retain the radioactive material during transport;

(d) "Fissile classification" means classification of a package or shipment of fissile materials according to the controls needed to provide nuclear criticality safety during transportation as follows:

(1) Fissile Class I: Packages which may be transported in unlimited numbers and in any arrangement, and which require no nuclear criticality safety controls during transportation. For purposes of nuclear criticality safety control, a transport index is not assigned to Fissile Class I packages. However, the external radiation levels may require a transport index number.

(2) Fissile Class II: Packages which may be transported together in any arrangement but in numbers which do not exceed an aggregate transport index of 50. For purposes of nuclear criticality safety control, individual packages may have a transport index of not less than 0.1 and not more than 10. However, the external radiation levels may require a higher transport index number but not to exceed 10. Such shipments require no nuclear criticality safety control by the shipper during transportation.

(3) Fissile Class III: Shipments of packages which do not meet the requirements of Fissile Classes I or II and which are controlled in transportation by special arrangements between the shipper and the carrier to provide nuclear criticality safety.

(e) "Fissile materials" means uranium 233, uranium 235, plutonium 238, plutonium 239, and plutonium 241;

(f) "Large quantity" means a quantity of radioactive material, the aggregate radioactivity of which exceeds any one of the following:

(1) For transport groups as defined in paragraph (p) of this section:

(i) Group I or II radionuclides: 20 curies;

(ii) Group III or IV radionuclides: 200 curies;

(iii) Group V radionuclides: 5,000 curies;

(iv) Group VI or VII radionuclides: 50,000 curies; and

(2) For special form material as defined in paragraph (o) of this section: 5,000 curies.

(g) "Low specific activity material" means any of the following:

(1) Uranium or thorium ores and physical or chemical concentrates of those ores;

(2) Unirradiated natural or depleted uranium or unirradiated natural thorium;

(3) Tritium oxide in aqueous solutions provided the concentration does not exceed 5.0 millicuries per milliliter;

(4) Material in which the activity is essentially uniformly distributed and in which the estimated average concentration per gram of contents does not exceed:

(i) 0.0001 millicurie of Group I radionuclides; or

(ii) 0.005 millicurie of Group II radionuclides; or

(iii) 0.3 millicurie of Groups III or IV radionuclides.

NOTE: This includes, but is not limited to, materials of low radioactivity concentration such as residues or solutions from chemical processing; wastes such as building rubble, metal, wood, and fabric scrap, glassware, paper, and cardboard; solid or liquid plant waste, sludges, and ashes.

(5) Objects of nonradioactive material externally contaminated with radioactive material, provided that the radioactive material is not readily dispersible and the surface contamination, when averaged over an area of 1 square meter, does not exceed 0.0001 millicurie (220,000 disintegrations per minute) per square centimeter of Group I radionuclides or 0.001 millicurie (2,200,000 disintegrations per minute) per square centimeter of other radionuclides.

(h) "Maximum normal operating pressure" means the maximum gauge pressure which is expected to develop in the containment vessel under the normal conditions of transport specified in Appendix A of this part;

(i) "Moderator" means a material used to reduce, by scattering collisions and without appreciable capture, the kinetic energy of neutrons;

(j) "Optimum interspersed hydrogenous moderation" means the occurrence of hydrogenous material between containment vessels to such an extent that the maximum nuclear reactivity results;

(k) "Package" means packaging and its radioactive contents;

(l) "Packaging" means one or more receptacles and wrappers and their contents excluding fissile material and other radioactive material, but including absorbent material, spacing structures, thermal insulation, radiation shielding, devices for cooling and for absorbing mechanical shock, external fittings, neutron moderators, nonfissile neutron absorbers, and other supplementary equipment;

(m) "Primary coolant" means a gas, liquid, or solid, or combination of them, in contact with the radioactive material or, if the material is in special form, in contact with its capsule, and used to remove decay heat;

(n) "Sample package" means a package which is fabricated, packed, and closed to fairly represent the proposed package as it would be presented for transport, simulating the material to be transported, as to weight and physical and chemical form;

(o) "Special form" means any of the following physical forms of licensed material of any transport group:

(1) The material is in solid form having no dimension less than 0.5 millimeter or at least one dimension greater than five millimeters; does not melt, sublime, or ignite in air at a temperature of 1,000° F.; will not shatter or crumble if subjected to the percussion test described in Appendix D of this part; and is not dissolved or converted into dispersible form to the extent of more than 0.005 percent by weight by immersion for 1 week in water at 68° F. or in air at 86° F.; or

(2) The material is securely contained in a capsule having no dimension less than 0.5 millimeter or at least one dimension greater than five millimeters, which will retain its contents if subjected to the tests prescribed in Appendix D of this part; and which is constructed of materials which do not melt, sublime, or ignite in air at 1,475° F., and do not dissolve or convert into dispersible form to the extent of more

than 0.005 percent by weight by immersion for 1 week in water at 68° F. or in air at 86° F.

(p) "Transport group" means any one of seven groups into which radionuclides in normal form are classified, according to their toxicity and their relative potential hazard in transport, in Appendix C of this part.

(1) Any radionuclide not specifically listed in one of the groups in Appendix C shall be assigned to one of the Groups in accordance with the following table:

Radionuclide	Radioactive half-life		
	0 to 1,000 days	1,000 days to 10 ⁴ years	Over 10 ⁴ years
Atomic number 1-81	Group III	Group II	Group III
Atomic number 82 and over	Group I	Group I	Group III

(2) For mixtures of radionuclides the following shall apply:

(i) If the identity and respective activity of each radionuclide are known, the permissible activity of each radionuclide shall be such that the sum, for all groups present, of the ratio between the total activity for each group to the permissible activity for each group will not be greater than unity.

(ii) If the groups of the radionuclides are known but the amount in each group cannot be reasonably determined, the mixture shall be assigned to the most restrictive group present.

(iii) If the identity of all or some of the radionuclides cannot be reasonably determined, each of those unidentified radionuclides shall be considered as belonging to the most restrictive group which cannot be positively excluded.

(iv) Mixtures consisting of a single radioactive decay chain where the radionuclides are in the naturally occurring proportions shall be considered as consisting of a single radionuclide. The group and activity shall be that of the first member present in the chain, except that if a radionuclide "x" has a half-life longer than that of that first member and an activity greater than that of any other member, including the first, at any time during transport,

the transport group of the nuclide "x" and the activity of the mixture shall be the maximum activity of that nuclide "x" during transportation.

(q) "Type A quantity" and "type B quantity" means a quantity of radioactive material the aggregate radioactivity of which does not exceed that specified in the following table:

Transport groups (see § 71.4(p))	Type A quantity (in curies)	Type B quantity (in curies)
I	0.001	20
II	0.05	20
III	3	200
IV	20	200
V	20	5,000
VI and VII	1,000	50,000
Special form	20	5,000

¹ Except that for californium-252, the limit is 2 Ci.

[31 FR 9941, July 22, 1966, as amended at 33 FR 17622, Nov. 26, 1968; 38 FR 10438, Apr. 27, 1973]

§ 71.5 Transportation of licensed material.

(a) No licensee shall transport any licensed material outside of the confines of his plant or other place of use, or deliver any licensed material to a carrier for transport, unless the licensee complies with the applicable requirements of the regulations appropriate to the mode of transport, of the Department of Transportation in 49 CFR Parts 170 through 189, and the U.S. Postal Service in the Postal Service Manual¹ (Domestic Mail Manual), section 124.3, incorporated by reference, 39 CFR 111.1 (1974), insofar as such regulations relate to the packaging of byproduct, source, or special nuclear material, marking and labeling of the packages, loading and storage of packages, placarding of the transportation vehicle, monitoring requirements and accident reporting.

(b) When Department of Transportation regulations are not applicable to shipments of licensed material by rail, highway, or water because the shipment or the transportation of the shipment is not in interstate or foreign commerce, or to shipments of licensed material by air because the shipment is not transported in civil aircraft, the licensee shall conform to the standards and requirements of the

[33 FR 17622, Nov. 26, 1968, as amended at 35 FR 11461, July 17, 1970. Redesignated and amended at 37 FR 3986, Feb. 25, 1972; 38 FR 10438, Apr. 27, 1973; 38 FR 16347, June 22, 1973; 44 FR 63084, Nov. 2, 1979; 45 FR 20463, Mar. 23, 1980]

§ 71.8 Exemption of physicians.

Physicians, as defined in § 35.3(b) of this chapter, are exempt from the regulations in this part to the extent that they transport licensed material for use in the practice of medicine.

[37 FR 3986, Feb. 25, 1972. Redesignated at 38 FR 10438, Apr. 27, 1973]

§ 71.9 Exemption for fissile material.

A licensee is exempt from requirements in §§ 71.33, 71.35(b), 71.36(b), 71.37, 71.38, 71.39, and 71.40 to the extent that he delivers to a carrier for transport packages each of which contains one of the following:

(a) Not more than 15 grams of fissile material; or

(b) Thorium, or uranium containing not more than 0.72 percent by weight of fissile material; or

(c) Uranium compounds, other than metal (e.g., UF₄, UF₆, or uranium oxide in bulk form, not pelleted or fabricated into shapes) or aqueous¹ solutions of uranium, in which the total amount of uranium-233 and plutonium present does not exceed 1.0 percent by weight of the uranium-235 content, and the total fissile content does not exceed 1.00 percent by weight of the total uranium content; or

(d) Homogeneous hydrogenous² solutions or mixtures containing not more than:

(1) 500 grams of any fissile material, provided the atomic ratio of hydrogen to fissile material is greater than 7,600; or

(2) 800 grams of uranium-235: *Provided*, That the atomic ratio of hydrogen to fissile material is greater than 5,200, and the content of other fissile material is not more than 1 percent by weight of the total uranium-235 content; or

¹ This applies to light water and does not apply to heavy water.

² This applies to light hydrogen and does not apply to heavy hydrogen (i.e., deuterium or tritium).

(3) 500 grams of uranium-233 and uranium-235: *Provided*, That the atomic ratio of hydrogen to fissile material is greater than 5,200, and the content of plutonium is not more than 1 percent by weight of the total uranium-233 and uranium-235 content; or

(e) Less than 350 grams of fissile material: *Provided*, That there is not more than 5 grams of fissile material in any cubic foot within the package.

[38 FR 10438, Apr. 27, 1973; 38 FR 16347, June 22, 1973]

§ 71.10 Limited exemption for shipment of type B quantities of radioactive material.

A person delivering a type B quantity of radioactive material, as defined in § 71.4(q), to a carrier for transport in accordance with the provisions of a special permit, which has been issued by the Department of Transportation and is in effect on June 30, 1973, is exempt from the requirements in this part with respect to such shipments. The exemption granted by this section shall terminate on December 31, 1973, or on the date on which the DOT special permit expires, whichever is later, except as to activities described both in the special permit and in an application for a license which the person has, prior to the termination date of the exemption, filed with the Commission. If the person has filed such an application, the exemption granted by this section shall continue until the application has been finally determined by the Commission.

[38 FR 10438, Apr. 27, 1973]

GENERAL LICENSES

§ 71.11 General license for shipment of licensed material.

A general license is hereby issued, to persons holding specific licenses issued pursuant to this chapter, to deliver licensed material to a carrier for transport, without complying with the package standards of Subpart C of this part, when either:

(a) The material is shipped as a Fissile Class III shipment with the following limitations on its contents:

(1) No single package contains more than a type A quantity of radioactive material, as defined in § 71.4(q); and

(2) The fissile material contents of the shipment do not exceed:

(i) 500 grams of uranium-235; or

(ii) 300 grams total of uranium-233, plutonium-238, plutonium-239, and plutonium-241; or

(iii) Any combination of uranium-233, uranium-235, and plutonium in such quantities that the sum of the ratios of the quantity of each of them to the quantity specified in paragraphs (a)(2)(i) and (ii) of this section does not exceed unity; or

(iv) 2500 grams of plutonium-238, plutonium-239, and plutonium-241 encapsulated as plutonium-beryllium neutron sources, with no one package containing in excess of 400 grams of plutonium-238, plutonium-239, and plutonium-241; or

(b) The material is shipped as Fissile Class II packages with the following limitations on the contents of each package:

(1) No single package contains more than a type A quantity of radioactive material, as defined in § 71.4(q); and

(2) No package contains fissile material in excess of the amounts specified in the following table, and each package is labeled with the corresponding transport index:

Maximum quantity of fissile material in a single package				Corresponding transport index
U-235 (grams)	U-233 (grams)	Plutonium (grams)	Plutonium as Pu-Be neutron sources (grams)	
35-40	27-30	23-25	320-400	10
30-35	24-27	21-23	240-320	8
25-30	21-24	18-21	180-240	6
20-25	18-21	17-19	80-180	4
15-20	15-18	15-17	15-80	2

NOTE: Combinations of fissile materials are authorized. For combinations of fissile materials, the transport index is the sum of the individual corresponding transport indexes. The total transport index shall not exceed 10.

[31 FR 9941, July 22, 1966, as amended at 33 FR 17623, Nov. 26, 1968. Redesignated at 37 FR 3986, Feb. 25, 1972, and 38 FR 10439, Apr. 27, 1973]

§ 71.12 General license for shipment in DOT specification containers, in packages approved for use by another person, and in packages approved by a foreign national competent authority.

A general license is hereby issued to persons holding a general or specific license issued pursuant to this chapter, to deliver licensed material to a carrier for transport, provided the licensee has a quality assurance program, whose description has been submitted to and approved by the Commission as satisfying the provisions of § 71.51.

(a) In a specification container for fissile material as specified in § 173.396 (b) or (c) or for a type B quantity of radioactive material as specified in § 173.394(b) or § 173.395(b), or for a large quantity of radioactive material as specified in § 173.394(c) or § 173.395(c) of the regulations of the Department of Transportation, 49 CFR Part 173; or

(b) In a package for which a license, certificate of compliance or other approval has been issued by the Commission's Director of Nuclear Material Safety and Safeguards or the Atomic Energy Commission, provided that:

(1) The person using a package pursuant to the general license provided by this paragraph:

(i) Has a copy of the specific license, certificate of compliance, or other approval authorizing use of the package and all documents referred to in the license, certificate, or other approval, as applicable;

(ii) Complies with the terms and conditions of the license, certificate, or other approval, as applicable, and the applicable requirements of this part; and

(iii) Prior to first use of the package submits in writing to the Director of Nuclear Material Safety and Safeguards or the Atomic Energy Commission, his name and license number, the name and license or certificate number of the person to whom the package approval has been issued, and the package identification number specified in the package approval.

(2) The package approval authorizes use of the package under general license provided in this paragraph.

(c) In a package which meets the pertinent requirements in the 1967 regulations of the International Atomic Energy Agency and the use of which has been approved in a foreign national competent authority certificate which has been revalidated by the Department of Transportation: *Provided*, That the person using a package pursuant to the general license provided by this paragraph:

(1) Has and complies with the applicable certificate, the revalidation, and the documents referenced in the certificate relative to the use and maintenance of the packaging, and the actions to be taken prior to shipment; and

(2) Complies with the applicable requirements of this part, and of the Department of Transportation regulations in 49 CFR Part 173, 14 CFR Part 103, and 46 CFR Part 146.

(Sec. 62, Pub. L. 83-703, 86-489, 68 Stat. 932, 78 Stat. 602 (42 U.S.C. 2092); sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

[35 FR 6272, Apr. 17, 1970, as amended at 35 FR 11461, July 17, 1970. Redesignated at 37 FR 3986, Feb. 25, 1972, and 38 FR 10438, Apr. 27, 1973, and amended at 39 FR 22131, June 20, 1974; 40 FR 8792, Mar. 3, 1975; 42 FR 39365, Aug. 4, 1977]

§ 71.13 Communications.

All communications concerning the regulations in this part should be addressed to the Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director of Nuclear Material Safety and Safeguards, or may be delivered in person at the Commission's offices at 1717 H Street NW., Washington, D.C. or at 7920 Norfolk Avenue, Bethesda, Maryland.

[40 FR 8792, Mar. 3, 1975]

§ 71.14 Interpretations.

Except as specifically authorized by the Commission in writing, no interpretation of the meaning of the regulations in this part by an officer or employee of the Commission other than a written interpretation by the General Counsel will be recognized to be binding on the Commission.

[31 FR 9941, July 22, 1966. Redesignated at 37 FR 3986, Feb. 25, 1972, and 38 FR 10439, Apr. 27, 1973]

§ 71.15 Additional requirements.

The Commission may by rule, regulation, or order impose upon any licensee such requirements, in addition to those established in this part, as it deems necessary or appropriate to protect health or to minimize danger to life or property.

[31 FR 9941, July 22, 1966. Redesignated at 37 FR 3986, Feb. 25, 1972, and 38 FR 10439, Apr. 27, 1973]

§ 71.16 Amendment of existing license.

(a) Licenses issued pursuant to this part and in effect on October 4, 1968, which authorize Fissile Class II packages are hereby amended by increasing the minimum number of units specified for each Fissile Class II package by a factor of 1.25. The new number shall be rounded up to the first decimal. In addition, the term "radiation units" is changed to "transport index" wherever used in the license.

(b) The reference to § 71.7(b) in licenses issued pursuant to this part prior to March 26, 1972 is changed to § 71.9(b).

(c) The reference to § 71.9(b) in licenses issued pursuant to this part prior to June 30, 1973, is changed to § 71.12(b).

[37 FR 3986, Feb. 25, 1972, as amended at 38 FR 10439, Apr. 27, 1973; 40 FR 8792, Mar. 3, 1975]

Subpart B—License Applications

§ 71.21 Contents of application.

An application for a specific license under this part may be submitted as an application for a license or license amendment under this chapter and shall include, for each proposed packaging design and method of transport, the following information in addition to any otherwise required:

(a) A package description as required by § 71.22;

(b) A package evaluation as required by § 71.23;

(c) An identification of the proposed program of quality assurance as required by § 71.24;

(d) In the case of fissile material, an identification of the proposed fissile class.

(Sec. 62, Pub. L. 83-703, 88-489, 88 Stat. 932, 78 Stat. 802 (42 U.S.C. 2092); sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

[31 FR 9941, July 22, 1966, as amended at 42 FR 39365, Aug. 4, 1977]

§ 71.22 Package description.

The application shall include a description of the proposed package in sufficient detail to identify the package accurately and to provide a sufficient basis for evaluation of the packaging. The description should include:

- (a) With respect to the packaging:
 - (1) Gross weight;
 - (2) Model number;
 - (3) Specific materials of construction, weights, dimensions, and fabrication methods of:
 - (i) Receptacles, identifying the one which is considered to be the containment vessel;
 - (ii) Materials specifically used as nonfissile neutron absorbers or moderators;
 - (iii) Internal and external structures supporting or protecting receptacles;
 - (iv) Valves, sampling ports, lifting devices, and tie-down devices;
 - (v) Structural and mechanical means for the transfer and dissipation of heat; and
 - (4) Identification and volumes of any coolants and of receptacles containing coolant.

(b) With respect to the contents of the package:

- (1) Identification and maximum radioactivity of radioactive constituents;
- (2) Identification and maximum quantities of fissile constituents;
- (3) Chemical and physical form;
- (4) Extent of reflection, the amount and identity of non-fissile neutron absorbers in the fissile constituents, and the atomic ratio of moderator to fissile constituents;
- (5) Maximum weight; and
- (6) Maximum amount of decay heat.

§ 71.23 Package evaluation.

The applicant shall:

- (a) Demonstrate that the package satisfies the standards specified in Subpart C.

(b) For a Fissile Class II package, ascertain and specify the number of similar packages which may be transported together in accordance with § 71.39; and

(c) For a Fissile Class III shipment, describe any proposed special controls and precautions to be exercised during transport, loading, unloading, and handling, and in the event of accident or delay.

§ 71.24 Quality assurance.

(a) The applicant shall identify his approved quality assurance program to be applied to the design, fabrication, assembly, testing, maintenance, repair, modification, and use of the proposed packaging.

(b) The applicant shall identify any established codes and standards proposed for use in package design, fabrications, assembly, testing, maintenance, and use. In the absence of such codes and standards, the applicant shall describe the basis and rationale used to formulate the package quality assurance program.

(c) The applicant shall identify any specific provisions to be contained in his quality assurance program which are applicable to the particular package design under consideration.

(Sec. 62, Pub. L. 83-703, 88-489, 88 Stat. 932, 78 Stat. 802 (42 U.S.C. 2092); sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

[42 FR 39365, Aug. 4, 1977]

§ 71.25 Additional information.

The Commission may at any time require further information in order to enable it to determine whether a license, certificate of compliance, or other approval should be granted, denied, modified, suspended, or revoked.

[39 FR 22131, June 20, 1974]

Subpart C—Package Standards

§ 71.31 General standards for all packaging.

(a) Packaging shall be of such materials and construction that there will be no significant chemical, galvanic, or other reaction among the packaging

components, or between the packaging components and the package contents.

(b) Packaging shall be equipped with a positive closure which will prevent inadvertent opening.

(c) Lifting devices:

(1) If there is a system of lifting devices which is a structural part of the package, the system shall be capable of supporting three times the weight of the loaded package without generating stress in any material of the packaging in excess of its yield strength.

(2) If there is a system of lifting devices which is a structural part only of the lid, the system shall be capable of supporting three times the weight of the lid and any attachments without generating stress in any material of the lid in excess of its yield strength.

(3) If there is a structural part of the package which could be employed to lift the package and which does not comply with paragraph (c)(1) of this section, the part shall be securely covered or locked during transport in such a manner as to prevent its use for that purpose.

(4) Each lifting device which is a structural part of the package shall be so designed that failure of the device under excessive load would not impair the containment or shielding properties of the package.

(d) Tie-down devices:

(1) If there is a system of tie-down devices which is a structural part of the package, the system shall be capable of withstanding, without generating stress in any material of the package in excess of its yield strength, a static force applied to the center of gravity of the package having a vertical component of two times the weight of the package with its contents, a horizontal component along the direction in which the vehicle travels of 10 times the weight of the package with its contents, and a horizontal component in the transverse direction of 5 times the weight of the package with its contents.

(2) If there is a structural part of the package which could be employed to tie the package down and which does not comply with paragraph (d)(1) of this section, the part shall be securely covered or locked during trans-

port in such a manner as to prevent its use for that purpose.

(3) Each tie-down device which is a structural part of the package shall be so designed that failure of the device under excessive load would not impair the ability of the package to meet other requirements of this subpart.

§ 71.32 Structural standards for type B and large quantity packaging.

Packaging used to ship a type B or a large quantity of radioactive material, as defined in § 71.4 (q) and (f), shall be designed and constructed in accordance with the structural standards of this section. Standards different from those specified in this section may be approved by the Commission if the controls proposed to be exercised by the shipper are demonstrated to be adequate to assure the safety of the shipment.

(a) *Load resistance.* Regarded as a simple beam supported at its ends along any major axis, packaging shall be capable of withstanding a static load, normal to and uniformly distributed along its length, equal to 5 times its fully loaded weight, without generating stress in any material of the packaging in excess of its yield strength.

(b) *External pressure.* Packaging shall be adequate to assure that the containment vessel will suffer no loss of contents if subjected to an external pressure of 25 pounds per square inch gauge.

[31 FR 9941, July 22, 1966, as amended at 38 FR 10439, Apr. 27, 1973]

§ 71.33 Criticality standards for fissile material packages.

(a) A package used for the shipment of fissile material shall be so designed and constructed and its contents so limited that it would be subcritical if it is assumed that water leaks into the containment vessel, and:

(1) Water moderation of the contents occurs to the most reactive credible extent consistent with the chemical and physical form of the contents; and

(2) The containment vessel is fully reflected on all sides by water.

(b) A package used for the shipment of fissile material shall be so designed and constructed and its contents so limited that it would be subcritical if it is assumed that any contents of the package which are liquid during normal transport leak out of the containment vessel, and that the fissile material is then:

(1) In the most reactive credible configuration consistent with the chemical and physical form of the material;

(2) Moderated by water outside of the containment vessel to the most reactive credible extent; and

(3) Fully reflected on all sides by water.

(c) The Commission may approve exceptions to the requirements of this section where the containment vessel incorporates special design features which would preclude leakage of liquids in spite of any single packaging error and appropriate measures are taken before each shipment to verify the leak tightness of each containment vessel.

§ 71.34 Evaluation of a single package.

(a) The effect of the transport environment on the safety of any single package of radioactive material shall be evaluated as follows:

(1) The ability of a package to withstand conditions likely to occur in normal transport shall be assessed by subjecting a sample package or scale model, by test or other assessment, to the normal conditions of transport as specified in § 71.35; and

(2) The effect on a package of conditions likely to occur in an accident shall be assessed by subjecting a sample package or scale model, by test or other assessment, to the hypothetical accident conditions as specified in § 71.36.

(b) Taking into account controls to be exercised by the shipper, the Commission may permit the shipment to be evaluated together with or without the transporting vehicle, for the purpose of one or more tests.

(c) Normal conditions of transport and hypothetical accident conditions different from those specified in §§ 71.35 and 71.36 may be approved by the Commission if the controls proposed to be exercised by the shipper

are demonstrated to be adequate to assure the safety of the shipment.

§ 71.35 Standards for normal conditions of transport for a single package.

(a) A package used for the shipment of fissile material or more than a type A quantity of radioactive material, as defined in § 71.4(q), shall be so designed and constructed and its contents so limited that under the normal conditions of transport specified in Appendix A of this part:

(1) There will be no release of radioactive material from the containment vessel;

(2) The effectiveness of the packaging will not be substantially reduced;

(3) There will be no mixture of gases or vapors in the package which could, through any credible increase of pressure or an explosion, significantly reduce the effectiveness of the package;

(4) Radioactive contamination of the liquid or gaseous primary coolant will not exceed 10^{-7} curies of activity of Group I radionuclides per milliliter, 5×10^{-6} curies of activity of Group II radionuclides per milliliter, 3×10^{-6} curies of activity of Group III and Group IV radionuclides per milliliter; and

(5) There will be no loss of coolant.

(b) A package used for the shipment of fissile material shall be so designed and constructed and its contents so limited that under the normal conditions of transport specified in Appendix A of this part:

(1) The package will be subcritical;

(2) The geometric form of the package contents would not be substantially altered;

(3) There will be no leakage of water into the containment vessel. This requirement need not be met if, in the evaluation of undamaged packages under § 71.38(a), § 71.39(a)(1), or § 71.40(a), it has been assumed that moderation is present to such an extent as to cause maximum reactivity consistent with the chemical and physical form of the material; and

(4) There will be no substantial reduction in the effectiveness of the packaging, including:

(i) Reduction by more than 5 percent in the total effective volume of the packaging on which nuclear safety is assessed;

(ii) Reduction by more than 5 percent in the effective spacing on which nuclear safety is assessed between the center of the containment vessel and the outer surface of the packaging; or

(iii) Occurrence of any aperture in the outer surface of the packaging large enough to permit the entry of a 4-inch cube.

(c) A package used for the shipment of more than a type A quantity of radioactive material, as defined in § 71.4(q), shall be so designed and constructed and its contents so limited that under the normal conditions of transport specified in Appendix A of this part, the containment vessel would not be vented directly to the atmosphere.

[31 FR 9941, July 22, 1966, as amended at 38 FR 10439, Apr. 27, 1973]

§ 71.36 Standards for hypothetical accident conditions for a single package.

(a) A package used for the shipment of more than a type A quantity of radioactive material, as defined in § 71.4(q), shall be so designed and constructed and its contents so limited that if subjected to the hypothetical accident conditions specified in Appendix B of this part as the free drop, puncture, thermal, and water immersion conditions in the sequence listed in Appendix B, it will meet the following conditions:

(1) The reduction of shielding would not be sufficient to increase the external radiation dose rate to more than 1,000 millirems per hour at 3 feet from the external surface of the package.

(2) No radioactive material would be released from the package except for gases and contaminated coolant containing total radioactivity exceeding neither:

(i) 0.1 percent of the total radioactivity of the package contents; nor

(ii) 0.01 curie of Group I radionuclides, 0.5 curie of Group II radionuclides, 10 curies of Group III radionuclides, 10 curies of Group IV radionuclides, and 1,000 curies of inert gases irrespective of transport group.

A package need not satisfy the requirements of this paragraph if it contains only low specific activity materials, as defined in § 71.4(g), and is transported on a motor vehicle, railroad car, aircraft, inland water craft, or hold or deck of a seagoing vessel assigned for the sole use of the licensee.

(b) A package used for the shipment of fissile material shall be so designed and constructed and its contents so limited that if subjected to the hypothetical accident conditions specified in Appendix B of this part as the Free Drop, Puncture, Thermal, and Water Immersion conditions, in the sequence listed in Appendix B, the package would be subcritical. In determining whether this standard is satisfied, it shall be assumed that:

(1) The fissile material is in the most reactive credible configuration consistent with the damaged condition of the package and the chemical and physical form of the contents;

(2) Water moderation occurs to the most reactive credible extent consistent with the damaged condition of the package and the chemical and physical form of the contents; and

(3) There is reflection by water on all sides and as close as is consistent with the damaged condition of the package.

[31 FR 9941, July 22, 1966, as amended at 33 FR 17623, Nov. 26, 1968; 38 FR 10439, Apr. 27, 1973]

§ 71.37 Evaluation of an array of packages of fissile material.

(a) The effect of the transport environment on the nuclear safety of an array of packages of fissile material shall be evaluated by subjecting a sample package or a scale model, by test or other assessment, to the hypothetical accident conditions specified in § 71.38, § 71.39, or § 71.40 for the proposed fissile class, and by assuming that each package in the array is damaged to the same extent as the sample package or scale model. In the case of a Fissile Class III shipment, the Commission may, taking into account controls to be exercised by the shipper, permit the shipment to be evaluated as a whole rather than as individual packages, and either with or without

the transporting vehicle, for the purpose of one or more tests.

(b) In determining whether the standards of §§ 71.38(b), 71.39(a)(2), and 71.40(b) are satisfied, it shall be assumed that:

(1) The fissile material is in the most reactive credible configuration consistent with the damaged condition of the package, the chemical and physical form of the contents, and controls exercised over the number of packages to be transported together; and

(2) Water moderation occurs to the most reactive credible extent consistent with the damaged condition of the package and the chemical and physical form of the contents.

§ 71.38 Specific standards for a Fissile Class I package.

A Fissile Class I package shall be so designed and constructed and its contents so limited that:

(a) Any number of such undamaged packages would be subcritical in any arrangement, and with optimum interspersed hydrogenous moderation unless there is a greater amount of interspersed moderation in the packaging, in which case that greater amount may be considered; and

(b) Two hundred fifty such packages would be subcritical in any arrangement, if each package were subjected to the hypothetical accident conditions specified in Appendix B of this part as the Free Drop, Thermal, and Water Immersion conditions, in the sequence listed in Appendix B, with close reflection by water on all sides of the array and with optimum interspersed hydrogenous moderation unless there is a greater amount of interspersed moderation in the packaging, in which case that greater amount may be considered. The condition of the package shall be assumed to be as described in § 71.37.

§ 71.39 Specific standards for a Fissile Class II package.

(a) A Fissile Class II package shall be so designed and constructed and its contents so limited, and the number of such packages which may be transported together so limited, that:

(1) Five times that number of such undamaged packages would be subcritical in any arrangement if closely reflected by water; and

(2) Twice that number of such packages would be subcritical in any arrangement if each package were subjected to the hypothetical accident conditions specified in Appendix B of this part as the Free Drop, Thermal, and Water Immersion conditions, in the sequence listed in Appendix B, with close reflection by water on all sides of the array and with optimum interspersed hydrogenous moderation unless there is a greater amount of interspersed moderation in the packaging, in which case that greater amount may be considered. The condition of the package shall be assumed to be as described in § 71.37.

(b) The transport index for each Fissile Class II package is calculated by dividing the number 50 by the number of such Fissile Class II packages which may be transported together as determined under the limitations of paragraph (a) of this section. The calculated number shall be rounded up to the first decimal place.

(31 FR 9541, July 22, 1966, as amended at 33 FR 17623, Nov. 26, 1968)

§ 71.40 Specific standards for a Fissile Class III shipment.

A package for Fissile Class III shipment shall be so designed and constructed and its contents so limited, and the number of packages in a Fissile Class III shipment shall be so limited, that:

(a) The undamaged shipment would be subcritical with an identical shipment in contact with it and with the two shipments closely reflected on all sides by water; and

(b) The shipment would be subcritical if each package were subjected to the hypothetical accident conditions specified in Appendix B of this part as the Free Drop, Thermal, and Water Immersion conditions, in the sequence listed in Appendix B, with close reflection by water on all sides of the array and with the packages in the most reactive arrangement and with the most reactive degree of interspersed hydrogenous moderation which would be credible considering the controls to be exercised over the shipment. The condition of the package shall be assumed to be as described in § 71.37.

dition of the package shall be assumed to be as described in § 71.37. Hypothetical accident conditions different from those specified in this paragraph may be approved by the Commission if the controls proposed to be exercised by the shipper are demonstrated to be adequate to assure the safety of the shipment.

§ 71.41 Previously constructed packages for irradiated solid nuclear fuel.

(a) Notwithstanding any other provisions of this subpart, a package, the use of which has been authorized by the Atomic Energy Commission for the transport of irradiated solid nuclear fuel on or after September 23, 1961, and which has been completely constructed prior to January 1, 1967, shall be deemed to comply with the package standards of this subpart for that purpose, except as otherwise provided in paragraph (b) of this section.

(b) The holder (licensee) of the specific approval providing the authority specified in paragraph (a) of this section shall, within 6 months after October 18, 1977, file a consolidated application for superseding approval for the use of such packages, demonstrating that the packages satisfy the package standards of this subpart. If the licensee fails to submit such an application, the provisions of paragraph (a) of this section and the authority granted by the approval to deliver the material to a carrier for transport in such packages shall expire at the end of that 6 month period. The Commission may issue a new approval superseding the existing approval, may confirm the existing approval with or without modification, or may deny the application in whole or in part and terminate the existing approval in whole or in part. If modification of the design of a package being used under the authority of this section in effect prior to October 18, 1977, is proposed by a licensee in his application for a superseding approval in accordance with this paragraph, the licensee shall designate in his application the time period needed to modify the package(s) after approval by the Commission.

(Sec. 62, Pub. L. 83-703, 88-489, 68 Stat. 932, 78 Stat. 602 (42 U.S.C. 2092); sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

(42 FR 39365, Aug. 4, 1977)

§ 71.42 Special requirements for plutonium shipments after June 17, 1978.

(a) Notwithstanding the exemption in § 71.9, plutonium in excess of twenty (20) curies per package shall be shipped as a solid.

(b) Plutonium in excess of twenty (20) curies per package shall be packaged in a separate inner container placed within outer packaging that meets the requirements of Subpart C for packaging of material in normal form. The separate inner container shall not release plutonium when the entire package is subjected to the normal and accident test conditions specified in Appendices A and B. Solid plutonium in the following forms is exempt from the requirements of this paragraph:

- (1) Reactor fuel elements;
- (2) Metal or metal alloy; or
- (3) Other plutonium bearing solids that the Commission determines should be exempt from the requirements of this section.

(c) Authority in licenses issued pursuant to this part for delivery of plutonium to a carrier for transport under conditions which do not meet the limitations of paragraphs (a) and (b) of this section shall expire on June 17, 1978.

(39 FR 20960, June 17, 1974, as amended at 40 FR 8792, Mar. 3, 1975)

Subpart D—Operating Procedures

§ 71.51 Establishment and maintenance of a quality assurance program.

(a) The licensee shall establish, maintain and execute a quality assurance program satisfying each of the applicable criteria specified in Appendix E to this part, "Quality Assurance Criteria for Shipping Packages for Radioactive Material," and satisfying any specific provisions which are applicable to the licensee's activities including procurement of packaging. The description of the quality assurance program shall include a discussion of which requirements of Appendix E to this part are applicable and how they

will be satisfied. A description of that program shall be filed, in accordance with this section, by January 1, 1979, with the Director, Office of Nuclear Material Safety and Safeguards, Nuclear Regulatory Commission, Washington, D.C. 20555. If a person has filed such a description, the continued use of his existing quality assurance program is authorized until the acceptability of the program has been finally determined by the Commission.

(b) The provisions of this paragraph deal with packages which have been approved for use in accordance with this part prior to January 1, 1979, and which have been designed in accordance with the provisions of this part in effect at the time of package approval. Notwithstanding the provisions of paragraph (a) of this section, such packages shall be deemed to have been designed in accordance with a quality assurance program which satisfies the provisions of paragraph (a) of this section.

(c) The provisions of this paragraph deal with packages which have been approved for use in accordance with this part prior to January 1, 1979, have been at least partially fabricated prior to that date, and which have been fabricated in accordance with the provision of this part in effect at the time of package approval. Notwithstanding the provisions of paragraph (a) of this section, such packages shall be deemed to have been fabricated and assembled in accordance with a quality assurance program which satisfies the provisions of paragraph (a) of this section.

(d) A Commission-approved quality assurance program which satisfies the applicable criteria of Appendix B of Part 50, of this chapter and which is established, maintained, and executed with regard to transport packages shall be deemed to satisfy the requirements of paragraph (a) of this section.

(Sec. 62, Pub. L. 83-703, 88-489; 68 Stat. 932, 78 Stat. 602 (42 U.S.C. 2092); sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

*The pertinent requirements of Appendix E should be applied in a graded approach, i.e., applied to an extent consistent with their importance to safety as described in section 2 of Appendix E.

[42 FR 39365, Aug. 4, 1977, as amended at 43 FR 27174, June 23, 1978]

§ 71.52 Assumptions as to unknown properties.

When the isotopic abundance, mass, concentration, degree of irradiation, degree of moderation, or other pertinent property of fissile material in any package is not known, the licensee shall package the fissile material as if the unknown properties have such credible values as will cause the maximum nuclear reactivity.

§ 71.53 Preliminary determinations.

(a) Prior to the first use of any packaging for the shipment of licensed materials, the licensee shall ascertain that there are no cracks, pinholes, uncontrolled voids or other defects which could significantly reduce the effectiveness of the packaging.

(b) Prior to the first use of any packaging for the shipment of licensed materials, where the maximum normal operating pressure will exceed 5 pounds per square inch gauge, the licensee shall test the containment vessel to assure that it will not leak at an internal pressure 50 percent higher than the maximum normal operating pressure.

(c) Packaging shall be conspicuously and durably marked with its model number. Prior to applying the model number, the licensee shall determine that the packaging has been fabricated in accordance with the design approved by the Commission.

§ 71.54 Routine determinations.

Prior to each use of a package for shipment of licensed material the licensee shall ascertain that the package with its contents satisfies the applicable requirements of Subpart C of this part and of the license, including determinations that:

(a) The packaging has not been significantly damaged;

(b) Any moderators and nonfissile neutron absorbers, if required, are present and are as authorized by the Commission;

(c) The closure of the package and any sealing gaskets are present and are free from defects;

(d) Any valve through which primary coolant can flow is protected against tampering;

(e) The internal gauge pressure of the package will not exceed, during the anticipated period of transport, the maximum normal operating pressure;

(f) Contamination of the primary coolant will not exceed, during the anticipated period of transport, the limits specified in § 71.35(a)(4).

(g) Space provided for contained expansion of liquid coolant or a liquid shielding medium is adequate, and the systems for the liquid coolant and the liquid shielding medium are leaktight.

(h) The pressure relief valve or valves are operable, and set in accordance with written procedures.

(i) The package has been loaded and closed in accordance with written procedures.

The provisions of this section shall not be applicable for packages authorized in the general licenses granted by § 71.6. In such cases the licensee shall ascertain that the contents of the package are as authorized in the general license.

(Sec. 62, Pub. L. 83-703, 88-489; 68 Stat. 932, 78 Stat. 602 (42 U.S.C. 2092); sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

[31 FR 9941, July 22, 1966, as amended at 42 FR 39366, Aug. 4, 1977]

§ 71.55 Opening instructions.

Prior to delivery of a package to a carrier for transport, the licensee shall assure that any special instruction needed to safely open the package are sent to or have been made available to the consignee.

[37 FR 3986, Feb. 25, 1972]

§ 71.61 Reports.

The licensee shall report to the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, within 30 days any instance in which there is substantial reduction in the effectiveness of any authorized packaging during use.

[31 FR 9941, July 22, 1966, as amended at 38 FR 1272, Jan. 11, 1973; 40 FR 8792, Mar. 3, 1975]

§ 71.62 Records.

(a) The licensee shall maintain for a period of 2 years after its generation a record of each shipment of fissile material or of more than a type A quantity of radioactive material as defined in § 71.4(q), in a single package, showing, where applicable:

(1) Identification of the packaging by model number;

(2) Details of any significant defects in the packaging, with the means employed to repair the defects and prevent their recurrence;

(3) Volume and identification of coolant;

(4) Type and quantity of licensed material in each package, and the total quantity in each shipment;

(5) For each item of irradiated fissile material:

(i) Identification by model number;

(ii) Irradiation and decay history to the extent appropriate to demonstrate that its nuclear and thermal characteristics comply with license conditions;

(iii) Any abnormal or unusual condition relevant to radiation safety.

(6) Date of the shipment;

(7) For Fissile Class III, any special controls exercised;

(8) Name and address of the transferee;

(9) Address to which the shipment was made; and

(10) Results of the determinations required by § 71.54.

(b) The licensee shall make available to the Commission for inspection, upon reasonable notice, all records required by this part.

(c) The licensee shall maintain, during the life of the packaging to which they pertain, sufficient quality assurance records to furnish documentary evidence of the quality of packaging components which have safety significance, and of services affecting such quality, including records of the results of the determinations required by § 71.53, and of monitoring, inspection and auditing of work performance during the design, fabrication, assembly, testing, modification, maintenance, and repair of the packaging.

§ 71.63

(Sec. 62, Pub. L. 83-703, 88-489; 68 Stat. 932, 78 Stat. 602 (42 U.S.C. 2092); sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))
[31 FR 9941, July 22, 1966, as amended at 38 FR 10439, Apr. 27, 1973; 42 FR 39366, Aug. 4, 1977]

§ 71.63 Inspection and tests.

(a) The licensee shall permit the Commission at all reasonable times to inspect the licensed material, packaging, and premises and facilities in which the licensed material or packaging are used, produced, tested, stored or shipped.

(b) The licensee shall perform, and permit the Commission to perform, such tests as the Commission deems necessary or appropriate for the administration of the regulations in this chapter.

(c) The licensee shall notify the Director of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, at least 45 days prior to fabrication of a package to be used for the shipment, in that single package, of radioactive material having a decay heat load in excess of 5 kW or with an operating pressure in excess of 15 psig.

(Sec. 62, Pub. L. 83-703, 88-489; 68 Stat. 932, 78 Stat. 602 (42 U.S.C. 2092); sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))
[31 FR 9941, July 22, 1966, as amended at 42 FR 39366, Aug. 4, 1977]

§ 71.64 Violations.

An injunction or other court order may be obtained prohibiting any violation of any provision of the Atomic Energy Act of 1954, as amended, or Title II of the Energy Reorganization Act of 1974, or any regulation or order issued thereunder. A court order may be obtained for the payment of a civil penalty imposed pursuant to section 234 of the Act for violation of section 53, 57, 62, 63, 81, 82, 101, 103, 104, 107, or 109 of the Act, or section 206 of the Energy Reorganization Act of 1974, or any rule, regulation, or order issued thereunder, or any term, condition, or limitation of any license issued thereunder, or for any violation for which a license may be revoked under section 186 of the Act. Any person who willfully violates any provision of the Act or any regulation or order issued

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thereunder may be guilty of a crime and, upon conviction, may be punished by fine or imprisonment or both, as provided by law.

(Sec. 201, Pub. L. 93-438, 88 Stat. 1242 (42 U.S.C. 5841))

[40 FR 6792, Mar. 3, 1975, as amended at 42 FR 25721, May 19, 1977]

NOTE: The reporting and recordkeeping requirements contained in this part have been approved by the General Accounting Office under B-180225 (R0056).



NOTICE T

STANDARDS FOR PROTECTION

INSTRUCTIONS AND REPORT

In Part 20 of its Rules and Regulations, the Nuclear Regulatory Commission has established certain provisions for the options of

YOUR EMPLOYER'S RESPONSIBILITY

Your employer is required to —

1. Apply these NRC regulations and the conditions of his NRC license to all work under the license.
2. Post or otherwise make available to you a copy of the NRC regulations, licenses, and operating procedures which apply to work you are engaged in, and explain their provisions to you.
3. Post Notices of Violation involving radiological working conditions, proposed imposition of civil penalties and orders.

YOUR RESPONSIBILITY AS A WORKER

You should familiarize yourself with those provisions of the NRC regulations, and the operating procedures which apply to the work you are engaged in. You should observe their provisions for your own protection and protection of your co-workers.

WHAT IS COVERED BY THESE NRC REGULATIONS

1. Limits on exposure to radiation and radioactive material in restricted and unrestricted areas;
2. Measures to be taken after accidental exposure;
3. Personnel monitoring, surveys and equipment;
4. Caution signs, labels, and safety interlock equipment;
5. Exposure records and reports;
6. Options for workers regarding NRC inspections; and
7. Related matters.

REPORTS ON YOUR RADIATION EXPOSURE HISTORY

1. The NRC regulations require that your employer give you a written report if you receive an

exposure in excess of any applicable limit as set forth in the regulations or in the license. The basic limits for exposure to employees are set forth in Sections 20.101, 20.103, and 20.104 of the Part 20 regulations. These Sections specify limits on exposure to radiation and exposure to concentrations of radioactive material in air.

2. If you work where personnel monitoring is required pursuant to Section 20.202;
 - (a) your employer must give you a written report of your radiation exposures upon the termination of your employment, if you request it, and
 - (b) your employer must advise you annually of your exposure to radiation, if you request it

INSPECTIONS

All activities under the license are subject to inspection by representatives of the NRC. In addition, any worker or representative of workers who believes that there is a violation of the Atomic Energy Act of 1954, the regulations issued thereunder, or the terms of the employer's license with regard to radiological working conditions in which the worker is engaged, may request an inspection by sending a notice of the alleged violation to the appropriate United States Nuclear Regulatory Commission Inspection and Enforcement Regional Office (shown on map at right). The request must set forth the specific grounds for the notice and must be signed by the worker or the representative of the workers. During inspections, NRC inspectors may confer privately with workers, and any worker may bring to the attention of the inspectors any past or present condition which he believes contributed to or caused any violation as described above.

POSTING REQUIREMENTS

Copies of this notice must be posted in a sufficient number of places in every establishment where activities licensed by the NRC are conducted, to permit employees working in or frequenting any portion of a restricted area to observe a copy on the way to or from their place of employment.

EMPLOYEES

ST RADIATION (PART 20); NOTICES, WORKERS; INSPECTIONS (PART 19)

has established standards for your protection against radiation hazards
Commission. In Part 19 of its Rules and Regulations, the Nuclear Regulatory
engaged in NRC-licensed activities.



UNITED STATES NUCLEAR REGULATORY COMMISSION

representative of the Nuclear Regulatory Commission can be contacted at the following addresses and telephone
numbers. The Regional Office will accept collect telephone calls from employees who wish to register complaints or
concerns about radiological working conditions or other matters regarding compliance with Commission rules and
regulations.

Regional Offices

REGION	ADDRESS	TELEPHONE	
		DAYTIME	NIGHTS AND HOLIDAYS
I	Region I, Office of Inspection and Enforcement, USNRC 631 Park Avenue King of Prussia, Pennsylvania 19406	215 337-5000	215 337-5000
II	Region II, Office of Inspection and Enforcement, USNRC 101 Marietta St., N.W., Suite 3100 Atlanta, Georgia 30303	404 221-4503	404 221-4503
III	Region III, Office of Inspection and Enforcement, USNRC 799 Roosevelt Road Glen Ellyn, Illinois 60137	312 932-2500	312 932-2500
IV	Region IV, Office of Inspection and Enforcement, USNRC 611 Ryan Plaza Drive, Suite 1000 Arlington, Texas 76012	817 334-2841	817 334-2841
V	Region V, Office of Inspection and Enforcement, USNRC 1990 N. California Boulevard, Suite 202, Walnut Creek Plaza Walnut Creek, California 94596	415 943-3700	415 943-3700