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FLORIDA

STATE INFORMATION HANDBOOK

FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM

FEBRUARY 27, 1981

PREPARED FOR

U.S. DEPARTMENT OF ENERGY

OFFICE OF NUCLEAR WASTE MANAGEMENT

OAK RIDGE OPERATIONS OFFICE

CONTRACT NO. DE-AC05-800R20769

BY

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(02/27/81)

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(02/27/81)

INTRODUCTION

The Formerly Utilized Sites Remedial Action Program (FUSRAP) was initiated in 1974 by the Atomic Energy Commission (AEC). The formerly utilized sites were federally, privately and institutionally owned and were used primarily for research, processing, and storage of uranium and thorium ores, concentrates, or residues. The work at these sites was performed under contract to either the Corps of Engineers' Manhattan Engineer District (MED) or the U.S. AEC. In 1975, the AEC's programmatic responsibilities tranferred to the Energy Research and Development Administration (ERDA). The Department of Energy (DOE), which was organized in 1977, assumed these functions and authorities from ERDA.

Under the implied authority of the Atomic Energy Act of 1954, as amended, radiological surveys and research work has been conducted to determine rediological conditions at former MED/AEC sites. As of this time, 31 sites in 13 states have been identified that require or may require remedial action. The objectives of the FUSRAP are to:

- o Identify former MED/AEC sites;
- o Characterize their radiological conditions;
- o Decontaminate sites as required and pursuant to authorization and appropriation by Congress;
- o Develop acceptable disposal and stabilization sites in consultation with the affected states; and
- o Certify the acceptability of the sites for future use.

The Assistant Secretary for the Environment (ASEV), within DOE, has been assiqned the responsibility for the site-survey program. The Assistant Secretary for Nuclear Energy (ASNE) is responsible for implementing the required remedial action. Health and environmental standards which will be promulgated by the Environmental Protection Agency (EPA) will apply to all residual radioactive materials at the formerly utilized sites.

This volume is one of a series produced under contract with DOE, Office of Nuclear Waste Management, by POLITECH CORPORATION to develop a legislative and regulatory data base to assist the FUSRAP management in addressing the institutional and socioeconomic issues involved in carrying out the Remedial Action Program. This Information Handbook series contains information about all relevant government agencies at the federal and state levels, the pertinent programs they administer, each affected state legislature, and current

federal and state legislative and regulatory initiatives. This volume is a compilation of information about the State of Florida. It contains:

- o A description of the state executive branch structure;
- o A summary of relevant state statutes and regulations;
- o A description of the structure of the state legislature, identification of the officers and committee chairmen, and a summary of recent relevant legislative action; and
- o The full text of relevant statutes and regulations.

The loose-leaf format used in these volumes will allow the material to be updated periodically as the Remedial Action Program progresses.

SECTION 1

EXECUTIVE BRANCH

The executive branch administers the laws of Florida and develops and initiates a broad range of statewide policies and programs. The Governor, Lieutenant Governor, six elective officers known as the Cabinet, and twelve other separate departments constitute the executive branch of Florida.

The Florida Cabinet is unique in state government in the United States in that Cabinet officers are designated in the state Constitution and each member has an equal vote with the Governor. All functions of the executive branch are primarily the responsibility of the Governor and Cabinet. The Secretary of State, the Attorney General, The Comptroller, the Treasurer, and the Commissioners of Agriculture and Education make up the Cabinet. Each heads a Department and each serves on five ex-officio boards responsible for state departments.

While the Governor holds "supreme executive power" under the state Constitution, in fact he shares authority with the Cabinet members. The Governor does have considerable influence through the departments under his direct supervision. Of the twelve separate departments, ten are headed by a single executive appointed by the Governor to serve at his pleasure. These ten executives are the Secretaries of Business Regulation, Commerce, Veteran and Community Affairs, Health and Rehabilitative Services, Transportation, Corrections, Environmental Regulation, Labor and Employment Security, Citrus, and Administration. The Governor also appoints the three members of the Public Service Commission and the five division directors of the Department of Business Regulation.

Most authority within the executive branch governing hazardous waste has been concentrated in the Department of Environmental Regulation (DER), which administers the hazardous waste program. In 1980, the Florida legislature passed a law establishing the hazardous waste management program. DER is presently adopting rules and regulations to implement that law so that a permit program may be established. The Department also plans to adopt the U.S. EPA's regulations for the state, so that the state may assume primacy over the federal programs.

The Department of Health and Rehabilitative Services (DHRS) has responsibility for handling, transportation and usage of sources of radiation within the state. The Secretary of DHRS is appointed by the Governor and confirmed by the Senate. DHRS has a comprehensive program which includes licensing, a radiation emergency response program, surveillance and monitoring around nuclear power plants, and environmental radiation surveillance.

The following is a more detailed description of those executive offices and departments that may be relevant to the Formerly Utilized Sites Remedial Action Program.

Office of the Governor

The Chief Executive of Florida is the Governor. At present, the Governor is D. Robert Graham, a Democrat from Miami, Florida. He received a bachelor's degree from the University of Florida in 1959 and a law degree from Harvard in 1962. The Governor was elected to the Florida House of Representatives in 1966 and, four years later, to the Florida Senate. He served in the Senate for eight years prior to his election as Governor. The Florida Jaycees selected Governor Graham as one of the five most outstanding young men in Florida in 1970-71. He is also the recipient of the Allen Morris Award for the "Outstanding First Term Member of the Senate" for 1971-72, "Most Valuable Member of the Senate" in 1973, and "Second Most Effective Senator" in 1976. Governor Graham participates in the 4-H Youth Foundation, the National Commission on Reform of Secondary Education. The National Foundation for Improvement of Education, the Southern Regional Education Board, the National Committee for Citizens in Education, and Senior Centers of Dade County. Governor Graham was designated Lead Governor for Education for the Southern Governors' Association for 1981.

The Governor, in conjunction with the Cabinet, exercises numerous executive and legislative powers. He is the principal policy-maker for the state and is charged to see that the laws are faithfully executed. The Governor submits an annual budget to the legislature and may send messages and or proposed legislation to the legislature. He can call special sessions and can veto legislation. As was noted, he has broad appointive powers. In addition to the twelve separate departments, he appoints various agency heads, all appellate judges, certain local officials, and numerous advisory boards and commissions of executive departments, authorities and interstate agencies. The Governor may remove from office those officials who serve at his pleasure.

The Governor's address and his principal staff members are:

Governor Bob Graham
State Capitol
Tallahassee, Florida 32304
(904) 488-2050

Chief of Staff:	Garry Smith (488-4631)
Executive Assistant:	Sue Tully (488-4441)
Executive Secretary:	Sandy Thompson (488-4441)
General Counsel:	Bob Nabors (488-3494)
Govenor's Scheduling:	Bob Salem (488-9556)
Cabinet Liaison:	Jere Moore (488-5152)

The Washington office for the Florida Governor, state legislature, and state government agencies is:

State of Florida
Hall of the States
444 North Capitol Street, N.W.
Washington, D.C. 20031
(202) 624-7839

Director - Terry Smith
Natural Resources and Energy - David Johnson
Administrative Assistance - Ruth Jackson

Department of Health and Rehabilitative Services (DHRS)

The primary agency in Florida with responsibility for radiation health is the Department of Health and Rehabilitative Services(DHRS). In 1979 responsibility was taken from the Department of Environmental Regulation and given to DHRS. The Department's authority is derived from Code Chapter 290 of the Florida Statutes, the Florida Nuclear Code. The Nuclear Code gives the department broad powers and authorizes the Secretary to "adopt, promulgate, amend and repeal rules and standards which may provide for licensing or registration relating to the manufacture, production, transportation, use, handling, storage, disposal, sale, lease, or other disposition of radioactive material and radiation machines as may be necessary to carry out the provisions of this act." (A copy of the full text of the Nuclear Code is included as Appendix A.)

The Secretary continued in force current regulations of the Department but new regulations are presently being written and will be released in March, 1981. This publication will be updated at that time. The present regulations are included as Appendix B. The current Secretary of Health and Rehabilitative Services is Alvin J. Taylor, 1323 Winewood Boulevard, Tallahassee, Florida 32301 (904-487-1004).

Radiological Health Program Office

Contained within the Department of Health and Rehabilitative Services, the Radiological Health Program Office is the lead state agency for all radiological health programs and is the N.R.C. Agreement Agency. The duties and powers of the office are outlined in the Nuclear Code. The office is responsible for administering and enforcing a statewide radiation health program. The office issues all licenses and permits relating to sources of radiation. It also has responsibility for the regulation of radioactive materials transportation and waste management. The present Administrator is Ulray Clark, 1309 Winewood Boulevard, Tallahassee, Florida 32301 (904-487-1004).

Governor's Energy Office

The Governor's Energy Office is the lead state agency for energy planning and policy development and is charged with coordinating and monitoring Florida's energy program. Other duties of the office include energy contingency planning, trend forecasting, administration of federal energy programs, liaison between the U.S. Department of Energy and the State of Florida, submission of an annual report to the legislature, and preparation and distribution of energy information materials. The present Director of the Governor's Energy Office is Lex Hester, 301 Bryant Bldg., Tallahassee, Florida 32304 (904-488-6764).

Public Service Commission

Although the Department of Health and Rehabilitative Services has primary responsibility for regulation of radioactive materials, the Public Service Commission must issue a Certificate of Authority before a shipment may be moved on any facilities governed by the Florida Department of Transportation. Documentation that the shipment is in compliance with all relevant regulation must be provided before such a certificate will be granted. The current Chairman of the Public Service Commission is Robert T. Mann, 700 South Adams Street, Tallahassee, Florida 32304 (904-488-6943).

Other State Agencies

Section 381.512, Florida Statutes, provides that any rules or regulations promulgated by the Department of Health and Rehabilitative Services may be enforced, within their respective jurisdictions, by the Department of Health and Rehabilitative Services, the Department of Highway Safety and Motor Vehicles, the Department of Transportation, and the Public Service Commission.

SECTION 2

RELEVANT STATUTES AND REGULATIONS

The purpose of this section is to summarize Florida statutes or regulations which may be relevant to the Formerly Utilized Sites Remedial Action Program. The full text of all statutes and regulations citied in this section is included in the Appendix to this handbook.

Florida Nuclear Code

This Act, passed in 1979, consolidated virtually all regulation of radioactive materials within the Department of Health and Rehabilitative Services (DHRS). The purposes of the Act are:

1. To institute and maintain a program to permit development and utilization of sources of radiation for purposes consistent with the health and safety of the public.

2. To prevent any associated harmful effects of radiation upon the public through institution and maintenance of a regulatory program for all sources of radiation, providing for:

a. A single effective system of regulation within the state.

b. A system consonant with those of other states.

c. Compatability with the standards and regulatory programs of the Federal Government for byproduct, source and special nuclear materials.

The Nuclear Code also specifies the duties and responsibilities of the Department of Health and Rehabilitative Services and empowers the secretary to promulgate rules to implement a statewide radiation protection program. Among the duties of the department are:

- To develop comprehensive policies and programs for the evaluation, determination, and amelioration of hazards associated with the use of or disposal of ionizing radiation.

- To advise, consult, and cooperate with other public agencies and with affected groups and industries.

- To encourage, participate in, or conduct studies, investigations, public hearings, training, research, and demonstrations relating to the control of sources of ionizing radiation, the measurement of ionizing radiation, the effect upon public health and safety of exposure to

ionizing radiation, and related problems.

- To adopt, promulgate, amend, and repeal rules and standards which may provide for licensing or registration relating to the manufacture, production, transportation, use, handling, storage, disposal, sale, lease, or other disposition of radioactive material and radiation machines as may be necessary to carry out the provisions of the act.

- To provide necessary and desirable services to any agency of the state which will acquire, lease, develop, or operate land and facilities to be used for fostering development of the state's economic potential in the atomic energy field, including, but not limited to, the concentration of storage of radioactive byproducts and wastes.

- To require submission of plans, specifications, and reports for new construction and material alterations on design and protective shielding of installations for radioactive material and radiation machines, excluding X-ray machines of less than 25,000 volts potential, and on systems for the disposal of radioactive waste materials, for the determination of any ionizing hazards; and may render opinions and approve or disapprove such plans and specifications.

- To require all sources of ionizing radiation to be shielded, transported, handled, used, stored, or disposed of in a manner to provide compliance with the provisions of the act and rules and standards adopted pursuant to the act.

- To conduct evaluations of the levels of radioactive materials in the environment for the purpose of determining whether there is compliance with, or violation of, the provisions of the act or the rules issued pursuant thereto, or to otherwise protect the public health and safety.

- To collect and disseminate information relating to the control of sources of ionizing radiation, including but not limited to:

    a. Maintenance of a file of all license applications, issuances, denials, amendments, transfers, renewals, modifications, suspensions and revocations.

    b. Maintenance of a file of registrants possessing sources of ionizing radiation requiring registration under the provisions of the act.

- To require registration, periodic re-registration, or licensing of sources of ionizing radiation other than byproduct, source, and special nuclear material.

- To exempt certain sources of ionizing radiation, or kinds of users, from the licensing or registration requirements set forth in the act when the department determines that the exemption of such sources of ionizing radiation, or kinds of users or uses, will not constitute a significant risk to the health and safety of the public.

- To promulgate rules pursuant to the act which may provide for recognition of other state and federal licenses as the department shall deem desirable, subject to such registration requirements as it may prescribe.

- To respond to any emergency which involves possible or actual release of radioactive materials, carry out required decontamination, and otherwise protect the public health and safety.

- To develop and implement a responsible data management program for the purpose of collecting and analyzing statistical information necessary to protect the public health and safety.

The act also gives the department the authority to enter any public or private property, except a residential dwelling, to determine compliance with the act or rules and standards of the department. The act gives broad emergency powers to the department and, in the event of an emergency threatening the public health and safety, the department may, without notice or hearing, issue an order which states the existence of an emergency and requiring certain action to be taken to meet the emergency. The department may impound any sources of radiation in the possession of any person found to not be in compliance with the act or rules and standards of the department.(§ 290.072, 290.091, 290.101)

The department may also require the posting of a bond by licensees to provide funds in the the event of abandonment, default or other inability of the licensee to meet the department's requirements. Licensees may also be required to deposit funds into a perpetual care trust fund whenever the department finds that there is a reasonable possibility that the licensed facility may cease to operate while still containing radioactive materials. (§ 290.111 and 290.121)

The act grants authority to the governor to enter into agreements with the federal government and gives the authority to the department to provide for licensing in the event that the governor does enter into such an agreement and the state takes over certain of the responsibilities of the federal government. Florida is, in fact, an N.R.C. Agreement State and the Radiological Health Program Office of the department has been designated the agreement agency. (§ 290.061)

DHRS Control of Radiation Hazard Regulations

The Department of Health and Rehabilitative Services has promulgated rules and regulations governing the installation, use, handling, transportation and storage of radiation sources. These regulations are contained in Chapter 10 of the Florida Regulations. (Revised regulations are scheduled to be released in March 1981. These draft regulations have been reviewed and those sites formerly licensed by the U.S. Atomic Energy Commission or the Nuclear Regulatory Commission are included in the definitions section only for the purpose of exempting them totally from the regulations.)

Part 4C - Waste Disposal - requires approval from DHRS prior to disposing of any radioactive materials. Subpart 56.454 requires 30 days notice prior to vacating any contaminated premises. However, all regulations in force pertain to licensees of the department.

Section 10D-56.1032 requires that a notice be posted to inform employees of potential radiation hazards and exposure data must be maintained and reported to the individual employee.

None of the regulations in force directly relate to the Formerly Utilized Sites Remedial Action Program.

Transportation of Radioactive Materials

Florida Statutes 381.512 governs the transportation of radioactive materials. The Department of Health and Rehabilitative Services is empowered to promulgate reasonable rules and regulations which "shall promote the public health, safety, or welfare and protect the environment." The act stipulates that the rules of the department shall not be more restrictive than those imposed by the federal government.

The department has promulgated rules implementing Chapter 381.512. These regulations require that written notification be given ten days prior for all shipments of radioactive material defined in 49 CFR 173.389 (a)(3) and (b). All carriers are required to immediately notify DHRS - Radiological Health Program Office in the event of a real or suspected breach of containment. Shippers and carriers are required to meet all U.S. Department of Transportation regulations. DHRS personnel may inspect any shipments and enter into any premises to determine compliance, or violation, of Florida law and regulations. Florida Statutes 316.302 (1) also require that all vehicles used for transporting radioactive materials be placarded in accordance with Title 49 CFR 172.504. Violations of this requirement is a misdemeanor. The regulations are found in Chapter 10D-63 of the Florida Regulations.

SECTION 3

LEGISLATURE

The Florida Legislature consists of a Senate, which has 40 members, and a House of Representatives, which has 120 members. Each chamber's districts are separately apportioned (See Figure 3-1). The present districts will remain in effect until the legislature reapportions itself during 1982, following acceptance of the 1980 decennial census. Representatives are elected for a two-year term and senators are elected for a four-year term on a staggered basis. The legislature convenes on the first Monday in April in odd-numbered years, and in even-number years unless the date is specifically changed. In 1981 the legislature will convene on April 7. The length of each year's session is 60 days, although committees meet periodically year round. Each senator and representative receives an annual salary of $12,000 plus a $700 per month expense allowance to operate a district office.

Figure 3-2 depicts how a bill becomes law in the State of Florida. Table 3-1 provides a listing of the various Florida legislative information sources.

SENATE

Membership

The present membership of the Florida Senate consists of twenty-seven Democrats and thirteen Republicans. A roster of Senate members is provided on pages 3-10 and 3-11.

Leadership

The presiding officer of the Senate is the President. In his absence the President Pro Tempore presides. Both are elected unoffically by the majority party caucus and then officially elected by the full membership of the Senate at the biennial November organizational session. The officers of the Senate are:

President:	W. D. Childers (D-Pensacola)
President Pro Tempore:	Curtis Peterson (D-Eaton Park)
Majority Leader:	Sherrill "Pete" Skinner (D-Lake City)
Minority Leader:	James A. Scott (R, Fort Lauderdale)
Secretary of the Senate:	Joe Brown
Sergeant at Arms:	John D. Melton

Committee Structure

The Senate has sixteen standing committees, all of which handle legislation assigned to them by the Presiding Officer. Committee chairmen and members are appointed by the Presiding Officer. Committee meetings are open to the public. A listing of those Senate Committees which may be relevant to the Formerly Utilized Sites Remedial Action Program and their members can be found on pages 3-12 and 3-13.

Senators from Tampa and Hillsborough County and Polk County

Florida has multi-member Senatorial districts and Tampa and Hillsborough County, where the Gardinier Inc. production plant is located, is designated Senate Districts 21, 22 and 23. The three senators all represent the entire area of Tampa and Hillsborough County. The three Senators are David H. McClain of the 21st, Malcolm E. Beard of the 22nd and Pat Frank of the 23rd.

Senator McClain, a Democrat, serves on the Appropriations Committee, Commerce Committee and Health and Rehabilitative Services Committee. Senator McClain can be contacted at 800 West Platt Street, Suite 1, Tampa, Florida 33606 (813-256-2821). His address in Tallahassee is 312 Senate Office Building, Tallahassee, Florida 32301 (904-488-7455).

Senator Beard, a Democrat, is Chairman of the Transportation Committee. He also serves on the Finance, Taxation and Claims Committee, the Health and Rehabilitative Services Committee and the Judiciary-Criminal Committee. Senator Beard can be reached at P. O. Box 16516, Temple Terrace, Florida 33687 (813-988-4922). His address at the Capitol is 242 Senate Office Building, Tallahassee, Florida 32301 (904-488-1730).

Senator Frank, also a Democrat, is Chairman of the Education Committee. He serves on the Agriculture Committee, the Finance, Taxation and Claims Committee, and the Judiciary-Criminal Committee. He can be reached at P. O. Box 638, Tampa, Florida 33601 (813-272-6614). His address in Tallahassee is 304 Senate Office Building, Tallahassee, Florida 32301 (904-488-4929).

The Conserv, Inc. facility is in Nichols, Florida which lies in the western portion of Polk County. Polk County is contiguous to Hillsborough County to the east and is in Senatorial districts 12 and 13.

Senator Curtis Peterson, of the 12th, a Democrat, is Chairman of Subcommittee B of the Appropriations Committee. He also serves on the Agriculture Committee, Commerce Committee, Education Committee and the Committee on Rules and Calendar. Senator Peterson can be contacted at P. O. Box 180, Eaton Park, Florida 33840 (813-665-5545) or 405 Senate Office Building, Tallahassee, Florida 32301 (904-448-6260).

Senator Trask, of the 13th, also a Democrat, is Chairman of the Agriculture Committee and serves on the Appropriations Committee, the Commerce Committee, Natural Resources and Conservation Committee and the Rules and Calendar Committee. He can be reached at P. O. Drawer 9269, Winter Haven, Florida 33880 (813-299-5656) or 252 Senate Office Building, Tallahassee, Florida 32301 (904-488-1978).

HOUSE OF REPRESENTATIVES

Membership

The Florida House of Representatives is composed one hundred and twenty members, of which eighty-one are Democrats and thirty-nine are Republicans. A roster of the present members of the House of Representatives is found on pages 3-14 - 3-18.

Leadership

The presiding officer of the Florida House is the Speaker. In his absence the Speaker Pro Tempore presides. The Speaker and Speaker Pro Tempore are elected separately by the full membership of the House. Currently the officers of the House are:

Speaker:	Ralph H. Haben, Jr. (D-Palmetto)
Speaker Pro Tempore:	Barry Kuten (D-Miami Beach)
Majority Leader:	Richard S. Hodes (D-Tampa)
Majority Whip:	Wayne Hollingsworth (D-Lake City)
Majority Floor Leader:	Elvin Martinez (D-Tampa)
Minority Leader:	S. Curtis Kiser (R-Palm Harbor)
Minority Leader Pro Tempore:	Frederic H. Burrall (R-Port Charlotte)
Minority Whip:	Tom Gallagher (R-Coconut Grove)
Assistant Minority Whip:	R. Dale Patchett (R-Vero Beach)
Minority Caucus Chairman:	Mary Ellen Hawkins (R-Naples)
Clerk of the House:	Allen Morris
Sergeant at Arms:	Wayne Westmark

Committee Structure

The House has twenty-eight committees, of which five are select and twenty-three are standing committees. The standing committees are divided into subject areas with a House Administrative Committee handling fiscal affairs. The Speaker appoints all committee chairmen and members. All committee meetings are open to the public. Those House committees which may be relevant to the Formerly Utilized Sites Remedial Action Program are found on pages 3-19 - 3-22.

Representatives from Tampa and Hillsborough County and Polk County

Florida has multi-member House districts with each member representing the entire district. Nichols, Florida, the location of the Conserv, Inc. facility is in western Polk County. House districts 62 through 65 represent Hillsborough County and that portion of Polk County in which Nichols is located.

Representative Carl Carpenter, Jr., of the 62nd, a Democrat, is Chairman of the Higher Education Committee. He also serves on the Appropriations Committee, Energy Committee, Regulated Industries and Licensing Committee, and the Rules and Calendar Committee. Representative Carpenter can be reached at Joe Sanchez Road, Plant City, Florida 33566 (813-752-8018) or 224 House Office Building, Tallahassee, Florida 32301 (904-488-0807).

Representative S. L. "Spud" Clements, Jr. of the 63rd, a Democrat, serves on the Criminal Justice Committee, Governmental Operations Committee, Natural Resources Committee and the Transportation Committee. He can be reached at 314 Terrace Drive, Brandon, Florida 33511 (813-689-5055) or 307 House Office Building, Tallahassee, Florida 32301 (904-488-5744).

Representative John A. Grant, Jr., of the 64th District, a Republican, serves on the Insurance Committee, Tourism and Economic Development Committee, and the Select Committee on Mining and Reclamation. He can be reached at 10025 Orange Grove Drive, Tampa, Florida 33618 (813-933-1109) or 216 House Office Building, Tallahassee, Florida 32301 (904-488-0275).

Representative James S. "Jim" Foster, of the 65th, a Democrat, is Vice Chairman of the Rules and Calendar Committee and Chairman of the Citrus Subcommittee of the Committee on Agriculture and General Legislation. He also serves on the Health and Rehabilitative Services Committee, the Transportation Committee and the Veterans Affairs Committee. He can be reached at Box 1276, Offenhaur Road, Odessa, Florida 33556 (813-272-6710) or 407 House Office Building, Tallahassee, Florida 32301 (904-488-2234).

Tampa, where the Gardinier Inc. facility is located, is represented by House districts 66 through 70 with each member representing the city at large. Representative H. Lee Moffitt, of the 66th, a Democrat, is Chairman of the Select Committee on Reapportionment. He also serves on the Appropriations Committee, Commerce Committee, Insurance Committee and the Rules and Calendar Committee. He can be reached at 403 Barbara Lane, Tampa, Florida 33609 (813-867-3791) or 223 The Capitol, Tallahassee, Florida 32301 (904-488-8528).

Representative Elvin L. Martinez, of the 67th, a Democrat, is Chairman of the Criminal Code Subcommittee of the Committee on Criminal Justice. He is also Chairman of the Court System Subcommittee of the Committee on the Judiciary. In addition, Representative Martinez serves on the Corrections, Probation and Parole Committee. He can be reached at 4602 North Armenia, Tampa, Florida 33603 (813-877-6230) or 208 House Office Building, Tallahassee, Florida 32301 (904-488-9460).

Representative S. "Dick" Hodes, of the 68th, a Democrat, serves on the Education Committee, Finance and Taxation Committee, Retirement, Personnel and Collective Bargaining Committee and the Rules and Calendar Committee. He can be reached at 2611 Bayshore Boulevard, Tampa, Florida 33609 (813-251-3040) or 414 The Capitol, Tallahassee, Florida 32301 (904-488-2831).

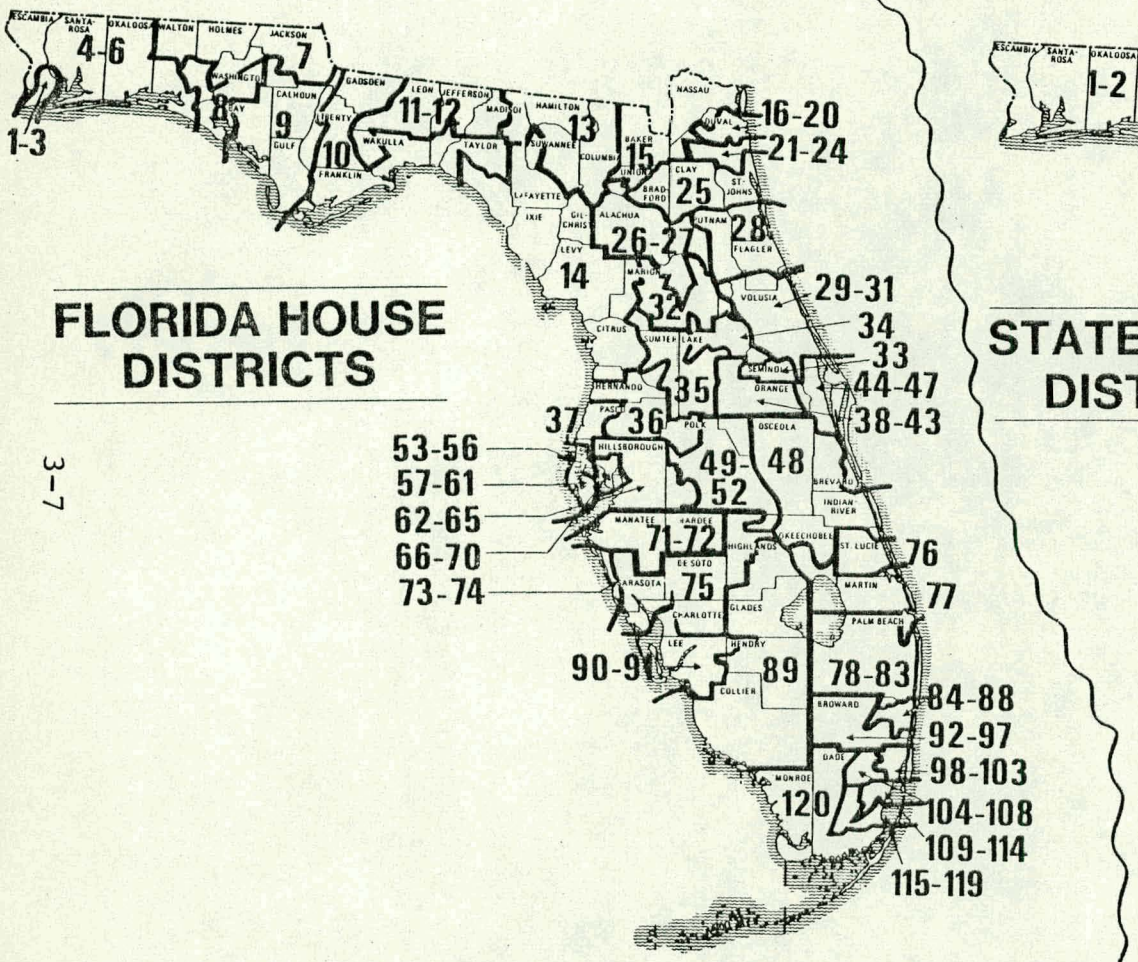
Representative George H. Sheldon, of the 69th District, a Democrat, is Chairman of the Governmental Operations Committee. He also serves on the Appropriations Committee, Insurance Committee and the Rules and Calendar Committee. He may be contacted at 2530 Maryland Avenue, Tampa, Florida 33609 (813-272-6719) or 406 House Office Building, Tallahassee, Florida 32301 (904-488-9175).

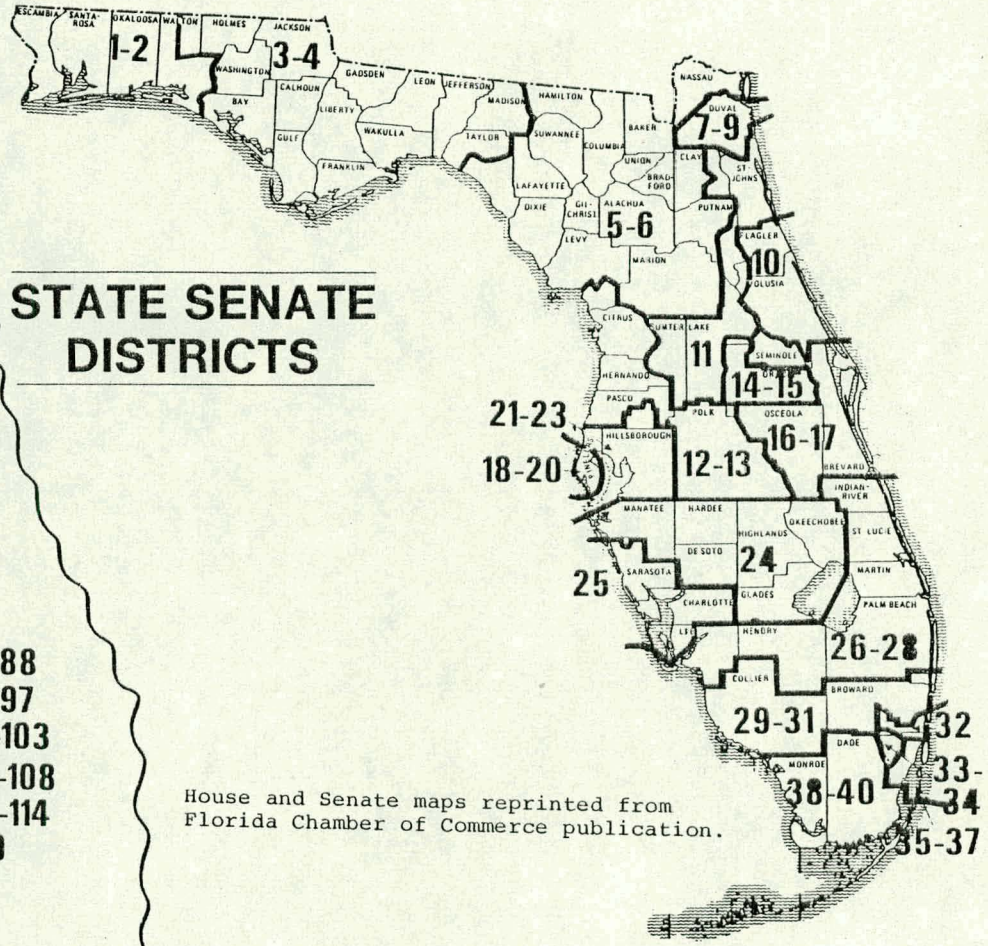
Representative Helen Gordon Davis, of the 70th District, a Democrat, is Vice Chairman of the Regulatory Reform Committee. Representative Davis also serves on the Health and Rehabilitative Services Committee and the Judiciary Committee. She may be contacted at 45 Adalia Avenue, Tampa, Florida 33606 (813-258-9791) or 226 House Office Building, Tallahassee, Florida 32301 (904-488-9910).

PENDING LEGISLATION

The Florida Legislature does not convene until April 7, 1981. To date there have been no bills prefiled which would have any impact on the Formerly Utilized Sites Remedial Action Program. This book will be updated in the event of legislation being filed which would impact on the program.

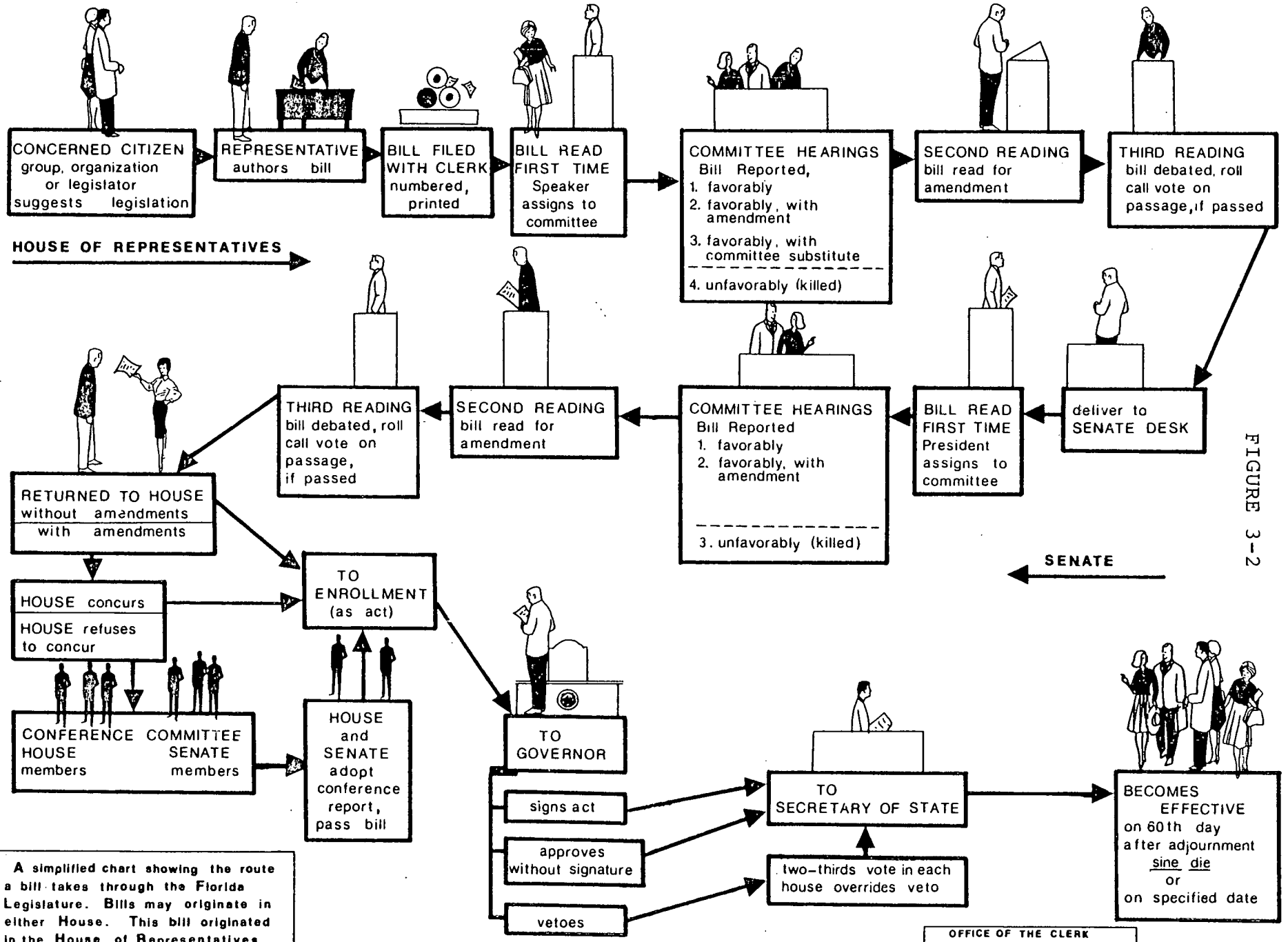
FIGURE 3-1
FLORIDA STATE SENATE AND HOUSE DISTRICTS





House and Senate maps reprinted from Florida Chamber of Commerce publication.

How An Idea Becomes A Law



A simplified chart showing the route a bill takes through the Florida Legislature. Bills may originate in either House. This bill originated in the House of Representatives.

OFFICE OF THE CLERK
HOUSE OF REPRESENTATIVES

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FIGURE 3-2

TABLE 3-1
LEGISLATIVE INFORMATION SOURCES

Type of Information	Source	Phone Number
General Information	Legislative Information Div.	(904) 488-4371
General Information - Senate	Secretary	488-1621
General Information - House	Clerk	488-1157
Information pertaining to previous years' legislative activity and laws	Legislative Library	488-2812
Information on pending legislation - Senate	Secretary	488-1621
Information on pending legislation - House	Clerk	488-1157
Information on bills pending before the Governor	Governor's Counsel	488-3494
To obtain copies of bills or laws	Legislative Information Division	488-4371

ROSTER OF SENATORS

Name and District	Political Affiliation and Hometown
Anderson, Dick (40th)	D, Miami
Barron, Dempsey (3rd)	D, Panama City
Beard, Malcolm E. (22nd)	D, Temple Terrace
Carlucci, Joe (8th)	D, Jacksonville
Childers, Don C. (28th)	D, West Palm Beach
Childers, W. D. (1st)	D, Pensacola
Dunn, Edgar M., Jr. (10th)	D, Daytona Beach
Frank, Pat (23rd)	D, Tampa
Gordon, Jack D. (35th)	D, Miami Beach
Grizzle, Mary R. (20th)	R, Belleair Bluffs
Hair, Mattox (9th)	D, Jacksonville
Henderson, Warren S. (25th)	R, Sarasota
Hill, John A. (33rd)	D, Hialeah
Jenkins, Dan (7th)	D, Jacksonville
Jenne, Kenneth C. (32nd)	D, Hollywood
Jennings, Toni (15th)	R, Orlando
Johnston, Harry A., II (26th)	D, West Palm Beach
Kirkpatrick, George (6th)	D, Gainesville
Langley, Richard H. (11th)	R, Clermont
Lewis, Tom (27th)	R, North Palm Beach
Margolis, Gwen (37th)	D, North Miami Beach
Maxwell, Clark, Jr. (16th)	R, Melbourne
Mclain, David H. (21st)	R, Tampa
McKnight, Robert W. "Bob" (38th)	D, Miami

Neal, Patrick K. (24th)	D, Bradenton
Peterson, Curtis (12th)	D, Eaton Park
Poole, Van B. (30th)	R, Fort Lauderdale
Rehm, Gerald S. "Jerry" (19th)	R, Dunedin
Renick, Richard "Dick" (39th)	D, Homestead
Scott, James A. (31st)	R, Fort Lauderdale
Skinner, Sherrill "Pete" (5th)	D, Lake City
Steinberg, Paul B. (36th)	D, Miami Beach
Stevens, J. W. "Bill" (29th)	R, Coral Springs
Stuart, George, Jr. (14th)	D, Orlando
Thomas, Pat (4th)	D, Tallahassee
Tobiassen, Tom (2nd)	R, Pensacola
Trask, Alan (13th)	D, Winter Haven
Vogt, John W. (17th)	D, Cocoa Beach
Ware, John T. (18th)	R, St. Petersburg
Winn, Sherman S. (34th)	D, Miami

RELEVANT SENATE COMMITTEES

Health and Rehabilitative Services

Don C. Childers, Chairman	(D-West Palm Beach)
John W. Vogt, Vice Chairman	(D-Cocoa Beach)
Malcolm E. Beard	(D-Temple Terrace)
Jack D. Gordon	(D-Miami Beach)
John A. Hill	(D-Hialeah)
Kenneth C. Jenne	(D-Hollywood)
David H. McClain	(R-Tampa)
Robert W. "Bob" McKnight	(D-Miami)
Gerald S. "Jerry" Rehm	(R-Dunedin)
J. W. "Bill" Stevens	(R-Coral Springs)

Staff Director: Larry Carnes (488-7833)

Natural Resources and Conservation

John W. Vogt, Chairman	(D-Cocoa Beach)
Robert W. McKnight, Vice Chairman	(D-Miami)
Dick Anderson	(D-Miami)
Joe Carlucci	(D-Jacksonville)
Edgar M. Dunn, Jr.	(D-Daytona Beach)
Mary R. Grizzle	(R-Belleair Bluffs)
Warren S. Henderson	(R-Sarasota)
Richard R. "Dick" Renick	(D-Coral Gables)
Pat Thomas	(D-Tallahassee)
Alan Trask	(D-Winter Haven)

Staff Director: Dan Fernandez (488-1710)

Transportation

Malcolm E. Beard, Chairman	(D-Temple Terrace)
Patrick K. Neal, Vice Chairman	(D-Bradenton)
Dan Jenkins	(D-Jacksonville)
Toni Jennings	(R-Orlando)
Tom Lewis	(R-North Palm Beach)
Paul B. Steinberg	(D-Miami Beach)
J. W. "Bill" Stevens	(R-Coral Springs)

Staff Director: John Christensen (488-6519)

Governmental Operations

Sherman S. Winn, Chairman	(D-Miami)
Joe Carlucci, Vice Chairman	(D-Jacksonville)
Mattox Hair	(D-Jacksonville)
Warren S. Henderson	(R-Sarasota)
Toni Jennings	(R-Orlando)
Patrick K. Neal	(D-Bradenton)
Paul B. Steinberg	(D-Miami Beach)
George Stuart, Jr.	(D-Orlando)
John T. Ware	(R-St. Petersburg)

Staff Director: Jack Overstreet (488-7833)

Appropriations

Jack D. Gordon, Chairman	(D-Miami Beach)
Harry A. Johnston, II, Vice Chairman	(D-West Palm Beach)
Joe Carlucci	(D-Jacksonville)
Edgar M. Dunn, Jr.	(D-Daytona Beach)
Mary R. Grizzle	(R-Belleair Bluffs)
Mattox Hair	(D-Jacksonville)
John A. Hill	(D-Hialeah)
Kenneth C. Jenne	(D-Hollywood)
George Kirkpatrick	(D-Gainesville)
Tom Lewis	(R-North Palm Beach)
Gwen Margolis	(D-North Miami Beach)
Clark Maxwell, Jr.	(R-Melbourne)
David H. McClain	(R-Tampa)
Robert W. "Bob" McKnight	(D-Miami)
Patrick K. Neal	(D-Bradenton)
Curtis Peterson	(D-Eaton Park)
Van B. Poole	(R-Fort Lauderdale)
James A. Scott	(R-Fort Lauderdale)
George Stuart, Jr.	(D-Orlando)
Pat Thomas	(D-Tallahassee)
Tom Tobiassen	(R-Pensacola)
Alan Trask	(D-Winter Haven)
John W. Vogt	(D-Cocoa Beach)

Staff Director: John Andrew Smith (488-5636)

ROSTER OF REPRESENTATIVES

Name and District	Political Affiliation and Hometown
Allen, Joseph B., Jr. (120th)	D, Key West
Bankhead, William G. (24th)	R, Jacksonville
Batchelor, Dick J. (43rd)	D, Orlando
Bell, Samuel P., III (30th)	D, Ormond Beach
Boles, Kenneth E. (5th)	D, Fort Walton
Brantley, Bobby (34th)	R, Longwood
Brodie, Jim (115th)	R, Miami
Brown, Tom C. (29th)	D, Fort Orange
Burnsed, Beverly B. (50th)	D, Lakeland
Burrall, Frederic H. "Fred" (75th)	R, Port Charlotte
Bush, Tom (84th)	R, Fort Lauderdale
Carlton, Fran (41st)	D, Orlando
Carpenter, Carl, Jr. (62nd)	D, Plant City
Clements, S. L., Jr. "Spud" (63rd)	D, Brandon
Cox, Linda C. (86th)	D, Fort Lauderdale
Crady, George (15th)	D, Yulee
Crawford, Robert B. "Bob" (49th)	D, Winter Haven
Crotty, Richard "Rich" (40th)	R, Orlando
Danson, Thomas E., Jr. (73rd)	R, Sarasota
Davis, Helen Gordon (70th)	D, Tampa
Deratany, Tim (47th)	R, Indialantic
Drage, Thomas B., Jr. "Tom" (42nd)	R, Orlando
Dunbar, Peter M. "Pete" (53rd)	R, Crystal Beach

Dyer, Harold J. (53rd)	D, Hollywood
Easley, Betty (56th)	R, Largo
Evan-Jones, Marilyn B. (46th)	R, Melbourne
Ewing, Ted (74th)	R, Venice
Fontana, A. M. "Tony" (107th)	D, Miami Lakes
Foster, James S. "Jim" (65th)	D, Odessa
Fox, Roberta (110th)	D, Miami
Friedman, Michael (102nd)	D, Miami Beach
Gallagher, Tom (111th)	R, Coconut Grove
Gardner, Winston W., Jr. "Bud" (45th)	D, Titusville
Gersten, Joseph M. (109th)	D, South Miami
Girardeau, Arnett E. (16th)	D, Jacksonville
Gordon, Elaine (98th)	D, North Miami
Grant, John A., Jr. (64th)	R, Tampa
Gustafson, Tom (88th)	D, Fort Lauderdale
Haben, Ralph H., Jr. (71st)	D, Palmetto
Hagler, Clyde H. "Jack" (3rd)	D, Pensacola
Hall, Charlie (118th)	D, Miami
Hall, Leonard J. (9th)	D, Callaway
Hattaway, Bob (33rd)	D, Altamonte Springs
Hawkins, Lawrence R. "Larry" (119th)	D, Miami
Hawkins, Mary Ellen (89th)	R, Naples
Hazouri, Thomas L. "Tommy" (21st)	D, Jacksonville
Hieber, George F., II (58th)	R, St. Petersburg
Hodes, Richard S. "Dick" (68th)	D, Tampa
Hodges, Gene (14th)	D, Cedar Key

Hodges, William Ray (104th)	D, Hialeah
Hollingsworth, Wayne (13th)	D, Lake City
Johnson, Andrew E. "Andy" (19th)	D, Jacksonville
Johnson, Bolley L. "Bo" (4th)	D, Gulf Breeze
Johnson, Ron (8th)	D, Panama City
Jones, C. Fred (52nd)	D, Auburndale
Jones, Dennis L. (57th)	R, Treasure Island
Kelly, Everett A. (35th)	D, Astatula
Kershaw, Joe Lang (105th)	D, Miami
Kimmel, Bernard "Doc" (82nd)	R, West Palm Beach
Kiser, S. Curtis "Curt" (54th)	R, Palm Harbor
Kutun, Barry (99th)	D, Miami Beach
Lehman, David J. (97th)	D, Hollywood
Lehtinen, Dexter (116th)	D, Perrine
Lewis, John W., III (18th)	D, Jacksonville
Liberti, Ray (78th)	D, West Palm Beach
Lippman, Fred (94th)	D, Hollywood
Mann, Franklin B. (90th)	D, Fort Myers
Martin, Sydney "Sid" (26th)	D, Hawthorne
Martinez, Elvin L. (67th)	D, Tampa
McEwan, Bruce (38th)	R, Orlando
McPherson, Scott (117th)	R, Miami
McPherson, Tom (92nd)	D, Fort Lauderdale
Meek, Carrie P. (106th)	D, Miami
Meffert, Chris (32nd)	D, Ocala
Melby, Robert E. "Bob" (59th)	R, St. Petersburg

Messersmith, Frank S. (83rd)	R, Lake Worth
Mills, Jon (27th)	D, Gainesville
Mitchell, Sam (7th)	D, Vernon
Moffitt, H. Lee (66th)	D, Tampa
Moore, Reid, Jr. (81st)	R, Boca Raton
Morgan, Herbert F. "Herb" (12th)	D, Tallahassee
Myers, William G. "Doc" (77th)	R, Hobe Sound
Nergard, Charles L. "Chuck" (76th)	R, Port St. Lucie
Nuckolls, H. Paul (91st)	R, Fort Myers
Ogden, Carl (20th)	D, Jacksonville
O'Malley, Terence T. "Terry" (85th)	D, Lauderhill
Pajcic, Steve (22nd)	D, Jacksonville
Patchett, R. Dale (48th)	R, Vero Beach
Patterson, Tom (2nd)	D, Pensacola
Plummer, John (114th)	R, Miami
Plummer, Lawrence H. "Larry" (112th)	D, Coconut Grove
Price, Don C. (11th)	D, Tallahassee
Ready, Gene (51st)	D, Lakeland
Reynolds, Robert "Bob" (108th)	D, Miami Lakes
Richmond, Ronald R. "Ron" (37th)	R, Holiday
Robinson, Grover C., III (1st)	D, Pensacola
Rosen, Virginia (100th)	D, North Miami
Sadowski, William E. "Bill" (113th)	D, Miami
Sample, Dorothy E. (61st)	R, St. Petersburg
Shackelford, Lawrence F. "Larry" (72nd)	D, Palmetto
Sheldon, George H. (69th)	D, Tampa

Silver, Ronald A. "Ron" (103rd)	D, North Miami Beach
Smith, Charles R. "Chuck" (36th)	D, Brooksville
Smith, Jim (55th)	R, Clearwater
Smith, Lawrence J. "Larry" (96th)	D, Hollywood
Spaet, Hal W. (101st)	D, Miami Beach
Steele, Jason (44th)	R, Rockledge
Thomas, John (17th)	D, Jacksonville
Thompson, James Harold (10th)	D, Quincy
Tygart, Fred (23rd)	R, Jacksonville
Upchurch, Hamilton D. (28th)	D, Elkton
Ward, James G. (6th)	D, Fort Walton Beach
Watt, Jim (80th)	R, Lake Park
Webster, Daniel (39th)	R, Orlando
Weinstock, Eleanor (79th)	D, Palm Beach
Wetherell, T. K. (31st)	D, Daytona Beach
Williams, Frank (25th)	D, Crystal Lake
Woodburn, Robert M. (87th)	R, Wilton Manors
Woodruff, T. M. "Tom" (60th)	R, St. Petersburg
Young, Walter C. (95th)	D, Pembroke Pines

RELEVANT COMMITTEES OF THE HOUSE OF REPRESENTATIVES

Health and Rehabilitative Services

Beverly B. Burnsed, Chairman	(D-Lakeland)
Everett A. Kelly, Vice Chairman	(D-Astatula)
William G. "Bill" Bankhead	(R-Jacksonville)
Fran Carlton	(D-Orlando)
Helen Gordon Davis	(D-Tampa)
James S. "Jim" Foster	(D-Odessa)
Winston W. "Bud" Gardner, Jr.	(D-Titusville)
Elaine Gordon	(D-North Miami)
Leonard J. Hall	(D-Callaway)
Bolley L. "Bo" Johnson	(D-Gulf Breeze)
Ron Johnson	(D-Panama City)
Dennis L. Jones	(R-Treasure Island)
David J. Lehman	(D-Hollywood)
Fred Lippman	(D-Hollywood)
Carrie P. Meek	(D-Miami)
Jon Mills	(D-Gainesville)
William G. "Doc" Myers	(R-Hobe Sound)
John Plummer	(R-Miami)
Virginia Rosen	(D-North Miami)
Hal W. Spaet	(D-Miami Beach)
Robert M. Woodburn	(R-Wilton Manors)
T. M. "Tom" Woodruff	(R-St. Petersburg)
Eleanor Weinstock	(D-Palm Beach)

Staff Director: Dr. Steve Hill (488-8315)

Appropriations

Herbert F. "Herb" Morgan, Chairman	(D-Tallahassee)
Fran Carlton, Vice Chairman	(D-Orlando)
Dick J. Batchelor	(D-Orlando)
Samuel P. Bell III	(D-Ormond Beach)
Beverly B. Burnsed	(D-Lakeland)
Frederic H. "Fred" Burrall	(R-Port Charlotte)
Carl Carpenter, Jr.	(D-Plant City)
Richard "Rich" Crotty	(R-Orlando)
Betty Easley	(R-Largo)
Roberta Fox	(D-Miami)
Tom Gallagher	(R-Coconut Grove)
Winston W. "Bud" Gardner, Jr.	(D-Titusville)
Elaine Gordon	(D-North Miami)

Tom Gustafson	(D-Fort Lauderdale)
Clyde H. "Jack" Hagler	(D-Pensacola)
Bob Hattaway	(D-Altamonte Springs)
Thomas L. "Tommy" Hazouri	(D-Jacksonville)
Gene Hodges	(D-Cedar Key)
C. Fred Jones	(D-Auburndale)
Barry Kutun	(D-Miami Beach)
Fred Lippman	(D-Hollywood)
Frankln B. Mann	(D-Fort Myers)
Sidney "Sid" Martin	(D-Hawthorne)
Jon Mills	(D-Gainesville)
H. Lee Moffitt	(D-Tampa)
Steve Pajcic	(D-Jacksonville)
William E. "Bill" Sadowski	(D-Miami)
George H. Sheldon	(D-Tampa)
James Harold Thompson	(D-Quincy)
Fred Tygart	(R-Jacksonville)
Hamilton D. Upchurch	(D-Elkton)
James G. Ward	(D-Fort Walton Beach)
Eleanor Weinstock	(D-Palm Beach)
Walter G. Young	(D-Pembroke Pines)

Staff Director: Tony Carvalho (488-6204)

Commerce

John W. Lewis, III, Chairman	(D-Jacksonville)
Gene Ready, Vice Chairman	(D-Lakeland)
William G. "Bill" Bankhead	(R-Jacksonville)
Kenneth E. "Ken" Boles	(D-Fort Walton)
Beverly B. Burnsed	(D-Lakeland)
Fran Carlton	(D-Orlando)
Robert B. "Bob" Crawford	(D-Winter Haven)
Ted Ewing	(R-Venice)
Roberta Fox	(D-Miami)
Tom Gallagher	(R-Coconut Grove)
Chris Meffert	(D-Ocala)
H. Lee Moffitt	(D-Tampa)
Herbert F. "Herb" Morgan	(D-Tallahassee)
Carl Ogden	(D-Jacksonville)
Tom Patterson	(D-Pensacola)
John Thomas	(D-Jacksonville)
James Harold Thompson	(D-Quincy)

Staff Director: Wyatt Martin (488-7024)

Energy

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Andrew E. Johnson, Vice Chairman	(D-Jacksonville)
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Bobby Brantley	(R-Longwood)
Carl Carpenter, Jr.	(D-Plant City)
A. M. "Tony" Fontana	(D-Miami Lakes)
Charlie Hall	(D-Miami)
C. Fred Jones	(D-Auburndale)
Scott McPherson	(R-Miami)
Reid Moore, Jr.	(R-Boca Raton)
Gene Ready	(D-Lakeland)
Lawrence F. "Larry" Shackelford	(D-Palmetto)
Jim Smith	(R-Clearwater)
Daniel Webster	(R-Orlando)

Staff Director: George Meier (488-3164)

Natural Resources

James Harold Thompson, Chairman	(D-Quincy)
Charles R. Smith, Vice Chairman	(D-Brooksville)
Joseph B. "Joe" Allen, Jr.	(D-Key West)
Kenneth E. "Ken" Boles	(D-Fort Walton)
Jim Brodie	(R-Miami)
Tom C. Brown	(D-Port Orange)
Frederic H. "Fred" Burrall	(R-Port Charlotte)
S. L. "Spud" Clements, Jr.	(D-Brandon)
Peter M. "Pete" Dunbar	(R-Crystal Beach)
Marilyn B. Evans-Jones	(R-Melbourne)
Gene Hodges	(D-Cedar Key)
Wayne Hollingsworth	(D-Lake City)
Sidney "Sid" Martin	(D-Hawthorne)
Tom McPherson	(D-Fort Lauderdale)
Sam Mitchell	(D-Vernon)
Herbert F. "Herb" Morgan	(D-Tallahassee)
John Thomas	(D-Jacksonville)
James G. Ward	(D-Fort Walton Beach)

Staff Director: Fred Breeze (488-1564)

Transportation

C. Fred Jones, Chairman	(D-Auburndale)
Clyde M. Hagler, Vice Chairman	(D-Pensacola)
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Ted Ewing	(R-Venice)
A. M. "Tony" Fontana	(D-Miami Lakes)
James S. "Jim" Foster	(D-Odessa)
Tom Gustafson	(D-Fort Lauderdale)

Wayne Hollingsworth	(D-Lake City)
Andrew E. "Andy" Johnson	(D-Jacksonville)
Everett A. Kelly	(D-Astatula)
Ray Liberti	(D-West Palm Beach)
Scott McPherson	(R-Miami)
Tom McPherson	(D-Fort Lauderdale)
H. Paul Nuckolls	(R-Fort Myers)
Lawrence H. "Larry" Plummer	(D-Coconut Grove)
Jason Steele	(R-Rockledge)
T. M. "Tom" Woodruff	(R-St. Petersburg)

Staff Director: Robert R. Funderburk (488-3483)

CHAPTER 290
FLORIDA NUCLEAR CODE AND SOUTHERN INTERSTATE NUCLEAR COMPACT LAW

290.011	Short title
290.02	Repealed
290.021	Declaration of policy
290.03	Repealed
290.031	Definitions
290.04	Repealed
290.041	Designation of state radiation protection agency
290.051	Repealed
290.052	Powers and duties of the Department of Health and Rehabilitative Services
290.06	Repealed
290.061	Manufacture and possession of byproduct, source, and special nuclear materials; licensing
290.07	Repealed
290.071	Repealed
290.072	Inspection, agreements, and training programs
290.08	Repealed
290.081	Records
290.09	Repealed
290.091	Emergency orders
290.10	Repealed
290.101	Impounding of materials
290.11	Repealed
290.111	Bonds
290.12	Repealed
290.121	Perpetual care trust funds
290.13	Repealed
290.131	Fees
290.14	Repealed
290.141	Prohibited uses
290.15	Repealed
290.151	Injunctive relief
290.16	Repealed
290.161	Penalties
290.17	Repealed
290.171	Construction
290.18	Repealed
290.19	Repealed
290.30	Definitions; Southern States Energy Compact
290.31	Florida party to Southern States Energy Compact
290.32	Florida participation

290.01 Council established

Derivation

Laws 1976, c. 76-168, § 3; Laws 1978, c. 78-323, § 3.

Editorial Note

Laws 1978, c. 78-323, § 3 repeals this section effective Oct. 1, 1979.

290.011 Short title

This chapter shall be known and may be cited as the "Florida Radiation Protection Act."

Derivation

Laws 1978, c. 78-373, § 1.

290.02 Repealed by Laws 1978, c. 78-373, § 3

290.021 Declaration of policy

It is the responsibility of the State of Florida, for protection of the public health and safety:

(1) To institute and maintain a program to permit development and utilization of sources of radiation for purposes consistent with the health and safety of the public.

(2) To prevent any associated harmful effects of radiation upon the public through the institution and maintenance of a regulatory program for all sources of radiation, providing for:

(a) A single effective system of regulation within the state.

(b) A system consonant with those of other states.

(c) Compatibility with the standards and regulatory programs of the Federal Government for byproduct, source, and special nuclear materials.

Derivation

Laws 1978, c. 78-373, § 1.

290.03 Repealed by Laws 1978, c. 78-373, § 3

290.031 Definitions

As used in this act, unless the context clearly indicates otherwise:

(1) "United States Nuclear Regulatory Commission" means the United States Nuclear Regulatory Commission or its successor agency.

(2) "Agreement materials" means those materials licensed by the state, under agreement with the United States Nuclear Regulatory Commission or its successor agency, which include byproduct, source, or special nuclear materials in a quantity not sufficient to form a critical mass, as defined by the Atomic Energy Act of 1954, as amended.

(3) "Agreement state" means any state which has consummated an agreement with the United States Nuclear Regulatory Commission under the authority of § 274 of the Atomic Energy Act of 1954, as amended, as authorized by compatible state legislation providing for acceptance by that state of licensing authority for agreement materials and the discontinuance of such activities by the United States Nuclear Regulatory Commission.

(4) "Atomic energy" means all forms of energy released in the course of nuclear fission or nuclear fusion or other atomic transformations.

(5) "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.

(6) "Department" means the Department of Health and Rehabilitative Services.

(7) "Emergency" means any condition existing outside the bounds of nuclear operating sites owned or licensed by a federal agency, and further any condition existing within or outside of the jurisdictional confines of a facility licensed by the department and arising from byproduct material, source material, special nuclear materials, or other radioactive materials, which is endangering, or could reasonably be expected to endanger, the health and safety of the public or to contaminate the environment.

(8) "General license" means a license effective pursuant to rules promulgated under the provisions of this act without the filing of an application to transfer, acquire, own, possess, or use quantities of, or devices or equipment utilizing, byproduct, source, special nuclear materials, or other radioactive materials occurring naturally or produced artificially.

(9) "Ionizing radiation" means gamma rays and X-rays, alpha and beta particles, high speed electrons, protons, neutrons, and other nuclear particles; but not sound or radio waves or infrared, ultraviolet, or visible light.

(10) "Person" means any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, agency, political subdivision of this state, any other state, or political subdivision or agency thereof, and any legal successor, representative, agent, or agency of the foregoing, other than the United States Nuclear Regulatory Commission, or any successor thereto, and other than Federal Government agencies licensed by the United States Nuclear Regulatory Commission, or any successors thereto.

(11) "Radiation machine" means any device designed to produce, or which produces, radiation or nuclear particles when the associated control devices of the machine are operated.

(12) "Radioactive material" means any solid, liquid, or gas which emits ionizing radiation spontaneously; however, this definition shall not include radioactive wastes regulated pursuant to the Hazardous Waste Management sections of the Federal Resource Conservation and Recovery Act of 1976 or the Department of Environmental Regulation's assumption of that program.

(13) "Source material" means:

(a) Uranium, thorium, or any other material which the department declares to be source material after the United States Nuclear Regulatory Commission, or any successor thereto, has determined the material to be such; or

(b) Ores containing one or more of the foregoing materials in such concentration to be source material.

(14) "Special nuclear material" means:

(a) Plutonium, uranium 233, uranium 235, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the department declares to be a special nuclear material after the United States Nuclear Regulatory Commission, or any successor thereto, has determined the material to be such, but does not include source material; or

(b) Any material artificially enriched by any of the foregoing, but does not include source material.

(15) "Specific license" means a license, issued after application, to use, manufacture, produce, transfer, receive, acquire, own or possess quantities of, or devices or equipment utilizing, byproduct, source, special nuclear materials, or other radioactive materials occurring naturally or produced artificially.

Derivation

Laws 1978, c.78-373, § 1.

290.04 Repealed by Laws 1978, c. 78-373, § 3

290.041 Designation of state radiation protection agency

The department is hereby designated the state agency to administer a statewide radiation protection program consistent with the provisions of this act.

Derivation

Laws 1978, c. 78-373, § 1.

290.051 Repealed by Laws 1978, c. 78-373, § 3

290.052 Powers and duties of the Department of Health and Rehabilitative Services

For protection of the public health and safety, the department is authorized to:

(1) Develop comprehensive policies and programs for the evaluation, determination, and amelioration of hazards associated with the use of or disposal of ionizing radiation. Such policies and programs shall be developed with due regard for compatibility with federal programs for regulation of byproduct, source, and special nuclear materials.

(2) Advise, consult, and cooperate with other public agencies and with affected groups and industries.

(3) Encourage, participate in, or conduct studies, investigations, public hearings, training, research, and demonstrations relating to the control of sources of ionizing radiation, the measurement of ionizing radiation, the effect upon public health and safety of exposure to ionizing radiation, and related problems.

(4) No later than January 1, 1979, adopt, promulgate, amend, and repeal rules and standards which may provide for licensing or registration relating to the manufacture, production, transportation, use, handling, storage, disposal, sale, lease, or other disposition of radioactive material and radiation machines as may be necessary to carry out the provisions of this act. The recommendations of nationally recognized bodies in the field of radiation protection shall be taken into consideration in such standards relative to permissible dosage of ionizing radiation.

(5) Provide necessary and desirable services to any agency of the state which will acquire, lease, develop, or operate land and facilities to be used for fostering development of the state's economic potential in the atomic energy field, including, but not limited to, the concentration of storage of radioactive byproducts and wastes. Such services may include, but are not limited to, site evaluation, critique of private or public site monitoring activities, and developing plans for perpetual custody and maintenance of radioactive materials held for custodial purposes at any publicly or privately operated facility located within the state.

(6) Require the submission of plans, specifications, and reports for new construction and material alterations on design and protective shielding of installations for radioactive material and radiation machines, excluding X-ray machines of less than 25,000 volts potential, and on systems for the disposal of radioactive waste materials, for the determination of any ionizing hazard; and may render opinions and approve or disapprove such plans and specifications. Nothing in this subsection shall require any facility required to submit plans and specifications to the department under § 395.09 to submit additional plans and specifications.

(7) Require all sources of ionizing radiation to be shielded, transported, handled, used, stored, or disposed of in a manner to provide compliance with the provisions of this act and rules and standards adopted hereunder.

(8) Conduct evaluations of the levels of radioactive materials in the environment for the purpose of determining whether there is compliance with, or violation of, the provisions of this act or the rules issued pursuant thereto, or to otherwise protect the public health and safety.

(9) Collect and disseminate information relating to the control of sources of ionizing radiation, including, but not limited to:

(a) Maintenance of a file of all license applications, issuances, denials, amendments, transfers, renewals, modifications, suspensions, and revocations.

(b) Maintenance of a file of registrants possessing sources of ionizing radiation requiring registration under the provisions of this act.

(10) Require, on forms prescribed and furnished by the department, registration, periodic re-registration, or licensing of sources of ionizing radiation other than byproduct, source, and special nuclear material.

(11) Exempt certain sources of ionizing radiation, or kinds of uses or users, from the

licensing or registration requirements set forth in this act when the department determines that the exemption of such sources of ionizing radiation, or kinds of users or uses, will not constitute a significant risk to the health and safety of the public.

(12) Promulgate rules pursuant to this act which may provide for recognition of other state and federal licenses as the department shall deem desirable, subject to such registration requirements as it may prescribe.

(13) Respond to any emergency which involves possible or actual release of radioactive materials, carry out required decontamination, and otherwise protect the public health and safety.

(14) Develop and implement a responsible data management program for the purpose of collecting and analyzing statistical information necessary to protect the public health and safety.

Derivation

Laws 1978, c. 78-373, § 1.

290.06 Repealed by Laws 1978, c. 78-373, § 3

290.061 Manufacture and possession of byproduct, source, and special nuclear materials; licensing

(1) The Governor is authorized to enter into agreements with the Federal Government providing for discontinuance of certain of the responsibilities of the Federal Government with respect to sources of ionizing radiation and the assumption thereof by this state.

(2) Upon signing of an agreement as provided in subsection (1), the department shall provide by rule for general or specific licensing of persons to use, manufacture, produce, transport, transfer, receive, acquire, own, or possess byproduct, source, or special nuclear materials or devices, installations, or equipment utilizing such materials. Such rule shall provide for amendment, suspension, or revocation of licenses. Each application for a specific license shall be in writing, on forms prescribed and furnished by the department, and shall state such information, and be accompanied by such documents, including, but not limited to, plans, specifications, and reports for new construction or material alterations, as the department may determine to be reasonable and necessary to decide the qualifications of the applicant and to protect the public health and safety. The department may require all applications or statements to be made under oath or affirmation. Each license shall be in such form and contain such terms and conditions as the department may deem necessary. No license issued under the authority of this act, and no right to possess or utilize sources of ionizing radiation granted by any license, shall be assigned or in any manner disposed of; and the terms and conditions of all licenses shall be subject to amendment, revision, or modification by rules or orders issued in accordance with the provisions of this act.

(3) Any person who, on the effective date of an agreement under subsection (1), possesses a license issued by the Federal Government shall be deemed to possess the same pursuant to a license issued under this act, which shall expire either 90 days after receipt from the department of a notice of expiration of such license or on the date of expiration specified in the federal license, whichever is earlier.

(4) Nothing in this act shall authorize any regulatory or licensing activities which are regulated by the Federal Government unless the Federal Government shall delegate appropriate authority for such activities to the State of Florida.

Derivation

Laws 1978, c. 78-373, § 1.

290.07 Repealed by Laws 1978, c. 78-373, § 3

290.071 Repealed by Laws 1978, c. 78-373, § 3

290.072 Inspection, agreements, and training programs

(1) Authorized representatives of the department shall have the authority to enter upon any public or private property, other than a private dwelling, at all reasonable

times for the purpose of determining compliance with the provisions of this act and rules and standards adopted hereunder.

(2) The Governor may enter into agreements with the Federal Government, other states, or interstate agencies, whereby this state will perform, on a cooperative basis with the Federal Government, other states, or interstate agencies, inspections, emergency responses to radiation accidents, and other functions related to the control of radiation.

(3) The department is authorized to institute training programs for the purpose of qualifying personnel to carry out the provisions of this act and may make said personnel available for participation in any program or programs of the Federal Government, other states, or interstate agencies in furtherance of the purpose of this act.

(4) The department is authorized to institute educational programs for the purpose of training or educating persons who possess, use, handle, transport, or service radioactive materials or radiation machines.

Derivation

Laws 1978, c. 78-373, § 1.

290.08 Repealed by Laws 1978, c. 78-373, § 3

290.081 Records

(1) The department is authorized to require each person who possesses or uses a source of ionizing radiation to:

(a) Maintain appropriate records relating to its receipt, storage, use, transfer, or disposal and maintain such other records as the department may require, subject to such exemptions as may be provided by rule.

(b) Maintain appropriate records showing the radiation exposure of all individuals for whom personnel monitoring may be required by the department, subject to such exemptions as may be provided by rule.

Copies of all records required to be kept by this subsection shall be submitted to the department or its duly authorized agents upon request.

(2) The department is authorized to require that any person possessing or using a source of ionizing radiation, at the request of any employee for whom personnel monitoring is required, furnish to such employee a copy of such employee's personnel exposure record annually, upon termination of employment, and at any time such employee has received excessive exposure.

Derivation

Laws 1978, c. 78-373, § 1.

290.09 Repealed by Laws 1978, c. 78-373, § 3

290.091 Emergency orders

Whenever the department finds that an emergency exists requiring immediate action to protect the public health and safety, the department may, without notice or hearing, issue an order stating the existence of such emergency and requiring that such action be taken as is necessary to meet the emergency. Notwithstanding any provision of this act, such order shall be effective immediately. Any person to whom such order is directed shall comply therewith immediately, and on application to the department shall be afforded a hearing within 10 days. On the basis of such hearing, the emergency order may be continued, modified, or revoked within 30 days after such hearing, as the department may deem appropriate under the evidence.

Derivation

Laws 1978, c. 78-373, § 1.

290.10 Repealed by Laws 1978, c. 78-373, § 3

290.101 Impounding of materials

(1) Authorized representatives of the department shall have the authority, in the event of an emergency, to impound or order the impounding of sources of ionizing radiation in the possession of any person who is not equipped to observe or fails to observe

the provisions of this act or any rules promulgated hereunder.

(2) The department may release such sources of ionizing radiation to the owner thereof upon terms and conditions in accordance with the provisions of this act or may bring an action in the appropriate circuit court for an order condemning such sources of ionizing radiation and providing for the destruction or other disposition so as to protect the public health and safety.

Derivation

Laws 1978, c. 78-373, § 1.

290.11 Repealed by Laws 1978, c. 78-373, § 3

290.111 Bonds

(1) The department shall require the posting of a bond by licensees to provide funds in the event of abandonment, default, or other inability of the licensee to meet the requirements of the department. The department is hereby authorized to establish bonding requirements. In establishing such requirements, the department shall give consideration to the potential for contamination, injury, cost of disposal, and reclamation of the property.

(2) All bonds forfeited shall be paid to the department for deposit by the State Treasurer in a special fund known as the Radiation Reclamation Fund. All moneys in such fund are hereby appropriated and may be expended by the department as necessary to assure the protection of the public health and safety from the dangerous effects of ionizing radiation. Moneys in this fund shall not be used for normal operating expenses of the department.

(3) A bond deemed acceptable in Florida shall be a bond issued by a fidelity or surety company authorized to do business in Florida, a personal bond supported by such collateral as the department deems satisfactory, or a cash bond.

(4) All state, local, or other governmental agencies shall be exempt from the requirements of this section and § 290.121. The department is authorized to exempt classes of licensees from the requirements of this section when a finding is made that such exemption will not result in a significant risk to the public health and safety.

Derivation

Laws 1978, c. 78-373, § 1.

290.12 Repealed by Laws 1978, c. 78-373, § 3

290.121 Perpetual care trust funds

(1) The department may require a licensee to deposit funds, on a quarterly basis, in a trust fund when it is deemed there is a reasonable possibility that the licensed facility may eventually cease to operate although still containing, or having associated with the facility property, licensable radioactive material which will require maintenance, surveillance, or other care on a continuing and perpetual basis.

(2) In order to provide for the proper care and surveillance of facilities subject to subsection (1), the state may acquire, by gift or transfer from another government agency or private person, any and all lands, buildings, and grounds necessary to fulfill the purposes of this section. Any such gift or transfer is subject to approval and acceptance by the state.

(3) The department may, by lease or license with any person, provide for the operation of a site or facility subject to this section for the purpose of carrying out the provisions of this act. Any lessee or licensee operating under the provisions of this subsection shall be subject to the provisions of this section.

(4) The funds required by subsection (1) shall be established at such rate that interest on the sum of all funds reasonably anticipated as payable shall provide an annual amount equal to the anticipated reasonable costs necessary to maintain, monitor, and otherwise supervise and care for the lands and facilities as required in the interest of public health and safety. In arriving at the rate of funds to be deposited, the department shall consider

the nature of the licensed material, size and type of facility, estimated future receipts, and estimated future expenses of maintenance, monitoring, and supervision.

(5) Recognizing the uncertainty of the existence of a person or corporation in perpetuity, and that ultimate responsibility to protect the public health and safety must be reposed in a solvent government, without regard to the existence of any particular agency or department thereof, all lands, buildings, and grounds acquired by the state under subsection (2) shall be owned in fee simple absolute by the state and dedicated in perpetuity to the purposes stated in subsection (2). All radioactive material received at such facility and located therein at time of acquisition of ownership by the state becomes the property of the state.

(6) In the event a person licensed by any governmental agency other than the State of Florida desires to transfer a facility to the state for the purpose of administering or providing perpetual care, a lump sum deposit shall be made to a trust fund. The amount of such deposit shall be determined by the department, taking into consideration the factors stated in subsection (4).

Derivation

Laws 1978, c. 78-373, § 1.

290.13 Repealed by Laws 1978, c. 78-373, § 3

290.131 Fees

The Department of Health and Rehabilitative Services is authorized to charge and collect reasonable fees for special and general licenses. The fees shall not exceed the estimated costs to the department of performing licensing and regulatory duties. All such fees shall be deposited to the credit of the Radiation Protection Trust Fund, to be held and applied solely for salaries and expenses of the department incurred in implementing and enforcing the provisions of this act.

Derivation

Laws 1978, c. 78-373, § 1.

290.14 Repealed by Laws 1978, c. 78-373, § 3

290.141 Prohibited uses

It is unlawful for any person to use, manufacture, produce, transport, transfer, receive, acquire, own, or possess any source of radiation unless licensed, registered, or exempted by the department in accordance with the provisions of this act and the rules adopted and promulgated hereunder.

Derivation

Laws 1978, c. 78-373, § 1.

290.15 Repealed by Laws 1978, c. 78-373, § 3

290.151 Injunctive relief

A civil action may be instituted in the circuit court on behalf of the department for injunctive relief to prevent the violation of the provisions of this act or rules promulgated under this act, and said court may proceed in the action as in other civil actions and may restrain in all such cases any person from violating any of the provisions of this act or the rules promulgated hereunder.

Derivation

Laws 1978, c. 78-373, § 1.

290.16 Repealed by Laws 1978, c. 78-373, § 3

290.161 Penalties

(1) Any person who violates any of the provisions of this act or any rule promulgated hereunder shall be guilty of a felony of the third degree, punishable as provided in § 775.082, § 775.083, or § 775.084.

(2) Any person who interferes with, hinders, or opposes any agent, officer, or member of the department in the discharge of his duties under this act shall be guilty of a felony of the third degree, punishable as provided in § 775.082, § 775.083, or § 775.084.

(3) Any person who fails to comply with a lawful order issued pursuant to this act within the time fixed by the department or the time allowed for review under § 290.151, whichever is longer, shall be guilty of a felony of the third degree, punishable as provided in § 775.082, § 775.083, or § 775.084.

Derivation

Laws 1978, c. 78-373, § 1.

290.17 Repealed by Laws 1978, c. 78-373, § 3

290.171 Construction

(1) This act is cumulative and is intended to supplement existing laws, and no part shall be construed to repeal any existing law, specifically enacted for the protection of public health and safety, with the exception of those sections included in this act.

Derivation

Laws 1978, c. 78-373, § 1.

290.18 Repealed by Laws 1978, c. 78-373, § 3

290.19 Repealed by Laws 1978, c. 78-373, § 3

RULES

OF THE

DEPARTMENT OF HEALTH AND

REHABILITATIVE SERVICES

HEALTH PROGRAMS

CHAPTER 10D-56

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10D-56.102 Definition of Terms.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.07, 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.103 Units of Radiation Exposure and Dose.

Specific Authority 290.10 FS. Law Implemented 290.10 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.104 Units of Radioactivity.

Specific Authority 290.10 FS. Law Implemented 290.10 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.105 Prohibited Radiation Use.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.17, 290.18, 290.19, 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

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Specific Authority 290.16 FS. Law Implemented 290.16, 290.17, 290.18, 290.19 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-107 Impounding.

Specific Authority 290.18 FS. Law Implemented 290.18 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.108 Additional Requirements.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.18, 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.109 Inspections and Tests.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.11, 290.12, 381, 386, FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.110 Exemptions.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(1),(3), 290.11, 290.12, 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.111 Communications.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12, 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

PART 2
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10D-56.201 Purpose and Scope.

Specific Authority 290.10 FS. Law Implemented 290.151, 290.15(1), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

PART 2A
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Specific Authority 290.10 FS. Law Implemented 290.51(1), 290.12(2) (3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.203 Exposure of Individuals to Radiation in Controlled Areas.
Specific Authority 290.10 FS. Law Implemented 290.05(1), 290.12(2)(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.204 Determination of Accumulated Dose.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.205 Exposure of Individuals to Concentrations of Radioactive Material in Controlled Areas.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.206 Exposure of Minors.
Specific Authority 290.10 FS. Law Implemented 290.051(1) 290.12(2)(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, FS., 1-1-77.

10D-56.207 Permissible Levels of Radiation in Uncontrolled Areas.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.208 Concentration in Effluents to Uncontrolled Areas.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.209 Special Examinations.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

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10D-56.210 Surveys.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.211 Personnel Monitoring.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.212 Caution Signs, Labels and Signals.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.213 Instruction of Personnel; Posting of Notice to Employees.
Specific Authority 290.10 FS. Law Implemented 290.05(1), 290.12(2)(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.214 Storage of Sources of Radiation.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.17, 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

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10D-56.215 General Requirements for Disposal of Radioactive Material.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.216 Disposal by Release into Sanitary Sewerage Systems.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S. 1-1-77.

10D-56.217 Disposal by Burial in Soil.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.218 Disposal by Incineration.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(3), 381 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.219 Approval - Other Proposed Disposal Procedures.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

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10D-56.220 Records of Surveys, Monitoring, and Disposal.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12, 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.221 Report of Theft or Loss of Sources of Radiation.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12, 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.222 Notification and Report of Incident
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12, 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.223 Reports of Overexposure and Excessive Levels and Concentrations.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.224 Report to Employees of Exposure.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.225 Report to Former Employees and Others of Exposure.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(3), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.226 Vacating Premises.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.11, 290.12, 290.16, 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

PART 3
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10D-56.301 Purpose and Scope.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(1)(2), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

PART 3A
SPECIFIC LICENSE

10D-56.302 Application for a Specific License.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.303 General Requirements for a Specific License.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.15, 381, 386 FS. History-Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.304 Special Requirements for a Specific License.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.305 License Issuance.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10, 381, 386 FS. History-Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.306 Specific Terms and Conditions of Licenses.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History-Revised 3-19-72, Repromulgated 1-1-75, Repealed 20.19, F.S., 1-1-77.

10D-56.307 License Expiration.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History-Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.308 License Renewal.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History-Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.309 License Amendment.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History-Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.310 License Inalienablitiy.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.311 Transfer of Material.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History-Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.312 License Modification, Revocation, and Termination.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.15, 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

PART 3B
GENERAL LICENSE

10D-56.313 Source Material.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(1), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.314 General Licenses - Radioactive Material Other Than Source Material.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(1), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.315 Reciprocal Recognition of Licenses.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(4), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

PART 4
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10D-56.401 Purpose and Scope.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(2), 290.17, 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.402 Initial Registration.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(2), 290.17, 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.403 Renewal of Registration.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(2), 290.17, 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.404 Report of Change.
Specific Authority 290.10, 290.12 FS. Law Implemented 290.051(1), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.405 Report of Discontinuance.
Specific Authority 290.10, 290.12 FS. Law Implemented 290.051(1), 290.10(2), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.406 Separate Installation.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(2), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.407 Approval Not Implied.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(2), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.408 Out-of-State Radiation Machines.
Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(4), 381, 386 FS. History—Revised 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.409 Vendor Obligation and Notification.

Specific Authority 290.10, 290.12 FS. Law Implemented 290.051(1), 381, 386 FS. History—Revised 3-9-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

PART 5
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10D-56.501 Purpose and Scope.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.502 Definition of Terms.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.07, 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

PART 5A
GENERAL SAFETY REQUIREMENTS

10D-56.503 Personnel Instruction.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.504 Shielding.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.505 X-Ray Apparatus.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History-New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

PART 5B
DIAGNOSTIC X-RAY INSTALLATION GENERAL REQUIREMENTS

10D-56.506 Personnel Protection - Patient and Operator.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.507 X-Ray Apparatus.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History-New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

PART 5C
DIAGNOSTIC X-RAY INSTALLATIONS SPECIFIC REQUIREMENTS

10D-56.508 Fixed Radiographic Installations.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History-New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.509 Mobile Radiographic Apparatus.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.12(2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.510 Photofluorographic Installations.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.511 Dental Radiographic Installations.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.512 Fixed Fluoroscopic X-ray Installations.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—Revised 3-19-72, Amended 11-18-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.513 Mobile Fluoroscopic X-ray Apparatus.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

PART 5D
X-RAY THERAPY INSTALLATIONS

10D-56.514 Safety Provisions.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.515 Personnel Protection — Patient and Operator.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.516 Treatment Room — X-ray Therapy.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.517 X-ray Therapy Apparatus.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.518 Veterinary X-ray Installations.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

PART 6
RADIATION SAFETY REQUIREMENTS FOR INDUSTRIAL RADIOGRAPHIC OPERATIONS

10D-56.601 Purpose.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1)(2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.602 Scope.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10 (1)(2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.603 Definition of Terms.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10 (1)(2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.604 Limits on Levels of Radiation for Radiographic Exposure Devices and Storage Containers.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10 (1)(2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.605 Locking of Sources of Radiation.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10 (1)(2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56 606 Storage Precautions.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10 (1)(2), 381, 386 FS. History — New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, FS, 1-1-77.

10D-56.607 Radiation Survey Instruments.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10 (1)(2)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.608 Leak Testing, Repair, Tagging, Opening, Modification, and Replacement of Sealed Sources.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10 (1)(2), 290.11, 290.12(2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.609 Quarterly Inventory.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10 (1), 290.11, 290.12 (2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.610 Utilization Logs.

Specific Authority 290.10 FS. Law Implemented 290.051(1),(3), 290.11, 290.12(2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.611 Inspection and Maintenance of Radiographic Exposure Devices and Storage Containers.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.612 Limitations.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.613 Operating and Emergency Procedures.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1), 290.11, 290.12(2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.614 Personnel Monitoring Control.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10 (1), 290.11, 290.12 (2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.615 Security.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.616 Posting.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.617 Radiation Surveys and Survey Records.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.11, 290.12(2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.618 Subjects to be Covered During the Instruction of Radiographers.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

PART 7
USE OF SEALED RADIOACTIVE SOURCES IN THE HEALING ARTS

10D-56.701 Purpose and Scope.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.702 Interstitial, Intracavitary and Superficial Applications.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.12(2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.703 Teletherapy.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.12, 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

PART 8
RADIATION SAFETY REQUIREMENTS FOR PARTICLE ACCELERATORS

10D-56.801 Purpose.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.802 Scope.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1)(2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.803 Registration of Particle Accelerators.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.12(2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.804 Control of Accelerator Operations.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.805 Accelerator Sources of Radiation Hazards.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.806 Accelerator Shielding.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.807 Interlock System.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.12(2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.808 Warning Devices.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.12(2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.809 Radiation Monitoring.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-56.810 Radiation Protection Inspection.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.11, 290.12(2), 381, 386 FS. History—New 3-19-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

PART 1 GENERAL PROVISIONS

10D-56.131 Scope.

(1) Except as otherwise specifically provided, these regulations apply to all persons who receive, possess, use, transfer, or acquire any source of radiation, provided, however, that nothing in these regulations shall apply to any person to the extent such person is subject to regulation by the U.S. Nuclear Regulatory Commission.[1]

Specific Authority 290.051 FS. Law Implemented 290.051 FS. History—New 1-1-77.

10D-56.132 Definitions. As used in these regulations, these terms have the definitions set forth below. Additional definitions used only in a certain part will be found in that part.

(1) "Accelerator produced material" means any material made radioactive by exposing it in a particle accelerator.

(2) "Act" means the Florida Nuclear Code, Chapter 290, Florida Statutes, as amended.

(3) "Agency" means the Florida Department of Health and Rehabilitative Services, Health Program Office, Radiological Health Program.

(4) "Agreement State" means any State with which the United States Nuclear Regulatory Commission has entered into an effective agreement under Section 274 b. of the Atomic Energy Act of 1954, as amended (73 Stat. 689).

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

(6) "Airborne radioactivity area" means (a) any room, enclosure, or operating area in which airborne radioactive material exists in concentrations in excess of the amounts specified in Appendix A, Table 1, Column 1 of Part 4; or (b) any room, enclosure, or operating area in which airborne radioactive 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 A, Table 1, Column 1 of Part 4.

1/ Attention is directed to the fact that regulation by the State of source material, byproduct material, and special nuclear material in quantities not sufficient to form a critical mass is subject to the provisions of the agreement between the State and the U.S. Nuclear Regulatory Commission and to Part 150 of the Commission's regulations (10 CFR Part 150).

(7) "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.

(8) "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 so arranged such that no day is included in more than one calendar quarter and no day in any one year is omitted from inclusion within a calendar quarter. No licensee or registrant shall change the method observed by him of determining calendar quarters for purposes of these regulations except at the beginning of a calendar year.

(9) "Controlled area" (See Restricted Area).

(10) "Curie" means a unit of measurement of radioactivity. One curie (Ci) is that quantity of radioactive material which decays at the rate of 3.7×10^{10} disintegrations per second (dps). Commonly used submultiples of the curie are the millicurie and the microcurie. One millicurie (mCi) = 0.001 curie = 3.7×10^{7} dps. One microcurie (uCi) = 0.000001 curie = 3.7×10^{4} dps.

(11) "Dose" as used in these regulations shall mean absorbed dose or dose equivalent as appropriate.

"Absorbed dose" is the energy imparted to matter by ionizing radiation per unit mass of irradiated material at the place of interest. The special unit of absorbed dose is the rad. (See rad.) "Dose equivalent" is a quantity that expresses on a common scale for all radiation a measure of the postulated effect on a given organ. It is defined as the absorbed dose in rads times certain modifying factors. The unit of dose equivalent is the rem. (See rem.)

(12) "Exposure" means the quotient of dQ by dm where "dQ" is the absolute value of the total charge of the ions of one sign produced in air when all the electrons (negatrons and positrons) liberated by photons in a volume element of air having mass "dm" are completely stopped in air. (The special unit of exposure is the roentgen (R). When not underlined as above, the term "exposure" has a more general meaning in these regulations.

(13) "Exposure rate" means the exposure per unit of time, such as R/min, mR/h etc.

(14) "Healing arts" means professions concerned with diagnosis or treatment of human and animal malodies including, but not limited to, the practice of medicine, dentistry, veterinary medicine, osteopathy, chiropractic, and podiatry.

(15) "High radiation area" means any area, accessible to individuals, in which there exists radiation at such levels that a major portion of the body could receive in any one hour a dose in excess of 100 millirems.

(16) "Human use" means the internal or external administration of radiation or radioactive material to human beings.

(17) "Individual" means any human being.

(18) "Inspection" means an official examination or observation including but not limited to, tests, surveys, and monitoring to determine compliance with rules, regulations, orders, requirements and conditions of the Agency.

(19) "License" means a license issued by the Agency in accordance with the regulations adopted by the Agency.

(20) Licensee" means any person who is licensed by the Agency in accordance with these regulations and the Act.

(21) "Natural radioactivity" means radioactivity of naturally occurring nuclides.

(22) "Occupational dose" means exposure of an individual to radiation (a) in a restricted area; or (b) 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 diagnosis or therapy of such individual.

(23) "Particle accelerator" means any machine capable of accelerating electrons, protons, deuterons, or other charged particles in a vacuum and of discharging the resultant particulate or other radiation into a medium at energies usually in excess of 1 MeV.

(24) "Person" means any individual corporation, partnership, firm, association, trust, estate, public or private institution, group, agency, political subdivision of this State, any other State or political subdivision or agency thereof, and any legal successor, representative, agent or agency of the foregoing.

(25) "Personnel monitoring equipment" means devices (e.g. film badges, pocket dosimeters, and thermoluminescent dosimeters) designed to be worn or carried by an individual for the purpose of estimating the dose received by the individual.

(26) "Pharmacist" means an individual licensed by this State to compound and dispense drugs, prescriptions, and poisons.

(27) "Physician" means any individual licensed by this State to administer drugs to humans in the practice of the healing arts.

(28) "Rad" means the special unit of absorbed dose. One rad equals one hundreth of a joule per kilogram of material; for example, if tissue is the material of interest, then 1 rad equals 100 ergs per gram of tissue.

(29) "Radiation" means ionizing radiation, i.e., gamma rays and x-rays, alpha and beta particles, high speed electrons, neutrons, and other nuclear particles.

(30) "Radiation area" means any area, accessible to individuals, in which there exists radiation at such levels that a major portion of the body could receive in any one hour a dose in excess of 5 millirems, or in any 5 consecutive days a dose in excess of 100 millirems.

(31) "Radiation machine" means any device capable of producing radiation except those which produce radiation only from radioactive material.

(32) "Radiation safety officer" means one who has knowledge and responsibility to apply appropriate radiation protection regulations.

(33) "Radioactive material" means any material (solid, liquid, or gas) which emits radiation spontaneously

(34) "Radioactivity" means the disintegration of unstable atomic nuclei by the emission of radiation.

(35) "Registrant". means any person who is registered with the Agency and is legally obligated to register with the Agency pursuant to these regulations and the Act.

(36) "Registration" means registration with the Agency in accordance with the regulations adopted by the Agency.

(37) "Regulations of the U.S. Department of Transportation" means the regulations in 49 CFR Parts 100 to 199.

(38) "Rem" means a measure of the dose of any radiation to body tissue in terms of its estimated biological effect relative to a dose received from an exposure to one roentgen (R) of x rays. [One millirem (mrem) = 0.001 rem.] For the purpose of these regulations, any of the following is considered to be equivalent to a dose of one rem.

(a) An exposure of 1 R of x, or gamma radiation;

(b) A dose of 1 rad due to x, gamma, or beta radiation;

(c) A dose of 0 05 rad due to particles heavier than protons and with sufficient energy to reach the lens of the eye.

(d) A dose of 0.1 rad due to neutrons or high energy protons; [2]

[2] If it is more convenient to measure the neutron flux, or equivalent, than to determine the neutron absorbed dose in rads, one rem of neutron radiation may, for purposes of these regulations, be assumed to be equivalent to 14 million neutrons per square centimeter indicent 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 for a dose equivalent of 1 rem (neutrons/cm^2)	Average flux density to deliver 100 millirems in 40 hours (Neutrons/cm^2 per second)
Thermal	970×10^6	670
0.0001	720×10^6	500
0.005	820×10^6	570
0.02	400×10^6	280
0.1	120×10^6	80
0.5	43×10^6	30
1.0	26×10^6	18
2.5	29×10^6	20
5.0	26×10^6	18
7.5	24×10^6	17
10.0	24×10^6	17
10 to 30	14×10^6	10

(39) "Research and development" means: (a) theoretical analysis, exploration, or experimentation; or (b) 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 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 does not include the internal or external administration of radiation or radioactive material to human beings.

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

(41) "Roentgen" (R) means the special unit of exposure. One roentgen equals 2.58×10^{-4} coulombs/kilogram of air (see "Exposure").

(42) "Sealed source" means radioactive material that is permanently bonded or fixed in a capsule or matrix designed to prevent release and dispersal of the radioactive material under the most severe conditions which are likely to be encountered in normal use and handling.

(43) "Source material" means: (a) uranium or thorium, or any combination thereof, in any physical or chemical form, or (b) ores which contain by weight one-twentieth of one percent (0.05 percent) or more of 1. uranium, 2. thorium, or 3. any combination thereof. Source material does not include special nuclear material.

(44) "Source of radiation" means any radioactive material, or any device or equipment emitting or capable of producing radiation.

(45) "Special nuclear material in quantities not sufficient to form a critical mass" means uranium enriched in the isotope U-235 in quantities not exceeding 350 grams of contained U-235; uranium—233 in quantities not exceeding 200 grams; plutonium in quantities not exceeding 200 grams; or any combination of them in accordance with the following formula: For each kind of special nuclear material, determine the ratio between the quantity of that special nuclear material and the quantity specified above for the same kind of special nuclear material. The sum of such ratios for all of the kinds of special nuclear material in combination shall not exceed "1" (i.e., unity). For example, the following quantities in combination would not exceed the limitation; and are within the formula:

$$\frac{175 \text{ (grams contained U-235)}}{350} + \frac{50 \text{ (grams U-233)}}{200} + \frac{50 \text{ (grams Pu)}}{200} = 1$$

(46) "Survey" means an evaluation of the production, use, release, disposal, and/or presence of sources of radiation under a specific set of conditions to determine actual or potential radiation hazards. When appropriate, such evaluation includes, but is not limited to tests, physical examination and measurements of levels of radiation or concentration of radioactive material present.

(47) "Test" means a method for determining the characteristics or condition of sources of radiation or components thereof.

(48) "These regulations" means all parts of Chapter 10D-56, FAC, "Control of Radiation Hazards Regulations", as revised.

(49) "Unrefined and unprocessed ore" means ore in its natural form prior to any processing, such as grinding, roasting, beneficiating, or refining.

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

(51) "Worker" means an individual engaged in work under a license or registration issued by the Agency and controlled by a licensee or registrant, but does not include the licensee or registrant.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.07, 381, 386 FS. History—New 1-1-77.

10D-56.133 Exemptions.

(1) General Provision. The Agency may, upon

application therefor or upon its own initiative, grant such exemptions or exceptions from the requirements of these regulations as it determines are authorized by law and will not result in undue hazard to public health and safety or property.

(2) U.S. Nuclear Regulatory Commission Contractors and Energy Research and Development Administration Contractors. Any U.S. Nuclear Regulatory Commission or Energy Research and Development Administration contractor or subcontractor of the following categories operating within this State is exempt from these regulations to the extent that such contractor or subcontractor under his contract receives, possesses, uses, transfers or acquires sources of radiation under the following conditions:

(a) Prime contractors performing work for the Energy Research and Development Administration at U.S. Government owned or controlled sites;

(b) Prime contractors of the Energy Research and Development Administration performing research in, or development, manufacture, storage, testing or transportation of, atomic weapons or components thereof;

(c) Prime contractors of the ERDA using or operating nuclear reactors or other nuclear devices in a United States Government owned vehicle or vessel; and

(d) Any other prime contractor or subcontractor of the Energy Research and Development Administration or of the Nuclear Regulatory Commission when the State, Energy Research and Development Administration, and the Nuclear Regulatory Commission jointly determine

1. that the exemption of the prime contractor or subcontractor is authorized by law, and

2. 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.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(1)(3), 290.11, 290.12, 381, 386 FS. History—New 1-1-77.

10D-56.134 Records. Each licensee and registrant shall maintain records showing the receipt, transfer, and disposal of all sources of radiation. Additional record requirements are specified elsewhere in these regulations.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12, 381, 386 FS. History—New 1-1-77.

10D-56.135 Inspections.

(1) Each licensee and registrant shall afford the Agency at all reasonable times opportunity to inspect sources of radiation and the premises and facilities wherein such sources of radiation are used or stored without the necessity of obtaining the licensee's or registrant's specific consent and without the necessity of obtaining any search or inspection warrant to inspect such sources of radiation or the premises or facilities wherein such sources of radiation are used or stored.

(2) Each licenseee and registrant shall make available to the Agency for inspection, upon reasonable notice, records maintained pursuant to these regulations, without the necessity of obtaining the licensee's or registrant's specific consent and without the necessity of obtaining any search or inspection warrant therefor.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.11, 290.12, 381, 386 FS. History—New 1-1-77.

10D-56.136 Tests.

(1) Each licensee and registrant shall perform upon instructions from the Agency, or shall permit the Agency to perform such reasonable tests as the Agency deems appropriate or necessary including, but not limited to, test of:

(a) Sources of radiation;

(b) Facilitities wherein sources of radiation are used or stored;

(c) Radiation detection and monitoring instruments; and

(d) Other equipment and devices used in connection with utilization or storage of licensed or registered sources of radiation.

(2) No test herein either by the licensee or registrant or by the Agency shall require directly or indirectly any prior court order or warrant as a prerequisite to their authorization or performance.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.11, 290.12, 381, 386 FS. History—New 1-1-77.

10D-56.137 Additional Requirements. The Agency may, by rule, regulations, or order, impose upon any licensee or registrant such requirements in addition to those established in these regulations as it deems appropriate or necessary to minimize danger to public health and safety or property.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.18, 381, 386 FS. History—New 1-1-77.

10D-56.138 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. 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.

Specific Authority 290.10 FS. Law Implemented 290.16, 290.17, 290.18, 290.19, 386 FS. History—New 1-1-77.

10D-56.139 Impounding. Sources of radiation shall be subject to impounding pursuant to Section 290.18 of the Act.

Specific Authority 290.18 FS. Law Implemented 290.18 FS. History—New 1-1-77.

10D-56.140 Prohibited Uses.

(1) It is unlawful and prohibited to operate or cause to allow operation of directly or indirectly, any device or machine using fluoroscopic, X-ray or radiation principles for fitting or selling of footwear.

(2) It is unlawful and prohibited to use or allow use of hand-held fluoroscopic screens.

(3) It is unlawful and prohibited to intentionally apply or allow, directly or indirectly, the application of radiation to human beings except by or under the supervision of persons licensed to practice the healing arts and authorized to use radiation.

NOTE: Supervision in this subsection shall mean the responsibility for, and control of, quality, radiation safety, and technical aspects of the applications of radiation to human beings for diagnostic and therapeutic purposes. This prohibition shall not be deemed to apply to persons who are

occupationally exposed to radiation or otherwise provided in these regulations.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.17, 290.18, 290.19, 381, 386 FS. History—New 1-1-77.

10D-56.141 Communications. All communications and reports concerning these regulations, and applications filed thereunder, should be addressed to:

Administrator
Radiological Health Program
Health Program Office
Department of Health and Rehabilitative Services
1323 Winewood Blvd., Building 1
Tallahassee, Florida 32301

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12, 381, 386 FS. History—New 1-1-77.

PART 2
REGISTRATION OF RADIATION MACHINE FACILITIES

10D-56.231 Purpose and Scope.

(1) This part provides for the registration of radiation machine facilities and for the registration of persons providing radiation machine installation, servicing, and/or services.

(2) For purposes of Part 2 of these regulations, "facility" means an office, building, building complex, structure, or location at which one or more stationary radiation machines under the same administrative control are installed or at which one or more mobile, portable, or transportable radiation machines are located or headquartered.

(3) In addition to the requirements of this part, all registrants are subject to the applicable provisions of other parts of these regulations.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(2), 290.17, 381, 386 FS. History—New 1-1-77.

10D-56.232 Exemptions.

(1) Electronic equipment that produces radiation incidental to its operation for other purposes is exempt from the registration and notification requirements of this part, providing dose equivalent rate averaged over an area of 10 square centimeters does not exceed 0.5 mrem per hour at 5 cm from any accessible surface of such equipment. The production, testing, or factory servicing of such equipment shall not be exempt.

(2) Radiation machines while in transit or storage incident thereto are exempt from the requirements of this part.

(3) Domestic television receivers are exempt from the requirements of this part.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(1)(3), 290.11, 290.12, 381, 386 FS. History—New 1-1-77.

10D-56.233 Application for Registration of Radiation Machine Facilities.

(1) Each person who acquires a radiation machine facility shall:

(a) Apply for registration of such radiation machine(s) with the Agency within 30 days after acquisition. This provision shall also apply to each current registrant who acquires an additional radiation machine. Application for registration shall be completed on forms furnished by the Agency and shall contain all the information required by the form and accompanying instructions.

(b) Designate on the application form an individual who is or will be responsible for radiation protection.

(c) Shall prohibit any person from furnishing radiation machine servicing or services as described in 10D-56.234(3) of this part to his radiation machine facility until such person provides evidence that he has been registered with the Agency as a provider of services in accordance with 10D-56.234 of these regulations.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(2), 290.17, 381, 386 FS. History—New 1-1-77.

10D-56.234 Application for Registration of Servicing and Services.

(1) Each person who is engaged in the business of installing or offering to install radiation machines or is engaged in the business of furnishing or offering to furnish radiation machine servicing or services in this state to a licensee or registrant, shall apply for registration of such services with the Agency within 30 days following the effective date of these regulations or thereafter prior to furnishing or offering to furnish any such services.

(2) Application for Registration shall be completed on forms furnished by the Agency and shall contain all information required by the Agency as indicated on the forms and accompanying instructions.

(3) For the purpose of this section, services may include but shall not be limited to:

(a) Installation and/or servicing of radiation machines and associated radiation machine components,

(b) Calibration of radiation machines or radiation measurement instruments or devices,

(c) Radiation protection or health physics consultations or surveys, and

(d) Personnel dosimetry services.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(2), 290.17, 381, 386 FS. History—New 1-1-77.

10D-56.235 Issuance of Certificate of Registration.

(1) Upon a determination that an applicant meets the requirements of this part, the Agency shall issue a Certificate of Registration.

(2) The Agency may incorporate in the Certificate of Registration at the time of issuance or thereafter by appropriate rule, regulation or order such additional requirements and conditions with respect to the registrant's receipt, possession, use and transfer of radiation machines as it deems appropriate or necessary.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(2), 290.17, 381, 386 FS. History—New 1-1-77.

10D-56.236 Expiration of Certificate of Registration. Except as provided by 10D-56.237 each certificate of Registration shall expire at the end of the day on the date so stated on each individual certificate.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(2), 290.17, 381, 386 FS. History—New 1-1-77.

10D-56.237 Renewal of Registration. Each person who has registered a radiation machine facility and anticipates continued or future use of such facility shall renew such registration not less than 30 days prior to the expiration of his existing certificate of Registration according to the renewal instructions provided to the Registrant by the Agency.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(2), 290.17, 381, 386 FS. History—New 1-1-77.

10D-56.238 Report of Changes. The registrant shall within 30 days report in writing any change which renders inaccurate the information contained in the Application of Registration or the Certificate of Registration. The report shall include, but not be limited to, name, address of installation change, receipt, sale, transfer, or disposal of any radiation machine or major component thereof.

Specific Authority 290.10, 290.12 FS. Law Implemented 290.051(1), 381, 386 FS. History—New 1-1-77.

10D-56.239 Approval Not Implied. No person, in any advertisement, shall refer to the fact that he or his facility is registered with the Agency pursuant to the provisions of Section 10D-56.235 FAC of this part, and no person shall state or imply that any activity under such registration has been approved by the Agency.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(2), 381, 386 FS. History—New 1-1-77.

10D-56.240 Assembler and/or Transferor Obligation.[1/]

(1) Any person who sells, leases, transfers, relocates, lends, assembles, installs or disposes of radiation machines or major components of such machines, shall notify the Agency within 15 days (on forms furnished by the Agency) of:

(a) The names and addresses of persons who have received this Assembler and/or Transferor action.

(b) The manufacturer, model and serial number of each machine affected.

(c) The date of this action on such machine(s).

(d) A statement indicating that the action was a replacement, exchange, transfer, relocation or addition.

(e) If no Assembler and/or Transferor actions have been made during a 6 month period a report stating so shall be made.

(2) Any person who sells, leases, transfers, lends, installs, repairs, or adjusts radiation machines shall, except where evidence to the contrary exists, warrant that such machines, when properly used, meet the requirements of these regulations. Where evidence to the contrary exists, the owner or user of such radiation machines shall be informed in writing that such machine does not meet the requirements of the regulations.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

[1/] In the case of diagnostic X-ray systems which contain certified components, a copy of the assembler's report prepared in compliance with requirements of the Federal Diagnostic X-ray Standard (21 CFR 1020.30 (d)) namely on Form FD 2579 shall be submitted to the Agency within 15 days following completion of the assembly. Such report shall suffice in lieu of any other report by the assembler.

10D-56.241 Out-of-State Radiation Machines.

(1) Whenever any radiation machine is to be brought into the State for any temporary use, the person proposing to bring such machine into the State shall give written notice to the Agency at least ten (10) days before such machine is to be used in the State. The notice shall include the type of radiation machine(s); the nature, duration, and scope of use; and the exact location(s) where the radiation machine(s) is to be used. If for a specific case the ten day period would impose an undue hardship on the person, he may, upon application to the Agency, obtain permission to proceed sooner.

(2) Any out-of-state person who proposes to bring a radiation machine(s) into this State shall register with the Agency as provided in the requirements of this Part if such person:

(a) Proposes to use such machine(s) for purposes other than industrial radiography for a period in excess of 30 days in any calendar year, or

(b) Proposes to use such machine(s) for the purpose of industrial radiography for a period in excess of 180 days in any calendar year.

(3) In addition, the out-of-state person further shall:

(a) Supply the Agency with such other information as the Agency may reasonably request; and

(b) Comply with the Act and all applicable regulations of the Agency.

(4) Any out-of-state person using a radiation machine in this state shall notify the Agency upon completion of activities utilizing radiation machines.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(4), 381, 386 FS. History—New 1-1-77.

PART 3
LICENSING OF RADIOACTIVE MATERIAL

10D-56.331 Purpose and Scope.

(1) This part provides for the licensing of radioactive material. No person shall receive, possess, use, transfer, or acquire radioactive material except as authorized in a specific or general license issued pursuant to this part or as otherwise provided in this part.

(2) In addition to the requirements of this part, all licensees are subject to the requirements of Part 1, Part 4, and Part 10 of these regulations. Licensees engaged in industrial radiographic operations are subject to the requirements of Part 5 and licensees using sealed sources in the healing arts are subject to the requirements of Part 7 of these regulations.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(1)(2), 381, 386 FS. History—New 1-1-77.

10D-56.332 Source Material — (Exemptions).

(1) Any person is exempt from this part to the extent that such person receives, possesses, uses, or transfers source material in any chemical mixture, compound, solution, or alloy in which the source material is by weight less than 1/20 of 1 percent (0.05 percent) of the mixture, compound, solution, or alloy.

(2) Any person is exempt from this part 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.

(3) Any person is exempt from this part to the extent that such person receives, possesses, uses, or transfers:

(a) Any quantities of thorium contained in

1. incandescent gas mantles,

2. vacuum tubes,

3. welding rods,

4. electric lamps for illuminating purposes provided that each lamp does not contain more than 50 milligrams of thorium,

5. germicidal lamps, sunlamps, and lamps for outdoor or industrial lighting provided that each lamp does not contain more than 2 grams of thorium, or

6. rare earth metals and compounds, mixtures, and products containing not more than 0.25 percent by weight thorium, uranium, or any combination of these;

(b) Source material contained in the following products

1. glazed ceramic tableware, provided that the glaze contains not more than 20 percent by weight source material.

2. 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, or

3. piezoelectric ceramic containing not more than 2 percent by weight source material;

(c) Photographic film, negatives, and prints containing uranium or thorium;

(d) Any finished product or part fabricated of, or containing, tungsten-thorium 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;

(e) 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

1. the counterweights are manufactured in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission or any Agreement State authorizing distribution by the licensee pursuant to 10 CFR, Part 40,

2. Each counterweight has been impressed with the following legend clearly legible through any plating or other covering: "DEPLETED URANIUM", 1/

3. each counterweight is durably and legibly labeled or marked with the identification of the manufacturer and the statement: "UNAUTHORIZED ALTERATIONS PROHIBITED",1/ and

4. the exemption contained in this subparagraph 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;

1/The requirements specified in 10D-56.332(3)(e)2. and 3., FAC need not be met by counterweights manufactured prior to December 31, 1969; provided, that such counterweights are impressed with the legend, "CAUTION-RADIOACTIVE MATERIAL-URANIUM", as previously required by the regulations.

(f) 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 material prescribed in Section 178.250, Specification 55, Part 178, of the regulations published by the U.S. Department of Transportation (49 CFR 178.250);

(g) 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 subparagraph shall not be deemed to authorize either

1. 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

2. the receipt, possession, use, or transfer of thorium contained in contact lenses, or in spectacles, or in eyepieces in binoculars or other optical instruments;

(h) 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; or

(i) Thorium contained in any finished aircraft engine part containing nickel-thoria alloy, provided that

1. the thorium is dispersed in the nickel-thoria alloy in the form of finely divided thoria (thorium dioxide), and

2. the thorium content in the nickel-thoria alloy does not exceed 4 percent by weight.

(4) The exemptions in 10D-56.332(3) FAC do not authorize the manufacture of any of the products described.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(1)(3), 290.11, 290.12, 381, 386 FS. History—New 1-1-77.

10D-56.333 Radioactive Material Other Than Source Material (Exemptions).

(1) Exempt Concentrations

(a) Except as provided in 10D-56.333(1) (b) FAC any person is exempt from this part to the extent that such person receives, possesses, uses, transfers, or acquires products or materials containing radioactive material in concentrations not in excess of those listed in Schedule A.

(b) No person may introduce radioactive material into a product or material knowing or having reason to believe that it will be transferred to persons exempt under 10D-56.333(1)(a) FAC or equivalent regulations of the U.S. Nuclear Regulatory Commission or any Agreement State, except in accordance with a specific license issued pursuant to 10D-56.342(1) FAC or the general license provided in 10D-56.353 FAC.

(2) Exempt Quantities

(a) Except as provided in 10D-56.333(2)(b) and (c) FAC, any person is exempt from these regulations to the extent that such person receives, possesses, uses, transfers, or acquires radioactive material in individual quantities each of which does not exceed the applicable quantity set forth in Schedule B of this part.

(b) This paragraph [.333(2)] does not authorize the production, packaging or repackaging

of radioactive material for purposes of commercial distribution or the incorporation of radioactive material into products intended for commercial distribution.

(c) No person may, for purposes of commercial distribution, transfer radioactive material in the individual quantities set forth in Schedule B, knowing or having reason to believe that such quantities of radioactive material will be transferred to persons exempt under 10D-56.333(2) FAC, or equivalent regulations of the U.S. Nuclear Regulatory Commission or any Agreement State, except in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission pursuant to section 32.18 of 10 CFR Part 32 or by the Agency pursuant to 10D-56.342(2) FAC which license states that the radio-active material may be transferred by the licensee to persons exempt under 10D-56.333(2) FAC or the equivalent regulations of the U.S. Nuclear Regulatory Commission or any Agreement State.

(3) Exempt Items

(a) Certain items containing radioactive material. Except for persons who apply radioactive material to, or persons who incorporate radioactive material into the following products, any person is exempt from these regulations to the extent that he receives, possesses, uses, transfers, or acquires the following products: [2/]

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

a. 25 millicuries of tritium per timepiece,

b. 5 millicuries of tritium per hand,

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

d. 100 microcuries of promethium-147 per watch or 200 microcuries of promethium-147 per any other timepiece,

e. 20 microcuries of promethium-147 per watch hand or 40 microcuries of promethium-147 per other timepiece hand,

f. 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),

g. 0.15 microcuries of radium per timepiece (radium shall not be used for pocket watches),

h. 0.03 microcuries of radium per hand,

i. 0.09 microcuries of radium per dial (bezels when used shall be considered part of the dial),

j. the levels of radiation from hands and dials containing promethium-147 or radium will not exceed, when measured through 50 milligrams per square centimeter of absorber:

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

(ii) For pocket watches, 0.1 millirad per hour at 1 centimeter from any surface. (Radium shall not be used for pocket watches),

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

2/Authority to transfer possession or control by the manufacturer, processor, or producer of any equipment, device, commodity, or other product containing source material or byproduct material whose subsequent possession, use, transfer, and disposal by all other persons are exempted from regulatory requirements may be obtained only from the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

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. Electron tubes; provided, that each tube does not contain more than one of the following specified quantities of radioactive material:

a. 150 millicuries of tritium per microwave receiver protector tube or 10 millicuries of tritium per any other electron tube;

b. 1 microcurie of cobalt—60;

c. 5 microcuries of nickel—63;

d. 30 microcuries of krypton—85;

e. 5 microcuries of cesium—137;

f. 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.[3/]

8. Ionizing radiation measuring instruments containing, for purposes of internal calibration or standardization, a source of radioactive material not exceeding the applicable quantity set forth in Schedule B of this part.

(b) Self-luminous products containing tritium, krypton-85, or promethium-147.

Except for persons who manufacture, process, or produce self-luminous products containing tritium, krypton-85, or promethium-147, any person is exempt from these regulations to the extent that such person receives, possesses, uses, transfers, or acquires tritium, krypton-85 or promethium-147 in self luminous products manufactured, processed, produced, imported, or transferred in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission pursuant to Section 32.22 of 10 CFR Part 32, which license authorizes the transfer of the product to persons who are exempt from regulatory requirements. The exemption in 10D-56.333(3)(b) does not apply to tritium, krypton-85, or promethium-147 used in products for frivolous purposes or in toys or adornments.

(c) Gas and aerosol detectors containing radioactive material

1. Except for persons who manufacture,

x3/For purposes of this subdivision, "electron tubes" include spark gap tubes, power tubes, gas tubes including glow lamps, receiving tubes, microwave tubes, indicator tubes, pick-up tubes, radiation detection tubes, and any other completely sealed tube that is designed to conduct or control electrical currents.

process, or produce gas and aerosol detectors containing radioactive material, any person is exempt from these regulations to the extent that such person receives, possesses, uses, transfers, or acquires radioactive material in gas and aerosol detectors designed to protect life or property from fires and airborne hazards provided that detectors containing radioactive material shall have been manufactured, imported, or transferred in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission[2/] or an Agreement State, pursuant to Section 32.26 of 10 CFR Part 32, or equivalent, which authorizes the transfer of the detectors to persons who are exempt from regulatory requirements.

2. Gas and aerosol detectors previously manufactured and distributed to general licensees in accordance with a specific license issued by an Agreement State shall be considered exempt under 10D-56.333(3)(c)1. FAC, provided that the device is labeled in accordance with the specific license authorizing distribution of the general licensed device, and provided further that they meet the requirements of 10D-56.342(3) FAC.

(d) Resins containing scandium-46 and designed for sand consolidation in oil wells.

Any person is exempt from these regulations to the extent that such person receives, possesses, uses, transfers, or acquires synthetic plastic resins containing scandium-46 which are designed for sand consolidation in oil wells. Such resins shall have been manufactured or imported in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission, or shall have been manufactured in accordance with the specifications contained in a specific license issued by the Agency or any Agreement State to the manufacturer of such resins pursuant to licensing requirements equivalent to those in Sections 32.16 and 32.17 of 10 CFR Part 32 of the regulations of the Nuclear Regulatory Commission. This exemption does not authorize the manufacture of any resins containing scandium-46.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(1)(3), 290.11, 290.12, 381, 386 FS. History—New 1-1-77.

PART 3A
LICENSES

10D-56.334 Types of Licenses. Licenses for radioactive materials are of two types: general and specific.

(1) General licenses provided in this part are effective without the filing of applications with the Agency or the issuance of licensing documents to the particular persons, although the filing of a certificate with the Agency may be required by the particular general license. The general licensee is subject to all other applicable portions of these regulations and any limitations of the general license.

(2) Specific licenses require the submission of an application to the Agency and the issuance of a licensing document by the Agency. The licensee is subject to all applicable portions of these regulations as well as any limitations specified in the licensing document.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(1)(2), 381, 386 FS. History—New 1-1-77.

PART 3B
GENERAL LICENSES

10D-56.335 General Licenses — Source Material.

(1) A general license is hereby issued authorizing receipt, possession, use, and transfer of not more than fifteen (15) pounds of source material at any one time by persons in the following categories:

(a) Pharmacists using the source material solely for the compounding of medicinals;

(b) Physicians using the source material for medicinal purposes;

(c) Persons receiving possession of source material from pharmacists and physicians in the form of medicinals or drugs;

(d) Commercial and industrial firms, and research, educational, and medical institutions for research, development, educational, or commercial purposes;

And provided, that no such person shall, pursuant to this general license, receive more than a total of 150 pounds of source material in any one calendar year.

(2) Persons who receive, possess, use, or transfer source material pursuant to the general license issued in 10D-56.335(1) FAC, are exempt from the provisions of Part 4 and Part 10 of these regulations to the extent that such receipt, possession, use, or transfer is 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.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(1), 381, 386 FS. History—New 1-1-77.

10D-56.336 General Licenses — Radioactive Material Other Than Source Material.

(1) Certain Devices and Equipment.

A general license is hereby issued to transfer, receive, acquire, possess, and use radioactive material incorporated in the following devices or equipment with a specific license issued to the manufacturer by the U.S. Nuclear Regulatory Commission, pursuant to 10 CFR Part 30, and authorizing distribution under this general license or its equivalent. This general license is subject to the provisions of 10D-56.134 FAC through 10D-56.139 FAC, 10D-56.333(1)(b) FAC, 10D-56.345 FAC, 10D-56.351 FAC, 10D-56.352 FAC, 10D-56.354 FAC, Part 4[4] and Part 10 of these regulations.

(a) Static Elimination Device. Devices designed for use as static eliminators which contain, as a sealed source or sources, radioactive material consisting of a total of not more than five hundred (500) microcuries of polonium-210 per device.

(b) Ion Generating Tube. Devices designed for ionization of air which contain, as a sealed source or

[2/] Authority to transfer possession or control by the manufacturer, processor, or producer of any equipment, device, commodity, or other product containing source material or byproduct material whose subsequent possession, use, transfer, and disposal by all other persons are exempted from regulatory requirements may be obtained only from the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

[4/] Attention is directed particularly to the provision of Part 4 of these regulations which relate to the labeling of containers.

sources, radioactive material consisting of a total of not more than five hundred (500) microcuries of polonium-210 per device or a total of not more than fifty (50) millicuries of hydrogen-3 (tritium) per device.

(2) Reserved.

(3) Reserved.

(4) Certain Measuring, Gauging and Controlling Devices.

(a) A general license is hereby issued to commercial and industrial firms and to research, educational and medical institutions, individuals in the conduct of their business, and State or local government agencies to receive, acquire, possess, use or transfer in accordance with the provisions of 10D-56.336(4)(b)(c) and (d) FAC, radioactive material, excluding special nuclear material, contained in devices designed and manufactured for the purpose of detecting, measuring, gauging or controlling thickness, density, level, interface location, radiation, leakage, or qualitative or quantitative chemical composition, or for producing light or an ionized atmosphere.

(b) The general license in 10D-56.336(4)(a) FAC, applies only to radioactive material contained in devices which have been manufactured and labeled in accordance with the specifications contained in a specific license issued by the Agency pursuant to 10D-56.342(4) or in accordance with the specifications contained in a specific license issued by the U.S. Nuclear Regulatory Commission or an Agreement State which authorizes distribution of devices to persons generally licensed by the NRC or an Agreement State.

(c) Any person who receives, acquires, possesses, uses, or transfers radioactive material in a device pursuant to the general license in 10D-56.336(4)(a) FAC:

1. shall assure that all labels affixed to the device at the time of receipt, and bearing a statement that removal of the label is prohibited, are maintained thereon and shall comply with all instructions and precautions provided by such labels;

2. shall assure that the device is tested for leakage of radioactive material and proper operation of the on-off mechanism and indicator, if any, at no longer than six-month intervals or at such other intervals as are specified in the label; however;

a. devices containing only krypton need not be tested for leakage of radioactive material, and

b. devices containing only tritium or not more than 100 microcuries of other beta and/or gamma emitting material or 10 microcuries of alpha emitting material and devices held in storage in the original shipping container prior to initial installation need not be tested for any purpose;

3. shall assure that the tests required by 10D-56.336(4)(c) 2. FAC and other testing, installation, servicing, and removal from installation involving the radioactive materials, its shielding or containment, are performed:

a. in accordance with the instructions provided by the labels; or

b. by a person holding a specific license from the Agency, the NRC, or an Agreement State to perform such activities;

4. shall maintain records showing compliance with the requirements of 10D-56.336(4)(c) 2. and (4)(c) 3. The records shall show the results of tests. The records also shall show the dates of performance of, and the names of persons performing, testing, installation servicing, and removal from installation concerning the radioactive material, its shielding or containment;

5. upon the occurrence of a failure of or damage to, or any indication of a possible failure of or damage to, the shielding of the radioactive material or the on-off mechanism or indicator, or upon the detection of 0.005 microcurie or more removable radioactive material, shall immediately suspend operation of the device until it has been repaired by the manufacturer or other person holding a specific license from the Agency, the NRC or an Agreement State to repair such device, or disposed of by transfer to a person authorized by a specific license to receive the radioactive material contained in the device and, within 30 days, furnish to the Agency a report containing a brief description of the event and the remedial action taken;

6. shall not abandon the device containing radioactive material;

7. except as provided in 10D-56.336(4)(c) 8. FAC, shall transfer or dispose of the device containing radioactive material only by transfer to a specific licensee of the Agency, the NRC, or an Agreement State whose specific license authorizes him to receive the device and within 30 days after transfer of a device to a specific licensee shall furnish to the Agency a report containing identification of the device by manufacturer's name and model number and the name and address of the person receiving the device. No report is required if the device is transferred to the specific licensee in order to obtain a replacement device;

8. shall transfer the device to another general licensee only:

a. where the device remains in use at a particular location. In such case the transferor shall give the transferee a copy of this regulation and any safety documents identified in the label on the device and within 30 days of the transfer, report to the Agency the manufacturer's name and model number of device transferred, the name and address of the transferee, and the name and/or position of an individual who may constitute a point of contact between the Agency and the transferee; or

b. where the device is held in storage in the original shipping container at its intended location of use prior to initial use by a general licensee.

9. shall comply with the provisions of 10D-56.451 FAC and 10D-56.452 FAC for reporting radiation incidents, theft, or loss of licensed material, but shall be exempt from the other requirements of Parts 4 and 10.

(d) The general license in 10D-56.336(4)(a) FAC does not authorize the manufacture of devices containing radioactive material.

(e) The general license provided in 10D-56.336(4)(a) FAC is subject to the provisions of 10D-56.134 FAC through 10D-56.139 FAC, 10D-56.345 FAC, 10D-56.351 FAC, 10D-56.352 FAC, and 10D-56.354 FAC.

(5) Luminous Safety Devices for Aircraft.

(a) A general license is hereby issued to receive, acquire, possess, and use tritium or promethium-147 contained in luminous safety devices for use in aircraft, provided:

1. each device contains not more than 10

curies of tritium or 300 millicuries of promethium-147; and

2. each device has been manufactured, assembled or imported in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission, or each device has been manufactured or assembled in accordance with the specifications contained in a specific license issued by the Agency or any Agreement State to the manufacturer or assembler of such device pursuant to licensing requirements equivalent to those in Section 32.53 of 10 CFR Part 32 of the regulations of the U.S. Nuclear Regulatory Commission.

(b) Persons who receive, acquire, possess, or use luminous safety devices pursuant to the general license in 10D-56.336(5)(a) FAC are exempt from the requirements of Part 4 and Part 10 except that they shall comply with the provisions of 10D-56.451 FAC and 10D-56.452 FAC.

(c) This general license does not authorize the manufacture, assembly, disassembly, or repair of luminous safety devices containing tritium or promethium-147.

(d) This general license does not authorize the receipt, acquisition, possession or use of promethium-147 contained in instrument dials.

(e) This general license is subject to the provisions of 10D-56.134 FAC through 10D-56.139 FAC, 10D-56.345 FAC, 10D-56.351 FAC, 10D-56.352 FAC, and 10D-56.354 FAC.

(6) Calibration and Reference Sources

(a) A general license is hereby issued to those persons listed below to receive, acquire, possess, use, and transfer, in accordance with the provisions of 10D-56.336(6)(c) and (d) FAC, Americium-241 in the form of calibration or reference sources:

1. Any person who holds a specific license issued by the Agency which authorizes him to receive, possess, use, and transfer radioactive material; and

2. Any person who holds a specific license issued by the U.S. Nuclear Regulatory Commission which authorizes him to receive, possess, use, and transfer special nuclear material.

(b) A general license is hereby issued to receive, possess, use, and transfer plutonium in the form of calibration or reference sources in accordance with the provisions of 10D-56.336(6)(c) and (d) FAC, to any person who holds a specific license issued by the Agency which authorizes him to receive, possess, use, and transfer radioactive material.

(c) The general licenses in 10D-56.336(6)(a) and (b) FAC apply only to calibration or reference sources which have been manufactured in accordance with the specifications contained in a specific license issued to the manufacturer or importer of the sources by the U.S. Nuclear Regulatory Commission pursuant to Section 32.57 of 10 CFR Part 32 or Section 70.39 of 10 CFR Part 70 or which have been manufactured in accordance with the specifications contained in a specific license issued to the manufacturer by the Agency or any Agreement State pursuant to licensing requirements equivalent to those contained in Section 32.57 of 10 CFR Part 32 or Section 70.39 of 10 CFR Part 70 of the regulations of the U.S. Nuclear Regulatory Commission.

(d) The general licenses provided in 10D-56.336(6)(a) and (b) FAC are subject to the provisions of 10D-56.134 FAC through 10D-56.139 FAC, 10D-56.345 FAC, 10D-56.351 FAC, 10D-56.352 FAC, 10D-56.354 FAC, Part 4 and Part 10 of these regulations. In addition, persons who receive, acquire, possess, use, or transfer one or more calibration or reference sources pursuant to these general licenses:

1. shall not possess at any one time, at any one location of storage or use, more than 5 microcuries of americium-241 and 5 microcuries of plutonium in such sources;

2. shall not receive, possess, use, or transfer such source unless the source, or the storage container, bears a label which includes the following statement or a substantially similar statement which contains the information called for in the following statement:

> The receipt, possession, use and transfer of this source, Model——— Serial No. ———, are subject to a general license and the regulations of the U.S. Nuclear Regulatory Commission or of a State with which the Commission has entered into an agreement for the exercise of regulatory authority. Do no remove this label.
>
> CAUTION-RADIOACTIVE MATERIAL — THIS SOURCE CONTAINS (AMERICIUM-241). (PLUTONIUM)[5/] DO NOT TOUCH RADIOACTIVE PORTION OF THIS SOURCE.
>
> _____
>
> Name of manufacturer or importer

3. shall not transfer, abandon, or dispose of such source except by transfer to a person authorized by a license from the Agency, the U.S. Nuclear Regulatory Commission, or an Agreement State to receive the source;

4. shall store such source, except when the source is being used, in a closed container adequately designed and constructed to contain americium-241 or plutonium which might otherwise escape during storage; and

5. shall not use such source for any purpose other than the calibration of radiation dectectors or the standardization of other sources.

(e) These general licenses do not authorize the manufacture of calibration or reference sources containing americium-241 or plutonium.

(7) General License for Certain Medical Diagnostic Uses in (In Vivo Testing) of Radioactive Material.[6/] [7/]

(a) A general license is hereby issued to any physician to receive, possess, transfer, or use radioactive material set forth below for the stated diagnostic uses, provided, however, that the use is in accordance with the provision of 10D-56.336(7), (b),

[5/] Showing only the name of the appropriate material.

[6/] 10D-56.342(7) requires manufacturers of radiopharmaceuticals which are under the general license in this paragraph to affix a certain identifying label to the container or in the leaflet or brochure which accompanies the radiopharmaceutical.

[7/] The New Drug provisions of the Federal Food, Drug, and Cosmetic Act also govern the availability and use of any specific diagnostic drugs in interstate commerce.

(c), and (d), the radioactive material is in the form of capsules, disposable syringes, or other prepackaged individual doses; and the radioactive material has been manufactured in accordance with a specific license issued pursuant to 10D-56.342(7) by the Agency, the U.S. Nuclear Regulatory Commission, or any Agreement State authorizing distribution under the general license granted in this paragraph or its equivalent:

1. Iodine-131 as sodium iodide ($Na^{131}I$) for measurement of thyroid uptake;

2. Iodine-131 as iodinated human serum albumin (IHSA) for determinations of blood and blood plasma volume;

3. Iodine-125 as iodinated human serum albumin (IHSA) for determinations of blood and blood plasma volume;

4. Cobalt-57 for the measurement of intestinal absorption of cyanocobalamin;

5. Cobalt-58 for the measurement of intestinal absorption of cyanocobalamin;

6. Cobalt-60 for the measurement of intestinal absorption of cyanocobalamin; and

7. Chromium-51 as sodium radiochromate for determination of red blood cell volumes and studies of red blood cell survival time.

(b) No physician shall receive, possess, use, or transfer radioactive material pursuant to the general license established by 10D-56.336(7)(a), until he has filed this Agency's form "Certificate-Medical Use of Radioactive Material Under General License" with the Agency and received from the Agency a validated copy of this form with certification number assigned. The generally licensed physician shall furnish on Agency form the following information and such other information as may be required by that form:

1. Name and address of the generally licensed physician;

2. A statement that the generally licensed physician is a duly licensed physician (authorized to dispense drugs) in the practice of medicine in this State; and

3. A statement that the generally licensed physician has appropriate radiation measuring instruments to carry out the diagnostic procedures for which he proposes to use radioactive material under the general license of 10D-56.336(7), and that he is competent in the use of such instruments.

(c) A physician who receives, possesses, or uses a pharmaceutical containing radioactive material pursuant to the general license established by 10D-56.336(7)(a), shall comply with the following:

1. He shall not possess at any one time, pursuant to the general license in 10D-56.336(7)(a), more than:

a. 200 microcuries of iodine-131,
b. 200 microcuries of iodine-125,
c. 5 microcuries of cobalt-57,
d. 5 microcuries of cobalt-58,
e. 5 microcuries of cobalt-60, and
f. 200 microcuries of chromium-51;

2. He shall store the pharmaceutical until administered in the original shipping container, or a container providing equivalent radiation protection;

3. He shall use the pharmaceutical only for the uses authorized by 10D-56.336(7)(a);

4. He shall not administer the pharmaceutical to a woman with confirmed pregnancy or to a person under 18 years of age; and

5. He shall not transfer the radioactive material to a person who is not authorized to receive it pursuant to a license issued by the Agency, the U.S. Nuclear Regulatory Commission or any Agreement State, or in any manner other than in the unopened, labeled shipping container as received from the supplier, except by administering it to a patient.

(d) The generally licensed physician possessing or using radioactive material under the general license of 10D-56.336(7)(a), shall report in duplicate to the Agency, any changes in the information furnished by him in the "Certificate-Medical Use of Radioactive Material Under General License." The report shall be submitted within 30 days after the effective date of such change.

(e) Any person using radioactive material pursuant to the general license 10D-56.336(7)(a), is exempt from the requirements of Part 4 and Part 10 of these regulations with respect to the radioactive material covered by the general license.

(8) General License for Use of Radioactive Material for Certain In Vitro Clinical or Laboratory Testing [8/]

(a) A general license is hereby issued to any physician, clinical laboratory or hospital to receive, acquire, possess, transfer or use, for any of the following stated tests, in accordance with the provisions of 10D-56.336(8)(b)(c)(d)(e)(f) FAC, the following radioactive materials in prepackaged units:

1. Iodine-125, in units not exceeding 10 microcuries each for use in in vitro clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation therefrom, to human beings or animals.

2. Iodine-131, in units not exceeding 10 microcuries each for use in in vitro clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation therefrom, to human beings or animals.

3. Carbon-14, in units not exceeding 10 microcuries each for use in in vitro clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation therefrom, to human beings or animals.

4. Hydrogen-3 (tritium), in units not exceeding 50 microcuries each for use in in vitro clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation therefrom, to human beings or animals.

5. Iron-59, in units not exceeding 20 microcuries each for use in in vitro clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation therefrom, to human beings or animals.

(b) No person shall receive, acquire, possess, use or transfer radioactive material pursuant to the general license established by 10D-56.336(8)(a) FAC until he has filed, in duplicate, "CERTIFICATE — IN VITRO TESTING WITH RADIOACTIVE MATERIAL UNDER GENERAL LICENSE", with the Agency and received from the Agency a validated copy with certification number assigned. The physician, clinical laboratory or hospital shall furnish on the certificate the following information and such other information as may be required by that form:

[8/] The New Drug provisions of the Federal Food, Drug, and Cosmetic Act also govern the availability and use of any specific diagnostic drugs in interstate commerce.

1. Name and address of the physician, clinical laboratory or hospital;

2. The location of use; and

3. A statement that the physician, clinical laboratory or hospital has appropriate radiation measuring instruments to carry out In vitro clinical or laboratory tests with radioactive material as authorized under the general license in 10D-56.336(8)(a) FAC and that such tests will be performed only by personnel competent in the use of such instruments and in the handling of the radioactive material.

(c) A person who receives, acquires, possesses or uses radioactive material pursuant to the general license established by 10D-56.336(8)(a) FAC shall comply with the following:

1. The general licensee shall not possess at any one time, pursuant to the general license in 10D-56.336(8)(a) FAC at any one location of storage or use a total amount of iodine-125, iodine-131, and/or iron-59 in excess of 200 microcuries.

2. The general licensee shall store the radioactive material, until used, in the original shipping container or in a container providing equivalent radiation protection.

3. The general licensee shall use the radioactive material only for the uses authorized by 10D-56.336(8)(a) FAC.

4. The general licensee shall not transfer the radioactive material to a person who is not authorized to receive it pursuant to a license issued by the Agency, the U.S. Nuclear Regulatory Commission, or any Agreement State, nor transfer the radioactive material in any manner other than in the unopened, labeled shipping container as received from the supplier.

(d) The general licensee shall not receive, acquire, possess, or use radioactive material pursuant to 10D-56.336(8)(a) FAC:

1. Except as prepackaged units which are labeled in accordance with the provisions of a specific license issued by the U.S. Nuclear Regulatory Commission, or any Agreement State which authorizes the manufacture and distribution of iodine-125, iodine-131, carbon-14, hydrogen-3 (tritium), or iron-59 for distribution to persons generally licensed under 10D-56.336(8) FAC or its equivalent, and

2. Unless the following statement, or a substantially similar statement which contains the information called for in the following statement, appears on a label affixed to each prepackaged unit or appears in a leaflet or brochure which accompanies the package:

> This radioactive material may be received, acquired, possessed, and used only by physicians, clinical laboratories or hospitals and only for In vitro clinical or laboratory tests not involving internal or external administration of the material, or the radiation therefrom, to human beings or animals. Its receipt, acquisition, possession, use, and transfer are subject to the regulations and a general license of the U.S. Nuclear Regulatory Commission or of a State with which the Commission has entered into an agreement for the exercise of regulatory authority.
>
> _____
>
> Name of manufacturer

(e) The physician, clinical laboratory or hospital possessing or using the radioactive material under the general license of 10D-56.336(8)(a) FAC shall report in writing to the Agency, any changes in the information furnished by him in the "CERTIFICATE — IN VITRO TESTING WITH RADIOACTIVE MATERIAL UNDER GENERAL LICENSE". The report shall be furnished within 30 days after the effective date of such change.

(f) Any person using radioactive material pursuant to the general license of 10D-56.336(8)(a) FAC is exempt from the requirements of Part 4 and Part 10 of these regulations with respect to radioactive material covered by that general license.

(9) **Ice Detection Devices**

(a) A general license is hereby issued to receive, acquire, possess, use, or transfer strontium-90 contained in ice detection devices, provided each device contains not more than 50 microcuries of strontium-90 and each device has been manufactured or imported in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission or each device has been manufactured in accordance with the specifications contained in a specific license issued by the Agency or any Agreement State to the manufacturer of such device pursuant to licensing requirements equivalent to those in Section 32.61 of 10 CFR Part 32 of the regulations of the Nuclear Regulatory Commission.

(b) Persons who receive, acquire, possess, use, or transfer strontium-90 contained in ice detection devices pursuant to the general license in 10D-56.336(9)(a) FAC,

1. shall, upon occurrence of visually observable damage, such as a bend or crack or discoloration from overheating to the device, discontinue use of the device until it has been inspected, tested for leakage and repaired by a person holding a specific license from the U.S. Nuclear Regulatory Commission or an Agreement State to manufacture or service such devices; or shall dispose of the device pursuant to the provisions of 10D-56.445 FAC;

2. shall assure that all labels affixed to the device at the time of receipt, and which bear a statement which prohibits removal of the labels, are maintained thereon; and

3. are exempt from the requirements of Part 4 and Part 10 except that such persons shall comply with the provisions of 10D-56.446 FAC, 10D-56.451 FAC, and 10D-56.452 FAC.

(c) This general license does not authorize the manufacture, assembly, disassembly or repair of Strontium-90 in ice detection devices.

(d) This general license is subject to the provisions of 10D-56.134 FAC through 10D-56.139 FAC, 10D-56.345 FAC, 10D-56.351 FAC, 10D-56.352 FAC, and 10D-56.354 FAC.

(10) **General Licensed Quantities for Radium-226**

(a) A general license is hereby issued to commercial and industrial firms, and to research, educational, medical and governmental institutions to receive, acquire, possess, use, and transfer radium-226 in units not exceeding 0.1 microcurie each in accordance with the provisions of 10D-56.336(10)(b), (c) and (d).

(b) No such person shall receive, acquire, possess, use or transfer radium-226 pursuant to the general license established by 10D-56.336(10)(a),

until he has filed an Agency form "Certificate-Radium-226 Under General License," with the Agency and has received from the Agency a validated copy of the form with a certification number assigned. The person identified in 10D-56.336(10)(a) shall furnish in the form the following information and such other information as he may be required by that form:

1. Name and address of the person identified in 10D-56.336(10)(a),

2. The location of use, and

3. A statement that such person has appropriate radiation measuring instruments to carry out an adequate program of radiation protection and that the use of authorized material will be performed only by personnel competent in the use of such instruments and in the handling of the radioactive material.

(c) A person who receives, acquires, possesses or uses radium-226 pursuant to the general license established by 10D-56.336(10)(a), shall comply with the following:

1. The general licensee shall not possess at any one time, pursuant to the general license in 10D-56.336(10)(a), at any one location of storage or use, a total amount of radium-226 in excess of 5 microcuries.

2. The general licensee shall store the radium-226 until used, in the original shipping container or in a container providing equivalent radiation protection.

3. The general licensee shall not transfer the radioactive material to a person who is not authorized to receive it pursuant to a license issued by the Agency, or any Agreement State, nor transfer the radioactive material in any manner other than in the unopened, labeled shipping container as received from the shipper.

4. The person possessing or using the radioactive material under the general license 10D-56.336(10)(a), shall report in writing to the Agency, any changes in the information furnished by him in the "Certificate-Radium-226 Under General License" form. The report shall be furnished within 30 days after the effective date of such change.

5. Any person using radium-226 pursuant to the general license 10D-56.336(10)(a), is exempt from the requirements of Part 4 and Part 10 of these regulations with respect to the radioactive material covered by the general license.

(d) This general license does not authorize the manufacture, commercial distribution, or human use of radium-226.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(1), 381, 386 FS. History—New 1-1-77.

10D-56.337 Transportation of Radioactive Material.

(1) A general license is hereby issued to any common or contract carrier to transport and store radioactive material in the regular course of their carriage for another or storage incident thereto, provided the transportation and storage is in accordance with the applicable requirements of the regulations, appropriate to the mode of transport, of the U.S. Department of Transportation insofar as such regulations relate to the loading and storage of packages, placarding of the transporting vehicle, and incident reporting.[9/] Persons who transport and store radioactive material pursuant to the general license in this paragraph are exempt from the requirements of Part 4 and Part 10 of these regulations.

(2) A general license is hereby issued to any private carrier to transport radioactive material, provided the transportation is in accordance with the applicable requirements of the regulations, appropriate to the mode of transport, of the U.S. Department of Transportation insofar as such regulations relate to the loading and storage of packages, placarding of the transporting vehicle, and incident reporting.[9/]

(a) Persons who transport radioactive material pursuant to the general license in 10D-56.337(2) FAC are exempt from the requirements of Part 4 and Part 10 of these regulations to the extent that they transport radioactive material.

(b) Physicians, as defined in 10D-56.132(27) FAC, are exempt from the requirements of 10D-56.337(2) FAC to the extent that they transport radioactive material for use in the practice of medicine.

Specific Authority 381.512 FS. Law Implemented 381.512 FS. History—New 1-1-77.

PART 3C
SPECIFIC LICENSES

10D-56.338 Filing Application for Specific Licenses.

(1) Applications for specific licenses shall be filed (in triplicate) on a form prescribed by the Agency.

(2) The Agency 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 Agency to determine whether the application should be granted or denied or whether a license should be modified or revoked.

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

(4) An application for a license may include a request for a license authorizing one or more activities.

(5) In his application, the applicant may incorporate by reference information contained in previous application, statements, or reports filed with the Agency provided such references are clear and specific.

(6) Applications and documents submitted to the Agency may be made available for public inspection except that the Agency may withhold any document or part thereof from public inspection if disclosure of its content is not required by law.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History—New 1-1-77.

10D-56.339 General Requirements for the Issuance of Specific Licenses. A license application will be approved if the Agency determines that:

(1) the applicant is qualified by reason of training and experience to use the material in question for the purpose requested in accordance with these regulations in wuch a manner as to minimize danger to public health and safety or property;

9/ Any notification of incidents referred to in those requirements shall also be filed with, or made to, the Agency.

(2) the applicant's proposed equipment, facilities, and procedures are adequate to minimize danger to public health and safety or property;

(3) the issuance of the license will not be inimical to the health and safety of the public; and

(4) the applicant satisfies any applicable special requirements in 10D-56.340 FAC, 10D-56.341 FAC, or 10D-56.342 FAC.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.15, 381, 386 FS. History—New 1-1-77.

10D-56.340 Special Requirements for Issuance of Certain Specific Licenses for Radioactive Material.

(1) **Human Use of Radioactive Material in Institutions.** In addition to the requirements set forth in 10D-56.339 FAC a specific license for human use of radioactive material in institutions will be issued if:

(a) The applicant has appointed a medical isotopes committee of at least three members to evaluate all proposals for research, diagnostic, and therapeutic use of radioactive material within that institution. The medical isotope committee shall hold a formal meeting at least once every 6 months. Minutes of all meetings of the medical isotopes committee shall be recorded and maintained for inspection by the Agency. Membership of the committee should include physicians expert in internal medicine, hematology, therapeutic radiology, and a person experienced in assay of radioactive material and protection against radiation;

(b) The applicant possesses adequate facilities for the clinical care of patients;

(c) The physician designated on the application as the individual user has substantial experience in the handling and administration of radioactive material and where applicable, the clinical management of radioactive patients; and

(d) If the application is for a license to use unspecified quantities or multiple types of radioactive material, the applicant's staff has substantial experience in the use of a variety of radioactive materials for a variety of human uses.

(2) **Licensing of Individual Physicians for Human Use of Radioactive Material.**

In addition to the requirements set forth in 10D-56.339 FAC, a specific license for the human use of radioactive material will be issued to an individual physician if:

(a) The applicant has access to a hospital possessing adequate facilities to hospitalize and monitor the applicant's radioactive patients whenever it is advisable; and

(b) The applicant has extensive experience in the handling and administration of radioactive material and, where applicable, the clinical management of radioactive patients.

(3) **Specific licenses for certain groups of medical uses of radioactive material.**

(a) Subject to the provisions of 10D-56.340(3)(b), (c), and (d) FAC, an application for a specific license pursuant to 10D-56.340(1) and (2) FAC for any medical use or uses of radioactive material specified in one or more of Groups I to VI, inclusive, of Schedule C of this part will be approved for all of the uses within the group or groups which include the use or uses specified in the application if:

1. The applicant satisfies the requirements of 10D-56.340(1),(2), and (4) FAC;

2. The applicant, or the physician designated in the application as the individual user, has adequate clinical experience in the types of uses included in the group or groups;

3. The applicant or the physicians and all other personnel who will be involved in the preparation and use of the radioactive material have adequate training and experience in the handling of radioactive material appropriate to their participation in the uses included in the group or groups;

4. The applicant's radiation detection and measuring instrumentation is adequate for conducting the procedures involved in the uses included in the group or groups;

5. The applicant's radiation safety operating procedures are adequate for handling and disposal of the radioactive material involved in the uses included in the group or groups.

(b) Any licensee who is authorized to use radioactive material pursuant to one or more groups in 10D-56.340(3)(a) FAC and Schedule C of this part is subject to the following conditions:

1. For Groups I, II, IV, and V, no licensee shall receive, possess, or use radioactive material except as a radiopharmaceutical manufactured in the form to be administered to the patient, labeled, packaged, and distributed in accordance with:

a. A specific license issued by the Agency pursuant to 10D-56.342(10) or an application filed with the Agency pursuant to 10D-56.342(10) within 60 days of the effective date of these regulations for a license to manufacture and distribute a radiopharmaceutical that the applicant distributed commercially on or before the effective date of these regulations on which application the Agency has not acted; or

b. A specific license issued by the U.S. Nuclear Regulatory Commission pursuant to Section 32.72 of 10 CFR Part 32 or an application filed with the U.S. Nuclear Regulatory Commission pursuant to Section 32.72 of 10 CFR Part 32 on or before October 15, 1974 for a license to manufacture and distribute a radiopharmaceutical that the applicant distributed commercially on or before August 16, 1974 on which application the U.S. Nuclear Regulatory Commission has not acted; or

c. A specific license issued by an Agreement State pursuant to equivalent regulations or an application filed with an Agreement State pursuant to equivalent regulations on or before the date established by the respective Agreement State for a licensee to manufacture and distribute a radiopharmaceutical that the applicant distributed commercially on or before the effective date of the regulations of that Agreement State on which application the Agreement State has not acted.

2. For Group III, no licensee shall receive, possess, or use generators or reagent kits containing radioactive material or shall use reagent kits that do not contain radioactive material to prepare radiopharmaceuticals containing radioactive material, except:

a. Reagent kits not containing radioactive material that are approved by the Agency, the U.S. Nuclear Regulatory Commission or an Agreement State for use by persons licensed pursuant to 10D-56.340(3) FAC and Schedule C of this part or equivalent regulations; or

b. Generators or reagent kits containing radioactive material that are manufactured, labeled,

packaged, and distributed in accordance with a specific license issued by the Agency pursuant to 10D-56.342(11) FAC or equivalent regulations; or

c. Generators or reagent kits that a manufacturer distributed on or before the effective date of these regulations for which an application for license or approval was filed with the Agency pursuant to 10D-56.342(11) FAC within 60 days of the effective date of these regulations on which application the Agency has not acted; or

d. Generators or reagent kits that a manufacturer distributed on or before August 16, 1974 for which an application for license or approval was filed with the U.S. Atomic Energy Commission pursuant to Section 32.73 of 10 CFR Part 32 on or before October 15, 1974 on which application the U.S. Nuclear Regulatory Commission has not acted; or

e. Generators or reagent kits that a manufacturer distributed on or before the effective date of the regulations of that Agreement State for which an application for license or approval was filed with an Agreement State pursuant to equivalent regulations on or before the date established by the respective Agreement State on which application the Agreement State has not acted.

3. For Group VI, no licensee shall receive, possess, or use radioactive material except as contained in a source or device that has been manufactured, labeled, packaged, and distributed in accordance with:

a. A specific license issued by the Agency pursuant to 10D-56.342(12) FAC or an application filed with the Agency pursuant to 10D-56.342(12) FAC within 60 days of the effective date of these regulations for a license to manufacture a source or device that the applicant distributed commercially on or before the effective date of these regulations on which application the Agency has not acted;

b. A specific license issued by the U.S. Nuclear Regulatory Commission pursuant to Section 32.74 of 10 CFR Part 32 or an application filed with the U.S. Atomic Energy Commission pursuant to Section 32.74 of 10 CFR Part 32 on or before October 15, 1974 for a license to manufacture a source or device that the applicant distributed commercially on or before August 16, 1974 on which application the U.S. Nuclear Regulatory Commission has not acted; or

c. A specific license issued by an Agreement State pursuant to equivalent regulations or an application filed with an Agreement State pursuant to equivalent regulations on or before the date established by the respective Agreement State for a license to manufacture a source or device that the applicant distributed commercially on or before the effective date of the regulations of that Agreement State on which application the Agreement State has not acted.

4. For Group III, any licensee who uses generators or reagent kits shall elute the generator or process radioactive material with the reagent kit in accordance with instruction which are approved by the Agency, the U.S. Nuclear Regulatory Commission or an Agreement State and are furnished by the manufacturer on the label attached to or in the leaflet or brochure which accompanies the generator or reagent kit.

5. For Group VI any licensee who possesses and uses sources or devices containing radioactive material shall:

a. Cause each source or device containing more than 100 microcuries of radioactive material with a half-life greater than thirty days, except iridium-192 seeds encased in nylon ribbon, to be tested for contamination and/or leakage at intervals not to exceed six months or at such other intervals as are approved by the Agency, the U.S. Nuclear Regulatory Commission or an Agreement State and described by the manufacturer on the label attached to the source, device, or permanent container thereof, or in the leaflet or brochure which accompanies the source or device. Each source or device shall be so tested prior to its first use unless the supplier furnishes a certificate that the source or device has been so tested within six months prior to the transfer;

b. Assure that the test required by 10D-56.340(3)(b)5.a. FAC shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the source or from the surfaces of the device in which the source is permanently or semipermanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Agency;

c. If the test required by 10D-56.340(3)(b)5.a. FAC reveals the presence of 0.005 microcurie or more of removable contamination, immediately withdraw the source from use and cause it to be decontaminated and repaired or to be disposed of in accordance with Agency regulations. A report shall be filed within 5 days of the test with the Agency, describing the equipment involved, the test results, and the corrective action taken;

d. Follow the radiation safety and handling instructions approved by the Agency, the U.S. Nuclear Regulatory Commission, or an Agreement State and furnished by the manufacturer on the label attached to the source, device or permanent container thereof, or in the leaflet or brochure which accompanies the source or device, and maintain such instruction in a legible and conveniently available form;

e. Conduct a quarterly physical inventory to account for all sources and devices received and possessed. Records of the inventories shall be maintained for inspection by the Agency and shall include the quantities and kinds of radioactive material, location of sources and devices, and the date of the inventory;

f. Assure that needles or standard medical applicator cells containing cobalt-60 as wire are not opened while in the licensee's possession unless specifically authorized by a license issued to him by the Agency;

g. Assure that patients containing cobalt-60, cesium-137 and/or iridium-192 implants shall remain hospitalized until the implants are removed.

(c) Any licensee who is licensed pursuant to 10D-56.340(3)(a) FAC for one or more of the medical use group in Schedule C also is authorized to use radioactive material under the general license in 10D-56.336(8) FAC for the specified in vitro uses without filing the Certificate as required by 10D-56.336(8)(b) FAC; provided, that the licensee is subject to the other provisions of 10D-56.336(8) FAC.

(d) Any licensee who is licensed pursuant to 10D-56.340(3)(a) FAC for one or more of the medical use groups in Schedule C also is authorized, subject to the provisions of 10D-56.340(3)(d) and (e) FAC, to receive, possess, and use for calibration and reference standards:

1. Any radioactive material listed in Group I, Group II or Group III, of Schedule C of this Part with a half-life not longer than 100 days, in amounts not to exceed 15 millicuries total;

2. Any radioactive material listed in Group I, Group II, or Group III of Schedule C of the part with half-life greater than 100 days in amounts not to exceed 200 microcuries total;

3. Technetium 99m in amounts not to exceed 30 millicuries;

4. Any radioactive material, in amounts not to exceed 3 millicuries per source, contained in calibration or reference sources that have been manufactured, labeled, packaged, and distributed in accordance with:

a. A specific license issued by the Agency pursuant to 10D-56.342(12) FAC or an application filed with the Agency pursuant to 10D-56.342(12) within 60 days of the effective date of these regulations for a license to manufacture and distribute a source that the applicant distributed commercially on or before the effective date of these regulations on which application the Agency has not acted; or

b. A specific license issued by the Nuclear Regulatory Commission pursuant to Section 32.74 of 10 CFR Part 32 or an application filed with the U.S. Atomic Energy Commission pursuant to Section 32.74 of 10 CFR Part 32 on or before October 15, 1974 for a license to manufacture and distribute a source that the applicant distributed commercially on or before August 16, 1974, on which application the U.S. Nuclear Regulatory Commission has not acted; or

c. A specific license issued by an Agreement State pursuant to equivalent regulations or an application filed with an Agreement State pursuant to equivalent regulations within 60 days of the effective date of the regulations of that Agreement State for a license to manufacture and distribute a source that the applicant distributed commercially on or before the effective date of the regulations of that Agreement State on which application the Agreement State has not acted.

(e) 1. Any licensee who possesses sealed sources as calibration or references sources pursuant to 10D-56.340(3)(d) FAC shall cause each sealed source containing radioactive material, other than hydrogen-3, with a half-life greater than thirty days in any form other than gas to be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be used until tested, provided, however, that no leak tests are required when:

a. The source contains 100 microcuries or less of beta and/or gamma emitting material or 10 microcuries or less of alpha emitting material, or

b. The sealed source is stored and is not being used; such sources shall, however, be tested for leakage prior to any use or transfer unless they have been leak tested within six months prior to the date of use or transfer.

2. The leak test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is mounted or stored on which contamination might be expected to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Agency.

3. If the leak test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee or registrant shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Parts 3 and 4 of these regulations. A report shall be filed within 5 days of the test with the Agency describing the equipment involved, the test results, and the corrective action taken;

(f) Any licensee who possesses and uses calibration and reference sources pursuant to 10D-56.340(3)(d)4. shall:

1. Follow the radiation safety and handling instructions approved by the Agency, the U.S. Nuclear Regulatory Commission, or an Agreement State and furnished by the manufacturer on the label attached to the source, or permanent container thereof, or in the leaflet or brochure that accompanies the source, and maintain such instruction in a legible and conveniently available form;

2. Conduct a quarterly physical inventory to account for all sources received and possessed. Records of the inventories shall be maintained for inspection by the Agency and shall include the quantities and kinds of radioactive material, location of sources, and the date of the inventory.

(4) Human Use of Sealed Sources. In addition to the requirements set forth in 10D-56.339 FAC, a specific license for human use of sealed sources will be issued only if the applicant or, if the application is made by an institution, the individual user (a) has specialized training in the diagnostic or therapeutic use of the sealed source considered, or has experience equivalent to such training, and (b) is a physician.

(5) Use of Sealed Sources in Industrial Radiography. In addition to the requirements set forth in 10D-56.339 FAC, a specific license for use of sealed sources in industrial radiography will be issued if:

(a) The applicant will have an adequate program for training radiographers and radiographer's assistants and submits to the Agency 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 Agency 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;

(b) The applicant has established and submits to the Agency satisfactory written operating procedures as described in 10D-56.543 FAC.

(c) The applicant will have an adequate internal inspection system, or other management control, to assure that license provisions, regulations, and the applicant's operating and emergency procedures are followed by radiographers and radiographer's assistants;

(d) The applicant submits to the Agency a description of his overall organizational structure pertaining to the industrial radiography program, including specified delegations of authority and responsibility for operation of the program;

(e) The applicant who desires to conduct his own leak test has established adequate procedures to be followed in leak testing sealed sources for possible leakage and contamination and submits to the Agency a description of such procedures including:

1. Instrumentation to be used,

2. Method of performing tests, 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; and

(f) The licensee shall conduct a program for inspection and maintenance of radiographic devices and storage containers to assure proper functioning of components important to safety.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History—New 1-1-77.

10D-56.341 Special Requirements for Specific Licenses of Broad Scope. This section prescribes requirements for the issuance of specific licenses of broad scope for radioactive material ("broad licenses") and certain regulations governing holders of such licenses.[10/]

(1) The different types of broad licenses are set forth below:

(a) A "Type A specific license of broad scope" is a specific license authorizing receipt, acquisition, possession, use and transfer of any chemical or physical form of the radioactive material specified in the license, but not exceeding quantities specified in the license, for any authorized purpose. The quantities specified are usually in the multicurie range.

(b) A "Type B specific license of broad scope" is a specific license authorizing receipt, acquisition, possession, use and transfer of any chemical or physical form of radioactive material specified in Schedule D, for any authorized purpose. The possession limit for a Type B broad license, if only one radionuclide is possessed thereunder, is the quantity specified for that radionuclide in Schedule D, Column I. If two or more radionuclides are possessed thereunder, the possession limit for each is determined as follows: For each radionuclide, determine the ratio of the quantity possessed to the applicable quantity specified in Schedule D, Column I, for that radionuclide. The sum of the ratios for all radionuclides possessed under the license shall not exceed unity.

10/ Authority to transfer possession or control by the manufacturer, processor, or producer of any equipment, device, commodity, or other product containing source material or byproduct material whose subsequent possession, use, transfer, and disposal by all other persons are exempted from regulatory requirements may be obtained only from the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

(c) A "Type C specific license of broad scope" is a specific license authorizing receipt, acquisition, possession, use and transfer of any chemical or physical form of radioactive material specified in Schedule D, for any authorized purpose. The possession limit for a Type C broad license, if only one radionuclide is possessed thereunder, is the quantity specified for that radionuclide in Schedule D, Column II. If two or more radionuclides are possessed thereunder, the possession limit is determined for each as follows: For each radionuclide determine the ratio of the quantity possessed to the applicable quantity specified in Schedule D, Column II, for that radionuclide. The sum of the ratios for all radionuclides possessed under the license shall not exceed unity.

(2) An application for a Type A specific license of broad scope will be approved if:

(a) The applicant satisfies the general requirements specified in 10D-56.339;

(b) The applicant has engaged in a reasonable number of activities involving the use of radioactive material; and

(c) The applicant has established administrative controls and provisions relating to organization and management, procedures, record keeping, material control and accounting, and management review that are necessary to assure safe operations, including:

1. The establishment of a radiation safety committee composed of such persons as a radiation safety officer, a representative of management, and persons trained and experienced in the safe use of radioactive material;

2. The appointment of a radiation safety officer who is qualified by training and experience in radiation protection, and who is available for advice and assistance on radiation safety matters; and

3. The establishment of appropriate administrative procedures to assure:

a. Control of procurement and use of radioactive material;

b. Completion of safety evaluations of proposed uses of radioactive material which take into consideration such matters as the adequacy of facilities and equipment, training and experience of the user, and the operating or handling procedures; and

c. Review, approval, and recording by the radiation safety committee of safety evaluation of proposed uses prepared in accordance with 10D-56.341(c)3.b., prior to use of the radioactive material.

(3) An application for a Type B specific license of broad scope will be approved if:

(a) The applicant satisfies the general requirements specified in 10D-56.339, and

(b) The applicant has established administrative controls and provisions relating to organization and management, procedures, record keeping, material control and accounting, and management review that are necessary to assure safe operations, including:

1. The appointment of a radiation safety officer who is qualified by training and experience in radiation protection, and who is available for advice and assistance on radiation safety matters, and

2. The establishment of appropriate administrative procedures to assure:

a. Control of procurement and use of radioactive material,

b. Completion of safety evaluations of proposed uses of radioactive material which take into consideration such matters as the adequacy of facilities and equipment, training and experience of the user, and the operating or handling procedures, and

c. Review, approval, and recording by the radiation safety officer of safety evaluations of proposed uses prepared in accordance with (3)(b)2.b. prior to use of radioactive material.

(4) An application for a Type C specific license of broad scope will be approved if:

(a) The applicant satisfies the general requirements specified in 10D-56.339, and

(b) The applicant submits a statement that radioactive material will be used only by, or under the direct supervision of, individuals who have received:

1. A college degree at the bachelor level, or equivalent training and experience, in physical or biological sciences or in engineering, and

2. At least 40 hours of training and experience in the safe handling of radioactive material, and in the characteristics of ionizing radiation, units of radiation dose and quantities, radiation detection instrumentation, and biological hazards of exposure to radiation appropriate to the type and forms of radioactive material to be used; and

(c) The applicant has established administrative controls and provisions relating to procurement of radioactive material, procedures, record keeping, material control and accounting, and management review necessary to assure safe operations.

(5) Specific licenses of broad scope are subject to the following conditions:

(a) Persons licensed pursuant to 10D-56.341 shall not:

1. Conduct tracer studies in the environment involving direct release of radioactive material;

2. Receive, acquire, own, possess, use or transfer devices containing 100,000 curies or more of radioactive material in sealed sources used for irradiation of materials;

3. Conduct activities for which a specific license issued by the Agency under 10D-56.340 or 10D-56.342;

4. Add or cause the addition of radioactive material to any food, beverage, cosmetic, drug, or other product designed for ingestion or inhalation by, or application to, a human being.

(b) Each Type A specific license of broad scope issued under this part shall be subject to the condition that radioactive material possessed under the license may only be used by, or under the direct supervision of, individuals approved by the licensee's radiation safety committee.

(c) Each Type B specific license of broad scope issued under this part shall be subject to the condition that radioactive material possessed under the license may only be used by, or under the direct supervision of, individuals approved by the licensee's radiation safety officer.

(d) Each Type C specific license of broad scope issued under this part shall be subject to the condition that radioactive material possessed under the license may only be used by, or under the direct supervision of, individuals who satisfy the requirements of 10D-56.341(4).

Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History—New 1-1-77.

10D-56.342 Special Requirements for a Specific License to Manufacture, Assemble, Repair, or Distribute Commodities, Products, or Devices Which Contain Radioactive Material.

(1) **Licensing the Introduction of Radioactive Material into Products in Exempt Concentrations.** In addition to the requirements set forth in 10D-56.339 FAC, a specific license authorizing the introduction of radioactive material into a product or material in the possession of the licensee or another to be transferred to persons exempt under 10D-56.333(1)(a) FAC will be issued if:

(a) The applicant submits a description of the product or material into which the radioactive material will be introduced, intended use of the radioactive material and the product or material into which it is introduced, method of introduction, initial concentration of the radioactive material in the product or material, control methods to assure that no more than the specified concentration is introduced into the product or material, estimated time interval between introduction and transfer of the product or material, and estimated concentration of the radioactive material in the product or material at the time of transfer; and

(b) The applicant provides reasonable assurance that the concentrations of radioactive material at the time of transfer will not exceed the concentrations in Schedule A, that reconcentration of the radioactive material in concentrations exceeding those in Schedule A is not likely, that use of lower concentrations is not feasible, and that the product or material is not likely to be incorporated in any food, beverage, cosmetic, drug or other commodity or product designed for ingestion or inhalation by, or application to a human being.

Each person licensed under 10D-56.342(1) FAC shall file an annual report with the Agency which shall identify the type and quantity of each product or material into which radioactive material has been introduced during the reporting period; name and address of the person who owned or possessed the product or material, into which radioactive material has been introduced, at the time of introduction; the type and quantity of radionuclide introduced into each such product or material; and the initial concentrations of the radionuclide in the product or material at time of transfer of the radioactive material by the licensee. If no transfers of radioactive material have been made pursuant to 10D-56.342 (1) FAC during the reporting period, the report shall so indicate. The report shall cover the year ending June 30, and shall be filed within 30 days thereafter.

(2) **Licensing the Distribution of Radioactive Material in Exempt Quantities** [10/]

(a) An application for a specific license to distribute radioactive material other than source or byproduct material to persons exempted from these regulations pursuant to 10D-56.333(2) FAC will be approved if:

1. The radioactive material is not contained in

10/ Authority to transfer possession or control by the manufacturer, processor, or producer of any equipment, device, commodity, or other product containing source material or byproduct material whose subsequent possession, use, transfer, and disposal by all other persons are exempted from regulatory requirements may be obtained only from the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

any food, beverage, cosmetic, drug, or other commodity designed for ingestion or inhalation by, or application to, a human being;

2. The radioactive material is in the form of processed chemical elements, compounds, or mixtures, tissue samples, bioassay samples, counting standards, plated or encapsulated sources, or similar substances, identified as radioactive and to be used for its radioactive properties, but is not incorporated into any manufactured or assembled commodity, product, or device intended for commercial distribution; and

3. The applicant submits copies of prototype labels and brochures and the Agency approves such labels and brochures.

(b) The license issued under 10D-56.342(2)(a) FAC is subject to the following conditions:

1. No more than 10 exempt quantities shall be sold or transferred in any single transaction. However, an exempt quantity may be composed of fractional parts of one or more of the exempt quantity provided the sum of the fractions shall not exceed unity.

2. Each exempt quantity shall be separately and individually packaged. No more than 10 such packaged exempt quantities shall be contained in any outer package for transfer to persons exempt pursuant to 10D-56.333(2) FAC. The outer package shall be such that the dose rate at the external surface of the package does not exceed 0.5 millirem per hour.

3. The immediate container of each quantity or separately packaged fractional quantity of radioactive material shall bear a durable, legible label which a. identifies the radionuclide and the quantity of radioactivity, and b. bears the words "Radioactive Material."

4. In addition to the labeling information required by 10D-56.342(2)(b)3. FAC, the label affixed to the immediate container, or an accompanying brochure, shall a. state that the contents are exempt from U.S. Nuclear Regulatory Commission or Agreement State requirements; b. bear the words "Radioactive Material—Not for Human Use—Introduction into Foods, Beverages, Cosmetics, Drugs, or Medicinals, or into Products Manufactured for Commercial Distribution is Prohibited—Exempt Quantities Should Not be Combined"; and c. set forth appropriate additional radiation safety precautions and instructions relating to the handling, use, storage, and disposal of the radioactive material.

(c) Each person licensed under 10D-56.342(2) FAC shall maintain records of transfer of material for a period of two years after such transfer, identifying, by name and address, each person to whom radioactive material is transferred for use under 10D-56.334(2) FAC of the equivalent regulations of an Agreement State, and stating the kinds and quantities of radioactive material transferred. An annual summary report stating the total quantity of each radionuclide transferred under the specific license shall be filed with the Agency. Each report shall cover the year ending June 30, and shall be filed within thirty (30) days thereafter. If no transfers of radioactive material have been made pursuant to 10D-56.342(2) FAC. during the reporting period, the report shall so indicate.

(3) Licensing the Incorporation of Radioactive Material other than Source or Byproduct Material into Gas and Aerosol Detectors.

An application for a specific license authorizing the incorporation of radioactive material other than source or byproduct material into gas and aerosol detectors to be distributed to persons exempt under 10D-56.333(3)(c) FAC will be approved if the application satisfies requirements equivalent to those contained in Section 32.26 of 10 CFR Part 32.

(4) Licensing the Manufacture and Distribution of Devices to Persons Generally Licensed Under 10D-56.336(4) FAC.

(a) An application for a specific license to manufacture or distribute devices containing radioactive material, excluding special nuclear material, to persons generally licensed under 10D-56.336(4) FAC or equivalent regulations of the U.S. NRC or an Agreement State will be approved if:

1. the applicant satisfies the general requirements of 10D-56.339 FAC;

2. the applicant submits sufficient information relating to the design, manufacture, prototype testing, quality control, labels, proposed uses, installation, leak teating, servicing, operating and safety instructions, and potential hazards of the device to provide reasonable assurance that:

a. the device can be safely operated by persons not having training in radiological protection;

b. under ordinary conditions of handling, storage, and use of the device, the radioactive material contained in the device will not be released or inadvertently removed from the device, and it is unlikely that any person will receive in any period of one calendar quarter a dose in excess of 10% of the limits specified in the table of 10D-56.432(1) FAC; and

and

c. under accident conditions (such as fire and explosion) associated with handling, storage, and use of the device, it is unlikely that any person would receive an external radiation dose or dose commitment in excess of the following organ doses:

Whole body; head and truck . . . . . 15 rems
active blood-forming
organs; gonads; or
lens of eye

Hands and forearms; feet . . . . . 200 rems
and ankles; localized
areas of skin averaged
over areas no larger
than 1 square centimeter

Other organs . . . . . 50 rems

3. Each device bears a durable, legible, clearly visible label or labels approved by the Agency, which contain in a clearly identified and separate statement:

a. Instructions and precautions necessary to assure safe installation, operation, and servicing of the device (documents such as operating and service manuals may be identified in the label and used to provide this information);

b. the requirement, or lack of requirement, for leak testing, or for testing any on-off mechanism and indicator, including the maximum time interval for such testing, and the identification of radioactive

material by isotope, quantity of radioactivity, and date of determination of the quantity; and

c. the information called for in the following statement in the same or substantially similar form:

The receipt, possession, use, and transfer of this device Model_____[11/] Serial No._____[11/] are subject to a general license or the equivalent and the regulations of the U.S. NRC or a State with which the NRC has entered into an agreement for the exercise of regulatory authority. This label shall be maintained on the device in a legible condition. Removal of this label is prohibited.

CAUTION-RADIOACTIVE MATERIAL

_____

(name of manufacturer or distributor.)

(b) In the event the applicant desires that the device be required to be tested at intervals longer than six months, either for proper operation of the on-off mechanism and indicator, if any, or for leakage of radioactive material or for both, he shall include in his application sufficient information to demonstrate that such longer interval is justified by performance characteristics of the device or similar devices and by design features which have a significant bearing on the probability or consequences of leakage of radioactive material from the device or failure of the on-off mechanism and indicator. In determining the acceptable interval for the test for leakage of radioactive material, the Agency will consider information which includes, but is not limited to:

1. primary containment (source capsule);
2. protection of primary containment;
3. method of sealing containment;
4. containment construction materials;
5. form of contained radioactive material;
6. maximum temperature withstood during prototype tests;
7. maximum pressure withstood during prototype tests;
8. maximum quantity of contained radioactive material;
9. radiotoxicity of contained radioactive material; and
10. operating experience with identical devices or similarly designed and constructed devices.

(c) In the event the applicant desires that the general licensee under 10D-56.336(4) FAC, or under equivalent regulations of the NRC or an Agreement State, be authorized to install the device, collect the sample to be analyzed by a specific licensee for leakage of radioactive material, service the device, test the on-off mechanism and indicator, or remove the device from installation, he shall include in his application written instructions to be followed by the general licensee, estimated calendar quarter doses associated with such activity or activities, and bases for such estimates. The submitted information shall demonstrate that performance of such activities by an individual untrained in radiological protection, in addition to other handling, storage, and use of devices under the general license, is unlikely to cause that individual to receive a calendar quarter dose in excess of 10% of the limits specified in the table in 10D-56.432(1) FAC.

[11/] The model, serial number, and name of the manufacturer or distributor may be omitted from this label provided they are elsewhere specified in labeling affixed to the device.

(d) Each person licensed under 10D-56.342(4) FAC to distribute devices to generally licensed persons shall:

1. furnish a copy of the general license contained in 10D-56.336(4) FAC to each person to whom he directly or through an intermediate person transfers radioactive material in a device for use pursuant to the general license in 10D-56.336(4) FAC.

2. Furnish a copy of the general license contained in the NRC or Agreement State's regulation equivalent to 10D-56.336(4) FAC, or alternatively, furnish a copy of the general license contained in 10D-56.336(4) FAC to each person to whom he directly or through an intermediate person transfers radioactive material of the NRC or the Agreement State. If a copy of the general license in 10D-56.336(4) FAC is furnished to such a person, it shall be accompanied by a note explaining that the use of the device is regulated by the U.S. NRC or Agreement State under requirements substantially the same as those in 10D-56.336(4) FAC.

3. Report to the Agency all transfers of such devices to persons for use under the general license in 10D-56.336(4) FAC. 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 the device transferred, and the quantity and type of radioactive material contained in the device. If one or more intermediate persons will temporarily possess the device at the intended place of use prior to its possession by the user, the report shall include identification of each intermediate person by name, address, contact, and relationship to the intended user. If no transfers have been made to persons generally licensed under 10D-56.336(4) FAC during the reporting period, the report shall so indicate. The report shall cover each calendar quarter and shall be filed within 30 days thereafter.

4.a. Report to the NRC all transfers of such devices to persons for use under the NRC general license in Section 31.5 of 10 CFR Part 31.

b. Report to the responsible Agreement State agency all transfers of such devices to persons for use under a general license in an Agreement State's regulations equivalent to 10D-56.336(4) FAC.

c. Such reports 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 general licensee, the type and model of the device transferred, and the quantity and type of radioactive material contained in the device. If one or more intermediate persons will temporarily possess the device at the intended place of use prior to its possession by the user, the report shall include identification of each intermediate person by name, address, contact, and relationship to the intended user. The report shall be submitted within 30 days after the end of each calendar quarter in which such a device is transferred to the generally licensed person.

d. If no transfers have been made to NRC licensees during the reporting period, this information shall be reported to the NRC.

e. 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 upon request of the agency.

5. Keep records showing the name, address, and the point of contact for each general licensee to whom he directly or through an intermediate person transfers radioactive material in devices for use pursuant to the general license provided in 10D-56.336(4) FAC, or equivalent regulations of the NRC or an Agreement State. The records should show the date of each transfer, the isotope and the quantity of radioactivity in each device transferred, the identity of any intermediate person, and compliance with the report requirements of this section. The records required by this paragraph shall be maintained for a period of five years from the date of the recorded event.

(5) **Special Requirements for the Manufacture, Assembly, or Repair of Luminous Safety Devices for Use in Aircraft.** An application for a specific license to manufacture, assemble, or repair luminous safety devices containing tritium or promethium-147 for use in aircraft, for distribution to persons generally licensed under 10D-56.336(5) FAC will be approved subject to the following conditions:

(a) The applicant satisfies the general requirements specified in 10D-56.339 FAC, and

(b) The applicant satisfies the requirments of Section 32.53, 32.54, 32.55, 32.56, 32.101 or 10 CFR Part 32 or their equivalent.

(6) **Special Requirements for License to Manufacture Calibration Sources Containing Americium-241 or Plutonium for Distribution to Persons Generally Licensed Under 10D-56.336 (6) FAC.** An application for a specific license to manufacture calibration sources containing Americium-241 or Plutonium to persons generally licensed under 10D-56.336(6) FAC will be approved subject to the following conditions:

(a) The applicant satisfies the general requirement of 10D-56.339 FAC, and

(b) The applicant satisfies the requirements of Sections 32.57, 32.58, 32.59, 32.60, 32.102 of 10 CFR Part 32 and Section 70.39 of 10 CFR Part 70 or their equivalent.

(7) **Manufacture and Distribution of Radioactive Material for Medical Use Under General License.** In addition to requirements set forth in 10D-56.339, a specific license authorizing the distribution of radioactive material for use by physicians under the general license in 10D-56.336(1) will be issued if:

(a) The applicant submits evidence that the radioactive material is to be manufactured, labeled, and packaged in accordance with a new drug application which the Commissioner of Food and Drugs, Food and Drug Administration, has approved, or in accordance with a license for a biologic product issued by the Secretary, Department of Helath, Education, and Welfare; and

(b) The following statement, or a substantially similar statement which contains the information called for in the following statement, appears on the label affixed to the container or appears in the leaflet or brochure which accompanies the package:

> This radioactive drug may be received, possessed, and used only by physicians licensed [to dispense drugs] in the practice of medicine. Its receipt, possession, use and transfer are subject to the regulations and a general license or its equivalent of the U.S. Nuclear Regulatory Commission or of a State with which the Commission has entered into an agreement for the exercise of regulatory authority.
>
> _____
>
> Name of manufacture r

(8) **Manufacture and Distribution of Radioactive Material For Certain in Vitro Clinical or Laboratory Testing Under General License.** An application for a specific license to manufacture or distribute radioactive material for use under the general license of 10D-56.336(8) FAC will be approved if:

(a) The applicant satisfies the general requirements specified in 10D-56.339 FAC.

(b) The radioactive material is to be prepared for distribution in prepackaged units of:

1. Iodine-125 in units not exceeding 10 microcuries each.
2. Iodine-131 in units not exceeding 10 microcuries each.
3. Carbon-14 in units not exceeding 10 microcuries each.
4. Hydrogen-3 (tritium) in units not exceeding 50 microcuries each.
5. Iron-59 in units not exceeding 20 microcuries each.

(c) Each prepackaged unit bears a durable, clearly visible label'

1. Identifying the radioactive contents as to chemical form and radionuclide, and indicating that the amount of radioactivity does not exceed 10 microcuries of iodine-125, iodine-131, or carbon-14; 50 microcuries of hydrogen-3 (tritium); or 20 microcuries of iron-59; and

2. Displaying the radiation caution symbol described in 10D-56.441(1)(a) FAC and the words, "CAUTION, RADIOACTIVE MATERIAL", and "Not for Internal or External Use in Humans or Animals".

(d) The following statements, or a substantially similar statement which contains the information called for in the following statement, appears on a label affixed to each prepackaged unit or appears in a leaflet or brochure which accompanies the package:

> This radioactive material may be received, acquired, possessed, and used only by physicians, clinical laboratories or hospitals and only for in vitro clincial or laboratory tests not involving internal or external administration of the material, or the radiation therefrom, to human beings or animals. Its receipt, acquisition, possession, use, and transfer are subject to the regulations and a general license of the United States Nuclear Regulatory Commission or of a State with which the Commission has entered into an agreement for the exercise of regulatory authority.
>
> _____
>
> Name of manufacturer

(e) The label affixed to the unit, or the leaflet or brochure which accompanies the package, contains adequate information as to the precautions to be observed in handling and storing such radioactive material.

(9) **Licensing the Manufacture and Distribution of Ice Detection Devices.** An application for a specific license to manufacture and distribute ice detection devices to persons generally licensed under 10D-56.336(9) FAC will be approved subject to the following conditions: (a) the applicant satisfies the general requirements of 10D-56.339 FAC, and (b) the criteria of Sections 32.61, 32.62, 32.63, 32.103 of 10 CFR Part 32 are met.

(10) **Manufacture and distribution of radiopharmaceuticals containing radioactive material for medical use under group licenses.**

(a) An application for a specific license to manufacture and distribute radiopharmaceuticals containing radioactive material for use by persons licensed pursuant to 10D-56.340(3) FAC for the uses listed in Group I, Group II, IV, or V of Schedule C of this part will be approved if:

1. The applicant satisfies the general requirements specified in 10D-56.339 FAC of this part;

2. The applicant submits evidence that:

a. The radiopharmaceutical containing radioactive material will be manufactured, labeled, and packed in accordance with the Federal Food, Drug and Cosmetic Act or the Public Health Service Act, such as a new drug application (NDA) approved by the Food and Drug Administration (FDA), a biologic product license issued by FDA or a "Notice of Claimed Investigational Exemption for a New Drug" (IND) that has been accepted by the FDA; or

b. The manufacture and distribution of the radiopharmaceutical containing radioactive material is not subject to the Federal Food, Drug, and Cosmetic Act and the Public Health Service Act.

3. The applicant submits information on the radionuclide, chemical and physical form, packaging including maximum activity per package, and shielding provided by the packaging of the radioactive material which is appropriate for safe handling and storage of radiopharmaceuticals by group licensees; and

4.a. The label affixed to each package of the radiopharmaceutical contains information on the radionuclide, quantity, and date of assay and the label affixed to each package, or the leaflet or brochure which accompanies each package, contains a statement that the radiopharmaceutical is licensed by the Agency for distribution to persons licensed pursuant to 10D-56.340(3) FAC and Schedule C Group I, Group II, Group IV, and V of Part C, as appropriate, or under equivalent licenses of the U.S. Nuclear Regulatory Commission or an Agreement State or that an application for such license has been filed with the Agency within 60 days of the effective date of the regulations of those respective agencies and is still pending.

b. The labels, leaflets or brochures required by this paragraph are in addition to the labeling required by the Food and Drug Administration (FDA) and they may be separate from or, with the approval of FDA, may be combined with the labeling required by FDA.

(b) If an application is filed pursuant to 10D-56.342(10)(a) FAC within 60 days of the effective date of these regulations for a license to manufacture and distribute a radiopharmaceutical that was distributed commercially on or before the effective date of these regulations, the applicant may continue the distribution of such radiopharmaceutical to group licensees until the Agency issues the license or notifies the applicant otherwise.

(11) **Manufacture and distribution of generators or reagent kits for preparation of radiopharmaceuticals containing radioactive material.**

(a) An application for a specific license to

(a) An application for a specific license to manufacture and distribute generators or reagent kits containing radioactive material for preparation of radiopharmaceuticals by persons licensed pursuant to 10D-56.340(3) FAC for the uses listed in Group III of Schedule C of this part will be approved if:

1. The applicant satisfies the general requirements specified in 10D-56.339 FAC of this part;

2. The applicant submits evidence that:

a. The generator or reagent kit is to be manufactured, labeled and packaged in accordance with the Federal Food, Drug, and Cosmetic Act, such as a new drug application (NDA) approved by the Food and Drug Administration (FDA), a biologic product license issued by FDA, or a "Notice of Claimed Investigational Exemption for a New Drug" (IND) that has been accepted by the FDA; or

b. The manufacture and distribution of the generator or reagent kit are not subject to the Federal Food, Drug, and Cosmetic Act and the Public Health Service Act.

3. The applicant submits information on the radionuclide, chemical and physical form, packaging including maximum activity per package, and shielding provided by the packaging of the radioactive material contained in the generator or reagent kit;

4. The label affixed to the generator or reagent kit contains information on the radionuclide, quantity, and date of assay; and

5. The label affixed to the generator or reagent kits, or the leaflet or brochure which accompanies the generator or reagent kit, contains:

a. Adequate information, from a radiation safety standpoint, on the procedures to be followed and the equipment and shielding to be used in eluting the generator or processing radioactive material with the reagent kit, and

b. A statement that this generator or reagent kit (as appropriate) is approved for use by persons licensed by the Agency pursuant to 10D-56.340(3) FAC and Schedule C Group III of Part 3 or under equivalent licenses of the U.S. Nuclear Regulatory Commission or an Agreement State, or that an application for such license has been filed with the Agency within 60 days of the effective date of the regulations of those respective agencies and is still pending. The labels, leaflets, or brochures required by this paragraph are in addition to the labeling required by FDA and they may be separate from or, with the approval of FDA, may be combined with the labeling required by FDA.

(b) If an application is filed pursuant to 10D-56.342(11)(a) FAC within 60 days of the effective date of these regulations, for a license to manufacture and distribute a generator or reagent kit that was distributed commercially on or before the effective date of these regulations, the applicant may continue the distribution of such generator or reagent kit until the Agency issues the license or notifies the applicant otherwise.

NOTE: Although the Agency does not regulate the manufacture and distribution of reagent kits that do not contain radioactive material, it does regulat the use of such reagent kits for the preparation of radiopharmaceuticals containing radioactive material as part of its licensing and regulation of the users of radioactive material. Any manufacturer of reagent kits that do not contain radioactive material who desires to have his reagent kits approved by the Agency for use by persons licensed pursuant to 10D-56.340(3) FAC and Group III of Schedule C of this part may submit the pertinent information specified in 10D-56.342(11) FAC.

(12) **Manufacture and distribution of sources or devices containing radioactive material for medical use.**

(a) An application for a specific license to manufacture and distribute sources and devices containing radioactive material to persons licensed pursuant to 10D-56.340(3) FAC for the use as a calibration or reference source or for the uses listed in Group VI of Schedule C of this part will be approved if:

1. The applicant satisfies the general requirements in 10D-56.339 FAC of this part;

2. The applicant submits sufficient information regarding each type of source or device pertinent to an evaluation of its radiation safety, including:

a. The radioactive material contained, its chemical and physical form, and amount;

b. Details of design and construction of the source or device;

c. Procedures for, and results of, prototype tests to demonstrate that the source or device will maintain its integrity under stresses likely to be encountered in normal use and accidents;

d. For devices containing radioactive material, the radiation profile of a prototype device;

e. Details of quality control procedure to assure that production sources and devices meet the standards of the design and prototype tests;

f. Procedures and standards for calibrating sources and devices;

g. Legend and methods for labeling sources and devices as to their radioactive content;

h. Instruction for handling and storing the source or device from the radiation safety standpoint; provided, that these instructions are to be included on a durable label attached to the source or device or attached to a permanent storage container for the source or device; provided, that instructions which are too lengthy for such label may be summarized on the label and printed in detail on a brochure which is referenced on the label;

3. The label affixed to the source or device, or to the permanent storage container for the source or device, contains information on the radionuclide, quantity, and date of assay, and a statement that the (name of source or device) is licensed by the Agency for distribution to persons licensed pursuant to 10D-56.340(3) FAC and Schedule C group VI of this part or under equivalent licenses of the U.S. Nuclear Regulatory Commission or an Agreement State or that a pending application for such license has been filed with the Agency within 60 days of the effective date of the regulations of thos respective agencies provided, that such labeling for sources which do not require long term storage (e.g., Gold-198 seeds) may be on a leaflet or brochure which accompanies the source.

(b)1. In the event the applicant desires that the source or device be required to be tested for leakage of radioactive material at intervals longer than six months, he shall include in his application sufficient information to demonstrate that such longer interval is justified by performance characteristics of the source or device or similar sources or devices and by design features that have a significant bearing on the probability or consequences of leakage of radioactive material from the source.

2. In determining the acceptable interval for test of leakage of radioactive material, the Agency will consider information that includes, but is not limited to:

a. Primary containment (source capsule);

b. Protection of primary containment;

c. Method of sealing containment;

d. Containment construction materials;

e. Form of contained radioactive material;

f. Maximum temperature withstood during prototype tests;

g. Maximum pressure withstood during prototype tests;

h. Maximum quantity of contained radioactive material;

i. Radiotoxicity of contained radioactive material; and

j. Operating experience with identical sources or devices or similarly designed and constructed sources or devices.

(c) If an application is filed pursuant to 10D-56.342(12)(a) FAC within 60 days of the effective date of these regulations for a license to manufacture and distribute a source or device that was distributed commercially on or before the effective date of these regulations, the applicant may continue the distribution of such source or device to group licensees until the Agency issues the license or notifies the applicant otherwise.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History—New 1-1-77.

10D-56.343 Reserved.

10D-56.344 Issuance of Specific Licenses.

(1) Upon a determination that an application meets the requirements of the Act and the regulations of the Agency, the Agency will issue a specific license authorizing the proposed activity in such form and containing such conditions and limitations as it deems appropriate or necessary.

(2) The Agency 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 radioactive material subject to this part as it deems appropriate or necessary in order to:

(a) Minimize danger to public health and safety or property;

(b) Require such reports and the keeping of such records, and to provide for such inspections of activities under the license as may be appropriate or necessary; and

(c) Prevent loss or theft of material subject to this part.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10, 381, 386 FS. History—New 1-1-77.

10D-56.345 Specific Terms and Conditions of Licenses.

(1) Each license issued pursuant to 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 Agency.

(2) No license issued or granted under this part and no right to possess or use radioactive material granted by any license issued pursuant to 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 Agency 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.

(3) Each person licensed by the Agency pursuant to this part shall confine use and possession of the material licensed to the locations and purposes authorized in the license.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History—New 1-1-77.

10D-56.346 Expiration of Licenses. Except as provided in 10D-56.347(2) FAC, each specific license shall expire at the end of the day, in the month and year stated therein.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History—New 1-1-77.

10D-56.347 Renewal of Licenses.

(1) Applications for renewal of specific licenses shall be filed in accordance with 10D-56.338 FAC.

(2) 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 authorizing the same activities, such existing license shall not expire until the application has been finally determined by the Agency.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History—New 1-1-77.

10D-56.348 Amendment of Licenses at Request of Licensee. Applications for amendment of a license shall be filed in accordance with 10D-56 338 FAC and shall specify the respects in which the licensee desires his license to be amended and the grounds for such amendment.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History—New 1-1-77.

10D-56.349 Agency Action on Applications to Renew or Amend. In considering an application by a licensee to renew or amend his license, the Agency will apply the criteria set forth in 10D-56.339 FAC and 10D-56.340 FAC, or 10D-56.342 FAC as applicable.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History—New 1-1-77.

10D-56.350 Reserved.

10D-56.351 Transfer of Material.

(1) No licensee shall transfer radioactive material except as authorized pursuant to this section.

(2) Except as otherwise provided in his license and subject to the provisions of 10D-56.351(3) and (4) FAC, any licensee may transfer radioactive material:

(a) To the Agency;[12/]

(b) To the U.S. Nuclear Regulatory Commission;

(c) To any person exempt from the regulations in this part to the extent permitted under such exemption;

(d) To any person authorized to receive such material under terms of a general license or its equivalent, or a specific license or equivalent licensing document, issued by the Agency, the U.S. Nuclear Regulatory Commission, or any Agreement State, or to any person otherwise authorized to receive such material by the Federal Government or any agency thereof, the Agency, or any Agreement State; or

(e) As otherwise authorized by the Agency in writing.

(3) Before transferring radioactive material to a specific licensee of the Agency, the U.S. Nuclear Regulatory Commission, or an Agreement State, or to a general licensee who is required to register with the Agency, the U.S. Nuclear Regulatory Commission, or an Agreement State prior to receipt of the radioactive material, the licensee transferring the material shall verify that the transferee's license authorizes the receipt of the type, form, and quantity of radioactive material to be transferred.

(4) The following methods for the verification required by 10D-56.351(3) FAC are acceptable:

(a) The transferor may have in his possession, and read, a current copy of the transferee's specific license or registration certificate;

(b) The transferor may have in his possession a written certification by the transferee that he is authorized by the license or registration certificate to receive the type, form, and quantity of radioactive material to be transferred, specifying the license or registration certificate number, issuing agency, and expiration date;

(c) 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 radioactive 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 ten (10) days;

(d) The transferor may obtain other sources of information compiled by a reporting service from official records of the Agency, the U.S. Nuclear Regulatory Commission, or the licensing agency of an Agreement State as to the identity of licensees and the scope and expiration dates of licenses; or

(e) When none of the methods of verification described in 10D-56.351(4)(a) to (d) FAC 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 Agency, the U.S. Nuclear Regulatory Commission, or the licensing Agency of an Agreement State that the transferee is licensed to receive the radioactive material.

(5) Preparation for shipment and transport of radioactive material shall be in accordance with the provisions of 10D-56.354 FAC.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History—New 1-1-77.

12/ A licensee may transfer material to the Agency only after receiving prior approval from the Agency.

10D-56.352 Modification, Revocation, and Termination of Licenses.

(1) The terms and conditions of all licenses shall be subject to amendment, revision, or modification or the license may be suspended or revoked by reason of amendments to the Act, or by reason of rules, regulations, and orders issued by the Agency.

(2) 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 provisions 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 Agency 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 of the license, or of any rule, regulation, or order of the Agency.

(3) 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.

(4) The Agency may terminate a specific license upon request submitted by the licensee to the Agency in writing.

Specific Authority 290.10 fS. Law Implemented 290.051(1), 290.15, 381, 386 FS. History—New 1-1-77.

PART 3D
RECIPROCITY

10D-56.353 Reciprocal Recognition of Licenses.

(1) Subject to these regulations, any person who holds a specific license from the U.S. Nuclear Regulatory Commission or any Agreement State, and issued by the agency having jurisdiction where the licenseee maintains an office for directing the licensed activity and at which radiation safety records are normally maintained, is hereby granted a general license to conduct the activities authorized in such licensing document within this State for a period not in excess of 180 days in any calendar year provided that:

(a) The licensing document does not limit the activity authorized by such document to specified installations or locations;

(b) The out-of-state licensee notifies the Agency in writing at least ten (10) days prior to engaging in such activity. Such notification shall indicate the location, period, and type of proposed possession and use within the State, and shall be accompanied by a copy of the pertinent licensing document. If, for a specific case, the ten (10) day period would impose an under hardship on the out-of-state licensee, he may, upon application to the Agency, obtain permission to proceed sooner. The Agency may waive the requirement for filing additional written notifications during the remainder of the calendar year following the receipt of the initial notification from a person engaging in activities under the general license provided in 10D-56.353 FAC;

(c) The out-of-state licensee complies with all applicable regulations of the Agency and with all the terms and conditions of his licensing document, except any such terms and conditions which may be inconsistent with applicable regulations of the Agency;

(d) The out-of-state licensee supplies such other information as the Agency may request; and

(e) The out-of-state licensee shall not transfer or dispose of radioactive material possessed or used under the general license provided in this section except by transfer to a person:

1. specifically licensed by the Agency or by the U.S. Nuclear Regulatory Commission to receive such material, or

2. exempt from the requirements for a license for such material under 10D-56.333(1) FAC.

(2) Notwithstanding the provisions of 10D-56.333(1) FAC, any person who holds a specific license issued by the U.S. Nuclear Regulatory Commission or an Agreement State authorizing the holder to manufacture, transfer, install, or service a device described in 10D-56.336(4)(a) FAC within areas subject to the jurisdiction of the licensing body is hereby granted a general license to install, transfer, demonstrate or service such a device in this State provided that:

(a) Such person shall file a report with the Agency within thirty (30) days after the end of each calendar quarter in which any device is transferred to or installed in this State. Each such report shall identify each general licensee to whom such device is transferred by name and address, the type of device transferred, and the quantity and type of radioactive material contained in the device;

(b) The device has been manufactured, labeled, installed, and serviced in accordance with applicable provisions of the specific license issued to such person by the U.S. Nuclear Regulatory Commission or an Agreement State;

(c) Such person shall assure that any labels required to be affixed to the device under regulations of the authority which licensed manufacture of the device bear a statement that "Removal of this label is prohibited"; and

(d) The holder of the specific license shall furnish to each general licensee to whom he transfers such device or to whose premises he installs such device a copy of the general license contained in 10D-56.336(4) FAC.

(3) The Agency may withdraw, limit, or qualify its acceptance of any specific license or equivalent licensing document issued by another agency, or any product distributed pursuant to such licensing document, upon determining that such action is necessary in order to prevent undue hazard to public health and safety or property.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(4), 381, 386 FS. History—New 1-1-77.

PART 3E
TRANSPORTATION

10D-56.354 Preparation of Radioactive Material for Transport.

(1) No licensee shall deliver any radioactive material to carrier[13/] for transport, unless:

(a) The licensee complies with the applicable requirements of the regulations, appropriate to the mode of transport, of the U.S. Department of Transportation insofar as such regulations relate to the packing of radioactive material, and to the monitoring, marking and labeling of those packages;

(b) The licensee has established procedures for opening and closing packages in which radioactive material is transported to provide safety and to assure that, prior to the delivery to a carrier for transport, each package is properly closed for transport; and

(c) Prior to delivery of a package to a carrier for transport, the licensee shall assure that any special instructions needed to safely open the package are sent to, or have been available to the consignee.

(2) Paragraph (1) of 10D-56.354 shall not apply to the transportation of licensed material, or to the delivery of licensed material to a carrier for transport, where such transportation is already subject to the regulations of the U.S. Department of Transportation or the U.S. Postal Service.

Specific Authority 381.512 FS. Law Implemented 381.512 FS. History—New 1-1-77.

13/ For the purpose of this regulation, a licensee who transports his own licensed material as a private carrier is considered to have delivered such material to a carrier for transport.

PART 3

SCHEDULE A
EXEMPT CONCENTRATIONS

Element (atomic number)	Isotope	Column I Gas concentration uCi/ml[1]	Column II Liquid and solid concentration uCi/ml[2]
Antimony (51)	Sb 122		$3x10^{-4}$
	Sb 124		$2x10^{-4}$
	Sb 125		$1x10^{-3}$
Argon (18)	A 37	$1x10^{-3}$	
	A 41	$4x10^{-7}$	
Arsenic (33)	As 73		$5x10^{-3}$
	As 74		$5x10^{-4}$
	As 76		$2x10^{-4}$
	As 77		$8x10^{-4}$
Barium (56)	Ba 131		$2x10^{-3}$
	Ba 140		$3x10^{-4}$
Beryllium (4)	Be 7		$2x10^{-2}$
Bismuth (83)	Bi 206		$4x10^{-4}$
Bromine (35)	Br 82	$4x10^{-7}$	$3x10^{-3}$
Cadmium (48)	Cd 109		$2x10^{-3}$
	Cd 115m		$3x10^{-4}$
	Cd 115		$3x10^{-4}$
Calcium (20)	Ca 45		$9x10^{-5}$
	Ca 47		$5x10^{-4}$
Carbon (6)	C 14	$1x10^{-6}$	$8x10^{-3}$
Cerium (58)	Ce 141		$9x10^{-4}$
	Ce 143		$4x10^{-4}$
	Ce 144		$1x10^{-4}$
Cesium (55)	Cs 131		$2x10^{-2}$
	Cs 134m		$6x10^{-2}$
	Cs 134		$9x10^{-5}$
Chlorine (17)	Cl 38	$9x10^{-7}$	$4x10^{-3}$
Chromium (24)	Cr 51		$2x10^{-2}$
Cobalt (27)	Co 57		$5x10^{-3}$
	Co 58		$1x10^{-3}$
	Co 60		$5x10^{-4}$
Copper (29)	Cu 64		$3x10^{-3}$
Dysprosium (66)	Dy 165		$4x10^{-3}$
	Dy 166		$4x10^{-4}$

Erbium (68)	Er 169		$9x10^{-4}$
	Er 171		$1x10^{-3}$
Europium (63)	Eu 152 (T_r=9.2 h)		$6x10^{-4}$
	Eu 155		$2x10^{-3}$
Fluorine (9)	F 18	$2x10^{-6}$	$8x10^{-3}$
Gadolinium (64)	Gd 153		$2x10^{-3}$
	Gd 159		$8x10^{-4}$
Gallium (31)	Ga 72		$4x10^{-4}$
Germanium (32)	Ge 71		$2x10^{-2}$
Gold (79)	Au 196		$2x10^{-3}$
	Au 198		$5x10^{-4}$
	Au 199		$2x10^{-3}$
Hafnium (72)	Hf 181		$7x10^{-4}$
Hydrogen (1)	H 3	$5x10^{-6}$	$3x10^{-2}$
Indium (49)	In 113m		$1x10^{-2}$
	In 114m		$2x10^{-4}$
Iodine (53)	I 126	$3x10^{-9}$	$2x10^{-5}$
	I 131	$3x10^{-9}$	$2x10^{-5}$
	I 132	$8x10^{-8}$	$6x10^{-4}$
	I 133	$1x10^{-8}$	$7x10^{-5}$
	I 134	$2x10^{-7}$	$1x10^{-3}$
Iridium (77)	Ir 190		$2x10^{-3}$
	Ir 192		$4x10^{-4}$
	Ir 194		$3x10^{-4}$
Iron (26)	Fe 55		$8x10^{-3}$
	Fe 59		$6x10^{-4}$
Krypton (36)	Kr 85m	$1x10^{-6}$	
	Kr 85	$3x10^{-6}$	
Lanthanum (57)	La 140		$2x10^{-4}$
Lead (82)	Pb 203		$4x10^{-3}$
Lutetium (71)	Lu 177		$1x10^{-3}$
Manganese (25)	Mn 52		$3x10^{-4}$
	Mn 54		$1x10^{-3}$
	Mn 56		$1x10^{-3}$
Mercury (80)	Hg 197m		$2x10^{-3}$
	Hg 197		$3x10^{-3}$
	Hg 203		$2x10^{-4}$
Molybdenum (42)	Mo 99		$2x10^{-3}$
Neodymium (60)	Nd 147		$6x10^{-4}$
	Nd 149		$3x10^{-3}$
Nickel (28)	Ni 65		$1x10^{-3}$
Niobium (Columbium)(41)	Nb 95		$1x10^{-3}$
	Nb 97		$9x10^{-3}$
Osmium (76)	Os 185		$7x10^{-4}$
	Os 191m		$3x10^{-2}$
	Os 191		$2x10^{-3}$
	Os 193		$6x10^{-4}$
Palladium (46)	Pd 103		$3x10^{-3}$
	Pd 109		$9x10^{-4}$
Phosphorus (15)	P 32		$2x10^{-4}$
Platinum (78)	Pt 191		$1x10^{-3}$
	Pt 193m		$1x10^{-2}$
	Pt 197m		$1x10^{-2}$
	Pt 197		$1x10^{-3}$
Polonium (84)	Po 210		$7x10^{-6}$
Potassium (19)	K 42		$3x10^{-3}$
Praseodymium (59)	Pr 142		$3x10^{-4}$
	Pr 143		$5x10^{-4}$
Promethium (61)	Pm 147		$2x10^{-3}$
	Pm 149		$4x10^{-4}$
Radium (88)	Ra 226		$1x10^{-7}$
	Ra 228		$3x10^{-7}$
Rhenium (75)	Re 183		$6x10^{-3}$
	Re 186		$9x10^{-4}$
	Re 188		$6x10^{-4}$
Rhodium (45)	Rh 103m		$1x10^{-1}$
	Rh 105		$1x10^{-3}$
Rubidium (37)	Rb 86		$7x10^{-4}$

Ruthenium (44)	Ru 97		$4x10^{-3}$
	Ru 105		$1x10^{-3}$
	Ru 106		$1x10^{-4}$
Samarium (62)	Sm 153		$8x10^{-4}$
Scandium (21)	Sc 46		$4x10^{-4}$
	Sc 47		$9x10^{-4}$
	Sc 48		$3x10^{-4}$
Selenium (34)	Se 75		$3x10^{-3}$
Silicon (14)	Si 31		$9x10^{-3}$
Silver (47)	Ag 105		$1x10^{-3}$
	Ag 110m		$3x10^{-4}$
	Ag 111		$4x10^{-4}$
Sodium (11)	Na 24		$2x10^{-3}$
Strontium (38)	Sr 85		$1x10^{-3}$
	Sr 89		$1x10^{-4}$
	Sr 91		$7x10^{-4}$
	Sr 92		$7x10^{-4}$
Sulfur (16)	S 35	$9x10^{-8}$	$6x10^{-4}$
Tantalum (73)	Ta 182		$4x10^{-4}$
Technetium (43)	Tc 96m		$1x10^{-1}$
	Tc 96		$1x10^{-3}$
Tellurium (52)	Te 125m		$2x10^{-3}$
	Te 127		$3x10^{-3}$
	Te 129m		$3x10^{-4}$
	Te 131m		$6x10^{-4}$
	Te 132		$3x10^{-4}$
Terbium (65)	Tb 160		$4x10^{-4}$
Thallium (81)	Tl 200		$4x10^{-3}$
	Tl 201		$2x10^{-3}$
	Tl 202		$1x10^{-3}$
	Tl 204		$1x10^{-3}$
Thulium (69)	Tm 170		$5x10^{-4}$
	Tm 171		$5x10^{-3}$
Tin (50)	Sn 113		$9x10^{-4}$
	Sn 125		$2x10^{-4}$
Tungsten (Wolfram) (74)	W 181		$4x10^{-3}$
	W 187		$7x10^{-4}$
Vanadium (23)	V 48		$3x10^{-4}$
Xenon (54)	Xe 131m	$4x10^{-6}$	
	Xe 133	$3x10^{-6}$	
	Xe 135	$1x10^{-6}$	
Ytterbium (70)	Yb 175		$1x10^{-3}$
Yttrium (39)	Y 90		$2x10^{-4}$
	Y 91m		$3x10^{-2}$
	Y 92		$6x10^{-4}$
	Y 93		$3x10^{-4}$
Zinc (30)	Zn 65		$1x10^{-3}$
	Zn 69m		$7x10^{-4}$
	Zn 69		$2x10^{-2}$
Zirconium (40)	Zr 95		$6x10^{-4}$
	Zr 97		$2x10^{-4}$
Beta and/or gamma emitting radioactive material not listed above with half-life less than 3 years		$1x10^{-10}$	$1x10^{-6}$

NOTE 1: Many radioisotopes disintegrate into isotopes which are also radioactive. In expressing the concentrations in Schedule A the activity stated is that of the parent isotope and takes into account the daughters.

NOTE 2: For purposes of Section 10D-56.334 where there is involved a combination of isotopes, the limit for the combination should be derived as follows: Determine for each isotope in the product the ratio between the concentration present in the product and the exempt concentration established in Schedule A for the specific isotope when not in combination. The sum of such ratios may not exceed "1" (i.e., unity).

EXAMPLE:

$$\frac{\text{Concentration of Isotope A in Product}}{\text{Exempt concentration of Isotope A}} + \frac{\text{Concentration of Isotope B in Product}}{\text{Exempt concentration of Isotope B}} \leqq 1$$

1/ Values are given in Column I only for those materials normally used as gases

2/ uCi/gm are for solids

PART 3

SCHEDULE B

EXEMPT QUANTITIES

Radioactive Material	Microcuries
Antimony 122 (Sb 122)	100
Antimony 124 (Sb 124)	10
Antimony 125 (Sb 125)	10
Arsenic 73 (As 73)	100
Arsenic 74 (As 74)	10
Arsenic 76 (As 76)	10
Arsenic 77 (As 77)	100
Barium 131 (Ba 131)	10
Barium 133 (Ba 133)	10
Barium 140 (Ba 140)	10
Bismuth 210 (Bi 210)	1
Bromine 82 (Br 82)	10
Cadmium 109 (Cd 109)	10
Cadium 115m (Cd 115m)	10
Cadmium 115 (Cd 115)	100
Calcium 45 (Ca 45)	10
Calcium 47 (Ca 47)	10
Carbon 14 (C 14)	100
Cerium 141 (Ce 141)	100
Cerium 143 (Ce 143)	100
Cerium 144 (Ce 144)	1
Cesium 129 (Cs 129)	100
Cesium 131 (Cs 131)	1,000
Cesium 134m (Cs 134m)	100
Cesium 134 (Cs 134)	1
Cesium 135 (Cs 135)	10
Cesium 136 (Cs 136)	10
Cesium 137 (Cs 137)	10
Chlorine 36 (Cl 36)	10
Chlorine 38 (Cl 38)	10
Chromium 51 (Cr 51)	1,000
Cobalt 57 (Co 57)	100
Cobalt 58m (Co 58m)	10
Cobalt 58 (Co 58)	10
Cobalt 60 (Co 60)	1
Copper 64 (Cu 64)	100
Dysprosium 165 (Dy 165)	10
Dysprosium 166 (Dy 166)	100
Erbium 169 (Er 169)	100
Erbium 171 (Er 171)	100
Europium 152 (Eu $152m_1$) 9.2 h	100
Europium 152 (Eu $152m_2$) 13 yr	1
Europium 154 (Eu 154)	1
Europium 155 (Eu 155)	10
Flourine 18 (F 18)	1,000
Gadolinium 153 (Gd 153)	10
Gadolinium 159 (Gd 159)	100
Gallium 67 (Ga 67)	100
Gallium 72 (Ga 72)	10
Germanium 71 (Ge 71)	100
Gold 198 (Au 198)	100
Gold 199 (Au 199)	100
Hafnium 181 (Hf 181)	10
Holmium 166 (Ho 166)	100
Hydrogen 3 (H 3)	1,000
Indium 111 (In 111)	100
Indium 113m (In 113m)	100
Indium 114m (In 114m)	10
Indium 115m (In 115m)	100
Indium 115 (In 115)	10
Iodine 123 (I 123)	100
Iodine 125 (I 125)	1
Iodine 126 (I 126)	1
Iodine 129 (I 129)	0.1
Iodine 131 (I 131)	1
Iodine 132 (I 132)	10
Iodine 133 (I 133)	1
Iodine 134 (I 134)	10
Iodine 135 (I 135)	10
Iridium 192 (Ir 192)	10
Iridium 194 (Ir 194)	100
Iron 52 (Fe 52)	10
Iron 55 (Fe 55)	100
Iron 59 (Fe 59)	10
Krypton 85 (Kr 85)	100
Krypton 87 (Kr 87)	10
Lanthanum 140 (La 140)	10
Lutetium 177 (Lu 177)	100
Manganese 52 (Mn 52)	10
Manganese 54 (Mn 54)	10
Manganese 56 (Mn 56)	10
Mercury 197m (Hg 197m)	100
Mercury 197 (Hg 197)	100
Mercury 203 (Hg 203)	10
Molybdenum 99 (Mo 99)	100
Neodymium 147 (Nd 147)	100
Neodymium 149 (Nd 149)	100
Nickel 59 (Ni 59)	100
Nickel 63 (Ni 63)	10
Nickel 65 (Ni 65)	100
Niobium 93m (Nb 93m)	10
Niobium 95 (Nb 95)	10
Niobium 97 (Nb 97)	10
Osmium 185 (Os 185)	10
Osmium 191m (Os 191m)	100
Osmium 191 (Os 191)	100
Osmium 193 (Os 193)	100
Palladium 103 (Pd 103)	100
Palladium 109 (Pd 109)	100
Phosphorus 32 (P 32)	10
Platinum 191 (Pt 191)	100
Platinum 193m (Pt 193m)	100
Platinum 193 (Pt 193)	100
Platinum 197m (Pt 197m)	100
Platinum 197 (Pt 197)	100
Polonium 210 (Po 210)	0.1
Potassium 42 (K 42)	10
Praseodymium 142 (Pr 142)	100
Praseodymium 143 (Pr 143)	100
Promethium 147 (Pm 147)	10
Promethium 149 (Pm 149)	10
Rhenium 186 (Re 186)	100
Rhenium 188 (Re 188)	100
Rhodium 103m (Rh 103m)	100
Rhodium 105 (Rh 105)	100
Rubidium 81 (Rb 81)	10
Rubidium 86 (Rb 86)	10
Rubidium 87 (Rb 87)	10
Ruthenium 97 (Ru 97)	100
Ruthenium 103 (Ru 103)	10

Ruthenium 105 (Ru 105)	10
Ruthenium 106 (Ru 106)	1
Samarium 151 (Sm 151)	10
Samarium 153 (Sm 153)	100
Scandium 46 (Sc 46)	10
Scandium 47 (Sc 47)	100
Scandium 48 (Sc 48)	10
Selenium 75 (Se 75)	10
Silicon 31 (Si 31)	100
Silver 105 (Ag 105)	10
Silver 110m (Ag 110m)	1
Silver 111 (Ag 111)	100
Sodium 22 (Na 22)	10
Sodium 24 (Na 24)	10
Strontium 85 (Sr 85)	10
Strontium 89 (Sr 89)	1
Strontium 90 (Sr 90)	0.1
Strontium 91 (Sr 91)	10
Strontium 92 (Sr 92)	10
Sulphur 35 (S 35)	100
Tantalum 182 (Ta 182)	10
Technetium 96 (Tc 96)	10
Technetium 97m (Tc 97m)	100
Technetium 97 (Tc 97)	100
Technetium 99m (Tc 99m)	100
Technetium 99 (Tc 99)	10
Tellurium 125m (Te 125m)	10
Tellurium 127m (Te 127m)	10
Tellurium 127 (Te 127)	100
Tellurium 129m (Te 129m)	10
Tellurium 129 (Te 129)	100
Tellurium 131m (Te 131m)	10
Tellurium 132 (Te 132)	10
Terbium 160 (Tb 160)	10
Thallium 200 (Tl 200)	100
Thallium 201 (Tl 201)	100
Thallium 202 (Tl 202)	100
Thallium 204 (Tl 204)	10
Thulium 170 (Tm 170)	10
Thulium 171 (Tm 171)	10
Tin 113 (Sn 113)	10
Tin 125 (Sn 125)	10
Tungsten 181 (W 181)	10
Tungsten 185 (W 185)	10
Tungsten 187 (W 187)	100
Vanadium 48 (V 48)	10
Xenon 131m (Xe 131m)	1,000
Xenon 133 (Xe 133)	100
Xenon 135 (Xe 135)	100
Ytterbium 175 (Yb 175)	100
Yttrium 87 (Y 87	10
Yttrium 90 (Y 90)	10
Yttrium 91 (Y 91)	10
Yttrium 92 (Y 92)	100
Yttrium 93 (Y 93)	100
Zinc 65 (Zn 65)	10
Zinc 69m (Zn 69m)	100
Zinc 69 (Zn 69)	1,000
Zirconium 93 (Zr 93)	10
Zirconium 95 (Zr 95)	10
Zirconium 97 (Zr 97)	10
Any radioactive material not listed above other than alpha emitting radioactive material	0.1

PART 3
SCHEDULE C
Groups of Medical Uses of Radioactive Material

Group I. Use of prepared radiopharmaceuticals for certain diagnostic studies involving measurements of uptake, dilution and excretion. This group does not include uses involving imaging and tumor localizations.

(1) Iodine-131 as sodium iodide ($Na^{131}I$) for measurement of thyroid uptake;

(2) Iodine-125 as sodium iodide ($Na^{125}I$) for measurement of thyroid uptake;

(3) Iodine-131 as iodinated human serum albumin (IHSA) for determinations of blood and blood plasma volume and for studies of cardiovascular function and protein turnover;

(4) Iodine-125 as iodinated human serum albumin (IHSA) for determination of blood and blood plasma volume and for studies of cardiovascular function and protein turnover;

(5) Iodine-131 as labeled rose bengal for liver function studies;

(6) Iodine-125 as labeled rose bengal for liver function studies;

(7) Iodine-131 as labeled fats or fatty acids for fat absorption studies;

(8) Iodine-125 as labeled fats or fatty acids for fat absorption studies;

(9) Iodine-131 as labeled iodopyracet, sodium iodohippurate, sodium diatrizoate, diatrizoate methylglucamine, sodium diprotrizoate, sodium acetrizoate, or sodium iothalamate for kidney function studies;

(10) Iodine-125 as labeled iodopyracet, sodium iodohippurate, sodium diatrizoate, diatrizoate methylglucamine, sodium diprotrizoate, sodium acetrizoate, or sodium iothalamate for kidney function studies;

(11) Cobalt-57 as labeled cyanocobalamin for intestinal absorption studies;

(12) Cobalt-58 as labeled cyanocobalamin for intestinal absorption studies;

(13) Cobalt-60 as labeled cyanocobalamin for intestinal absorption studies;

(14) Chromium-51 as sodium chromate for determination of red blood cell volume and studies of red blood cell survival time and gastrointestinal blood loss;

(15)Chromium-51 as labeled human serum albumin for gastrointestinal protein loss studies;

(16) Iron-59 as chloride, citrate, or sulfate for iron turnover studies;

(17) Potassium-42 as chloride for potassium space determinations;

(18) Sodium-24 as chloride for sodium space determinations;

(19) Technetium-99m as pertechnetate for blood flow studies;

(20) Mercury-197 as chlormerodrin for kidney function studies;

(21) Any radioactive material in a radiopharmaceutical and for a diagnostic use involving measurements of uptake, dilution, or excretion for which a "Notice of Claimed Investigational Exemption for a New Drug" (IND) has been accepted by the Food and Drug Administration (FDA) or for which an NDA has been issued.

Group II. Use of prepared radiopharmaceuticals for diagnostic studies involving imaging and tumor localizations.

(1) Iodine-131 as sodium iodide for thyroid imaging;

(2) Iodine-125 as sodium iodide for thyroid imaging;

(3) Iodine-131 as iodinated human serum albumin (IHSA) for brain tumor localizations and cardiac imaging;

(4) Iodine-131 as macroaggregated iodinated human serum albumin for lung imaging;

(5) Iodine-131 as colloidal (microaggregated) iodinated human serum albumin for liver imaging;

(6) Iodine-131 as labeled rose bengal for liver imaging;

(7) Iodine-131 as iodopyracet, sodium iodohippurate, sodium diatrizoate, diatrizoate methyglucamine, sodium diprotrizoate, or sodium acetrizoate for kidney imaging;

(8) Iodine-131 as sodium iodipamide for cardiac imaging;

(9) Iodine-131 as iodinated human serum albumin (IHSA) for placenta localization;

(10) Chromium-51 as sodium chromate for spleen imaging;

(11) Chromium-51 as labeled human serum albumin for placenta localization;

(12) Gold-198 in collodial form for liver imaging;

(13) Mercury-197 as labeled chlormerodrin for kidney and brain imaging;

(14) Mercury-203 as labeled chlormerodrin for brain imaging;

(15) Selenium-75 as labeled selenomethionine for pancreas imaging;

(16) Strontium-85 as nitrate or chloride for bone imaging in patients with suspected or diagnosed cancer;

(17) Technetium-99m as pertechnetate for brain imaging;

(18) Technetium-99m as pertechnetate for thyroid imaging;

(19) Technetium-99m as pertechnetate for salivary gland imaging;

(20) Technetium-99m as pertechnetate for blood pool imaging, including placenta localization;

(21) Technetium-99m as labeled sulfur colloid for liver, spleen, and bone marrow imaging;

(22) Technetium-99m as labeled macroaggregated human serum albumin for lung imaging;

(23) Any radioactive material in a radiopharmaceutical prepared from a reagent kit listed in Section (3) of Group III;

(24) Any radioactive material in a radiopharmaceutical and for a diagnostic use involving imaging for which a "Notice of Claimed Investigational Exemption for a New Drug" (IND) has been accepted by the Food and Drug Administration (FDA) or for which an NDA has been issued.

Group III. Use of generators and reagent kits for the preparation and use of radiopharmaceuticals containing radioactive material for certain diagnostic uses.

(1) Molybdenum-99/technetium-99m generators for the elution of technetium-99m as pertechnetate for;

(a) Brain imaging;

(b) Thyroid imaging;

(c) Salivary gland imaging;

(d) Blood pool imaging including placenta localization;

(e) Blood flow studies;

(f) Use with reagent kits for preparation and use of radiopharmaceuticals containing technetium-99m as provided in Sections (3) and (4) of this Group.

(2) Technetium-99m as pertechnetate for use with reagent kits for preparation and use of radiopharmaceuticals containing technetium-99m as provided in Sections (3) and (4) of this Group.

(3) Reagent kits for preparation of technetium-99m labeled:

(a) Sulfur colloid for liver and spleen imaging;

(b) Iron-ascorbate-diethylenetriamine penetaacetic acid complex for kidney imaging;

(c) Diethylenetriamine pentaacetic acid (Sn) for kidney imaging and kidney function studies;

(d) Diethylenetriamine pentaacetic acid (Sn) for brain imaging;

(e) Human serum albumin microspheres for lung imaging;

(f) Polyphosphates for bone imaging;

(g) Macroaggregated human serum albumin for lung imaging;

(h) Distannous etidronate complex for bone imaging;

(i) Stannous pyrophosphate for bone imaging or myocardial imaging.

(4) Any generator or reagent kit for preparation and diagnostic use of a radiopharmaceutical containing radioactive material for which generator or reagent kit a "Notice of Claimed Investigational Exemption for a New Drug" (IND) has been accepted by the Food and Drug Administration (FDA) or for which an NDA has been issued.

(5) Tin 113/indium 113m generators for the elution of indium 113m as chloride for:

(a) Blood pool imaging including placenta localization.

Group IV. Use of prepared radiopharmaceuticals for certain therapeutic uses that do not normally require hospitalization for purposes of radiation safety:

(1) Iodine-131 as iodide for treatment of hyperthyroidism and cardiac dysfunction;

(2) Phosphorus-32 as soluble phosphate for treatment of polycythemia vera, leukemia, and bone metastases;

(3) Phosphorus-32 as colloidal chromic phosphate for intracavitary treatment of malignant effusions;

(4) Any radioactive material in a radiopharmaceutical and for therapeutic use not normally requiring hospitalization for purposes of radiation safety for which a "Notice of Claimed Investigational Exemption for a New Drug" (IND) has been accepted by the Food and Drug Administration (FDA) or for which an NDA has been issued.

Group V. Use of prepared radiopharmaceuticals for certain therapeutic uses that normally require hospitalization for purposes of radiation safety:

(1) Gold-198 as colloid for intracavitary treatment of malignant effusions;

(2) Iodine-131 as iodide for treatment of thyroid carcinoma;

(3) Any radioactive material in a radiopharmaceutical and for a therapeutic use

normally requiring hospitalization for radiation safety reasons for which a "Notice of Claimed Investigational Exemption for a New Drug" (IND) has been accepted by the Food and Drug Administration (FDA) or for which an NDA has been issued.

Group VI. Use of sources and devices containing radioactive material for certain medical uses.

(1) Americium-241 as a sealed source in a device for bone mineral analysis;

(2) Cesium-137 encased in needles and applicator cells for topical, interstitial, and intracavitary treatment of cancer;

(3) Cobalt-60 encased in needles and applicator cells for topical, interstitial, and intracavitary treatment of cancer;

(4) Gold-198 as seeds for interstitial treatment of cancer;

(5) Iodine-125 as a sealed source in a device for bone mineral analysis;

(6) Iridium-192 as seeds encased in nylon ribbon for interstitial treatment of cancer;

(7) Strontium-90 sealed in an applicator for treatment of superficial eye conditions;

(8) Iodine-125 seeds for interstitial treatment of cancer;

(9) Radium-226 encased in needles and applicator cells for use in intercavitary and interstitial treatment of cancer;

(10) Radon-222 as sealed sources (encapsulated seeds) for use in interstitial treatment of cancer.

PART 3
SCHEDULE D
LIMITS FOR BROAD LICENSES (10D-56.341)

Radioactive Material	Column I Curies	Column II Curies
Antimony-122	1	0.01
Antimony-124	1	0.01
Antimony-125	1	0.01
Arsenic-73	10	0.1
Arsenic-74	1	0.01
Arsenic-76	1	0.01
Arsenic-77	10	0.1
Barium-131	10	0.1
Barium-140	1	0.01
Beryllium-7	10	0.1
Bismuth-210	0.1	0.001
Bromine-82	10	0.1
Cadmium-109	1	0.01
Cadmium-115m	1	0.01
Cadmium-115	10	0.1
Calcium-45	1	0.01
Calcium-47	10	0.1
Carbon-14	100	1.
Cerium-141	10	0.1
Cerium-143	10	0.1
Cerium-144	0.1	0.001
Cesium-131	100	1.
Cesium-134m	100	1.
Cesium-134	0.1	0.001
Cesium-135	1	0.01
Cesium-136	10	0.1
Cesium-137	0.1	0.001
Chlorine-36	1	0.01
Chlorine-38	100	1.
Chromium-51	100	1.
Cobalt-57	10	0.1
Cobalt-58m	100	1.
Cobalt-58	1	0.01
Cobalt-60	0.1	0.001
Copper-64	10	0.1
Dysprosium-165	100	1.
Dysprosium-166	10	0.1
Erbium-169	10	0.1
Erbium-171	10	0.1
Europium-152(9.2 h)	10	0.1
Europium-152(13 Y)	0.1	0.001

Europium-154	0.1	0.001
Europium-155	1	0.01
Fluorine-18	100	1.
Gadolinium-153	1	0.01
Gadolinium-159	10	0.1
Gallium-72	10	0.1
Germanium-71	100	1.
Gold-198	10	0.1
Gold-199	10	0.1
Hafnium-181	1	0.01
Holmium-166	10	0.1
Hydrogen-3	100	1.
Indium-113m	100	1.
Indium-114m	1	0.01
Indium-115m	100	1.
Indium-115	1	0.01
Iodine-125	0.1	0.001
Iodine-126	0.1	0.001
Iodine-129	0.1	0.001
Iodine-131	0.1	0.001
Iodine-132	10	0.1
Iodine-133	1	0.01
Iodine-134	10	0.1
Iodine-135	1	0.01
Iridium-192	1	0.01
Iridium-194	10	0.1
Iron-55	10	0.1
Iron-59	1	0.01
Krypton-85	100	1.
Krypton-87	10	0.1
Lanthanum-140	1	0.01
Lutetium-177	10	0.1
Manganese-52	1	0.01
Manganese-54	1	0.01
Manganese-56	10	0.1
Mercury-197m	10	0.1
Mercury-197	10	0.1
Mercury-203	1	0.01
Molybdenum-99	10	0.1
Neodymium-147	10	0.1
Neodymium-149	10	0.1
Nickel-59	10	0.1
Nickel-63	1	0.01
Nickel-65	10	0.1
Niobium-93m	1	0.01
Niobium-95	1	0.01
Niobium-97	100	1.
Osmium-185	1	0.01
Osmium-191m	100	1.
Osmium-191	10	0.1
Osmium-193	10	0.1
Palladium-103	10	0.1
Palladium-109	10	0.1
Phosphorus-32	1	0.01
Platinum-191	10	0.1
Platinum-193m	100	1.
Platinum-193	10	0.1
Platinum-197m	100	1.
Platinum-197	10	0.1
Polonium-210	0.01	0.0001
Potassium-42	1	0.01
Praseodymium-142	10	0.1
Praseodymium-143	10	0.1
Promethium-147	1	0.01
Promethium-149	10	0.1
Radium-226	0.01	0.0001
Rhenium-186	10	0.1
Rhenium-188	10	0.1

Rhodium-103m	1,000	10.
Rhodium-105	10	0.1
Rubidium-86	1	0.01
Rubidium-87	1	0.01
Ruthenium-97	100	1.
Ruthenium-103	1	0.01
Ruthenium-105	10	0.1
Ruthenium-106	1	0.001
Samarium-151	0.1	0.01
Samarium-153	10	0.1
Scandium-46	1	0.01
Scandium-47	10	0.1
Scandium-48	1	0.01
Selenium-75	1	0.01
Silicon-31	10	0.1
Silver-105	1	0.01
Silver-110m	0.1	0.001
Sodium-22	0.1	0.001
Sodium-24	1	0.001
Strontium-85m	1,000	10.
Strontium-85	1	0.01
Strontium-89	1	0.01
Strontium-90	0.01	0.0001
Strontium-91	10	0.1
Strontium-92	10	0.1
Sulphur-35	10	0.1
Tantalum-182	1	0.01
Technetium-96	10	0.1
Technetium-97m	10	0.1
Technetium-97	10	0.1
Technetium-99m	100	1.
Technetium-99	1	0.01
Tellurium-125m	1	0.01
Tellurium-127m	1	0.01
Tellurium-127	10	0.1
Tellurium-129m	1	0.01
Tellurium-129	100	1.
Tellurium-131m	10	0.1
Tellurium-132	1	0.01
Terbium-160	1	0.01
Thallium-200	10	0.1
Thallium-201	10	0.1
Thallium-202	10	0.1
Thallium-204	1	0.01
Thulium-170	1	0.01
Thulium-171	1	0.01
Tin-113	1	0.01
Tin-125	1	0.01
Tungsten-181	1	0.01
Tungsten-185	1	0.01
Tungsten-187	10	0.1
Vanadium-48	1	0.01
Xenon-131m	1,000	10.
Xenon-133	100	1.
Xenon-135	100	1.
Ytterbium-175	10	0.1
Yttrium-90	1	0.01
Yttrium-91	1	0.01
Yttrium-92	10	0.1
Yttrium-93	1	0.01
Zinc-65	1	0.01
Zinc-69m	10	0.1
Zinc-69	100	1.
Zirconium-93	1	0.01
Zirconium-95	1	0.01
Zirconium-97	1	0.01

Any radioactive material other than source material, special nuclear material, or alpha emitting radioactive material not listed above.	0.1	0.001

PART 4
STANDARDS FOR PROTECTION AGAINST RADIATION

10D-56.431 Purpose and Scope.

(1) This part establishes standards for protection against radiation hazards. Except as otherwise specifically provided, this part applies to all licensees or registrants. Nothing in this part shall be interpreted as limiting the intentional exposure of patients to radiation for the purpose of medical diagnosis or therapy.

(2) In addition to complying with the requirements set forth in this part every reasonable effort should be made to maintain radiation exposures, and releases of radioactive materials in effluents to unrestricted areas, as far below the limits specified in this part as practicable. The term "as far below the limits specified in this part as practicable" means as low as is practicably achievable taking into account the state of technology, and the economics of improvements in relation to benefits to the public health and safety and in relation to utilization of ionizing radiation in the public interest.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 381, 386 FS. History—New 1-1-77.

PART 4A
PERMISSIBLE DOSES, LEVELS AND CONCENTRATIONS

10D-56.432 Radiation Dose to Individuals in Restricted Areas. [1/]

(1) Except as provided in 10D-56.432(2) FAC, no licensee or registrant shall possess, use, receive, or transfer sources of radiation in such a manner as to cause any individual in a restricted area to receive in any period of one calendar quarter from all sources of radiation in the licensee's or registrant's possession a dose in excess of the limits specified in the following table:

	Rems per Calendar Quarter
Whole body; head and trunk; active blood-forming organs; lens of eyes; or gonads	1¼
Hands and forearms; feet and ankles	18 3/4
Skin of whole body	7½

(2) A licensee or registrant may permit an individual in a restricted area to receive a dose to the whole body greater than permitted under 10D-56.432(1) FAC, provided:

(a) During any calendar quarter the dose to the whole body from sources of radiation in the licensee's or registrant's possession shall not exceed 3 rems;

(b) 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

(c) The licensee or registrant has determined the individual's accumulated occupational dose to the whole body on Agency Form RAD-2 or on a clear and legible record containing all the information required in that form and has otherwise complied with the requirements of 10D-56.433 FAC. As used in 10D-56.432(2) FAC, "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.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—New 1-1-77.

10D-56.433 Determination of Accumulated Dose.

(1) This section contains requirements which must be satisfied by licensees or registrants who propose, pursuant to 10D-56.432(2) FAC to permit individuals in a restricted area to receive exposure to radiation in excess of the limits specified in 10D-56.432(1) FAC.

(2) Before permitting any individual in a restricted area to be exposed to radiation in excess of the limits specified in 10D-56.432(1) FAC, each licensee or registrant shall:

(a) Obtain a certificate on Agency Form RAD-2 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

(b) Calculate on Agency Form RAD-2, 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 received by the individual and the additional dose allowed for that individual under 10D-56.432(2) FAC.

(3)(a) In the preparation of the Agency Form RAD-2, or a clear and legible record containing all the information required in that form, the licensee or registrant shall make a reasonable effort to obtain reports of the individual's previously accumulated occupational dose. For each period for which the licensee or registrant obtains such reports, he shall use the dose shown in the report in preparing the form. In any case where a licensee or registrant is unable to obtain reports of the

[1/] For determining the doses specified in 10D-56.432 FAC a dose from x or gamma rays up to 10 MeV may be assumed to be equivalent to the exposure measured by a properly calibrated appropriate instrument in air at or near the body surface in the region of the highest dose rate.

individual's occupational dose for a previous complete calendar quarter, it shall be assumed that the individual has whichever of the following columns apply:

Part of Body	Column 1 Assumed Dose in Rems for Calendar Quarters Prior to January 1, 1961	Column 2 Assumed Dose in Rems for Calendar Quarters Beginning on or After January 1, 1961
Whole body gonads, active blood-forming organs, head and trunk,lens of eye	3 3/4	1 1/4

(b) The licensee or registrant shall retain and preserve records used in preparing Agency Form RAD-2. 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 10D-56.432(2)(b) FAC, the excess may be disregarded.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—New 1-1-77.

10D-56.434 Exposure of Individuals to Concentrations of Radioactive Material in Restricted Areas.

(1) No licensee shall possess, use, receive, or transfer radioactive material in such a manner as to cause an individual in a restricted area to be exposed to airborne radioactive material in an average concentration in excess of the limits specified in Appendix A, Table I, of this part. "Expose," as used in this section means that the individual is present in an airborne concentration. No allowance shall be made for the use of protective clothing or equipment, or particle size, except as authorized by the Agency pursuant to 10D-56.434(3) FAC.

(2) The limits given in Appendix A, Table I, of this part are based upon exposure to the concentrations specified for forty (40) hours in any period of seven (7) consecutive days. In any such period where the number of hours of exposure is less than forty (40), the limits specified in the table may be increased proportionately. In any such period where the number of hours of exposure is greater than forty (40), limits specified in the table shall be decreased proportionately.

(3)(a) Except as authorized by the Agency pursuant to this paragraph, no allowance shall be made for particle size or the use of protective clothing or equipment in determining whether an individual is exposed to an airborne concentration in excess of the limits specified in Appendix A, Table I.

(b) The Agency may authorize a licensee to expose an individual in a restricted area to airborne concentrations in excess of the limits specified in Appendix A, Table I, upon receipt of an application demonstrating that the concentration is composed in whole or in part of particles of such size that such particles are not respirable and that the individual will not inhale the concentrations in excess of the limits established in Appendix A, Table I. Each application under this subparagraph shall include an analysis of particle sizes in the concentrations and a description of the methods used in determining the particle sizes.

(c) The Agency may authorize a licensee to expose an individual in a restricted area to airborne concentrations in excess of the limits specified in Appendix A, Table I, upon receipt of an application demonstrating that the individual will wear appropriate protective equipment and that the individual will not inhale, ingest, or absorb quantities of radioactive material in excess of those which might otherwise be permitted under this part for individuals in restricted areas during a 40-hour week. Each application under this subparagraph shall contain the following information:

1. A description of the protective equipment to be employed, including the efficiency of the equipment for the material involved;

2. Procedures for the fitting, maintenance, and cleaning of the protective equipment;

3. Procedures governing the use of the protective equipment; including supervisory procedures and length of time the equipment will be used by the individuals in each work week. The proposed periods for use of the equipment by any individual should not be of such duration as would discourage observance by the individual of the proposed procedures; and

4. The average concentrations present in the areas occupied by individuals.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—New 1-1-77.

10D-56.435 Exposure of Minors.[2/]

(1) No licensee or registrant shall possess, use, or transfer sources of radiation 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 all sources of radiation in such licensee's or registrant's possession a dose in excess of 10 percent of the limits specified in the table in 10D-56.432(1) FAC.

(2) No licenseee shall possess, use, or transfer radioactive material in such a manner as to cause any individual within a restricted area, who is under 18 years of age, to be exposed to airborne radioactive material in an average concentration in excess of the limits specified in Appendix A, Table II, of this part. For purposes of this paragraph, concentrations may be averaged over periods not greater than a week.

(3) The provisions of 10D-56.434(3) FAC shall apply to exposures subject to 10D-56.435(2) FAC.

2/ For determining the doses specified in this section, a dose from x or gamma rays up to 10 MeV may be assumed to be equivalent to the exposure measured by a properly calibrated appropriate instrument in air at or near the body surface in the region of the highest dose rate.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—New 1-1-77.

10D-56.436 Permissible Levels of Radiation From External Sources in Unrestricted Areas.[3/]

(1) Except as authorized by the Agency pursuant to 10D-56.436(2) FAC no licensee or registrant shall possess, use, or transfer sources of radiation in such a manner as to create in any unrestricted area from such sources of radiation in his possession:

(a) Radiation levels which, if an individual were continuously present in the area, could result in his receiving a dose in excess of 2 millirems in any hour; or

(b) Radiation levels which, if an individual were continuously present in the area could result in excess of 100 millirems in any 7 consecutive days.

(2) Any person may apply to the Agency for proposed limits upon levels of radiation in unrestricted areas in excess of those specified in 10D-56.436(1) FAC resulting from the applicant's possession or use of sources of radiation. Such applications should include information as to anticipated average radiation levels and anticipated occupancy times for each unrestricted area involved. The Agency will approve the proposed limits if the applicant demonstrates to the satisfaction of the Agency 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.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—New 1-1-77.

10D-56.437 Concentration in Effluents to Unrestricted Areas.

(1) 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 A, Table II of this part, except as authorized pursuant to 10D-56.447 FAC or 10D-56.437(2) FAC. For purposes of this section concentrations may be averaged over a period not greater than one month.

(2) An application for a license or amendment may include proposed limits higher than those specified in 10D-56.437(1) FAC. The applicant must demonstrate to the Agency's satisfaction that:

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

(b) 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 A, Table II of this part.

(3) An application for higher limits pursuant to 10D-56.437(2) FAC 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:

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

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

1. Chemical composition,

2. Physical characteristics, including suspended solids content in liquid effluents, and nature of gas or aerosol for air effluents,

3. The hydrogen ion concentration (pH) of liquid effluents, and

4. The size range of particulates in effluents release into air;

(c) 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;

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

1. In air at any point of human occupancy, or

2. In water at points of use downstream from the point of release of the effluent;

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

(f) 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; and

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

(4) For the purposes of this section, the concentration limits in Appendix A, 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.

(5) In addition to limiting concentrations in effluent streams, the Agency may limit quantities of radioactive material 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

[3/] It is the intent of this section to limit radiation levels so that it is unlikely that individuals in unrestricted areas would receive a dose to the whole body in excess of 0.5 rem in any one year. If in specific instances, it is determined by the Agency that this intent is not met, the Agency may, pursuant to 10D-56.137 FAC, impose such additional requirements on the licensee or registrant as may be necessary to meet the intent.

month, would otherwise exceed the daily intake resulting from continuous exposure to air or water containing one-third (1/3) the concentration of radioactive material specified in Appendix A, Table II of this part.

(6) The provisions of this section do not apply to disposal of radioactive material into sanitary sewerage systems, which is governed by 10D-56.448 FAC.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—New 1-1-77.

10D-56.438 Orders Requiring Furnishing of Bioassay Services. Where necessary or disirable in order to aid in determining the extent of an individual's exposure to concentrations of radioactive material, the Agency may incorporate license provisions or issue an order requiring a licensee or registrant to make available to the individual appropriate bioassay services and to furnish a copy of the reports of such services to the Agency.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—New 1-1-77.

PART 4B
PRECAUTIONARY PROCEDURES

10D-56.439 Surveys. Each licensee or registrant shall make or cause to be made such surveys as may be necessary for him to establish compliance with these regulations.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—New 1-1-77.

10D-56.440 Personnel Monitoring. Each licensee or registrant 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 10D-56.432(1) FAC.

(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 10D-56.432(1) FAC.

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

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—New 1-1-77.

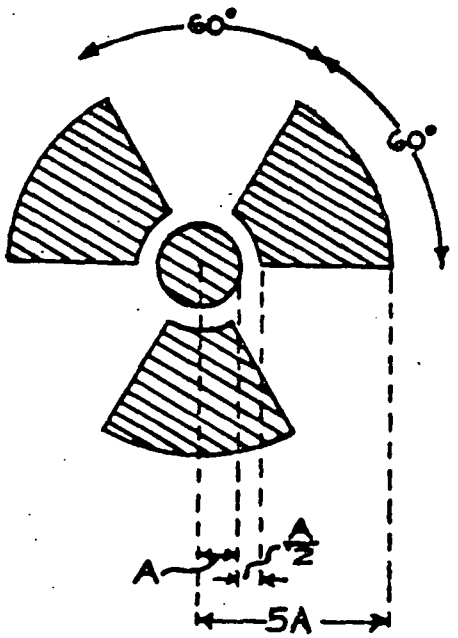
10D-56.441 Caution Signs, Labels, and Signals.

(1) General

(a) Except as otherwise authorized by the Agency, 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-blade design:

RADIATION SYMBOL

1. Cross-hatch area is to be magenta or purple.
2. Background is to be yellow.



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

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

CAUTION[4/]
RADIATION AREA

(3) High Radiation Areas.

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

CAUTION[4/]
HIGH RADIATION AREA

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

1. Equipped with a control device which shall cause the level of radiation 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

2. 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 operator or a supervisor of the activity are made aware of the entry; or

[4/] or Danger.

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

(c) Egress shall be possible without the use of keys or outside assistance.

(d) 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 10D-56.441(3)(b) FAC.

(e) Any licensee or registrant may apply to the Agency for approval of methods not included in 10D-56.441(3)(b) and (d) FAC for controlling access to high radiation areas. The Agency will approve the proposed alternatives if the licensee or registrant demonstrates that the alternative methods of control will prevent unauthorized entry into a high radiation area, and that the requirement of 10D-56.441(3)(c) FAC is met.

(4) Airborne Radioactivity Areas. Each airborne radioactivity area shall be conspicuously posted with a sign or signs bearing the caution symbol and the words:

CAUTION[4/]
AIRBORNE RADIOACTIVITY AREA

(5) Additional Requirements

(a) Each area or room in which any radioactive material, other than natural uranium or thorium, is used or stored in an amount exceeding 10 times the quantity of radioactive material specified in Appendix B of this part shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION[4/]
RADIOACTIVE MATERIAL

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

CAUTION[4/]
RADIOACTIVE MATERIAL

(6) Containers.

(a) Except as provided in 10D-56.441(6)(c) FAC each container of radioactive material shall bear a durable, clearly visible label identifying the radioactive contents.

(b) A label required pursuant to 10D-56.441(6)(a) FAC shall bear the radiation caution symbol and the words:

CAUTION[4/]
RADIOACTIVE MATERIAL

It shall also provide sufficient information[5/] to permit individuals handling or using the containers, or working in the vicinity thereof, to take precautions to avoid or minimize exposures.

4/ or Danger.

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

(c) Notwithstanding the provisions of 10D-56.441(6)(a) FAC labeling is not required:

1. For containers that do not contain radioactive material in quantities greater than the applicable quantities listed in Appendix B of this part;

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

3. For containers that do not contain radioactive material in concentration greater than the applicable concentrations listed in Column 2, Table I, Appendix A of this part;

4. 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 material in excess of the limits established by the regulations in this part;

5. For containers when they are in transport and packaged and labeled in accordance with regulations published by the Department of Transportation;

6. For containers which are accessible only to individuals authorized to handle or use them[6/] or to work in the vicinity thereof, provided that the contents are identified to such individuals by a readily available written record; and

7. For manufacturing and process equipment such as piping and tanks.

(7) All radiation machines shall be labeled in a manner which cautions individuals that radiation is produced when the machine is being operated.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(3), 381, 386 FS. History—New 1-1-77.

10D-56.442 Exceptions from Posting and Labeling Requirements. Notwithstanding the provisions of 10D-56.441 FAC:

(1) 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 thirty (30) centimeters from the surface of the source container or housing does not exceed five (5) millirem per hour.

(2) Rooms or other areas in hospitals are not required to be posted with caution signs, and control of entrance or access thereto pursuant to 10D-56.441(3) FAC is not required, because of the presence of patients containing radioactive 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.

(3) Caution signs are not required to be posted in areas or rooms containing radioactive material for periods of less than eight (8) hours provided that (a) the material is 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 material in excess of the limits established in this part, and (b) such area or room is subject to the licensee's or registrant's control.

(4) A room or other area is not required to

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

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 material prepared for transport and packaged and labeled in accordance with regulations of the Department of Transportation.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(3), 381, 386 FS. History—New 1-1-77.

10D-56.443 Instruction of Personnel. Instructions required for individuals working in or frequenting any portion of a restricted area are specified in 10D-56.1033 FAC of these regulations.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—New 1-1-77.

10D-56.444 Storage and Control of Sources of Radiation and of Licensed Materials in Unrestricted Areas. Sources of radiation shall be secured against unauthorized removal from the place of storage.

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

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

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.17, 381, 386 FS. History—New 1-1-77.

10D-56.445 Procedures for Picking Up, Receiving, and Opening Packages.

(1)(a) Each licensee or registrant who expects to receive a package containing quantities of radioactive material in excess of the Type A quantities specified in 10D-56.445 (2) FAC shall:

1. if the package is to be delivered to the licensee's or registrant's facility by the carrier, make arrangements to receive the package when it is offered for delivery by the carrier; or

2. if the package is to be picked up by the licensee or registrant at the carrier's terminal, make arrangements to receive notification from the carrier of the arrival of the package, at the time of arrival.

(b) Each licensee or registrant 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.

(2)(a) Each licensee or registrant, 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:

1. Packages containing no more than the exempt quantity specified in the table in this paragraph;

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

3. Packages containing only radioactive material as gases or in special form;

4. 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

5. 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.

(b) If removable radioactive contamination in excess of 0.01 microcurie (22,200 disintegrations per minute) per 100 square centimeters of package surface is found on the external surface of the package, the licensee shall immediately notify the final delivering carrier and, by telephone or telegraph, the Agency.

Table of Exempt and Type A Quantities

Tranport Group[7/]	Exempt Quantity Limit (in millicuries)	Type A Quantity Limit (in curies)
I	0.01	0.001
II	0.1	0.050
III	1	3
IV	1	20
V	1	20
VI	1	1,000
VII	25,000	1,000
Special form[7/]	1	20

[7/] The definitions of "special form" and "transport group" are specified in Section 173.389(g) and (h) respectively, of the regulations published by the U.S. Department of Transportation [49 CFR 173.389(g) and (h) transportation regulations from which this state agency has identically modeled its own (State of Florida 10D-63 Rules, Department of Health and Rehabilitative Services, Transportation of Radioactive Materials).

(3)(a) Each licensee or registrant, upon receipt of a package containing quantities of radioactive material in excess of the Type A quantities special in 10D-56.445(2) FAC, 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 working hours, or 18 hours if received after normal working hours.

(b) 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 or registrant shall immediately notify, by telephone and telegraph, the final delivering carrier and the Agency.

(4) Each licensee or registrant shall establish and maintain procedures for safely opening packages in which radioactive 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.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2), 290.17, 381, 386 FS. History—New 1-1-77.

PART 4C
WASTE DISPOSAL

10D-56.446 General Requirement. No licensee shall dispose of any radioactive material except:

(1) By transfer to an authorized recipient as provided in Part 3, or

(2) As authorized pursuant to 10D-56.437 FAC, 10D-56.447 FAC, or 10D-56.448 FAC.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(3), 381, 386 FS. History—New 1-1-77.

10D-56.447 Method of Obtaining Approval of Proposed Disposal Procedures. Any person may apply to the Agency for approval of proposed procedures to dispose of radioactive material in a manner not otherwise authorized in these regulations. Each application shall include a description of the radioactive material, the quantities and kinds of material, the levels of radioactivity involved and the proposed manner and conditions of disposal. The application, where applicable, shall contain a complete environmental report and also include an analysis and evaluation of pertinent information as to the nature of the environment, including topographical, geological, meteorological, and hydorlogical 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.

No licensee shall dispose of radioactive material by burial in soil except as specifically approved by the Agency.

The Agency will not approve any application for a license for disposal on land not owned by the Federal or State Government, and further will not approve any application for a license to receive radioactive waste from other persons for purposes of disposal on land within this state.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(3), 381, 386 FS. History—New 1-1-77.

10D-56.448 Disposal by Release Into Sanitary Sewerage Systems. No licensee shall discharge radioactive material into a sanitary sewerage system unless:

(1) It is readily soluble or dispersible in water;

(2) The quantity of any radioactive material released into the system by the licensee in any one day does not exceed the larger of 10D-56.448(2)(a) or (b) FAC:

(a) 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 not greater than the limits specified in Appendix A, Table I, Column 2, of this part, or

(b) Ten (10) times the quantity of such material specified in Appendix B of this part;

(3) The quantity of any 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 A, Table I, Column 2, of this part; and

(4) The gross quantity of radioactive material released into the sewerage system by the licensee does not exceed one (1) curie per year.

Excreta from individuals undergoing medical diagnosis or therapy with radioactive material shall be exempt from any limitations contained in this section.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(3), 381, 386 FS. History—New 1-1-77.

10D-56.449 Disposal by Incineration. No licensee shall incinerate radioactive material for the purpose of disposal or preparation for disposal except as specifically approved by the Agency pursuant to 10D-56.437 FAC and 10D-56.447 FAC.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.10(3), 381, 386 FS. History—New 1-1-77.

PART 4D
RECORDS, REPORTS, AND NOTIFICATION

10D-56.450 Records of Surveys, Radiation Monitoring, and Disposal.

(1) Each licensee or registrant shall maintain records showing the radiation exposures of all individuals for whom personnel monitoring is required under 10D-56.440 FAC of this part. Such records shall be kept on Agency Form RAD-3, in accordance with the instructions contained in that form, or on clear and legible records containing all the information required by Agency Form RAD-3. The doses entered on the forms or records shall be for periods of time not exceeding one calendar quarter.

(2) Each licensee or registrant shall maintain records in the same units used in this part, showing the results of surveys required by 10D-56.439 FAC, monitoring required by 10D-56.445(2) and (3) FAC, and disposals made under 10D-56.447 FAC and 10D-56.448 FAC.

(3) Records of individual exposure to radiation and to radioactive material which must be maintained pursuant to the provisions of 10D-56.450(1) FAC and records of bioassays,

including results of whole body counting examinations, made pursuant to 10D-56.438 FAC shall be preserved indefinitely or until the Agency authorizes their disposal. (Records which must be maintained pursuant to this part may be maintained in the form of microfilms).

(4) The discontinuance of or curtailment of activities, does not relieve the licensee or registrant of responsibility for retaining all records required by this section. A licensee or registrant may, however, request the Agency to accept such records. The acceptance of the records by the Agency relieves the licensee or registrant of subsequent responsibility only in respect to their preservation as required by this section.

(5) Records of the results of surveys and monitoring which must be maintained pursuant to paragraph (2) of this section shall be preserved for two years after completion of the survey except that the following records shall be maintained until the Agency authorizes their disposition: (a) records of the results of surveys to determine compliance with 10D-56.434(1); (b) in the absence of personnel monitoring data, records of the results of surveys to determine external radiation dose; and, (c) records of the results of surveys used to evaluate the release of radioactive effluents to the environment.

(6) Records of disposal of licensed material made pursuant to 10D-56.447 and 10D-56.448 shall be maintained until the Agency authorizes their disposition.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12, 381, 386 FS. History—New 1-1-77.

10D-56.451 Reports of Theft or Loss of Sources of Radiation.

(1) Each licensee or registrant shall report by telephone and promptly confirm by letter to the Agency (section 10D-56.141 FAC) the theft or loss of any source of radiation immediately after such occurrence becomes known.

(2) Any report filed with the Agency pursuant to subsection (1) above shall give details of the theft or loss to the extent applicable, and give a description of the source of radiation including, but not limited to, the radioactive material; quantity; chemical and physical form; containment, markings, labeling or signs, source model, serial numbers, and manufacturer. The report shall also describe action initiated or planned to recover the source, evaluation of potential hazards to public health and safety or property, and steps taken or planned to prevent recurrences.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12, 381, 386 FS. History—New 1-1-77.

10D-56.452 Notification of Incidents.

(1) Immediate Notification. Each licensee or registrant shall immediately notify the Agency by telephone or telegraph of any incident involving any source of radiation possessed by him and which may have caused or threatens to cause:

(a) A dose to the whole body of any individual of 25 rems or more of radiation. a dose to the skin of the whole body of any individual of 150 rems or more of radiation; or a dose to the feet, ankles, hands, or forearms of any individual of 375 rems or more of radiation; or

(b) 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 A, Table II; or

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

(d) Damage to property in excess of $100,000.

(2) Twenty-four Hour Notification. Each licensee or registrant shall within 24 hours notify the Agency by telephone or telegraph of any incident involving any source of radiation possessed by him and which may have caused or threatens to cause:

(a) A dose to the whole body of any individual of 5 rems or more of radiation; a dose to the skin of the whole body of any individual of 30 rems or more of radiation; or a dose to the feet, ankles, hands, or forearms of 75 rems or more of radiation; or

(b) 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 A, Table II; or

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

(d) Damage to property in excess of $1,000.

(3) Any report filed with the Agency pursuant to this section shall be prepared in such a manner that names of individuals who have received excessive doses will be stated in a separate part of the report.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12, 381, 386 FS. History—New 1-1-77.

10D-56.453 Reports of Overexposures and Excessive Levels and Concentrations.

(1) In addition to any notification required by 10D-56.452 FAC, each licensee or registrant shall make a report in writing within 30 days to the Agency of (a) each exposure of an individual to radiation or concentrations of radioactive material in excess of any applicable limit as set forth in this part or as otherwise approved by the Agency; (b) any incident for which notification is required by 10D-56.452 FAC; and (c) levels of radiation or concentrations of radioactive material (not involving excessive exposure of any individual) in an unrestricted area in excess of ten (10) times any applicable limit as set forth in this part or as otherwise approved by the Agency. 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 dose as required by 10D-56.453(2) FAC; levels of radiation and concentrations of radioactove material involved; the cause of exposure, levels or concentrations; and corrective steps taken or planned to assure against a recurrence.

(2) Any report filed with the Agency pursuant to these regulations shall be prepared in such a manner that the name(s) of individual(s), social security number, birth date and estimate of exposure of radiation will be stated in a separate part of the report.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(3), 381, 386 FS. History—New 1-1-77.

10D-56.454 Vacating Premises. Each licensee shall, no less than 30 days before vacating or relinquishing possession or control of premises or facilities which may have been contaminated with radioactive material, notify the Agency in writing of intent to vacate. The licensee shall decontaminate such premises, if necessary, to the satisfaction of the Agency, and shall not vacate or relinquish possession or control of said premises or facilities until any and all decontamination is complete and prior written permission to vacate or relinquish possession or control of the premises is obtained from the Agency.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.11, 290.12, 290.16, 381, 386 FS. History—New 1-1-77.

10D-56.455 Notifications and Reports to Individuals.

(1) Requirements for notification and reports to individuals of exposure to radiation or radioactive material are specified in 10D-56.1034 FAC of these regulations.

(2) When a licensee or registrant is required pursuant to 10D-56.453 FAC to report to the Agency any exposure of an individual to radiation or radioactive material, the licensee or registrant shall also notify the individual. Such notice shall be transmitted at a time not later than the transmittal to the Agency, and shall comply with the provisions of 10D-56.1034(1) FAC of these regulations.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(3), 381, 386 FS. History—New 1-1-77.

APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

Element (atomic number)	Isotope[1]		Table I Column 1 Air (uCi/ml)	Table I Column 2 Water (uCi/ml)	Table II Column 1 Air (uCi/ml)	Table II Column 2 Water (uCi/ml)
Actinium (89)	Ac 227	S	2×10^{-12}	6×10^{-5}	8×10^{-14}	2×10^{-6}
		I	3×10^{-11}	9×10^{-8}	9×10^{-13}	3×10^{-6}
	Ac 228	S	8×10^{-6}	3×10^{-8}	3×10^{-8}	9×10^{-6}
		I	2×10^{-4}	3×10^{-6}	6×10^{-10}	9×10^{-8}
Americium (95)	Am 241	S	6×10^{-13}	1×10^{-4}	2×10^{-13}	4×10^{-6}
		I	1×10^{-10}	8×10^{-4}	4×10^{-13}	2×10^{-6}
	Am 242 m	S	6×10^{-13}	1×10^{-4}	2×10^{-13}	4×10^{-6}
		I	3×10^{-10}	8×10^{-8}	9×10^{-13}	9×10^{-6}
	Am 242	S	4×10^{-6}	4×10^{-8}	1×10^{-9}	1×10^{-4}
		I	5×10^{-6}	4×10^{-8}	2×10^{-9}	1×10^{-4}
	Am 243	S	6×10^{-13}	1×10^{-4}	2×10^{-13}	4×10^{-6}
		I	1×10^{-10}	8×10^{-6}	4×10^{-13}	3×10^{-6}
	Am 244	S	4×10^{-6}	1×10^{-1}	1×10^{-7}	5×10^{-3}
		I	2×10^{-6}	1×10^{-1}	8×10^{-7}	5×10^{-3}
Antimony (51)	Sb 122	S	2×10^{-7}	8×10^{-4}	6×10^{-9}	3×10^{-5}
		I	1×10^{-7}	8×10^{-4}	5×10^{-9}	3×10^{-5}
	Sb 124	S	2×10^{-7}	7×10^{-4}	5×10^{-9}	2×10^{-5}
		I	2×10^{-6}	7×10^{-4}	7×10^{-10}	2×10^{-5}
	Sb 125	S	5×10^{-7}	3×10^{-3}	2×10^{-9}	1×10^{-4}
		I	3×10^{-6}	3×10^{-3}	9×10^{-10}	1×10^{-4}
Argon (18)	Ar 37	Sub[2]	6×10^{-3}	.....	1×10^{-4}	.....
	Ar 41	Sub	2×10^{-6}	.....	4×10^{-8}	.....
Arsenic (33)	As 73	S	2×10^{-6}	1×10^{-2}	7×10^{-8}	5×10^{-4}
		I	4×10^{-7}	1×10^{-2}	1×10^{-8}	5×10^{-4}
	As 74	S	3×10^{-7}	2×10^{-3}	1×10^{-8}	5×10^{-5}
		I	1×10^{-7}	2×10^{-3}	4×10^{-9}	5×10^{-5}
	As 76	S	1×10^{-7}	6×10^{-4}	4×10^{-9}	2×10^{-5}
		I	1×10^{-7}	6×10^{-4}	3×10^{-9}	2×10^{-5}
	As 77	S	5×10^{-7}	2×10^{-3}	2×10^{-8}	8×10^{-5}
		I	4×10^{-7}	2×10^{-3}	1×10^{-8}	8×10^{-5}
Astatine (85)	At 211	S	7×10^{-9}	5×10^{-6}	2×10^{-10}	2×10^{-4}
		I	3×10^{-8}	2×10^{-5}	1×10^{-9}	7×10^{-4}
Barium (56)	Ba 131	S	1×10^{-6}	5×10^{-3}	4×10^{-8}	2×10^{-4}
		I	4×10^{-7}	5×10^{-3}	1×10^{-8}	2×10^{-4}
	Ba 140	S	1×10^{-7}	8×10^{-4}	4×10^{-9}	3×10^{-5}
		I	4×10^{-8}	7×10^{-4}	1×10^{-9}	2×10^{-5}
Berkelium (97)	Bk 249	S	9×10^{-10}	2×10^{-1}	3×10^{-11}	6×10^{-3}
		I	1×10^{-7}	2×10^{-1}	4×10^{-9}	6×10^{-3}
	Bk 250	S	1×10^{-7}	6×10^{-3}	5×10^{-9}	2×10^{-4}
		I	1×10^{-6}	6×10^{-3}	4×10^{-8}	2×10^{-4}
Beryllium (4)	Be 7	S	6×10^{-6}	5×10^{-2}	2×10^{-7}	2×10^{-3}
		I	1×10^{-6}	5×10^{-2}	4×10^{-8}	2×10^{-3}
Bismuth (83)	Bi 206	S	2×10^{-7}	1×10^{-3}	6×10^{-9}	4×10^{-5}
		I	1×10^{-7}	1×10^{-3}	5×10^{-9}	4×10^{-5}
	Bi 207	S	2×10^{-7}	2×10^{-3}	6×10^{-9}	6×10^{-5}
		I	1×10^{-6}	2×10^{-3}	5×10^{-10}	6×10^{-5}
	Bi 210	S	6×10^{-8}	1×10^{-3}	2×10^{-10}	4×10^{-5}
		I	6×10^{-9}	1×10^{-3}	2×10^{-10}	4×10^{-5}
	Bi 212	S	1×10^{-7}	1×10^{-2}	3×10^{-9}	4×10^{-4}
		I	2×10^{-7}	1×10^{-2}	7×10^{-9}	4×10^{-4}
Bromine (35)	Br 82	S	1×10^{-6}	8×10^{-3}	4×10^{-8}	3×10^{-4}
		I	2×10^{-7}	1×10^{-2}	6×10^{-9}	4×10^{-4}

Element (atomic number)	Isotope[1]		Table I Column 1 Air (uCi/ml)	Table I Column 2 Water (uCi/ml)	Table II Column 1 Air (uCi/ml)	Table II Column 2 Water (uCi/ml)
Cadmium (48)	Cd 109	S	5×10^{-6}	5×10^{-2}	2×10^{-8}	2×10^{-4}
		I	7×10^{-6}	5×10^{-2}	3×10^{-8}	2×10^{-4}
	Cd 115 m	S	4×10^{-6}	7×10^{-4}	1×10^{-8}	3×10^{-6}
		I	4×10^{-6}	7×10^{-4}	1×10^{-8}	3×10^{-6}
	Cd 115	S	2×10^{-7}	1×10^{-2}	8×10^{-9}	3×10^{-5}
		I	2×10^{-7}	1×10^{-2}	6×10^{-9}	4×10^{-5}
Calcium (20)	Ca 45	S	3×10^{-6}	3×10^{-4}	1×10^{-8}	9×10^{-6}
		I	1×10^{-7}	5×10^{-3}	4×10^{-9}	2×10^{-4}
	Ca 47	S	2×10^{-7}	1×10^{-3}	6×10^{-9}	5×10^{-5}
		I	2×10^{-7}	1×10^{-3}	6×10^{-9}	3×10^{-5}
Californium (98)	Cf 249	S	2×10^{-12}	1×10^{-4}	5×10^{-14}	4×10^{-6}
		I	1×10^{-10}	7×10^{-4}	3×10^{-12}	2×10^{-5}
	Cf 250	S	5×10^{-12}	4×10^{-4}	2×10^{-13}	1×10^{-5}
		I	1×10^{-10}	7×10^{-4}	3×10^{-12}	3×10^{-5}
	Cf 251	S	2×10^{-12}	1×10^{-4}	6×10^{-14}	4×10^{-6}
		I	1×10^{-10}	8×10^{-4}	3×10^{-12}	3×10^{-5}
	Cf 252	S	6×10^{-12}	2×10^{-4}	2×10^{-12}	7×10^{-6}
		I	3×10^{-11}	2×10^{-4}	1×10^{-12}	7×10^{-6}
	Cf 253	S	8×10^{-10}	4×10^{-3}	3×10^{-11}	1×10^{-4}
		I	8×10^{-10}	4×10^{-3}	3×10^{-11}	1×10^{-4}
	Cf 254	S	5×10^{-13}	4×10^{-6}	2×10^{-15}	1×10^{-7}
		I	5×10^{-13}	4×10^{-6}	2×10^{-15}	1×10^{-7}
Carbon (6)	C 14	S	4×10^{-6}	2×10^{-2}	1×10^{-7}	8×10^{-4}
	(CO_2)	Sub[2]	5×10^{-5}	.....	1×10^{-6}	.....
Cerium (58)	Ce 141	S	4×10^{-7}	3×10^{-3}	2×10^{-8}	9×10^{-5}
		I	2×10^{-7}	3×10^{-3}	5×10^{-9}	9×10^{-5}
	Ce 143	S	3×10^{-7}	1×10^{-3}	9×10^{-9}	4×10^{-5}
		I	2×10^{-7}	1×10^{-3}	7×10^{-9}	4×10^{-5}
	Ce 144	S	1×10^{-8}	3×10^{-4}	3×10^{-10}	1×10^{-5}
		I	6×10^{-9}	3×10^{-4}	2×10^{-10}	1×10^{-5}
Cesium (55)	Cs 131	S	1×10^{-5}	7×10^{-2}	4×10^{-7}	2×10^{-3}
		I	3×10^{-6}	3×10^{-2}	1×10^{-7}	9×10^{-4}
	Cs 134 m	S	4×10^{-5}	2×10^{-1}	1×10^{-6}	6×10^{-3}
		I	6×10^{-6}	3×10^{-2}	2×10^{-7}	1×10^{-3}
	Cs 134	S	4×10^{-8}	3×10^{-4}	1×10^{-9}	9×10^{-6}
		I	1×10^{-8}	1×10^{-3}	4×10^{-10}	4×10^{-5}
	Cs 135	S	5×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
		I	9×10^{-8}	7×10^{-3}	3×10^{-9}	2×10^{-4}
	Cs 136	S	4×10^{-7}	2×10^{-3}	1×10^{-8}	9×10^{-5}
		I	2×10^{-7}	2×10^{-3}	6×10^{-9}	6×10^{-5}
	Cs 137	S	6×10^{-8}	4×10^{-4}	2×10^{-9}	2×10^{-5}
		I	1×10^{-8}	1×10^{-3}	5×10^{-10}	4×10^{-5}
Chlorine (17)	Cl 36	S	4×10^{-7}	2×10^{-3}	1×10^{-8}	8×10^{-5}
		I	2×10^{-6}	2×10^{-3}	8×10^{-10}	6×10^{-5}
	Cl 38	S	3×10^{-6}	1×10^{-2}	9×10^{-8}	4×10^{-4}
		I	2×10^{-6}	1×10^{-2}	7×10^{-8}	4×10^{-4}
Chromium (24)	Cr 51	S	1×10^{-5}	5×10^{-2}	4×10^{-7}	2×10^{-3}
		I	2×10^{-6}	5×10^{-2}	8×10^{-8}	2×10^{-3}
Cobalt (27)	Co 57	S	3×10^{-6}	2×10^{-2}	1×10^{-7}	5×10^{-4}
		I	2×10^{-7}	1×10^{-2}	6×10^{-9}	4×10^{-4}
	Co 58 m	S	2×10^{-5}	8×10^{-2}	6×10^{-7}	3×10^{-3}
		I	9×10^{-6}	6×10^{-2}	3×10^{-7}	2×10^{-3}

See footnotes at end of appendix

APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND—Continued

Element (atomic number)	Isotope[1]		Table I Column 1 Air (uCi/ml)	Table I Column 2 Water (uCi/ml)	Table II Column 1 Air (uCi/ml)	Table II Column 2 Water (uCi/ml)
	Co 58	S	8×10^{-7}	4×10^{-6}	3×10^{-8}	1×10^{-4}
		I	5×10^{-8}	3×10^{-6}	2×10^{-9}	9×10^{-5}
	Co 60	S	3×10^{-7}	1×10^{-5}	1×10^{-8}	5×10^{-5}
		I	9×10^{-9}	1×10^{-5}	3×10^{-10}	3×10^{-5}
Copper (29)	Cu 64	S	2×10^{-6}	1×10^{-5}	7×10^{-8}	3×10^{-4}
		I	1×10^{-6}	6×10^{-5}	4×10^{-8}	2×10^{-4}
Curium (96)	Cm 242	S	1×10^{-10}	7×10^{-4}	4×10^{-12}	2×10^{-2}
		I	2×10^{-10}	7×10^{-4}	6×10^{-12}	3×10^{-2}
	Cm 243	S	6×10^{-11}	1×10^{-4}	2×10^{-12}	5×10^{-3}
		I	1×10^{-10}	7×10^{-4}	3×10^{-12}	2×10^{-2}
	Cm 244	S	9×10^{-11}	2×10^{-4}	3×10^{-12}	7×10^{-3}
		I	1×10^{-10}	8×10^{-4}	3×10^{-12}	3×10^{-2}
	Cm 245	S	5×10^{-11}	1×10^{-4}	2×10^{-12}	4×10^{-3}
		I	1×10^{-10}	8×10^{-4}	4×10^{-12}	3×10^{-2}
	Cm 246	S	5×10^{-11}	1×10^{-4}	2×10^{-12}	4×10^{-3}
		I	1×10^{-10}	8×10^{-4}	4×10^{-12}	3×10^{-2}
	Cm 247	S	5×10^{-11}	1×10^{-4}	2×10^{-12}	4×10^{-3}
		I	1×10^{-10}	8×10^{-4}	4×10^{-12}	2×10^{-2}
	Cm 248	S	6×10^{-12}	1×10^{-4}	2×10^{-13}	4×10^{-4}
		I	1×10^{-11}	4×10^{-4}	4×10^{-13}	1×10^{-2}
	Cm 249	S	1×10^{-6}	6×10^{-2}	4×10^{-8}	2×10^{-0}
		I	1×10^{-6}	6×10^{-2}	4×10^{-8}	2×10^{-0}
Dysprosium (66)	Dy 165	S	3×10^{-6}	1×10^{-2}	9×10^{-8}	4×10^{-1}
		I	2×10^{-6}	1×10^{-2}	7×10^{-8}	4×10^{-1}
	Dy 166	S	2×10^{-7}	1×10^{-3}	5×10^{-9}	4×10^{-2}
		I	2×10^{-7}	1×10^{-3}	7×10^{-9}	4×10^{-2}
Einsteinium (99)	Es 253	S	8×10^{-10}	7×10^{-4}	3×10^{-11}	2×10^{-2}
		I	6×10^{-10}	7×10^{-4}	2×10^{-11}	2×10^{-2}
	Es 254 m	S	5×10^{-9}	5×10^{-4}	2×10^{-10}	2×10^{-2}
		I	6×10^{-9}	5×10^{-4}	2×10^{-10}	2×10^{-2}
	Es 254	S	2×10^{-11}	4×10^{-4}	6×10^{-13}	1×10^{-2}
		I	1×10^{-10}	4×10^{-4}	4×10^{-12}	1×10^{-2}
	Es 255	S	5×10^{-10}	8×10^{-4}	2×10^{-11}	3×10^{-2}
		I	4×10^{-10}	8×10^{-4}	1×10^{-11}	3×10^{-2}
Erbium (68)	Er 169	S	6×10^{-7}	3×10^{-3}	2×10^{-8}	9×10^{-2}
		I	4×10^{-7}	3×10^{-3}	1×10^{-8}	9×10^{-2}
	Er 171	S	7×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-1}
		I	6×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-1}
Europium (63)	Eu 152 (T½ = 9.2 hrs)	S	4×10^{-7}	2×10^{-3}	1×10^{-8}	6×10^{-2}
		I	3×10^{-7}	2×10^{-3}	1×10^{-8}	6×10^{-2}
	Eu 152 (T½ = 13 yrs)	S	1×10^{-8}	2×10^{-3}	4×10^{-10}	8×10^{-2}
		I	2×10^{-8}	2×10^{-3}	6×10^{-10}	8×10^{-2}
	Eu 154	S	4×10^{-9}	6×10^{-4}	1×10^{-10}	2×10^{-2}
		I	7×10^{-9}	6×10^{-4}	2×10^{-10}	2×10^{-2}
	Eu 155	S	9×10^{-8}	6×10^{-3}	3×10^{-9}	2×10^{-1}
		I	7×10^{-8}	6×10^{-3}	3×10^{-9}	2×10^{-1}
Fermium (100)	Fm 254	S	6×10^{-9}	4×10^{-3}	2×10^{-9}	1×10^{-1}
		I	7×10^{-8}	4×10^{-3}	2×10^{-9}	1×10^{-1}
	Fm 255	S	2×10^{-8}	1×10^{-3}	6×10^{-10}	3×10^{-2}
		I	1×10^{-8}	1×10^{-3}	4×10^{-10}	3×10^{-2}
	Fm 256	S	3×10^{-9}	3×10^{-4}	1×10^{-10}	9×10^{-3}
		I	2×10^{-9}	3×10^{-4}	6×10^{-11}	9×10^{-3}
Fluorine (9)	F 18	S	5×10^{-6}	2×10^{-1}	2×10^{-7}	8×10^{-4}
		I	3×10^{-6}	1×10^{-1}	9×10^{-8}	5×10^{-4}
Gadolinium (64)	Gd 153	S	2×10^{-7}	6×10^{-3}	8×10^{-9}	2×10^{-2}
		I	9×10^{-8}	6×10^{-3}	3×10^{-9}	2×10^{-2}
	Gd 159	S	5×10^{-7}	2×10^{-2}	2×10^{-8}	8×10^{-2}
		I	4×10^{-7}	2×10^{-2}	1×10^{-8}	8×10^{-2}
Gallium (31)	Ga 72	S	2×10^{-7}	1×10^{-2}	9×10^{-9}	4×10^{-2}
		I	2×10^{-7}	1×10^{-2}	6×10^{-9}	4×10^{-2}
Germanium (32)	Ge 71	S	1×10^{-6}	5×10^{-2}	4×10^{-7}	2×10^{-1}
		I	6×10^{-6}	5×10^{-2}	2×10^{-7}	2×10^{-1}
Gold (79)	Au 196	S	1×10^{-6}	5×10^{-3}	4×10^{-8}	2×10^{-2}
		I	6×10^{-7}	4×10^{-3}	2×10^{-8}	1×10^{-2}
	Au 198	S	3×10^{-7}	2×10^{-3}	1×10^{-8}	5×10^{-2}
		I	2×10^{-7}	1×10^{-3}	9×10^{-9}	5×10^{-2}
	Au 199	S	1×10^{-6}	5×10^{-3}	1×10^{-8}	2×10^{-2}
		I	8×10^{-7}	4×10^{-3}	3×10^{-8}	2×10^{-2}
Hafnium (72)	Hf 181	S	4×10^{-6}	2×10^{-2}	1×10^{-7}	7×10^{-2}
		I	7×10^{-6}	2×10^{-2}	1×10^{-7}	7×10^{-2}
Holmium (67)	Ho 166	S	2×10^{-7}	9×10^{-4}	7×10^{-9}	3×10^{-2}
		I	2×10^{-7}	9×10^{-4}	5×10^{-9}	3×10^{-2}
Hydrogen (1)	H 3	S	5×10^{-4}	1×10^{-1}	2×10^{-7}	3×10^{-2}
		I	5×10^{-6}	1×10^{-1}	2×10^{-7}	3×10^{-2}
		Sub	2×10^{-6}		4×10^{-8}	
Indium (49)	In 113 m	S	5×10^{-6}	4×10^{-2}	3×10^{-7}	1×10^{-1}
		I	7×10^{-6}	4×10^{-2}	2×10^{-7}	1×10^{-1}
	In 114 m	S	1×10^{-7}	5×10^{-4}	4×10^{-9}	2×10^{-2}
		I	2×10^{-6}	5×10^{-4}	7×10^{-10}	2×10^{-2}
	In 115 m	S	2×10^{-6}	1×10^{-2}	9×10^{-8}	4×10^{-2}
		I	2×10^{-6}	1×10^{-2}	6×10^{-8}	4×10^{-2}
	In 115	S	7×10^{-7}	3×10^{-2}	2×10^{-8}	9×10^{-2}
		I	3×10^{-7}	3×10^{-2}	1×10^{-8}	9×10^{-2}
Iodine (53)	I 125	S	5×10^{-8}	1×10^{-2}	9×10^{-11}	2×10^{-1}
		I	4×10^{-7}	6×10^{-3}	6×10^{-9}	2×10^{-2}
	I 126	S	8×10^{-8}	5×10^{-3}	9×10^{-11}	3×10^{-1}
		I	3×10^{-7}	3×10^{-3}	1×10^{-8}	9×10^{-2}
	I 129	S	2×10^{-8}	1×10^{-3}	2×10^{-11}	6×10^{-2}
		I	7×10^{-8}	6×10^{-3}	2×10^{-9}	2×10^{-2}
	I 131	S	9×10^{-8}	6×10^{-3}	1×10^{-10}	3×10^{-1}
		I	3×10^{-7}	2×10^{-2}	1×10^{-9}	6×10^{-2}
	I 132	S	2×10^{-7}	2×10^{-2}	3×10^{-9}	8×10^{-2}
		I	9×10^{-7}	5×10^{-2}	3×10^{-9}	2×10^{-1}
	I 133	S	3×10^{-8}	2×10^{-3}	4×10^{-10}	1×10^{-2}
		I	2×10^{-7}	1×10^{-2}	7×10^{-9}	4×10^{-2}
	I 134	S	5×10^{-7}	4×10^{-2}	6×10^{-9}	2×10^{-1}
		I	3×10^{-6}	2×10^{-2}	1×10^{-7}	6×10^{-1}
	I 135	S	1×10^{-7}	7×10^{-3}	1×10^{-9}	4×10^{-2}
		I	4×10^{-7}	2×10^{-2}	1×10^{-8}	7×10^{-2}
Iridium (77)	Ir 190	S	1×10^{-6}	6×10^{-3}	4×10^{-9}	2×10^{-2}
		I	4×10^{-7}	5×10^{-3}	1×10^{-9}	2×10^{-2}
	Ir 192	S	1×10^{-7}	1×10^{-3}	4×10^{-9}	4×10^{-2}
		I	3×10^{-8}	1×10^{-3}	9×10^{-10}	4×10^{-2}
	Ir 194	S	2×10^{-7}	1×10^{-3}	8×10^{-9}	3×10^{-2}
		I	2×10^{-7}	9×10^{-4}	5×10^{-9}	3×10^{-2}

See footnotes at end of appendix

APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND—Continued

Element (atomic number)	Isotope[1]		Table I Column 1 Air (uCi/ml)	Table I Column 2 Water (uCi/ml)	Table II Column 1 Air (uCi/ml)	Table II Column 2 Water (uCi/ml)
Iron (26)	Fe 55	S	9×10^{-7}	2×10^{-5}	3×10^{-6}	8×10^{-4}
		I	1×10^{-6}	7×10^{-7}	3×10^{-6}	2×10^{-8}
	Fe 59	S	1×10^{-7}	2×10^{-8}	5×10^{-9}	6×10^{-5}
		I	5×10^{-6}	2×10^{-6}	2×10^{-6}	5×10^{-4}
Krypton (36)	Kr 85 m	Sub	6×10^{-6}	.....	1×10^{-7}	.....
	Kr 85	Sub	1×10^{-6}	.....	3×10^{-7}	.....
	Kr 87	Sub	1×10^{-6}	.....	2×10^{-6}	.....
	Kr 88	Sub	1×10^{-6}	.....	2×10^{-6}	.....
Lanthanum (57)	La 140	S	2×10^{-7}	7×10^{-6}	5×10^{-9}	2×10^{-4}
		I	1×10^{-7}	7×10^{-6}	4×10^{-9}	2×10^{-4}
Lead (82)	Pb 203	S	3×10^{-6}	1×10^{-4}	9×10^{-8}	4×10^{-6}
		I	2×10^{-6}	1×10^{-5}	6×10^{-8}	4×10^{-6}
	Pb 210	S	1×10^{-10}	4×10^{-9}	4×10^{-12}	1×10^{-7}
		I	2×10^{-10}	5×10^{-9}	8×10^{-12}	2×10^{-7}
	Pb 212	S	2×10^{-8}	6×10^{-6}	6×10^{-10}	2×10^{-4}
		I	2×10^{-8}	5×10^{-6}	7×10^{-10}	2×10^{-4}
Lutetium (71)	Lu 177	S	6×10^{-7}	3×10^{-5}	2×10^{-8}	1×10^{-3}
		I	5×10^{-7}	3×10^{-5}	2×10^{-8}	1×10^{-3}
Manganese (25)	Mn 52	S	2×10^{-7}	1×10^{-5}	7×10^{-9}	3×10^{-5}
		I	1×10^{-7}	9×10^{-6}	5×10^{-9}	3×10^{-5}
	Mn 54	S	4×10^{-7}	4×10^{-5}	1×10^{-8}	1×10^{-3}
		I	4×10^{-8}	3×10^{-5}	1×10^{-9}	1×10^{-3}
	Mn 56	S	8×10^{-7}	4×10^{-5}	3×10^{-8}	1×10^{-3}
		I	5×10^{-7}	3×10^{-5}	2×10^{-8}	1×10^{-3}
Mercury (80)	Hg 197 m	S	7×10^{-7}	6×10^{-5}	3×10^{-8}	2×10^{-3}
		I	8×10^{-7}	5×10^{-5}	3×10^{-8}	2×10^{-3}
	Hg 197	S	1×10^{-6}	9×10^{-5}	4×10^{-8}	3×10^{-3}
		I	3×10^{-6}	1×10^{-5}	9×10^{-8}	5×10^{-3}
	Hg 203	S	7×10^{-8}	5×10^{-6}	2×10^{-9}	2×10^{-4}
		I	1×10^{-7}	3×10^{-5}	4×10^{-9}	1×10^{-3}
Molybdenum (42)	Mo 99	S	7×10^{-7}	5×10^{-5}	3×10^{-8}	2×10^{-3}
		I	2×10^{-7}	1×10^{-5}	7×10^{-9}	4×10^{-4}
Neodymium (60)	Nd 144	S	8×10^{-11}	2×10^{-5}	3×10^{-12}	7×10^{-4}
		I	3×10^{-10}	2×10^{-5}	1×10^{-11}	8×10^{-4}
	Nd 147	S	4×10^{-7}	2×10^{-5}	1×10^{-8}	6×10^{-4}
		I	2×10^{-7}	2×10^{-5}	8×10^{-9}	6×10^{-4}
	Nd 149	S	2×10^{-6}	5×10^{-5}	6×10^{-8}	3×10^{-3}
		I	1×10^{-6}	8×10^{-5}	5×10^{-8}	3×10^{-3}
Neptunium (93)	Np 237	S	4×10^{-13}	9×10^{-6}	1×10^{-14}	3×10^{-4}
		I	1×10^{-10}	9×10^{-6}	4×10^{-13}	3×10^{-4}
	Np 239	S	8×10^{-7}	4×10^{-5}	3×10^{-8}	1×10^{-3}
		I	7×10^{-7}	4×10^{-5}	2×10^{-8}	1×10^{-3}
Nickel (28)	Ni 59	S	5×10^{-7}	6×10^{-5}	2×10^{-8}	2×10^{-3}
		I	8×10^{-7}	6×10^{-5}	3×10^{-8}	2×10^{-3}
	Ni 63	S	6×10^{-6}	5×10^{-4}	2×10^{-7}	3×10^{-2}
		I	3×10^{-7}	2×10^{-5}	1×10^{-8}	7×10^{-4}
	Ni 65	S	9×10^{-7}	4×10^{-5}	3×10^{-8}	1×10^{-3}
		I	5×10^{-7}	3×10^{-5}	2×10^{-8}	1×10^{-3}
Niobium (41)	Nb 93 m	S	1×10^{-7}	1×10^{-5}	4×10^{-9}	4×10^{-4}
		I	2×10^{-7}	1×10^{-5}	5×10^{-9}	4×10^{-4}
	Nb 95	S	5×10^{-7}	3×10^{-5}	2×10^{-8}	1×10^{-3}
		I	1×10^{-7}	3×10^{-5}	3×10^{-9}	1×10^{-3}
	Nb 97	S	6×10^{-6}	3×10^{-5}	2×10^{-7}	9×10^{-3}
		I	5×10^{-6}	3×10^{-5}	2×10^{-7}	9×10^{-3}
Osmium (76)	Os 185	S	5×10^{-7}	2×10^{-5}	2×10^{-8}	7×10^{-4}
		I	5×10^{-6}	2×10^{-5}	2×10^{-8}	7×10^{-4}
	Os 191 m	S	2×10^{-6}	7×10^{-5}	6×10^{-8}	3×10^{-3}
		I	9×10^{-6}	7×10^{-5}	3×10^{-7}	2×10^{-2}
	Os 191	S	1×10^{-6}	5×10^{-5}	4×10^{-8}	2×10^{-3}
		I	4×10^{-7}	5×10^{-5}	1×10^{-8}	2×10^{-3}
	Os 193	S	4×10^{-7}	2×10^{-5}	1×10^{-8}	6×10^{-4}
		I	3×10^{-7}	2×10^{-5}	9×10^{-9}	5×10^{-4}
Palladium (46)	Pd 103	S	1×10^{-6}	1×10^{-5}	5×10^{-8}	3×10^{-3}
		I	7×10^{-7}	8×10^{-6}	3×10^{-8}	3×10^{-3}
	Pd 109	S	6×10^{-7}	3×10^{-5}	2×10^{-8}	9×10^{-3}
		I	4×10^{-7}	2×10^{-5}	1×10^{-8}	7×10^{-3}
Phosphorus (15)	P 32	S	7×10^{-8}	5×10^{-6}	2×10^{-9}	2×10^{-4}
		I	8×10^{-8}	7×10^{-6}	3×10^{-9}	2×10^{-4}
Platinum (78)	Pt 191	S	8×10^{-7}	4×10^{-5}	3×10^{-8}	1×10^{-3}
		I	6×10^{-7}	3×10^{-5}	2×10^{-8}	1×10^{-3}
	Pt 193 m	S	7×10^{-6}	3×10^{-5}	2×10^{-7}	1×10^{-2}
		I	5×10^{-6}	3×10^{-5}	2×10^{-7}	1×10^{-2}
	Pt 197 m	S	6×10^{-6}	3×10^{-5}	2×10^{-7}	1×10^{-2}
		I	5×10^{-6}	3×10^{-5}	2×10^{-7}	9×10^{-3}
	Pt 197	S	8×10^{-7}	4×10^{-5}	3×10^{-8}	1×10^{-3}
		I	6×10^{-7}	3×10^{-5}	2×10^{-8}	1×10^{-3}
Plutonium (94)	Pu 238	S	2×10^{-13}	1×10^{-6}	7×10^{-16}	5×10^{-6}
		I	3×10^{-11}	8×10^{-6}	1×10^{-13}	3×10^{-4}
	Pu 239	S	2×10^{-13}	1×10^{-6}	6×10^{-16}	5×10^{-6}
		I	4×10^{-11}	8×10^{-6}	1×10^{-13}	3×10^{-4}
	Pu 240	S	2×10^{-13}	1×10^{-6}	6×10^{-16}	5×10^{-6}
		I	4×10^{-11}	8×10^{-6}	1×10^{-13}	3×10^{-4}
	Pu 241	S	9×10^{-11}	7×10^{-5}	3×10^{-13}	3×10^{-3}
		I	4×10^{-8}	4×10^{-3}	1×10^{-9}	1×10^{-1}
	Pu 242	S	2×10^{-13}	1×10^{-6}	6×10^{-16}	5×10^{-6}
		I	4×10^{-11}	9×10^{-6}	1×10^{-13}	3×10^{-4}
	Pu 243	S	2×10^{-6}	1×10^{-3}	6×10^{-9}	3×10^{-3}
		I	2×10^{-6}	1×10^{-3}	8×10^{-9}	3×10^{-3}
	Pu 244	S	2×10^{-13}	1×10^{-6}	6×10^{-16}	4×10^{-6}
		I	3×10^{-11}	3×10^{-6}	1×10^{-13}	1×10^{-4}
Polonium (84)	Po 210	S	5×10^{-10}	2×10^{-6}	2×10^{-11}	7×10^{-7}
		I	2×10^{-10}	8×10^{-6}	7×10^{-12}	3×10^{-6}
Potassium (19)	K 42	S	2×10^{-6}	9×10^{-5}	7×10^{-9}	3×10^{-3}
		I	1×10^{-7}	6×10^{-6}	4×10^{-9}	2×10^{-4}
Praseodymium (59)	Pr 142	S	2×10^{-7}	9×10^{-6}	7×10^{-9}	3×10^{-4}
		I	2×10^{-7}	9×10^{-6}	5×10^{-9}	3×10^{-4}
	Pr 143	S	3×10^{-7}	1×10^{-5}	1×10^{-8}	5×10^{-4}
		I	2×10^{-7}	1×10^{-5}	6×10^{-9}	5×10^{-4}
Promethium (61)	Pm 147	S	6×10^{-6}	6×10^{-5}	2×10^{-9}	2×10^{-4}
		I	1×10^{-7}	6×10^{-5}	3×10^{-9}	2×10^{-4}
	Pm 149	S	3×10^{-7}	1×10^{-5}	1×10^{-8}	4×10^{-4}
		I	2×10^{-7}	1×10^{-5}	8×10^{-9}	4×10^{-4}
Protoactinium (91)	Pa 230	S	2×10^{-9}	7×10^{-5}	6×10^{-11}	2×10^{-3}
		I	8×10^{-10}	7×10^{-5}	3×10^{-11}	2×10^{-3}

See footnotes at end of appendix

APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND—Continued

Element (atomic number)	Isotope[1]		Table I Column 1 Air (uCi/ml)	Table I Column 2 Water (uCi/ml)	Table II Column 1 Air (uCi/ml)	Table II Column 2 Water (uCi/ml)
	Pa 231	S	1×10^{-12}	3×10^{-8}	4×10^{-14}	9×10^{-7}
		I	1×10^{-10}	8×10^{-6}	4×10^{-12}	2×10^{-4}
	Pa 233	S	6×10^{-7}	4×10^{-3}	2×10^{-8}	1×10^{-1}
		I	2×10^{-7}	3×10^{-3}	6×10^{-9}	1×10^{-1}
Radium (88)	Ra 223	S	2×10^{-9}	2×10^{-6}	6×10^{-11}	7×10^{-5}
		I	2×10^{-10}	1×10^{-6}	8×10^{-12}	4×10^{-6}
	Ra 224	S	5×10^{-9}	7×10^{-6}	2×10^{-10}	2×10^{-4}
		I	7×10^{-10}	2×10^{-6}	2×10^{-11}	5×10^{-6}
	Ra 226	S	3×10^{-11}	4×10^{-7}	3×10^{-13}	3×10^{-6}
		I	5×10^{-11}	9×10^{-6}	2×10^{-12}	3×10^{-6}
	Ra 228	S	7×10^{-11}	8×10^{-7}	2×10^{-12}	3×10^{-6}
		I	4×10^{-11}	7×10^{-6}	1×10^{-12}	3×10^{-6}
Radon (86)	Rn 220	S	3×10^{-7}	.....	1×10^{-8}	.....
		I	.....	.....	.....	.....
	Rn 222[3/]	S	3×10^{-8}	.....	3×10^{-9}	.....
Rhenium (75)	Re 183	S	3×10^{-6}	2×10^{-5}	9×10^{-8}	6×10^{-4}
		I	2×10^{-7}	8×10^{-8}	5×10^{-9}	3×10^{-4}
	Re 186	S	6×10^{-7}	3×10^{-5}	2×10^{-8}	9×10^{-4}
		I	2×10^{-7}	1×10^{-5}	8×10^{-9}	5×10^{-4}
	Re 187	S	9×10^{-6}	7×10^{-1}	3×10^{-7}	3×10^{-2}
		I	5×10^{-7}	4×10^{-1}	2×10^{-8}	2×10^{-2}
	Re 188	S	4×10^{-7}	2×10^{-5}	1×10^{-8}	6×10^{-4}
		I	2×10^{-7}	9×10^{-6}	6×10^{-9}	3×10^{-4}
Rhodium (45)	Rh 103 m	S	8×10^{-6}	4×10^{-1}	3×10^{-8}	1×10^{-1}
		I	6×10^{-6}	3×10^{-1}	2×10^{-8}	1×10^{-2}
	Rh 105	S	8×10^{-7}	4×10^{-6}	3×10^{-8}	1×10^{-4}
		I	5×10^{-7}	3×10^{-6}	2×10^{-8}	1×10^{-4}
Rubidium (37)	Rb 86	S	3×10^{-7}	2×10^{-5}	1×10^{-8}	7×10^{-5}
		I	7×10^{-8}	7×10^{-6}	2×10^{-9}	2×10^{-5}
	Rb 87	S	5×10^{-7}	3×10^{-5}	2×10^{-8}	1×10^{-4}
		I	7×10^{-8}	5×10^{-6}	2×10^{-9}	2×10^{-5}
Ruthenium (44)	Ru 97	S	2×10^{-6}	1×10^{-5}	8×10^{-8}	4×10^{-4}
		I	2×10^{-6}	1×10^{-5}	6×10^{-8}	3×10^{-4}
	Ru 103	S	5×10^{-7}	2×10^{-5}	2×10^{-8}	8×10^{-4}
		I	8×10^{-8}	2×10^{-5}	3×10^{-9}	8×10^{-4}
	Ru 105	S	7×10^{-7}	3×10^{-5}	2×10^{-8}	1×10^{-4}
		I	5×10^{-7}	3×10^{-5}	2×10^{-8}	1×10^{-4}
	Ru 106	S	8×10^{-6}	4×10^{-4}	3×10^{-7}	1×10^{-3}
		I	6×10^{-7}	3×10^{-4}	2×10^{-10}	1×10^{-3}
Samarium (62)	Sm 147	S	7×10^{-11}	2×10^{-5}	2×10^{-12}	6×10^{-4}
		I	3×10^{-10}	2×10^{-5}	9×10^{-12}	7×10^{-4}
	Sm 151	S	6×10^{-6}	1×10^{-4}	2×10^{-7}	4×10^{-3}
		I	1×10^{-7}	1×10^{-4}	5×10^{-9}	4×10^{-3}
	Sm 153	S	5×10^{-7}	2×10^{-5}	2×10^{-8}	8×10^{-4}
		I	4×10^{-7}	2×10^{-5}	1×10^{-8}	8×10^{-4}
Scandium (21)	Sc 46	S	2×10^{-7}	1×10^{-5}	8×10^{-9}	4×10^{-4}
		I	2×10^{-6}	1×10^{-5}	8×10^{-10}	4×10^{-4}
	Sc 47	S	6×10^{-7}	3×10^{-5}	2×10^{-8}	9×10^{-4}
		I	5×10^{-7}	3×10^{-5}	2×10^{-8}	9×10^{-4}
	Sc 48	S	2×10^{-7}	8×10^{-6}	6×10^{-9}	3×10^{-4}
		I	1×10^{-7}	8×10^{-6}	5×10^{-9}	3×10^{-4}
Selenium (34)	Se 75	S	1×10^{-6}	9×10^{-5}	4×10^{-8}	3×10^{-4}
		I	1×10^{-7}	8×10^{-5}	4×10^{-9}	3×10^{-4}

Element (atomic number)	Isotope[1]		Table I Column 1 Air (uCi/ml)	Table I Column 2 Water (uCi/ml)	Table II Column 1 Air (uCi/ml)	Table II Column 2 Water (uCi/ml)
Silicon (14)	Si 31	S	6×10^{-6}	3×10^{-3}	2×10^{-7}	9×10^{-6}
		I	1×10^{-6}	6×10^{-5}	3×10^{-8}	2×10^{-6}
Silver (47)	Ag 105	S	6×10^{-7}	3×10^{-5}	2×10^{-8}	1×10^{-4}
		I	8×10^{-8}	3×10^{-5}	3×10^{-9}	1×10^{-4}
	Ag 110 m	S	2×10^{-7}	9×10^{-6}	7×10^{-9}	3×10^{-4}
		I	1×10^{-8}	9×10^{-6}	3×10^{-10}	3×10^{-4}
	Ag 111	S	3×10^{-7}	1×10^{-3}	1×10^{-8}	4×10^{-4}
		I	2×10^{-7}	1×10^{-3}	8×10^{-9}	4×10^{-4}
Sodium (11)	Na 22	S	2×10^{-7}	1×10^{-5}	6×10^{-9}	4×10^{-4}
		I	9×10^{-8}	9×10^{-6}	3×10^{-10}	3×10^{-4}
	Na 24	S	1×10^{-6}	6×10^{-3}	4×10^{-8}	2×10^{-1}
		I	1×10^{-7}	8×10^{-6}	5×10^{-9}	3×10^{-4}
Strontium (38)	Sr 85 m	S	4×10^{-6}	2×10^{-1}	1×10^{-8}	7×10^{-3}
		I	3×10^{-6}	2×10^{-1}	1×10^{-8}	7×10^{-3}
	Sr 85	S	2×10^{-7}	3×10^{-5}	8×10^{-9}	1×10^{-4}
		I	1×10^{-7}	5×10^{-6}	4×10^{-9}	2×10^{-4}
	Sr 89	S	3×10^{-8}	3×10^{-6}	3×10^{-10}	3×10^{-4}
		I	4×10^{-8}	8×10^{-6}	1×10^{-9}	3×10^{-4}
	Sr 90	S	1×10^{-8}	1×10^{-6}	3×10^{-11}	3×10^{-7}
		I	6×10^{-9}	1×10^{-6}	2×10^{-10}	4×10^{-7}
	Sr 91	S	4×10^{-7}	2×10^{-5}	2×10^{-8}	7×10^{-4}
		I	3×10^{-7}	1×10^{-5}	9×10^{-9}	5×10^{-4}
	Sr 92	S	4×10^{-7}	2×10^{-5}	2×10^{-8}	7×10^{-4}
		I	3×10^{-7}	2×10^{-5}	1×10^{-8}	6×10^{-4}
Sulfur (16)	S 35	S	3×10^{-7}	2×10^{-5}	9×10^{-9}	6×10^{-4}
		I	3×10^{-7}	8×10^{-6}	9×10^{-9}	3×10^{-4}
Tantalum (73)	Ta 182	S	4×10^{-8}	1×10^{-5}	1×10^{-9}	4×10^{-4}
		I	2×10^{-8}	1×10^{-5}	7×10^{-10}	4×10^{-4}
Technetium (43)	Tc 96 m	S	8×10^{-6}	4×10^{-1}	3×10^{-8}	1×10^{-2}
		I	3×10^{-6}	3×10^{-1}	1×10^{-8}	1×10^{-2}
	Tc 96	S	6×10^{-7}	3×10^{-5}	2×10^{-8}	1×10^{-4}
		I	2×10^{-7}	1×10^{-5}	8×10^{-9}	5×10^{-5}
	Tc 97 m	S	2×10^{-6}	1×10^{-5}	8×10^{-8}	4×10^{-4}
		I	2×10^{-7}	5×10^{-6}	5×10^{-9}	2×10^{-4}
	Tc 97	S	1×10^{-6}	5×10^{-1}	4×10^{-7}	2×10^{-2}
		I	3×10^{-7}	2×10^{-1}	1×10^{-8}	8×10^{-3}
	Tc 99 m	S	4×10^{-6}	2×10^{-1}	1×10^{-8}	6×10^{-3}
		I	1×10^{-6}	8×10^{-6}	5×10^{-9}	3×10^{-4}
	Tc 99	S	2×10^{-6}	1×10^{-5}	7×10^{-9}	3×10^{-4}
		I	6×10^{-8}	5×10^{-6}	2×10^{-9}	2×10^{-4}
Tellurium (52)	Te 125 m	S	4×10^{-7}	5×10^{-6}	1×10^{-8}	2×10^{-4}
		I	1×10^{-7}	3×10^{-6}	4×10^{-9}	1×10^{-4}
	Te 127 m	S	1×10^{-7}	2×10^{-5}	5×10^{-9}	6×10^{-4}
		I	4×10^{-8}	2×10^{-5}	1×10^{-9}	5×10^{-4}
	Te 127	S	2×10^{-6}	8×10^{-5}	6×10^{-8}	3×10^{-3}
		I	9×10^{-7}	5×10^{-5}	3×10^{-8}	2×10^{-3}
	Te 129 m	S	8×10^{-8}	1×10^{-5}	3×10^{-9}	3×10^{-4}
		I	3×10^{-8}	6×10^{-6}	1×10^{-9}	2×10^{-4}
	Te 129	S	5×10^{-6}	2×10^{-1}	2×10^{-7}	8×10^{-3}
		I	4×10^{-6}	2×10^{-1}	1×10^{-7}	8×10^{-3}
	Te 131 m	S	4×10^{-7}	2×10^{-5}	1×10^{-8}	6×10^{-4}
		I	2×10^{-7}	1×10^{-5}	6×10^{-9}	4×10^{-4}

See footnotes at end of appendix

APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND—Continued

Element (atomic number)	Isotope[1]		Table I Column 1 Air (uCi/ml)	Table I Column 2 Water (uCi/ml)	Table II Column 1 Air (uCi/ml)	Table II Column 2 Water (uCi/ml)
	Te 132	S	2×10^{-7}	9×10^{-6}	7×10^{-9}	3×10^{-6}
		I	1×10^{-7}	6×10^{-6}	4×10^{-9}	2×10^{-6}
Terbium (65)	Tb 160	S	1×10^{-7}	1×10^{-8}	3×10^{-9}	4×10^{-6}
		I	3×10^{-8}	1×10^{-8}	1×10^{-9}	4×10^{-6}
Thallium (81)	Tl 200	S	3×10^{-6}	1×10^{-5}	9×10^{-8}	4×10^{-6}
		I	1×10^{-6}	7×10^{-8}	4×10^{-8}	2×10^{-6}
	Tl 201	S	2×10^{-6}	9×10^{-8}	7×10^{-8}	3×10^{-6}
		I	9×10^{-7}	6×10^{-8}	3×10^{-8}	2×10^{-6}
	Tl 202	S	8×10^{-7}	4×10^{-8}	3×10^{-8}	1×10^{-6}
		I	2×10^{-7}	2×10^{-8}	8×10^{-9}	7×10^{-6}
	Tl 204	S	6×10^{-7}	3×10^{-8}	2×10^{-8}	1×10^{-6}
		I	3×10^{-8}	2×10^{-8}	9×10^{-10}	6×10^{-6}
Thorium (90)	Th 228	S	9×10^{-12}	2×10^{-6}	3×10^{-13}	7×10^{-6}
		I	6×10^{-10}	4×10^{-6}	2×10^{-10}	1×10^{-6}
	Th 230	S	2×10^{-10}	6×10^{-6}	8×10^{-14}	2×10^{-6}
		I	1×10^{-11}	9×10^{-6}	3×10^{-10}	3×10^{-6}
	Th 232	S	3×10^{-11}	5×10^{-6}	1×10^{-13}	2×10^{-6}
		I	3×10^{-11}	1×10^{-8}	1×10^{-10}	4×10^{-6}
	Th natural	S	3×10^{-11}	3×10^{-6}	1×10^{-13}	1×10^{-6}
		I	3×10^{-11}	3×10^{-6}	1×10^{-10}	1×10^{-6}
	Th 234	S	6×10^{-6}	5×10^{-6}	2×10^{-8}	2×10^{-6}
		I	3×10^{-6}	6×10^{-6}	1×10^{-8}	2×10^{-6}
Thulium (69)	Tm 170	S	4×10^{-8}	1×10^{-8}	1×10^{-9}	5×10^{-6}
		I	3×10^{-8}	1×10^{-8}	1×10^{-9}	5×10^{-6}
	Tm 171	S	1×10^{-7}	1×10^{-7}	4×10^{-9}	5×10^{-6}
		I	2×10^{-7}	1×10^{-7}	8×10^{-9}	5×10^{-6}
Tin (50)	Sn 113	S	4×10^{-7}	2×10^{-8}	1×10^{-8}	9×10^{-6}
		I	8×10^{-8}	2×10^{-8}	2×10^{-9}	8×10^{-6}
	Sn 125	S	1×10^{-7}	5×10^{-6}	4×10^{-9}	2×10^{-6}
		I	8×10^{-8}	5×10^{-6}	3×10^{-9}	2×10^{-6}
Tungsten (74)	W 181	S	2×10^{-6}	1×10^{-5}	8×10^{-8}	4×10^{-6}
		I	1×10^{-7}	1×10^{-7}	4×10^{-9}	3×10^{-6}
	W 185	S	8×10^{-7}	4×10^{-8}	3×10^{-8}	1×10^{-6}
		I	1×10^{-7}	3×10^{-8}	4×10^{-9}	1×10^{-6}
	W 187	S	4×10^{-7}	2×10^{-8}	2×10^{-8}	7×10^{-6}
		I	3×10^{-7}	2×10^{-8}	1×10^{-8}	6×10^{-6}
Uranium (92)	U 230	S	3×10^{-10}	1×10^{-6}	1×10^{-11}	8×10^{-6}
		I	1×10^{-10}	1×10^{-6}	4×10^{-12}	5×10^{-6}
	U 232	S	1×10^{-10}	8×10^{-6}	3×10^{-12}	3×10^{-6}
		I	3×10^{-11}	8×10^{-6}	9×10^{-13}	3×10^{-6}
	U 233	S	5×10^{-10}	9×10^{-6}	2×10^{-11}	3×10^{-6}
		I	1×10^{-10}	9×10^{-6}	4×10^{-12}	3×10^{-6}
	U 234	S[4/]	6×10^{-10}	9×10^{-6}	2×10^{-11}	3×10^{-6}
		I	1×10^{-10}	9×10^{-6}	4×10^{-12}	3×10^{-6}
	U 235	S[4/]	5×10^{-10}	8×10^{-6}	2×10^{-11}	3×10^{-6}
		I	1×10^{-10}	8×10^{-6}	4×10^{-12}	3×10^{-6}
	U 236	S	6×10^{-10}	1×10^{-5}	2×10^{-11}	3×10^{-6}
		I	1×10^{-10}	1×10^{-5}	4×10^{-12}	3×10^{-6}
	U 238	S[4/]	7×10^{-11}	1×10^{-5}	3×10^{-12}	4×10^{-6}
		I	1×10^{-10}	1×10^{-5}	5×10^{-12}	4×10^{-6}
	U 240	S	2×10^{-7}	1×10^{-5}	8×10^{-9}	3×10^{-6}
		I	2×10^{-7}	1×10^{-5}	6×10^{-9}	3×10^{-6}
	U natural	S[4/]	7×10^{-11}	5×10^{-6}	3×10^{-12}	2×10^{-6}
		I	6×10^{-11}	5×10^{-6}	2×10^{-12}	2×10^{-6}
Vanadium (23)	V 48	S	2×10^{-7}	9×10^{-6}	6×10^{-9}	3×10^{-6}
		I	6×10^{-8}	8×10^{-6}	2×10^{-9}	3×10^{-6}
Xenon (54)	Xe 131 m	Sub[2/]	2×10^{-5}	.....	4×10^{-7}	.....
	Xe 133 m	Sub	1×10^{-5}	.....	3×10^{-7}	.....
	Xe 133	Sub	1×10^{-5}	.....	3×10^{-7}	.....
	Xe 135	Sub	4×10^{-6}	.....	1×10^{-7}	.....
Ytterbium (70)	Yb 175	S	7×10^{-7}	3×10^{-5}	2×10^{-8}	1×10^{-4}
		I	6×10^{-7}	3×10^{-5}	2×10^{-8}	1×10^{-4}
Yttrium (39)	Y 90	S	1×10^{-7}	6×10^{-6}	4×10^{-9}	2×10^{-6}
		I	1×10^{-7}	6×10^{-6}	3×10^{-9}	2×10^{-6}
	Y 91 m	S	2×10^{-5}	1×10^{-1}	8×10^{-7}	3×10^{-5}
		I	2×10^{-5}	1×10^{-1}	6×10^{-7}	3×10^{-5}
	Y 91	S	4×10^{-8}	8×10^{-6}	1×10^{-9}	3×10^{-6}
		I	3×10^{-8}	8×10^{-6}	1×10^{-9}	3×10^{-6}
	Y 92	S	4×10^{-7}	2×10^{-5}	1×10^{-8}	6×10^{-6}
		I	3×10^{-7}	2×10^{-5}	1×10^{-8}	6×10^{-6}
	Y 93	S	2×10^{-7}	8×10^{-6}	6×10^{-9}	3×10^{-6}
		I	1×10^{-7}	8×10^{-6}	5×10^{-9}	3×10^{-6}
Zinc (30)	Zn 65	S	1×10^{-7}	3×10^{-5}	4×10^{-9}	1×10^{-4}
		I	6×10^{-8}	5×10^{-5}	2×10^{-9}	2×10^{-4}
	Zn 69 m	S	4×10^{-7}	2×10^{-5}	1×10^{-8}	7×10^{-6}
		I	3×10^{-7}	2×10^{-5}	1×10^{-8}	6×10^{-6}
	Zn 69	S	7×10^{-6}	5×10^{-3}	2×10^{-7}	2×10^{-3}
		I	9×10^{-6}	5×10^{-3}	3×10^{-7}	2×10^{-3}
Zirconium (40)	Zr 93	S	1×10^{-7}	2×10^{-5}	4×10^{-9}	8×10^{-6}
		I	3×10^{-7}	2×10^{-5}	1×10^{-8}	8×10^{-6}
	Zr 95	S	1×10^{-7}	2×10^{-5}	4×10^{-9}	6×10^{-6}
		I	3×10^{-8}	2×10^{-5}	1×10^{-9}	6×10^{-6}
	Zr 97	S	1×10^{-7}	5×10^{-6}	4×10^{-9}	2×10^{-6}
		I	9×10^{-8}	5×10^{-6}	3×10^{-9}	2×10^{-6}
Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life less than 2 hours.		Sub	1×10^{-6}	.....	3×10^{-8}	.....
Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life greater than 2 hours.			3×10^{-9}	9×10^{-8}	1×10^{-10}	3×10^{-9}
Any single radionuclide not listed above, which decays by alpha emission or spontaneous fission.			6×10^{-12}	4×10^{-7}	2×10^{-13}	3×10^{-8}

1/ Soluble (s); Insoluble (I).

2/ "Sub" means that values given are for submersion in a semi-spherical infinite cloud of airborne material.

3/ These Radon concentrations are appropriate for protection from Radon-222 combined with its short-lived daughters. Alternatively, the value in Table I may be replaced by one-third (1/3) "working level". (A "working level" is defined as any combination of short-lived Radon-222 daughters, Polonium-218, Lead-214, Bismuth-214 and Polonium-214, in one liter of air, without regard to the degree of equilibrium, that will result in the ultimate emission of 1.3×10^{5} Mev of alpha particle energy.) The Table II value may be replaced by one-thirtieth (1/30) of a "working level". The limit on Radon-222 concentrations in restricted areas may be based on an annual average.

4/ For soluble mixtures of U-238, U-234 and U-235 in air chemical toxicity may be the limiting factor. If the percent by weight (enrichment) of U-235 is less than 5, the concentration value for a 40-hour workweek, Table I, is 0.2 milligrams uranium per cubic meter of air average. For any enrichment, the product of the average concentration and time of exposure during a 40-hour workweek shall not exceed 8×10^{-3} SA uCi-hr/ml, where SA is the specific activity of the uranium inhaled. The concentration value for Table II is 0.007 milligrams uranium per cubic meter of air. The specific activity for natural uranium is 6.77×10^{-7} curies per gram U. The specific activity for other mixtures of U-238, U-235 and U-234, if not known shall be:

APPENDIX A

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND—Continued

$SA = 3.6 \times 10^{-7}$ curies/gram U

$SA = (0.4 + 0.38\,E + 0.0034\,E^2)\,10^{-6}$ U-depleted $E \geq 0.72$

Where E is the percentage by weight of U-235, expressed as percent.

Note: In any case where there is a mixture in air or water of more than one radionuclide, the limiting values for purposes of this Appendix should be determined as follows:

1. If the identity and concentration of each radionuclide in the mixture are known, the limiting values should be derived as follows: Determine, for each radionuclide in the mixture, the ratio between the quantity present in the mixture and the limit otherwise established in Appendix "A" for the specific radionuclide when not in a mixture. The sum of such ratios for all the radionuclides in the mixture may not exceed "1" (i.e., "unity").

Example: If radionuclides a, b, and c are present in concentrations C_a, C_b, and C_c, and if the applicable MPC's and MPC_a, and MPC_b, and MPC_c respectively, then the concentrations shall be limited so that the following relationship exists:

$$\frac{C_a}{MPC_a} + \frac{C_b}{MPC_b} + \frac{C_c}{MPC_c} \leq 1$$

2. If either the identity or the concentration of any radionuclide in the mixture is not known, the limiting values for purposes of Appendix "A" shall be:

a. For purposes of Table I, Col. 1 . . . . . 6×10^{-13}
b. For purposes of Table I, Col. 2 . . . . . 4×10^{-7}
c. For purposes of Table II, Col. 1 . . . . . 2×10^{-14}
d. For purposes of Table II, Col. 2 . . . . . 3×10^{-8}

3. If any of the conditions specified below are met, the corresponding values specified below may be used in lieu of those specified in paragraph 2 above.

a. If the identity of each radionuclide in the mixture is known but the concentration of one or more of the radionuclides in the mixture is not known, the concentration limit for the mixture is the limit specified in Appendix "A" for the radionuclide in the mixture having the lowest concentration limit; or,

b. If the identity of each radionuclide specified in Appendix "A" are not present in the mixture, the concentration limit for the mixture is the lowest concentration limit specified in Appendix "A" for any radionuclide which is not known to be absent from the mixture; or,

4. If the mixture of radionuclides consists of uranium and its daughter products in ore dust prior to chemical processing of the uranium ore, the values specified below may be used in lieu of those determined in accordance with paragraph 1 above or those specified in paragraphs 2 and 3 above.

a. For purposes of Table I, Column 1, 1×10^{-10} uCi/ml gross alpha activity; or 5×10^{-11} uCi/ml natural uranium; or 75 micrograms per cubic meter of air natural uranium.

b. For purposes of Table II, Column 1, 3×10^{-12} uCi/ml gross alpha activity; 2×10^{-12} uCi/ml natural uranium; or 3 micrograms per cubic meter of air natural uranium.

5. For purposes of this note, a radionuclide may be considered as not present in a mixture if (a) the ratio of the concentration of that radionuclide in the mixture (C_a) to the concentration limit for that radionuclide specified in Table II of Appendix "A" (MPC_a) does not exceed 1/10, (i.e., $\frac{C_a}{MPC_a} \leq \frac{1}{10}$) and (b) the sum of such ratios for all radionuclides considered as not present in the mixture does not exceed 1/4, (i.e., $\frac{C_a}{MPC_a} + \frac{C_b}{MPC_b} + \ldots\ldots \leq \frac{1}{4}$).

c. Radionuclide	Table I		Table II	
	Column 1 Air (uCi/ml)	Column 2 Water (uCi/ml)	Column 1 Air (uCi/ml)	Column 2 Water (uCi/ml)
If it is known that Sr 90, I 125, I 126, I 129, I 131, (I 133, Table II only), Pb 210, Po 210, At 211, Ra 223, Ra 224, Ra 226, Ac 227, Ra 228, Th 230, Pa 231, Th 232, Th-nat, Cm 248, Cf 254, and Fm 256 are not present	. . . . .	9×10^{-6}	. . . . .	3×10^{-6}
If it is known that Sr 90, I 125, I 126, I 129, (I 131, I 133, Table II only), Pb 210, Po 210, Ra 223, Ra 226, Ra 228, Pa 231, Th-nat, Cm 248, Cf 254, and Fm 256 are not present	. . . . .	6×10^{-6}	. . . . .	2×10^{-6}
If it is known that Sr 90, I 129, (I 125, I 126, I 131, Table II only), Pb 210, Ra 226, Ra 228, Cm 248, and Cf 254 are not present	. . . . .	2×10^{-6}	. . . . .	6×10^{-7}
If it is known that (I 129, Table 2 only), Ra 226, and Ra 228 are not present	. . . . .	3×10^{-6}	. . . . .	1×10^{-7}
If it is known that alpha emitters and Sr 90, I 129, Pb 210, Ac 227, Ra 228, Pa 230, Pu 241, and Bk 249 are not present	3×10^{-9}	. . . . .	1×10^{-10}	. . . . .
If it is known that alpha-emitters and Pb 210, Ac 227, Ra 228, and Pu 241 are not present	3×10^{-10}	. . . . .	1×10^{-11}	. . . . .
If it is known that alpha-emitters and Ac 227 are not present	3×10^{-11}	. . . . .	1×10^{-12}	. . . . .
If it is known that Ac 227, Th 230, Pa 231, Pu 238, Pu 239, Pu 240, Pu 242, Pu 244, Cm 248, Cf 249 and Cf 251 are not present	3×10^{-12}	. . . . .	1×10^{-13}	. . . . .

PART 4

APPENDIX B

(For use in 10D-56.441 FAC and 10D-56.448 FAC)

Material	Microcuries
Americium 241	0.01
Antimony 122	100
Antimony 124	10
Antimony 125	10
Arsenic 73	100
Arsenic 74	10
Arsenic 76	10
Arsenic 77	100
Barium 131	10
Barium 133	10
Barium 140	10
Bismuth 210	1
Bromine 82	10
Cadmium 109	10
Cadmium 115m	10
Cadmium 115	100
Calcium 45	10
Calcium 47	10
Carbon 14	100
Cerium 141	100
Cerium 143	100
Cerium 144	1
Cesium 131	1,000
Cesium 134m	100
Cesium 134	1
Cesium 135	10
Cesium 136	10
Cesium 137	10
Chlorine 36	10
Chlorine 38	10
Chromium 51	1,000
Cobalt 58m	10
Cobalt 58	10
Cobalt 60	1
Copper 64	100
Dysprosium 165	10
Dysprosium 166	100
Erbium 169	100
Erbium 171	100
Europium 152 9.2 h	100
Europium 152 13 yr	1
Europium 154	1
Europium 155	10
Fluorine 18	1,000
Gadolinium 153	10
Gadolinium 159	100
Gallium 72	10
Germanium 71	100
Gold 198	100
Gold 199	100
Hafnium 181	10
Holmium 166	100
Hydrogen 3	1,000
Indium 113m	100
Indium 114m	10
Indium 115m	100
Indium 115	10
Iodine 125	1
Iodine 126	1
Iodine 129	0.1
Iodine 131	1
Iodine 132	10
Iodine 133	1
Iodine 134	10
Iodine 135	10
Iridium 192	10
Iridium 194	100
Iron 55	100
Iron 59	10
Krypton 85	100
Krypton 87	10
Lanthanum 140	10
Lutetium 177	100
Manganese 52	10
Manganese 54	10
Manganese 56	10
Mercury 197m	100
Mercury 197	100
Mercury 203	10
Molybdenum 99	100
Neodymium 147	100
Neodymium 149	100
Nickel 59	100
Nickel 63	10
Nickel 65	100
Niobium 93m	10
Niobium 95	10
Niobium 97	10
Osmium 185	10
Osmium 191m	100
Osmium 191	100
Osmium 193	100
Palladium 103	100
Palladium 109	100
Phosphorus 32	10
Platinum 191	100
Platinum 193m	100
Platinum 193	100
Platinum 197m	100
Platinum 197	100
Plutonium 239	0.01
Polonium 210	0.1
Potassium 42	10
Praseodymium 142	100
Praseodymium 143	100
Promethium 147	10
Promethium 149	10
Radium 226	0.01
Rhenium 186	100
Rhenium 188	100
Rhodium 103m	100
Rhodium 105	100
Rubidium 86	10
Rubidium 87	10
Ruthenium 97	100
Ruthenium 103	10
Ruthenium 105	10
Ruthenium 106	1
Samarium 151	10
Samarium 153	100

Material	Microcuries
Scandium 46	10
Scandium 47	100
Scandium 48	10
Selenium 75	10
Silicon 31	100
Silver 105	10
Silver 110m	1
Silver 111	100
Sodium 24	10
Strontium 85	10
Strontium 89	1
Strontium 90	0.1
Strontium 91	10
Strontium 92	10
Sulphur 35	100
Tantalum 182	10
Technetium 96	10
Technetium 97m	100
Technetium 97	100
Technetium 99m	100
Technetium 99	10
Tellurium 125m	10
Tellurium 127m	10
Tellurium 127	100
Tellurium 129m	10
Tellurium 129	100
Tellurium 131m	10
Tellurium 132	10
Terbium 160	10
Thallium 200	100
Thallium 201	100
Thallium 202	100
Thallium 204	10
Thorium (natural)	50
Thulium 170	10
Thulium 171	10
Tin 113	10
Tin 125	10
Tungsten 181	10
Tungsten 185	10
Tungsten 187	100
Uranium (natural) 2/	50
Uranium 233	0.01
Uranium 234	0.01
Uranium 235	0.01
Vandaium 48	10
Xenon 131m	1,000
Xenon 133	100
Xenon 135	100
Ytterbium 175	100
Yttrium 90	10
Yttrium 91	10
Yttrium 92	100
Yttrium 93	100
Zinc 65	10
Zinc 69m	100
Zinc 69	1,000
Zirconium 93	10
Zirconium 95	10
Zirconium 97	10
Any alpha emitting radionuclide not listed above or mixtures of alpha emitters of unknown composition	0.01
Any radionuclide other than alpha emitting radionuclides; not listed above or mixtures of beta emitters of unknown composition	0.1

NOTE: For purposes of 10D-56.441 and 10D-56.448, 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").

PART 5
RADIATION SAFETY REQUIREMENTS FOR INDUSTRIAL RADIOGRAPHIC OPERATIONS

10D-56.531 Purpose. The regulations in this part establish radiation safety requirements for persons utilizing sources of radiation for industrial radiography. The requirements of this part are in addition to and not in substitution for the other requirements of these regulations.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1)(2), 381, 386 FS. History—New 1-1-77.

10D-56.532 Scope. The regulations in this part apply to all licensees or registrants who use sources of radiation for industrial radiography; provided, however, that nothing in this part shall apply to the use of sources of radiation in the healing arts.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1)(2), 381, 386 FS. History—New 1-1-77.

10D-56.533 Definitions. As used in this part:

(1) "Radiographer" means any individual who performs or who, in attendance at the site where sources of radiation are being used, personally supervises industrial radiographic operations and who is responsible to the licensee or registrant for assuring compliance with the requirements of these regulations and all license conditions.

(2) "Radiographer's assistant" means any individual who, under the personal supervision of a radiographer, uses sources of radiation, related handling tools, or survey instruments in industrial radiography.

(3) "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.

(4) "Industrial radiography" means the examination of the macroscopic structure of

1/ Based on alpha disintegration rate of Th-232, Th-230 and their daughter products.

2/ Based on alpha disintegration rate of U-238, U-234, and U-235.

materials by nondestructive methods utilizing sources of radiation.

(5) "Storage container" means a device in which sealed sources are transported or stored.

(6) "Cabinet radiography using radiation machines" means industrial radiography using radiation machines, which is conducted in an enclosed, interlocked cabinet, such that the radiation machine will not operate unless all openings are securely closed, and which cabinet is so shielded that every location on the exterior meets conditions for an unrestricted area as specified in 10D-56.436 FAC.

(7) "Shielded room radiography using radiation machines" means industrial radiography using radiation machines, which is conducted in an enclosed room, the interior of which is not occupied during radiographic operations, which is so shielded that every location on the exterior meets conditions for an unrestricted area as specified in 10D-56.436 FAC, and the only access to which is through openings which are interlocked so that the radiation machine will not operate unless all openings are securely closed.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1)(2), 381, 386 FS. History—New 1-1-77.

PART 5A
EQUIPMENT CONTROL

10D-56.534 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 a sealed source storage position to any exterior surface of the device, and all storage containers for sealed sources or outer containers 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.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1)(2), 381, 386 FS. History—New 1-1-77.

10D-56.535 Locking of Sources of Radiation. Each source of radiation shall be provided with a lock or outer-locked container designed to prevent unauthorized or accidental production of radiation or 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 10D-56.545 FAC. 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.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1)(2), 381, 386 FS. History—New 1-1-77.

10D-56.536 Storage Precautions. Locked radiographic exposure devices and storage containers shall be physically secured to prevent tampering or removal by unauthorized personnel.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1)(2), 381, 386 FS. History—New 1-1-77.

10D-56.537 Radiation Survey Instruments. The licensee or registrant shall maintain sufficient calibrated and operable radiation survey instruments to make physical radiation surveys as required by this part and Part 4 of these regulations. Each radiation survey instrument shall be calibrated at intervals not to exceed three (3) months and after each instrument servicing and a record 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.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1)(2)(3), 381, 386 FS. History—New 1-1-77.

10D-56.538 Leak Testing, Repair, Tagging, Opening, Modification, and Replacement of Sealed Sources.

(1) 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 to do so by the Agency, the U.S. Nuclear Regulatory Commission, or any Agreement State.

(2) 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 month period prior to the transfer, the sealed source shall not be put into use until tested.

(3) 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 10D-56.341(5)(e) FAC. Records of the leak test results shall be kept in units of microcuries and maintained for inspection by the Agency, for six months after the next required leak test is performed or until the sealed source is transferred or disposed of.

(4) Any test conducted pursuant to paragraphs (2) and (3) 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 regulations of the Agency. Within 5 days after obtaining results of the test, the licenseee shall file a report with the Agency describing the equipment involved, the test results, and the corrective action taken.

(5) 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."

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1)(2), 290.11, 290.12(2), 381, 386 FS. History—New 1-1-77.

10D-56.539 Quarterly Inventory. Each licensee shall conduct a quarterly physical inventory to account for all sealed sources received and/or 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 Agency and shall include the quantities and kinds of radioactive material, the location of sealed sources, and the date of the inventory.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1), 290.11, 290.12(2), 381, 386 FS. History—New 1-1-77.

10D-56.540 Utilization Logs. Each licensee or registrant shall maintain current logs, which shall be kept available for two years from the date of the recorded event for inspection by the Agency, showing for each source of radiation the following information:

(1) A description (or make and model number) of each source of radiation or exposure device storage container in which the sealed source is located;

(2) The identity of the radiographer to whom assigned; and

(3) Locations where used and dates of use.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.11, 290.12(2), 381, 386 FS. History—New 1-1-77.

10D-56.541 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.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1), 381, 386 FS. History—New 1-1-77.

PART 5B

PERSONAL RADIATION SAFETY REQUIREMENTS FOR RADIOGRAPHERS AND RADIOGRAPHERS' ASSISTANT

10D-56.542 Limitations.

(1) No licensee or registrant shall permit any individual to act as a radiographer as defined in this part until such individual:

(a) Has been instructed in the subjects outlined in Appendix A of this part and shall have demonstrated understanding thereof;

(b) Has received copies of and instruction in the regulations contained in this part and the applicable sections of Part 4, Part 9, and Part 10, appropriate license(s), and the licensee's or registrant's operating and emergency procedures, and shall have demonstrated understanding thereof; and

(c) Has demonstrated competence to use the source of radiation, related handling tools, and survey instruments which will be employed in his assignment.

(2) No licensee or registrant shall permit any individual to act as a radiographer's assistant as defined in this part until such individual:

(a) Has received copies of and instruction in the licensee's or registrant's operating and emergency procedures, and shall have demonstrated understanding thereof; and

(b) Has demonstrated competence to use under the personal supervision of the radiographer the sources of radiation, related handling tools, and radiation survey instruments which will be employed in his assignment.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

10D-56.543 Operating and Emergency Procedures. The licensee's or registrant's operating and emergency procedures shall include instructions in at least the following:

(1) The handling and use of sources of radiation to be employed such that no individual is likely to be exposed to radiation doses in excess of the limits established in Part 4, Standards For Protection Against Radiation;

(2) Methods and occasions for conducting radiation surveys;

(3) Methods for controlling access to radiographic areas;

(4) Methods and occasions for locking and securing sources of radiation;

(5) Personnel monitoring and the use of personnel monitoring equipment;

(6) Transportation to field locations, including packing of sources of radiation in the vehicles, posting of vehicles, and control of sources of radiation during transportation;

(7) Minimizing exposure of individuals in the event of an accident;

(8) The procedure for notifying proper personnel in the event of an accident;

(9) Maintenance of records; and

(10) The inspection and maintenance of radiographic exposure devices and storage containers.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1), 290.11, 290.12(2), 381, 386 FS. History—New 1-1-77.

10D-56.544 Personnel Monitoring Control.

(1) No licensee or registrant shall permit any individual to act as a radiographer or as a radiographer's assistant unless, at all times during radiographic operation, each such individual shall wear a film badge or Thermoluminescent Dosimeter (TLD) and either a pocket dosimeter or pocket chamber. Pocket dosimeters and pocket chambers shall be capable of measuring doses (i.e. 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 or TLD shall be assigned to and worn by only one individual.

(2) Pocket dosimeters and pocket chambers shall be read and doses recorded and shall be recharged to zero daily. A film badge or TLD shall

be immediately processed if the individual's accompanying pocket chamber or pocket dosimeter is discharged beyond its range. The film badge or TLD reports received from the film badge or TLD processor and records of pocket dosimeter and pocket chamber readings shall be maintained for inspection by the Agency until it authorizes their disposal.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1), 290.11, 290.12(2), 381, 386 FS. History—New 1-1-77.

PART 5C
PRECAUTIONARY PROCEDURES IN RADIOGRAPHIC OPERATIONS

10D-56.545 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 1, except (1) where the high radiation area is equipped with a control device or alarm system as described in subparagraph 10D-56.441(3)(b) FAC, or (2) where the high radiation area is locked to protect against unauthorized or accidental entry.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

10D-56.546 Posting. Notwithstanding any provisions in paragraph 10D-56.442(3) FAC, areas in which radiography is being performed shall be conspicuously posted as required by 10D-56.441(2) FAC and 10D-56.441(3)(a) FAC.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

10D-56.547 Radiation Surveys and Survey Records.

(1) No radiographic operation shall be conducted unless calibrated and operable radiation survey instrumentation as described in 10D-56.537 FAC is available and used at each site where radiographic exposures are made.

(2) A physical radiation survey shall be made after each radiographic exposure utilizing radiographic exposure devices or sealed sources of radioactive material to determine that the sealed source has been returned to its shielded condition.

(3) 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 or storage container as specified in 10D-56.535 FAC.

(4) Records shall be kept of the surveys required by paragraph (3) of this section and maintained for inspection by the Agency, for two years after completion of the survey. If the survey was used to determine an individuals' exposure, however, the records of the survey shall be maintained until the Agency authorizes their disposal.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.11, 290.12(2), 381, 386 FS. History—New 1-1-77.

10D-56.548 Special Requirements for Radiography Employing Radiation Machines.

(1) **Cabinet Radiography.** Cabinet radiography using radiation machines, as defined in 10D-56.533(6) FAC shall be exempt from other requirements of this Part 5; however, no registrant shall permit any individual to operate a cabinet radiography unit until such individual has received a copy of, and instruction in, and demonstrated an understanding of operating procedures for the unit, and has demonstrated competence in its use.

(2) **Shielded Room Radiography.** Shielded room radiography using radiation machines, as defined in 10D-56.533(7) FAC, shall be exempt from 10D-56.534, 536, 538, 539, and 547 of this Part; however, (a) No registrant shall permit any individual to operate a radiation machine for shielded room radiography until such individual has received a copy of, and instruction in, and demonstrated an understanding of operating procedures for the unit, and has demonstrated competence in its use; and (b) A physical radiation survey shall be conducted to determine that the radiation machine is "off" prior to each entry into the shielded room. Such surveys shall be made with a radiation measuring instrument which is capable of measuring radiation of the energies and at the exposure rates to be encountered, which is in good working order, and which has been properly calibrated within the preceeding three months or following the last instrument servicing, whichever is later; and (c) Individuals who operate, make set ups, or performs maintenance shall have the appropriate personnel monitoring equipment, furnished by the Registrant.

(3) **Other Radiography Using Radiation Machines.** Other radiography using radiation machines shall be exempt from 10D-56.534 FAC, 10D-56.536 FAC, 10D-56.538 FAC, 10D-56.539 FAC and 10D-56.547 FAC of this part; however,

(a) A physical radiation survey shall be conducted to determine that the radiation machine is "off" prior to each entry into the radiographic exposure areas. Such surveys shall be made with a radiation measuring instrument capable of measuring radiation of the energies and at the exposure rates to be encountered, which is in good working order, and which has been properly calibrated within the preceeding three months or following the last instrument servicing, whichever is later. Survey results and records of boundary locations shall be maintained and kept available for inspection.

(b) Mobile or portable radiation machines shall be physically secured to prevent removal by unauthorized personnel.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

APPENDIX A

SUBJECTS TO BE COVERED DURING THE INSTRUCTION OF RADIOGRAPHERS

I. Fundamentals of Radiation Safety

- A. Characteristics of gamma and x radiation
- B. Units of radiation dose (mrem) and quantity of radioactivity (curie)
- C. Hazards of exessive exposure of radiation

D. Levels of radiation from sources of radiation
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. TLD Badges
3. Pocket dosimeters
4. Pocket chamber

III. Radiographic Equipment to be Used

A. Remote handling equipment
B. Radiographic exposure devices and sealed sources
C. Storage Containers
D. Operation and control of x-ray equipment

IV. The Requirements of Pertinent Federal and State Regulations

V. The Licensee's or Registrant's Written Operating and Emergency Procedures

PART 6
X-RAYS IN THE HEALING ARTS

10D-56.631 Purpose and Scope. This part establishes requirements, for which a registrant is responsible, for use of X-ray equipment in accordance with state statutes to engage in healing arts or veterinary medicine. These requirements are in addition to and not in substitution for other applicable provisions of these regulations.
Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

10D-56.632 Definitions. As used in this part, the following definitions apply:

(1) "Accessible surface" means the external surface of any enclosure or housing.

(2) "Added filter" means the filter added to the inherent filtration of an X-ray tube housing assembly.

(3) "Aluminum equivalent" means the thickness of aluminum (type 1100 alloy) affording the same degree of radiation attenuation, under specified conditions, as a material or combination of materials under consideration. (The nominal chemical composition of type 1100 aluminum alloy is 99.00 percent minimum aluminum, 0.12 percent copper.)

(4) "Assembler" means any person engaged in the business of assembling, installing or replacing an X-ray system or any component thereof.

(5) "Attenuation block" means a block or stack, having dimensions 20 cm by 20 cm by 3.8 cm, of type 1100 aluminum alloy or other materials having equivalent attenuation.

(6) "Automatic exposure control" means a device which automatically controls one or more technique factors in order to obtain at a preselected location(s) a required quantity of radiation (See also "Phototimer").

(7) "Barrier" (See "Protective barrier").

(8) "Beam axis" means a line from the source through the centers of the X-ray field.

(9) "Beam-limiting device" means a device which provides a means to restrict the dimensions of the X-ray field.

(10) "Certified components" means X-ray system components which are subject to regulations promulgated under U.S. P.L. 90-602.

(11) "Certified system" means any X-ray system which has one or more certified component(s), excluding the tube housing assembly.

(12) "Changeable filters" means any filter which can be readily removed from the useful beam through any electronic, mechanical or physical process.

(13) "Coefficient of variation (C)" means the ratio of the standard deviation to the mean value of a population of observations. It is estimated using the following equation:

$$C = \frac{s}{\bar{X}} = \frac{1}{\bar{X}}\left[\sum_{i=1}^{n} \frac{(X_i - \bar{X})^2}{n-1}\right]^{1/2}$$

Where:

s = Estimated standard deviation of the population of observations;

$\bar{X}$ = Mean value of observations in sample;

X_i = ith observations in sample; and

n = Number of observations in sample.

(14) "Contact therapy system" means that the X-ray tube port is put in contact with or within 5 centimeters of the surface being treated.

(15) "Control panel" means that part of the X-ray control upon which are mounted the switches, knobs, pushbuttons, and other hardware necessary for manually setting the technique factors and operating modes.

(16) "Cooling curve" means the graphical relationship between the stored heat units and cooling time of a tube housing assembly.

(17) "Dead-man switch" means a switch so constructed that a circuit-closing contact can be maintained only by continuous pressure on the switch by the operator.

(18) "Density (D)" (as used in conjunction with processed radiographic film) means the logarithm to the base 10 of the ratio of the incident to the transmitted luminous flux.

$$D = \log_{10} \frac{I\ \text{incident}}{I\ \text{transmitted}}$$ where I is luminous flux.

(19) "Diagnostic source assembly" means the tube housing assembly with a beam-limiting device attached.

(20) "Diagnostic-type protective tube housing" means a tube housing so constructed that the leakage radiation measured at a distance of one meter from the source does not exceed 100 mR in one hour when the tube is operated at its maximum rated tube potential.

(21) "Diagnostic X-ray system" means an X-ray system designed for irradiation of any part of the human body as an aid to diagnosis through visualization of anatomical parts.

(22) "Direct scattered radiation" means that scattered radiation which has been deviated in direction only by materials irradiated by the useful beam (See also "Scattered radiation").

(23) "Entrance exposure rate" means the roentgens per unit time at the point where the center of the useful beam enters the patient.

(24) "Equipment" (See "X-ray equipment").

(25) "Exposure" means the quotient of dQ by dm where dQ is the absolute value of the total charge of the ions of one sign produced in air when all the electrons (negatrons and positrons) liberated by photons in a volume element of air having mass dm are completely stopped in air. (The special unit of exposure is the roentgen.)

(26) "Field emission equipment" means equipment which uses an X-ray tube in which electron emission from the cathode is due solely to the action of an electric field.

(27) "Filter" means material placed in the useful beam to preferentially absorb selected radiations.

(28) "Fluoroscopic imaging assembly" means a component which comprises a reception system in which X-ray photons produce a fluoroscopic image. It includes equipment housings, electrical interlocks if any, the primary protective barrier, and structural material providing linkage between the image receptor and the diagnostic source assembly.

(29) "General purpose radiographic X-ray system" means any radiographic X-ray system which, by design, is not limited to radiographic examination of a specific anatomical region.

(30) "Gonadal shield" means a primary protective barrier for the testes or ovaries.

(31) "Half-value layers (HVL)" means the thickness of specified material which attenuates the beam of radiation to an extent such that the exposure rate is reduced to one-half of its original value. In this definition the contribution of all scattered radiation, other than any which might be present initially in the beam concerned, is deemed to be excluded.

(32) "Image intensifier" means a system designed to convert instantaneously by means of photo-emissive surfaces and electronic circuitry and X-ray pattern from the input phosphor image into a light pattern image of greater intensity than would have been produced by the original X-ray pattern on a phospor screen.

(33) "Image receptor" means any device, such as a fluorescent screen (input phosphor) or radiographic film which transforms incident X-ray photons either into a visible image or into another form which can be made into a visible image by further transformations (electronic or chemical).

(34) "Inherent filtration" means the filtration permanently in the useful beam. It includes the window of the X-ray tube housing and any permanent tube or source enclosure.

(35) "Kilovolts peak (kVp)" (See "Peak tube potential").

(36) "kWs" means Kilowatt second which is equal to the product of peak kilovolts, amperes, and seconds (or kV-mA-sec.-10^{-3}).

(37) "Lead equivalent" means the thickness of lead affording the same attenuation, under specified conditions, as a material or combination of materials under consideration.

(38) "Leakage radiation" means radiation emanating from the diagnositc or therapeutic source assembly except for the useful beam, and radiation produced when the exposure switch or timer is not activated.

(39) "Leakage technique factors" means the technique factors associated with the tube housing assembly which are used in measuring leakage radiation. They are defined as follows:

(a) For capacitor energy storage equipment, the maximum rated number of exposures in an hour for operation at the maximum rated tube potential with the quantity of charge per exposure being 10 millicoulombs (mAs) or the minimum obtainable from the unit, whichever is greater.

(b) For field emission equipment rated for pulsed operation, the maximum rated number of X-ray pulses in an hour for operation at the maximum rated tube potential.

(c) For all other equipment, the maximum rated continuous tube current for the maximum rated peak tube potential.

(40) "Light field" means that area of the intersection of the light beam from the beam-limiting device and one of the set of planes parellel to and including the plane of the image receptor, whose perimeter is the locus of points at which the illumination is one-fourth of the maximum in the intersection.

(41) "Line pair" means one space and one wire or strip in an assembly of parallel wires or strips so placed that the space between each wire or strip is equal to the width of the wire or strip.

(42) "Line-voltage regulation" means the difference between the no-load and the load line potentials expressed as a percent of the load line potential; that is,

Percent line-voltage regulation = 100 $(V_n - V_1)/V_1$ where:

V_n = No—load line potential and

V_1 = Load line potential.

(43) "Maximum line current" means the root mean square (rms) current in the supply line of an X-ray machine operating at its maximum rating.

(44) "Mobile equipment" (See "X-ray equipment").

(45) "Peak tube potential" means the maximum value of the potential difference across the X-ray tube during an exposure.

(46) "Phototimer" means a device for controlling radiation exposures to image receptors by the amount of radiation which reaches a radiation monitoring device (s). The radiation monitoring device(s) is part of an electronic circuit

which controls the duration of time the tube is activated. The monitoring device(s) terminates exposure after a given quantity of radiation has been generated. (see also "Automatic exposure control").

(47) "Portable equipment" (See "X-ray equipment").

(48) "Position indicating device (PID)" means a device on dental X-ray equipment used to indicate the beam position and to establish a definite source-skin distance. It may or may not incorporate or serve as a beam-limiting device.

(49) "Primary protective barrier" (See "Protective barrier").

(50) "Protective apron" means an apron made of radiation absorbing materials used to reduce radiation exposure.

(51) "Protective barrier" means a barrier containing radiation absorbing material(s) used to reduce radiation exposure.

(a) "Primary protective barrier" means the material, excluding filters, placed in the useful beam, for protection purposes, to reduce the radiation exposure by a required degree.

(b) "Secondary protective barrier" means a barrier sufficient to attenuate the stray radiation by a required degree for protection purposes.

(52) "Protective glove" means a glove made of radiation absorbing materials and used to reduce radiation exposure.

(53) "Qualified person" means an individual who has the knowledge and training to measure ionizing radiation, to evaluate safety techniques, and to advise regarding radiation protection needs. The individual must be able to demonstrate this knowledge to the satisfaction of the Agency.

(54) "Radiograph" means an image receptor on which an image is created directly or indirectly by an X-ray pattern and results in a permanent record.

(55) "Radiographic imaging system" means any system whereby a permanent or semi-permanent image is recorded on an image receptor by the action of ionizing radiation.

(56) "Rating" means the operating limits of a component as specified by the component manufacturer.

(57) "Recording" means producing a permanent form of an image resulting from X-ray photons (e.g., film, video tape).

(58) "Registrant," as used in this part, means any person who possesses and administratively controls an X-ray system which is used to deliberately expose humans or animals to the useful beam of the system and is required by the provisions in Parts 1 and 2 of these regulations to register with this Agency.

(59) "Repair person (Service person)" means an individual who repairs, adjusts or otherwise maintains an X-ray system. The term includes but is not limited to a manufacturer, assembler or user.

(60) "Response time" means the time required for an instrument system to reach 90 percent of its final reading when the radiation-sensitive volume of the instrument system is exposed to a step change in radiation flux from zero sufficient to provide a steady state midscale reading.

(61) "Scattered radiation" means radiation that, during passage through matter, has been deviated in direction (See also "Direct scattered radiation").

(62) "Secondary protective barrier" (See "Protective barrier").

(63) "SID" (See "Source-image receptor distance").

(64) "Source" means the focal spot of the X-ray tube.

(65) "Source-image receptor distance (SID)" means the distance from the source to the center of the input surface of the image receptor.

(66) "Spot film" means a radiograph which is made during a fluoroscopic examination to permanently record conditions which exist during that fluoroscopic procedure.

(67) "Stationary equipment" (See "X-ray equipment").

(68) "Stray radiation" means the sum of leakage and scattered radiation.

(69) "Technique factors" means the conditions of operation of an X-ray system. They are specified as follows:

(a) For capacitor energy storage equipment, peak tube potential in kV and quantity of charge in mAs.

(b) For field emission equipment rated for pulsed operation, peak tube potential in kV and number of X-ray pulses.

(c) For all other equipment, peak tube potential in kV and either tube current in mA and exposure time in seconds, or the product of tube current and exposure time in mAs.

(70) "Therapeutic-type protective tube housing" means a tube housing used for radiation treatments with installed tube, high voltage and/or filament transformers, and other elements the tube housing is designed to contain, and so designed as to meet the following requirements:

(a) For X-ray therapy apparatus not capable of operating at 500 kVp or above, an X-ray tube housing so constructed that the leakage radiation at a distance of 1 meter from the source does not exceed 1 R in an hour when the tube is operated at its maximum rated continuous current at maximum rated tube potential.

(b) For X-ray therapy equipment capable of operating at 500 kVp or above, an X-ray tube housing so constructed that the exposure rate due to leakage radiation at a distance of 1 meter from the source does not exceed 0.1 percent of the exposure rate in the useful beam at 1 meter from the source, for any of its operating conditions.

(71) "Tube" means an X-ray tube, unless otherwise specified.

(72) "Tube housing assembly" means the tube housing with installed tube, high voltage and/or filament transformers, and other elements the tube housing is designed to contain.

(73) "Tube rating chart" means the set of curves which specify the rated limits of operation of the tube in terms of the technique factors.

(74) "Useful beam" means the radiation which passes through the tube housing port and the aperture of the beam-limiting device when the exposure switch or timer is activated.

(75) "Variable-aperture beam-limiting device" means a beam-limiting device which has the capacity for stepless adjustment of the X-ray field size at a given SID.

(76) "Visible area" means that portion of the input surface of the image receptor over which incident X-ray photons produce a visible image.

(77) "X-ray control" means a device which controls input power to the X-ray high-voltage generator and/or the X-ray tube. It includes equipment which controls the technique factors of an X-ray exposure.

(78) "X-ray equipment" means an X-ray system, subsystem, or component thereof.

(a) "Mobile" means X-ray equipment mounted on a permanent base with wheels or casters for moving while completely assembled.

(b) "Portable" means X-ray equipment designed to be hand-carried.

(c) "Stationary" means X-ray equipment which is installed in a fixed location and which is neither mobile nor portable.

(d) "Transportable" means X-ray equipment installed in a vehicle or trailer.

(e) "Special Purpose" means X-ray equipment or systems designed for radiographic examinations of a specific anatomical area of the human body utilizing image receptors or more than one size (e.g. the head or the spinal column).

(79) "X-ray field" means that area of the intersection of the useful beam and any one of the set of planes parallel to and including the plane of the image receptor, whose perimeter is the locus of points at which the exposure rate is one-fourth of the maximum in the intersection.

(80) "X-ray high-voltage generator" means a device which transorms electrical energy from the potential supplied by the X-ray control to the tube operating potential. The device may also include means for transforming alternating current to direct current, filament transformers for the X-ray tube(s), high-voltage switches, electrical protective devices, and other appropriate elements.

(81) "X-ray system" means an assemblage of components for the controlled production of X-rays. It includes minimally an X-ray high-voltage generator, an X-ray control, a tube housing assembly, a beam-limiting device, and the necessary supporting structures. Additional components which function with the system are considered integral parts of the system.

(82) "X-ray subsystem" means any combination of two or more components of an X-ray system for which requirements are specified in this part.

(83) "X-ray tube" means any electron tube which is designed for the conversion of electrical energy into X-ray energy.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.07, 381, 386 FS. History—New 1-1-77.

10D-56.633 General Requirements.

(1) Administrative Controls

(a) Registrant. The registrant shall be responsible for directing the operation of the X-ray machines which he has registered with the Agency. He or his agent shall assure that the following provisions are met in the operation of the X-ray machine(s).

1. An X-ray machine which does not meet the provisions of these regulations shall not be operated for diagnostic or therapeutic purposes.

2. Each registrant shall furnish safety rules and instructions to each individual operating X-ray systems, including any restrictions of the operating techniques required for the safe operation of any particular X-ray system, and shall require that the operator demonstrate familiarity with and understanding of such safety rules, be competent in the safe use of the equipment, and be knowledgeable of the requirements of these rules and regulations.

3. In the vicinity of each X-ray system's control panel a chart shall be provided, which specifies techniques and procedures to be used for all examinations which are performed by that system.

4. Except for patients who cannot be moved out of the room, only the staff and ancillary personnel required for the medical procedure or training shall be in the room during the radiographic exposure. Other than the patient being examined:

a. All individuals shall be positioned such that no part of the body not protected by 0.5 mm lead equivalent, will be struck by the useful beam.

b. Staff and ancillary personnel shall be protected from the direct scatter radiation by protective aprons or whole body protective barriers of not less than 0.25 mm lead equivalent.

c. Patients who cannot be removed from the room shall be protected from the direct scatter radiation by whole body protective barriers of 0.25 mm lead equivalent or shall be so positioned that the nearest portion of the body is at least 2 meters from both the tube head and the nearest edge of the useful beam.

d. When a portion of the body of any staff or ancillary personnel is potentially subjected to stray radiation which could result in that individual receiving one quarter of the maximum permissible dose as defined in Part 4 of these regulations, additional protective devices may be required by the Agency.

5. Gonadal shielding of not less than 1.5 mm lead equivalent shall be used for potentially procreative patients during radiographic procedures in which the gonads are in the direct (useful) beam, except for cases in which this would interfere with the diagnostic procedure.

6. Persons shall not be exposed to the useful beam except for healing arts purposes, each exposure for which has been authorized by a licensed practitioner of the healing arts. This provision specifically prohibits deliberate exposure for the following purposes:

a. Exposure of an individual for training, demonstration, or other purposes unless there are also healing arts requirements and proper prescription has been provided.

b. Exposure of an individual for the purpose of healing arts screening without prior written approval of a physician. (Screening means an exposure of a person without a prior examination by a licensed practitioner of the healing arts).

7. When a patient or film must be provided with auxiliary support during a radiation exposure:

a. Mechanical holding devices shall be used when the technique permits. The safety rules required by 10D-56.633 shall list individual projections where holding devices cannot be utilized;

b. Safety procedures, as required by 10D-56.633(1)(a)2. FAC shall indicate the requirements for selecting a holder and the procedure the holder shall follow;

c. The human holder shall be protected as required by paragraph 10D-56.633(1)(a)4. FAC;

d. No person occupationally exposed to radiation shall be permitted to hold patients during exposures, nor shall any person be used routinely to hold patients.

8. Personnel Monitoring. All persons who are associated with the operation of an X-ray system are subject to the occupational exposure limits and the requirements for the determination of the doses which are stated in Section 10D-56.432 FAC and 10D-56.433 FAC. In addition, the following requirements shall apply:

a. When protective clothing or devices are worn on portions of the body and a monitoring device(s) is required, at least one such device shall be utilized as follows:

i. When a protective apron is worn, the monitoring device shall be worn at the collar outside of the apron.

ii. The dose to the whole body based on the maximum dose attributed to any one critical organ (which are the gonads, the blood forming organs, head, trunk, and lens of eye) shall be recorded in the reports required by Section 10D-56.450 FAC. If more than one device is used and a record is made of the data, each dose shall be identified with the area where the device was worn on the body.

b. Exposure of a personnel monitoring device to deceptively indicate a dose delivered to an individual is prohibited.

9. Exposure Procedures Designed to Minimize Patient and Personnel Exposure.

a. The speed of film or screen and film combinations shall be the fastest speed consistent with the diagnostic objectives of the examination.

b. The radiation exposure to the patient shall be the minimum exposure required to produce images of good diagnostic quality.

c. Portable or mobile equipment shall be used only for examinations where it is impractical to transfer the patient(s) to a stationary radiographic installation.

d. Means shall be provided for permitting the operator to observe the patient during an exposure.

(b) Information and Maintenance Record and Associated Information. The registrant shall maintain at least the following information for each X-ray machine:

1. Tube rating charts and cooling curves.

2. Record of surveys, calibrations, maintenance, modifications (from the original schematics and drawings) performed on the X-ray machine after the effective date of these regulations, along with the names of persons who performed the service.

3. A copy of all correspondence with this Agency regarding that X-ray machine.

(c) Maintenance of X-ray Equipment. X-ray systems and accessory devices shall be maintained in good working condition, both mechanically and electrically, so that the clinical objectives may be fulfilled without risk of unproductive exposure due to equipment failure or malfunction.

(2) Shielding.

(a) Each installation shall have adequate primary and secondary protective barriers.

(b) Structural shielding in walls and other vertical barriers shall extend without breach from the floor to a height of at least 2.1 meters.

(c) Doors, door frames, windows and window frames shall have the same lead equivalent shielding as that required in the wall or other barrier in which they are installed.

(d) In computation of protective barrier requirements the maximum anticipated workload, use factors, and occupancy factors, together with the potential for radiation exposure from other sources, shall be taken into consideration.

(3) Chemicals, Film Processing, and Darkrooms — See Appendix A.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.12(2)(3), 381, 386 FS. History—New 1-1-77.

10D-56.634 General Requirements for All Diagnostic X-ray Systems. In addition to other requirements of this part, all diagnostic X-ray systems shall meet the following requirements:

(1) Warning Label. The control panel containing the main power switch shall bear the warning statement, legible and accessible to view, "WARNING: This X-ray unit may be dangerous to patient and operator unless safe exposure factors and operating instructions are observed."

(2) Battery Charge Indicator. Visual means shall be provided on the control panel of battery-powered generators to indicate whether the battery is in a state of charge adequate for proper operation.

(3) Leakage Radiation from the Diagnostic Source Assembly. The leakage radiation from the diagnostic source assembly measured at a distance of 1 meter in any direction from the source shall not exceed 100 milliroentgens in 1 hour when the X-ray tube is operated at its leakage technique factors. Compliance shall be determined by measurements averaged over an area of 100 square centimeters with no linear dimension greater than 20 centimeters.

(4) Radiation from Components Other Than the Diagnostic Source Assembly. The radiation emitted by a component other than the diagnostic source assembly shall not exceed 2 milliroentgens in 1 hour at 5 centimeters from any accessible surface of the component when it is operated in an assembled X-ray system under any conditions for which it was designed. Compliance shall be determined by measurements averaged over an area of 100 square centimeters with no linear dimension greater than 20 centimeters.

(5) Beam Quality.

(a) Half-Value Layer.

1. The half-value layer (HVL) of the useful beam for a given X-ray tube potential shall not be less than the values shown in Table I. If it is necessary to determine such half-value layer at an X-ray tube potential which is not listed in Table I, linear interpolation or extrapolation may be made.

TABLE I.

Design operating range (Kilovolts peak)	Measured potential (Kilovolts peak)	Half-value layer(Millimeters of aluminum)
Below 50	30	0.3
	40	0.4
	49	0.5
50 to 70	50	1.2
	60	1.3
	70	1.5
Above 70	71	2.1
	80	2.3
	90	2.5
	100	2.7
	110	3.0
	120	3.2
	130	3.5
	140	3.8
	150	4.1

NOTE: When related to minimum total filtration, the above values are valid only for X-rays produced by single phase generators.

2. The above HVL criteria will be considered to have been met if it can be demonstrated that the aluminum equivalent of the total filtration in the primary beam is not less than that shown in Table II.

TABLE II
Filtration Required vs. Operating Voltage

Operating Voltage (kVp)	Total Filtration (inherent plus added) (millimeters aluminum equivalent)
Below 50	0.5 millimeters
50-70	1.5 millimeters
Above 70	2.5 millimeters

3. Beryllium window tubes shall have a minimum of 0.5 mm aluminum equivalent filtration permanently mounted in the useful beam.

4. For capacitor energy storage equipment, compliance shall be determined with the maximum quantity of charge per exposure.

5. The required minimum aluminum equivalent filtration shall include the filtration contributed by all materials which are always present between the focal spot of the tube and the patient. (e.g., a tabletop when the tube is mounted "under the table" and inherent filtration of the tube)

(b) **Filtration Controls.** For X-ray systems which have variable kVp and variable filtration for the useful beam, a device shall link the kVp selector with the filter(s) and will prevent an exposure unless the minimum required amount of filtration (see Table I or II above) is in the useful beam for the selected kVp.

(6) **Aluminum equivalent of material between patient and image receptor.** The aluminum equivalent of each of the items listed below, which are used between the patient and image receptor, shall not exceed the indicated limits. This requirement is applicable to front panel(s) of cassette holders and film changers provided by the manufacturer for purposes of patient support and/or to prevent foreign object intrusions. It does not apply to such items as a screen and its associated mechanical support panel or grids.

Item	Maximum Aluminum Equivalent (millimeters)
Front panel(s) of cassette holder (total of all)	1.0
Front panel(s) of film changer (Total of all)	1.0
Stationary tabletop	1.0
Moveable tabletop (including stationary subtop)	1.5
Cradle	2.0

(7) **Multiple Tubes.** Where two or more radiographic tubes are controlled by one exposure switch, the tube or tubes which have been selected shall be clearly indicated prior to initiation of exposure. This indication shall be both on the X-ray control and at or near the selected tube housing assembly.

(8) **Mechanical Support of Tube Head.** The tube housing assembly supports shall be adjusted such that the tube housing assembly will remain stable during an exposure unless the tube housing movement is a designed function of the X-ray system.

(9) **Technique Indicators.**

(a) Each X-ray system shall be equipped with devices (such as labeled control settings or meters) correctly indicating the physical factors and modes of operation used for exposures. X-ray systems utilizing arbitrary number or letter designators for

kVp, time and milliamperage shall be accompanied by a chart giving the value of physical factors for each arbitrary designator.

(b) The technique factors to be used during an exposure shall be indicated before the exposure begins, except when automatic exposure controls are used, in which case the technique factors which are set prior to the exposure shall be indicated.

(c) On equipment having fixed technique factors, the requirement 10D-56.634(9)(a) FAC may be met by permanent markings. Indication of technique factors shall be visible from the operator's position except in the case of fluoroscopy or spot films made by the fluoroscopist.

(10) **Accuracy of Technique Factors.** Meters, labeled control settings, exposure time selectors and other physical factor indicators shall be accurate within the following tolerances:

Milliamperage—Radiographic ± 10%
Milliamperage—Fluoroscopic ± 0.2 mA
Kilovolt peak ± 5%
Timer at settings:
Greater than 10 sec. ± one second
10 sec. or less ± 10%

(11) **Timer Reproducibility.** When four timer tests are performed at identical timer settings, the average time period ($\bar{T}$) shall be greater than 12.5 times the maximum period (T_{max}) less the minimum period (T_{min}). T shall be equal to or less than 0.5 seconds. That is,

$$\bar{T} > 12.5\ (T_{max} - T_{min}).$$

(12) **Exposure Reproducibility.** The exposure produced shall be reproducible to within the following criteria:

When all technique factors are held constant, the coefficient of variation shall not exceed 0.05. This shall be deemed to have been met if when four or more exposures at identical technique factors are made the value of the average exposure ($\bar{E}$) is greater than 11.55 times the quantity of maximum exposure (E_{max}) minus the minimum exposure (E_{min}).

$$\bar{E} \geq 11.55\ (E_{max} - E_{min})$$

(13) **Linearity.** When a choice of two or more tube current values may be selected, the average ratios of exposure for a given milliampere-second product in mR/mAs obtained at any two tube current settings shall not differ by more than 0.05 times their sum. That is,

$$\left|\bar{X}_1 - \bar{X}_2\right| < 0.05\ (\bar{X}_1 + \bar{X}_2)$$

Where $\bar{X}_1$ and $\bar{X}_2$ are the average mR/mAs values obtained from 4 exposures on each of two current settings at the same potential.

(14) **Automatic Exposure Controls (Phototimers).** When an automatic exposure control is provided:

(a) Indication shall be made on the control panel when this mode of operation is selected;

(b) When the X-ray tube potential is equal to or greater than 50 kVp, the minimum exposure time for field emission equipment rated for pulsed operation shall be equal to or less than a time interval equivalent to two pulses;

(c) The minimum exposure time for all equipment other than that specified in 10D-56.634(14)(b) FAC shall be equal to or less than 1/60 second or a time interval required to deliver 5 mAs, whichever is greater;

(d) Either the product of peak X-ray tube potential, current, and exposure time shall be limited to not more than 60 kWs per exposure or the product of X-ray tube current and exposure time shall be limited to not more than 600 mAs per exposure except when the X-ray tube potential is less than 50 kVp, in which case the product of X-ray tube current and exposure time shall be limited to not more than 2000 mAs per exposure; and

(e) A visible signal shall indicate when an exposure has been terminated at the limits described in (d) of this subsection, and manual resetting shall be required before further automatically timed exposures can be made.

(f) Reproducibility. In a series of four consecutive exposures when the x-ray tube is operated at a given current and the potential the average value ($\bar{E}$) shall meet the following criteria:

$$E_{max} - E_{min} \leq 0.08\ \bar{E}$$

Where: E_{max} is the highest exposure value and E_{min} is the lowest exposure value.

(g) Linearity. when a choice of two or more current values may be selected, the average ($\bar{E}_1$) of four consecutive exposures made at any one current setting, shall not deviate from the average ($\bar{E}_n$) of four consecutive exposures made at any other current setting by more than 10% of the average of all exposures:

$$\left|\bar{E}_1 - \bar{E}_n\right| \leq 0.05\ (\bar{E}_1 + \bar{E}_n)$$

when the potential is constant for all exposures.

(15) **Beam Limiting Devices.**

(a) Beam limiting devices capable of restricting the useful beam to the area of clinical interest shall be provided.

(b) Beam limiting devices shall provide a degree of attenuation not less than that required for the tube housing.

(16) **Remote Exposure Switches.** Where an X-ray control is equipped with two or more remote exposure switches, each remote switch shall serve a single X-ray tube, and exposures with any tube shall be possible only by closing the remote switch with which that particular tube is associated.

(17) **Electrical power supply.** The electrical power supply and service lines to X-ray systems shall be of sufficient capacity to permit operation without significant variation in voltage or machine output.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

10D-56.635 Fluoroscopic X-ray Systems. All fluoroscopic X-ray systems shall meet the following requirements:

(1) Limitation of Useful Beam.

(a) The fluoroscopic tube shall not produce X-rays unless the primary protective barrier is in position to intercept the entire cross section of the useful beam at all times.

(b) The entire cross section of the useful beam shall be intercepted by the primary protective barrier of the fluoroscopic imaging assembly at any SID.

(c) Minimum Field Size. A means for stepless adjustment of the size of the X-ray field shall be provided. The minimum field size shall not be greater than 2 x 2 centimeters at the point where the beam enters the patient.

(d) Limitation to the Imaging Surface.

1. Fluoroscopic and spot film systems installed after September 19, 1972 shall meet applicable requirements as follows:

a. The x-ray field produced by non image-intensified fluoroscopic equipment shall not extend beyond the visible area of the image receptor. This requirement applies to field size during both fluoroscopic procedures and spot filming procedures. Unless collimation is automatically accomplished between tube and patient, the film shall be considered the image receptor in all cases.

b. The x-ray field produced by image-intensified fluoroscopic equipment shall not exceed the visible area of the image receptor by more than 3 percent of the SID in either the length or width dimension in the plane of the image receptor. The sum of the excess length and width shall be no greater than 4 percent of the SID. Unless collimation is automatically accomplished between tube and patient, the input phosphor shall be considered the image receptor in all cases.

2. The x-ray field produced by fluoroscopic and spot filming systems installed prior to September 20, 1972 shall not exceed the dimensions of the largest film used in the spot film device, when the distance between the bottom of the image intensifier frame and table top is 35 cm.

3. The x-ray field produced by fluoroscopic systems without spot film capability shall not extend beyond the visible area of the image receptor (which usually in most cases is the input phosphor).

4. Compliance shall be determined with the beam axis perpendicular to the image receptor. For rectangular x-ray fields with circular image receptors, the error in alignment shall be determined along the length and width dimensions of the x-ray field which pass through the center of the visible area of the image receptor. For circular x-ray fields with rectangular image receptors, the error in alignment shall be determined along radii perpendicular to the length and width dimensions of the image receptor.

5. The center of the x-ray field in the plane of the film shall be aligned with the center of the selected portion of the film to within 2 percent of the SID.

6. Adjustable automatic and manual collimators shall operate smoothly throughout the entire range of use.

7. It shall be possible to adjust the x-ray field size in the plane of the film to a size smaller than the selected position of the film.

(2) Activation of the Fluoroscopic Tube. X-ray production in the fluoroscopic mode shall be controlled by a device which requires continuous pressure by the fluoroscopist for the entire time of any exposure. When recording serial fluoroscopic images, the fluoroscopist shall be able to terminate the X-ray exposure(s) at any time, but means may be provided to permit completion of any single exposure of the series in process.

(3) Exposure Rate Limits.

(a) Entrance Exposure Rate Allowable Limits.

1. The exposure rate measured at the point where the center of the useful beam enters the patient shall not exceed ten (10) roentgens per minute, except during recording of fluoroscopic images.

2. When provided with optional high level control, the equipment shall not be operable at any combination of tube potential and current which will result in an exposure rate in excess of 5 roentgens per minute at the point where the center of the useful beam enters the patient unless the high level control is activated. The exposure rate shall not exceed 10 roentgens per minute at the skin surface of the patient when the high level control is activated.

a. Special means of activation of high level controls, such as additional pressure applied continuously by the operator, shall be required to avoid accidental use.

b. A continuous signal audible to the fluoroscopist shall indicate that the high level control is being employed.

3. For cinefluoroscopy, the exposure rate as measured in air at the point where the beam enters the patient shall not exceed 20 roentgens in any 1 minute with the fluoroscopic tube operated at maximum current and potential.

4. Measuring Compliance of Entrance Exposure Rate Limits. Compliance with 10D-56.635(3) FAC shall be determined as follows:

a. Movable grids and compression devices shall be removed from the useful beam during the measurement.

b. If the source is below the table, the exposure rate shall be measured at least 1 centimeter above the tabletop or cradle, and corrected for distance to show the actual entrance exposure rate.

c. If the source is above the table, the exposure rate shall be measured at 30 centimeters above the tabletop with the end of the beam-limiting device or spacer positioned as closely as possible to the point of measurement.

d. In a C-arm type of fluoroscope, the exposure rate shall be measured 30 centimeters from the input surface of the fluoroscopic imaging assembly.

5. Periodic Measurement of Entrance Exposure Rate Limits.

a. The entrance exposure rate shall be measured after completion of the initial installation and prior to use.

b. Periodic measurements of the exposure rate shall be made. Such measurements shall be made at least every year and after any maintenance of the system which might affect the exposure rate.

c. Results of these measurements shall be posted where any fluoroscopist may have ready access to them and shall appear in the record required by 10D-56.633(1)(b)2. FAC. Results of the measurements shall include an estimate of the maximum possible R/minute, as well as the physical factors used to determine all data; the name of the person performing the measurements; and the date the measurements were performed.

d. Use of monitoring devices (e.g. commercially available film badges, thermoluminescent dosimeters, or low energy dosimeters) may be used to perform the test, provided the measurements are made in accordance with the conditions set forth in the following, namely 10D-56.635(3)(a)6. FAC.

6. Conditions of Measurement of Exposure Rate Limits.

a. The measurement shall be made under the conditions that satisfy the requirements of 10D-56.635(3)(a)4. FAC;

b. The kVp shall be the maximum potential at which the system is capable for fluoroscopic examinations;

c. The x-ray system(s) that incorporates automatic exposure control (automatic brightness control, etc.) shall have sufficient material (e.g. lead or lead equivalent) placed in the useful beam to produce the maximum milliamperage of the X-ray system; and

d. X-ray system(s) that do not incorporate automatic exposure control shall utilize the maximum current and potential of the x-ray system. Materials (e.g. an attenuation block) may be placed in the useful beam to protect the imaging system.

7. Certified equipment which does not incorporate an automatic exposure control (e.g. automatic brightness control or ionization chamber control) shall not be operable at any combination of tube potential and current which will result in an exposure rate in excess of 5 roentgens per minute at the point where the center of the beam enters the patient except during recording of fluoroscopic images or when provided with an optional high level control. The exposure rate shall not exceed 10 roentgens per minute at the skin surface of the patient when the high level control is activated.

(4) Barrier Transmitted Radiation Rate Limits.

(a) The exposure rate due to transmission through the primary protective barrier with the attenuation block in the useful beam, combined with radiation from the image intensifier, if provided, shall not exceed 2 milliroentgens per hour at 10 centimeters from any accessible surface of the fluoroscopic imaging assembly beyond the plane of the image receptor for each roentgen per minute of entrance exposure rate.

(b) Measuring Compliance with Barrier Transmission Limits:

1. The exposure rate due to transmission through the primary protective barrier combined with radiation from the image intensifier shall be determined by measurements averaged over an area no greater than 100 square centimeters with no linear dimension greater than 20 centimeters.

2. If the source is below the tabletop, the measurement shall be made with the input surface of the fluoroscopic imaging assembly positioned 30 centimeters above the tabletop.

3. Movable grids and compression devices shall be removed from the useful beam during the measurement.

4. The attenuation block shall be positioned in the useful beam 10 centimeters toward the input surface of the imaging assembly from the point at which the entrance exposure rate was measured.

5. The maximum beam size shall be used during the measurements.

6. If the source is above the tabletop and the SID is variable, the measurement shall be made with the end of the beam limiting device or spacer as close to the tabletop as it can be placed, provided that it shall not be closer than 30 centimeters.

(5) Transmission Through Frame Around Imaging Assembly. With an attenuation block in the useful beam, the exposure rate 10 centimeters above the frame surrounding the primary barrier shall not exceed the exposure rate 10 centimeters above the primary barrier under any condition of use.

(6) Indication of Potential and Current. During fluoroscopy and cinefluorography, X-ray tube potential and current shall be continuously indicated.

(7) Source-Skin Distance. The source to skin distance shall not be less than:

(a) 38 centimeters on stationary fluoroscopes installed after the effective date of this regulation,

(b) 35.5 centimeters on stationary fluoroscopes which are in operation prior to the effective date of these regulations,

(c) 30 centimeters on all mobile fluoroscopes.

(8) Fluoroscopic Timer. A presettable cumulative timing device activated by the fluoroscopic exposure switch shall be provided, the maximum cumulative time of which shall not exceed 5 minutes without resetting. The timer shall indicate the passage of the predetermined and preset period of exposure by an audible signal or termination of the exposure. Such signal shall continue to sound while X-rays are produced until the timing device is reset.

(9) Mobile Fluoroscopes. In addition to the other requirements of Section 10D-56.635 FAC, mobile fluoroscopes shall provide intensified imaging.

(10) Control of Scattered Radiation.

(a) Fluoroscopic table designs shall be such that scattered radiation which originates beneath the tabletop is attenuated by not less than 0.25 mm lead equivalent, and that no unprotected part of any staff or ancillary person's body shall be exposed to unattenuated scattered radiation.

(11) Photofluorographic Medical X-ray Systems.

(a) In addition to other applicable sections of these regulations, photofluorographic X-ray systems shall conform with the following requirements:

1. Usage shall be limited to diagnostic radiography of the lungs and other soft tissues of the thoracic region.

2. Personnel monitoring shall be provided for all individuals who operate photofluorographic apparatus.

3. The average exposure, including

backscatter, for chests measuring 25 centimeters in thickness shall not exceed 200 millirems at the point where the X-ray beam enters the patient.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

10D-56.636 Radiographic Systems Other Than Fluoroscopic, Dental Intraoral, or Veterinary Systems.

(1) Beam Limitation. The useful beam shall be limited to the area of clinical interest.

(a) General Purpose Stationary and Mobile X-ray Systems

1. Variable X-ray Field Limitation. A means for stepless adjustment of the size of the X-ray field shall be provided. The minimum field size at an SID of 100 centimeters shall be equal to or less than 5 x 5 centimeters.

2. Visual Definition. Means shall be provided for visually defining the perimeter of the X-ray field. The total misalignment of the edges of the visually defined field with the respective edges of the X-ray field along either the length or width of the visually defined field shall not exceed 2 per cent of the distance from the source to the center of the visually defined field when the surface upon which it appears is perpendicular to the axis of the X-ray beam.

3. Visual Centering with Variable X-ray Field Limitation. Mobile X-ray systems procured after September 19, 1972 shall be equipped with a beam limiting device meeting the following requirements:

a. The device shall project a discreet light beam which illuminates a spot in the center of the X-ray field.

b. The device provides stepless adjustment of the X-ray field, the dimensions of which conform with the dimensions of the standard X-ray film sizes.

c. The device is equipped with a permanently attached scale which accurately indicates the X-ray beam dimensions at each standard SID.

d. The device is equipped with an attached rule to accurately measure the SID at any distance up to two meters or six feet.

(b) Additional Requirements for Stationary General Purpose X-ray Systems. In addition to the requirements of 10D-56.636(1)(a) FAC above all stationary X-ray systems shall meet the following requirements.

1. Positive means shall be provided to indicate when the axis of the X-ray beam is perpendicular to the plane of the image receptor; to align the center of the X-ray field with the center of the image receptor to within 2 percent of the SID; and to indicate the SID to within 2 percent.

2. The beam-limiting device shall numerically indicate the field size in the plane of the image receptor to which it is adjusted.

3. Indication of field size dimensions and SID's shall be specified in inches and/or centimeters, and shall be such that aperture adjustments result in X-ray field dimensions in the plane of the image receptor which correspond to those of the image receptor to within 2 percent of the SID when the beam axis is perpendicular to the plane of the image receptor.

(c) X-ray Systems Designed for One Image Receptor Size. Radiographic equipment designed for only one image receptor size at a fixed SID shall be provided with means to limit the field at the plane of the image receptor to the area of the image receptor, and to align the center of the X-ray field with the center of the image receptor to within 2 percent of the SID.

(d) Special Purpose X-ray Systems:

1. Means shall be provided to limit the X-ray field in the plane of the image receptor so that such field does not exceed each dimension of the image receptor by more than 2 percent of the SID when the axis of the X-ray beam is perpendicular to the plane of the image receptor.

2. Means shall be provided to align the center of the X-ray field with the center of the image receptor to within 2 percent of the SID.

3. These requirements are met by a system that meets the requirements for a general purpose X-ray system as specified in subparagraph 10D-56.636(1)(a) FAC above or, when positive alignment means are also provided, may be met with either:

a. An assortment of removable, fixed-aperture, beam-limiting devices sufficient to meet the requirement for each combination of image receptor size and SID for which the unit is designed (each such device shall have clear markings to indicate the image receptor size and SID for which it is designed); or

b. A beam-limiting device having multiple fixed apertures sufficient to meet the requirements for each combination of image receptor size and SID for which the unit is designed. Permanent, clearly legible markings shall indicate the image receptor size and SID for which each aperture is designed and shall indicate which aperture is in position for use.

(2) Radiation Exposure Control Devices

(a) Timers. Means shall be provided to terminate the exposure at a preset time interval, preset product of current and time, a preset number of pulses, or a preset radiation exposure to the image receptor. In addition,

1. Termination of exposure shall cause automatic resetting of the timer to its initial setting or to zero.

2. It shall not be possible to make an exposure when the timer is set to a zero or off position if either position is provided.

(b) X-ray Control (Exposure Switch)

1. A control shall be incorporated into each X-ray system such that an exposure can be terminated at any time except during serial radiography when means shall be provided to permit completion of any single exposure of the series in process.

2. Each X-ray control shall be located in such a way as to meet the following criteria:

a. For stationary X-ray systems, the control shall be permanently mounted in a protected area so that the operator is required to remain in that protected area during the entire exposure.

b. Mobile and portable x-ray systems which are:

(i) Used continuously in one room for a period greater than one week shall meet the requirements of 10D-56.636(2)(b)2.a. above.

(ii) Used at multiple locations shall be provided either with an adequate protective barrier for the operator or with a method of control which will permit the operator to be at least 3.75 meters (12 feet) from the tube, the patient, and the edge of the useful beam during exposures.

c. The x-ray control shall provide visual indication observable at or from the operator's protected position whenever x-rays are produced. In addition, a signal audible to the operator shall indicate that the exposure has terminated or is in progress.

(3) Source-to-Skin or Receptor Distance

(a) Limitation. All radiographic systems shall be provided with a durable, securely fastened means to limit the source-to-skin distance to not less than 30 centimeters. This can be met when the collimator or cone provides the required limits.

(b) Means of Determination of Receptor

Distance. All radiographic systems shall be provided with a device or reference, other than the collimator localizer, which will indicate or measure the source to image distance to within 2.5 centimeters.

(4) **Standby Radiation from Capacitor Energy Storage Equipment.** Radiation emitted from the X-ray tube when the exposure switch or timer is not activated shall not exceed a rate of 2 milliroentgens per hour at 5 centimeters from any accessible surface of the diagnostic source assembly, with the beam-limiting device fully open.

(5) **Intracavitary X-ray Systems** shall not be used unless specific approval has been granted by the Agency. Application for such use must include convincing evidence attesting to the exclusive advantages to be gained in the use of intracavitary radiographic techniques as opposed to conventional radiographic procedurers.

(6) **Capacity of Radiographic X-ray Systems.**

(a) With exception of X-ray systems used exclusively for extremities, all general purpose medical X-ray systems installed or re-installed hereafter shall be capable of producing radiographs of good diagnostic quality using no longer exposure time than would be necessary using a par speed film and screen combination at technique factors of 90 kVp and 100 mA for a specific procedure at a given source-film distance. For purposes of this regulation, a par speed film and screen combination has a speed of 700 reciprocal roentgens.

(b) Mobile and portable radiographic systems shall be capable of producing radiographs of good diagnostic quality using no longer exposure time than would be necessary using a par speed film and screen combination at technique factors of 80 kVp and 30 mA for a specific procedure at a given source-film distance. For purposes of this regulation, a par speed film and screen combination has a speed of 700 reciprocal roentgens.

(7) **Labeling of X-ray Systems Used at Multiple Locations.** The X-ray control of each mobile or portable radiographic X-ray system used for delivery of human diagnostic X-ray services at multiple locations shall be identified by a label bearing the words "Inspected and Approved by the Florida Radiological Health Program Office" and displaying the date of inspection, name of the inspector, and the make, model and serial number of the X-ray control. It shall be unlawful for any person other than a representative of the Agency to remove, alter, reproduce or transfer the label, and it shall be unlawful for any person to use a mobile or portable X-ray system unless the required labeling is present.

(8) Additional General Requirements With Regard to Illumination by Light Localizers and Systems with Automatic Collimation (Positive Beam Limitation)

(a) Under normal or ambient room lighting conditions the illumination by the light localizer field shall produce a sufficient contrast ratio as to define a clearly visible light field edge (or perimeter).

(b) Systems featuring automatic collimation (positive beam limitation) whose collimators fail to function as intended shall be manually adjusted to satisfy the provisions of 10D-56.636(1)(a).

(9) **Additional Requirements Applicable to Certified Systems Only.**

(a) Beam Limitation for Stationary and Mobile General Purpose X-ray Systems.

1. When a light localizer is used to define the x-ray field, it shall provide an average illumination of not less than 160 lux (15 footcandles) at 100 centimeters or at the maxmum SID, whichever is less. The average illumination shall be based upon measurements made in the approximate center of each quadrant of the light field.

2. The edge of the light field at 100 centimeters or at the maximum SID, whichever is less, shall have a contrast ratio, corrected for ambient lighting, of not less than 4 in the case of beam-limiting devices designed for use on stationary equipment, and a contrast ratio of not less than 3 in the case of beam-limiting devices designed for use on mobile equipment. The contrast ratio is defined as I_1/I_2 where I_1 is the illumination 3 millimeters from the edge of the light field toward the center of the field; and I_2 is the illumination 3 millimeters from the edge of the light field away from the center of the field. Compliance shall be determined with a measuring aperture (diameter) of 1 millimeter.

(b) Beam limitation for portable X-ray systems shall meet the field limitation requirements of 10D-56.636(1)(a) and (8)(a).

(c) Field Limitation and Alignment on Stationary General Purpose X-Ray Systems (Automatic collimation or Positive Beam Limitation).

1. Means shall be provided for positive beam limitation which will, at the SID for which the device is designed, either cause automatic adjustment of the x-ray field in the plane of the image receptor to the image receptor size within 5 seconds after insertion of the image receptor or, if adjustment is accomplished automatically in a time interval greater than 5 seconds or in manual, will prevent production of x-rays until such adjustment is completed. At SID's at which the device is not intended to operate, the device shall prevent the production of x-rays.

2. The x-ray field size in the plane of the image receptor, whether automatically or manually adjusted, shall be such that neither the length nor the width of the x-ray field differs from that of the image receptor by greater than 3 percent of the SID and that the sum of the length and width differences without regard to sign be no greater than 4 percent of the SID when the equipment indicates that the beam axis is perpendicular to the plane of the image receptor.

3. The radiographic system shall be capable of operation, at the discretion of the operator, such that the field size at the image receptor can be adjusted to a size smaller than the image receptor. The minimum field size at a distance of 100 centimeters shall be equal to or less than 5 by 5 centimeters. Return to positive beam limitation as defined in 1. and 2. of this paragraph shall occur upon a change in image receptor.

4. Positive beam limitation may be bypassed when radiography is conducted which does not use the cassette tray or permanently mounted vertical cassette holder, or when either the beam axis or table angulation is not within 10 of the horizontal or vertical during any part of the exposure, or during stereoscopic radiography. If the bypass mode is provided, return to positive beam limitation shall be automatic.

5. A capability may be provided for overriding positive beam limitation in the event of system failure or to perform special procedures which cannot be performed in the positive mode. If so provided, a key shall be required to override the positive mode. It shall be impossible to remove the key while the positive mode is overridden.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.12(2), 381, 386 FS. History—New 1-1-77.

10D-56.637 Intraoral Dental Radiographic Systems. In addition to the provisions of Section 10D-56.333 FAC, Subsection 10D-56.635(5) FAC, and with the subsections of 10D-56.634: (1)(2), (5)(a), (8), (9)(a) & (b), (10), (11), (12), (13), (15), (16) and (17) FAC, the requirements of this section apply to X-ray equipment and associated facilities used for dental radiography. Criteria for extraoral dental radiographic systems are covered in Section 10D-56.636.

(1) Source-to-Skin Distance. X-ray systems designed for use with an intraoral image receptor shall be provided with means to limit source-to-skin distance to not less than:

(a) 18 centimeters if operable above 50 kilovolts peak, or

(b) 10 centimeters if not operable above 50 kilovolts peak.

(2) Field Limitation

(a) Radiographic systems designed for use with an intraoral image receptor shall be provided with means to limit the X-ray beam such that:

1. If the minimum source-to-skin distance (SSD) is 18 centimeters or more, the X-ray field at the minimum SSD shall be containable in a circle having a diameter of no more than 7 centimeters; and

2. If the minimum SSD is less than 18 centimeters, the X-ray field at the minimum SSD shall be containable in a circle having a diameter of no more than 6 centimeters.

(b) An open-ended shielded position indicating device shall be used on machines procured after September 19, 1972. The shielding shall be equivalent to that required for the diagnostic source assembly (10D-56.634(3) FAC).

(3) Timers. Means shall be provided to terminate the exposure at a preset time interval, preset product of current and time, or a preset number of pulses or a preset radiation exposure to the image receptor. In addition,

(a) Termination of exposure shall cause automatic resetting of the timer to its initial setting or to zero.

(b) It shall not be possible to make an exposure when the timer is set to a zero or off position if either position is provided.

(4) X-ray Control (Exposure Switch)

(a) A control shall be incorporated into each X-ray system such that an exposure can be terminated at any time. This switch shall be of the dead-man type.

(b) Each X-ray control shall be located in such a way as to meet the following criteria:

1. For X-ray systems capable of operating at potentials equal to or less than 70 kVp, the operator shall stand as far as practicable and at least 1.8 meters (6 feet) from the patient and tube head and outside the useful beam or behind a protective barrier during exposures.

2. For X-ray systems capable of operating at potentials greater than 70 kVp, the operator shall stand at least 3.75 meters (12 feet) from the patient and tube head and outside the primary beam or behind a protective barrier during exposures.

3. For X-ray systems installed after the effective date of these regulations:

a. The control switcb shall be permanently mounted in a protected are (e.g., corridor outside the room) so that the operator is required to remain in that protected area during the entire exposure.

4. For mobile and portable x-ray systems which are:

a. Used continuously in one room for a period greater than one week shall meet the requirements of 10D-56.637(4)(b)1., 2., or 3.

b. Used at multiple locations shall be provided either with an adequate protective barrier for the operator or with a method of control which will permit the operator to be at least 3.75 meters (12 feet) from the tube; the patient, and the edge of the useful beam during exposure.

(c) The x-ray control shall provide visual indication observable at or from the operator's protected position whenever x-rays are produced. In addition, a signal audible to the operator shall indicate that the exposure has terminated or is in progress.

(5)Operating Controls.

(a) The dentist, operator and assistant(s) shall not hold the film in place for the patient during the exposure. Patient and film holding devices may be used when the techniques permit.

(b) No person other than the patient shall be exposed to the useful beam.

(c) Neither the tube housing nor the position indicating device shall be held during an exposure.

(d) The X-ray system shall be arranged and operated in such a manner that the useful beam at the patient's skin does not exceed the dimensions specified in 10D-56.637 (2)(a) FAC.

(e) Dental fluoroscopy without image intensification shall be prohibited.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

10D-56.638 Therapeutic X-ray Installations.

(1) Equipment

(a) The protective tube housing shall be of the therapeutic protective type.

(b) Permanent diaphragms or cones used for collimating the useful beam shall afford the same degree of protection as the tube housing. Adjustable or removable beam-defining diaphragms or cones shall transmit not more than five (5) percent of the useful beam when the tube is operated at the maximum kilovoltage and with maximum treatment filter in the useful beam.

(c) Filters shall be secured in place to prevent them from dropping out during treatment. The filter slot shall be so constructed that the radiation escaping through it does not exceed one (1) roentgen per hour at one (1) meter or, if the radiation from the slot is accessible to the patient, thirty (30) roentgens per hour at five (5) centimeters from the external opening. Each removable filter shall be marked with its thickness and material.

(d) A filter indication system shall be used on all therapy machines using changeable filters. It shall be designed so as to permit easy recognition of any added filter in place. The presence or absence of any filter shall be indicated on or be visible from the control panel.

(e) The X-ray tube shall be so mounted that it cannot turn or slide with respect to the housing aperture.

(f) Means shall be provided to immobilize the tube housing during stationary portal treatment.

(g) A device (e.g., an automatic timer, exposure meter or dose meter) shall be provided to terminate the exposure after a preset time interval or preset exposure or dose limit. Means shall be provided for the operator to terminate the exposure at any time. It shall not be possible to activate the X-ray system when the timing device is set on a "zero" or "off" position, if either position is present.

(h) Equipment utilizing shutters to control the useful beam shall have a shutter position indicator on the control panel.

(i) The control panel shall include a device (usually a milliammeter) which will give positive indication of the production of X-rays whenever the X-ray tube is energized.

(2) Structural Shielding

(a) All walls, floors, and ceilings that can be struck by the useful beam, shall be provided with primary barriers.

(b) All walls, floors, and ceilings that, because of restrictions in the orientation of the useful beam, cannot be struck by the useful beam shall be provided with secondary barriers.

(c) With equipment operating at voltages above fifty (50) kVp, the required barriers shall be an integral part of the building.

(d) With equipment operating above one hundred and fifty (150) kVp, the control panel shall be within a protective booth equipped with an interlocked door, or located outside the treatment room.

(e) Interlocks shall be provided for X-ray therapy equipment capable of operating above 150 kVp so that, when any door of the treatment room is opened, either the machine will shut off automatically or the radiation level within the room will be reduced to an average of not more than two milliroentgens per hour and a maximum of ten milliroentgens per hour at a distance of one (1) meter in any direction from the source. After such shutoff or reduction in output, it shall be possible to restore the machine to full operation only from the control panel.

(f) Windows, mirror systems, or closed-circuit television viewing screens shall be provided to permit continuous observation of the patient during irradiation and shall be so located that the operator may see the patient and the control panel from the same position.

(g) Provision shall be made for oral communication with the patient from the control room.

(h) Treatment rooms to which access is possible through more than one entrance shall be provided with flashing warning lights in a readily observable position near the outside of all access doors which will indicate when the useful beam is "on".

(3) Operating Procedure

(a) All new facilities, and existing facilities not previously surveyed, shall have a protection survey made by, or under the direction of a qualified person. This shall also be done after any change in the facility which might produce a radiation hazard. The Registrant shall obtain and maintain a written report of the survey results for Agency review.

(b) The facility shall be operated in compliance with any limitations indicated by the protected survey.

(c) When a patient must be held in position for radiation therapy, mechanical supporting or restraining devices shall be used whenever feasible. If the patient must be held by an individual, that individual shall be adequately protected. The holder shall be positioned so that no part of his body will be struck by the useful beam and his body is as far as possible from the edge of the useful beam. The exposure of any individual used for this purpose shall be monitored and records maintained for inspection by the Agency.

(d) The output of each therapeutic X-ray machine shall be calibrated by, or under the direction of, a qualified person. The calibration shall be repeated after any change in or replacement of components of the X-ray generating equipment which could cause a change in X-ray output. Check calibrations shall be made at least once per year thereafter. Records of calibration shall be maintained by the registtrant.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

10D-56.639 Special Requirements for X-ray Therapy Equipment Operated at Potentials of Sixty (60) kVp and Below.

(1) Equipment. All provisions of 10D-56.638(1) FAC apply except that the leakage radiation 5 cm from the surface of the tube housing shall not exceed 0.1 roentgen per hour.

(2) Operating Procedures

(a) Automatic timers shall be provided which will permit accurate presetting and termination of exposures as short as one second.

(b) In the therapeutic application of apparatus constructed with beryllium or other low-filtration window, the registrant shall insure that the unfiltered radiation reaches only the part intended, and that the useful beam is blocked at all times except when actually being used.

(c) Machines having an output of more than 1,000 roentgens per minute at any accessible place shall not be left unattended without the power being shut off at the main disconnect switch in addition to the control panel switch.

(d) If the tube must be hand-held during irradiation, the operator shall wear protective gloves and protective apron containing no less than 0.5 millimeter lead equivalent.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

10D-56.640 Veterinary Medicine X-ray Installations.

(1) Applicable Regulations. Veterinary medical X-ray installations shall conform with the requirements of the following sections of these regulations:

(a) 10D-56.633 General Requirements, except (1)(a)5., 6. and 7. FAC.

(b) 10D-56.634 FAC General Requirements for All Diagnostic X-ray Systems.

(c) 10D-56.635 FAC Fluoroscopic X-ray Systems

(d) The protective tube housing shall be of diagnostic type.

(2) Additional Requirements.

(a) Equipment

1. Positive means of beam alignment shall be provided in the form of accurate linear rulings, beam defining or beam centering lights, optical viewing devices, or the equivalent. Such alignment means or devices shall be adjusted to indicate the beam center or beam area to within 2% of the SID.

2. Means shall be provided to limit the useful beam to the area of diagnostic interest or to the area of the image receptor used in each particular case. Beam limitation may be accomplished by any of the means described under Section 10D-56.636(1) FAC of these regulations.

3. Each X-ray system shall be equipped with a device which will terminate the exposure after a preset time or exposure.

4. Each exposure switch shall be of the dead-man type.

5. Each exposure switch shall be located in such a way as to meet the following criteria:

a. For X-ray systems capable of operating at potentials equal to or less than 70 kVp, the operator shall stand as far as practicable and at least 1.8 meters (6 feet) from the patient and tube head and outside the useful beam or behind a protective barrier during exposures.

b. For X-ray systems capable of operating at potentials greater than 70 kVp, the operator shall stand as far as practicable and at least 3.75 meters (12 feet) from the patient and tube head and outside the useful beam or behind a protective barrier during exposures.

(3) Operating Procedures

(a) The operator shall stand in a protected position as indicated in 10D-56.640(2)(a)5. FAC during radiographic exposures with no other individuals in the X-ray room unless assistance of the nature described in (c) following, is required.

(b) To the greatest practicable extent, animals must be immobilized by anaesthetics, straps, sandbags, foam wedges and other supporting or restraining devices.

(c) If an animal must be held by an individual, that individual shall be protected by appropriate shielding devices such as protective apron and gloves, and the holder(s) shall be so positioned that no part of his body will be struck by the useful beam. The exposure of that individual shall be monitored when engaged in such purposes.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

APPENDIX A

X-ray Film Processing Facilities and Practices

(1) Darkroom Facilities

(a) Each installation using a radiographic x-ray system shall provide suitable space and equipment for handling and processing radiographic film. The enclosure in which undeveloped films are handled or processed shall be devoid of all light with exception of light emitted from a safelight specifically designed to produce only light in the wave lengths having no significant effect on the radiographic film.

(b) Film pass boxes if provided shall be so constructed as to exclude all light when film is placed in or removed from the boxes, and shall incorporate adequate shielding to prevent exposure of undeveloped film to x-radiation.

(c) Darkrooms used by more than one individual or for other purposes in addition to film loading and processing shall have locking devices on the door to prevent accidental entry while undeveloped films are being handled or processed.

(d) Adequate working space shall be provided for film storage, loading and handling.

(e) Darkrooms and other film processing equipment shall be kept clean.

(f) Adequate mechanical ventilation shall be provided in each darkroom.

(g) Where film is developed manually,

1. At least one three-sectional tank made of mechanically rigid, corrosion resistant material shall be available, and

2. The temperature of each solution shall be maintained within the range of 16 C to 27 C (60—80 F.)

3. Devices shall be available which will:

a. Give the actual temperature of the developer and

b. Give an audible or visible signal after passage of a preset time as short as two minutes.

(2) Darkroom Practices

(a) Film shall be stored in a cool, dry place and shall be protected from exposure to stray radiation. Film in open packages shall be stored in a light tight container or storage bin.

(b) Cassettes and screens shall be inspected periodically at intervals not exceeding six months for presence of any stains or foreign materials, and shall be cleaned or replaced as necessary to prevent the appearance of artifacts that would interfere with the diagnostic value of the radiographs.

(c) Film processing solution tanks shall be clean and free of corrosion.

(d) Except for special procedures, film developing solutions shall be prepared in accordance with the directions given by the manufacturer, and shall be maintained in strength by replenishment or renewal so that full development is accomplished within the time specified by the manufacturer.

(3) Manual Processing

(a) Except for special procedures, film shall be developed in accordance with the time-temperature relationships specified by the film manufacturer, or with the following time-temperature chart.

Time-Temperature Chart

Thermometer Reading (Degrees) C	F	Minimum Developing Times (Minutes)
26.7	80	2
26.1	79	2
25.6	78	2½
25.0	77	2½
24.4	76	3
23.9	75	3
23.3	74	3½
22.8	73	3½
22.0	72	4
21.7	71	4
21.1	70	4½
20.6	69	4½
20.0	68	5
19.4	67	5½
18.9	66	5½
18.3	65	6
17.8	64	6½
17.2	63	7
16.7	62	8
16.1	61	8½
15.6	60	9½

(4) Automatic Processors and Other Closed Processing Systems

(a) Preventive maintenance shall be performed on the unit, except for extended periods of nonuse, on a frequency basis which is not less than that schedule recommended by the manufacturer. In the event that no schedule is available from the manufacturer, a maintenance schedule shall be established which will preserve good diagnostic film quality.

(b) The radiance and spectral emission of the safelight (bulb and filter combination) shall be such that film shall not be "fogged" above the base level when exposed for 1 minute at a distance of about 120 centimeters from the lamp(s). Film manufacturer's recommendations for a safelight and its placement shall be adjudged to meet this criterion.

PART 7
USE OF SEALED RADIOACTIVE SOURCES IN THE HEALING ARTS

10D-56.731 Scope. The provisions of this part apply to all licensees who use sealed sources in the healing arts and are in addition to, and not in substitution for, other applicable provisions of these regulations.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

10D-56.732 Interstitial, Intracavitary and Superficial Applications.

(1) Accountability, Storage and Transit

(a) Except as otherwise specifically authorized by the Agency each licensee shall provide accountability of sealed sources and shall keep a record of the issue and return of all sealed sources. A physical inventory shall be made at least every six (6) months and a written record of the inventory maintained for inspection by the Agency.

(b) When not in use, sealed sources and applicators containing sealed sources shall be kept in a protective enclosure of such material and wall thickness as may be necessary to assure compliance with the provisions of 10D-56.432 FAC, 10D-56.435 FAC, and 10D-56.436 FAC.

(2) Testing Sealed Sources for Leakage and Contamination

(a) All sealed sources with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination prior to initial use and at intervals not to exceed six (6) months. If there is reason to suspect that a sealed source might have been damaged, or might be leaking, it shall be tested for leakage before further use.

(b) Leak tests shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample or, in the case of radium, the escape of radon at rate of 0.001 microcurie per 24 hours. Any test conducted pursuant to 10D-56.732(2)(a) FAC which reveals the presence of 0.005 microcurie or more of removable contamination or, in the case of radium, the escape of radon at the rate of 0.001 microcurie or more per 24 hours shall be considered evidence that the sealed source is leaking. The licensee shall immediately withdraw the source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with applicable provisions of Part 4.

(c) Leak test results shall be recorded in units of microcuries and maintained for inspection by the Agency.

(3) Radiation Surveys

(a) The maximum radiation level at a distance of one meter from the patient in whom brachytherapy sources have been inserted shall be determined by measurement and calculation. This radiation level shall be entered on the patients chart and signs as required under 10D-56.732(4) FAC.

(b) The radiation levels in the patient's room and the surrounding area shall be determined, recorded, and maintained for inspection by the Agency.

(4) Signs and Records. In addition to the requirements of 10D-56.441 FAC, the bed and room of the hospital brachytherapy patient shall be marked with a sign indicating the presence of brachytherapy sources. This sign shall incorporate the radiation symbol and specify the radionuclide, the activity, date, and the individual(s) to contact for radiation safety instructions. The sign on the room is not required provided the exception in 10D-56.442(2) FAC is met.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.12(2), 381, 386 FS. History—New 1-1-77.

10D-56.733 Teletherapy

(1) Equipment

(a) The housing shall be so constructed that, at one (1) meter from the source, the maximum

exposure rate does not exceed ten (10) milliroentgens per hour when the beam control mechanism is in the "off" position. The average exposure rate measured at a representative number of points about the housing, each one (1) meter from the source, shall not exceed two (2) milliroentgens per hour.

(b) The source housing leakage radiation measured at one (1) meter from the source when the beam control mechanism is in the "on" position shall not exceed one (1) roentgen per hour or 0.1 percent of the useful beam exposure rate.

(c) Adjustable or removable beam-defining diaphragms shall allow transmission of not more than five (5) percent of the useful beam exposure rate.

(d) The beam control mechanism shall be of a positive design capable of acting in any orientation of the housing for which it is designed to be used. In addition to an automatic closing device, the mechanism shall be designed so that it can be manually returned to the "off" position with a minimum risk of exposure.

(e) The closing device shall be so designed as to return automatically to the "off" position in the event of any breakdown or interruption of the activating force and shall stay in the "off" position until activated from the control panel.

(f) When any door to the treatment room is opened, the beam control mechanism shall automatically and rapidly restore the unit to the "off" position and cause it to remain there until the unit is reactivated from the control panel.

(g) There shall be at the housing and at the control panel a warning device that plainly indicates whether the beam is on or off.

(h) The equipment shall be provided with a locking device to prevent unauthorized use.

(i) The control panel shall be provided with a timer that automatically terminates the exposure after a preset time.

(j) Provision shall be made to permit continuous observation of patients during irradiation.

(k) Safety interlock systems shall be tested for proper function at intervals not to exceed 6 months. The test and results shall be recorded and maintained for inspection by the Agency.

(2) Operation. No individual who is occupationally exposed to radiation shall be in the treatment room during irradiation unless that individual is the patient. No other individual shall be there except when it is clinically necessary.

(3) Testing for Leakage and Contamination. Teletherapy sources shall be tested for leakage and contamination in accordance with the procedures described in 10D-56.732(2) FAC. Tests of leakage may be made by wiping accessible surfaces of the housing port or collimator while the source is in the "off" position and measuring these wipes for transferred contamination.

(4) Calibration.

(a) Any licensee who is authorized to use teletherapy units for human use shall cause full calibration measurements on each teletherapy unit to be performed:

1. Prior to the first use of the unit for treating humans;

2. Whenever the radiation meter or other device related to radiation output indicates a greater than 5% departure during a spot check between the meausred value and the calculated value as based on the prior calibration curves (or tables) and source decay chart.

3. Following replacement of the radiation source or following reinstallation of the unit in a new location;

4. At intervals not exceeding one year.

(b) Full calibration measurements shall include determination of:

1. The exposure rate or dose rate for the range in field sizes used and for each treatment distance used for radiation therapy;

2. The congruence between the radiation field and the field indicated by the localizing device when localizing devices are used;

3. The uniformity of the radiation field and its dependence upon the direction of the useful beam;

4. Timer accuracy.

(c) Full calibration measurements shall be made in accordance with nationally recognized standards and also accepted by this Agency.*

(d) Spot-check measurements shall be performed at intervals not exceeding one month and shall include:

1. Determination of timer accuracy,

2. Determination of congruency of the useful beam with the light localizer,

3. Determination of the exposure rate, dose rate or a quantity related in a known manner to these entities for one typical set of machine operating conditions, and,

4. Comparison of the measurements made in section (iii) of this paragraph with values calculated from physical decay of the radiation source.

(e) Calibration measurements required by paragraph (4)(a) of this section shall be performed by a qualified person such as an individual certified by the American Board of Radiology in Therapeutic Radiological Physics, Radiological Physics, Roentgen Ray and Gamma Ray Physics or X-ray and Radium Physics or an individual who has equivalent qualifications. Spot-check measurements required by paragraph (4)(d) of this section shall be performed and evaluated in accordance with procedures established by the qualified person.

(f) The licensee shall maintain records of the measurements made pursuant to paragraphs (4)(a) and (4)(d) of this section for inspection by the Agency.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.12, 381, 386 FS. History—New 1-1-77.

PART 8
RADIATION SAFETY REQUIREMENTS FOR ANALYTICAL X-RAY EQUIPMENT

10D-56.831 Purpose and Scope. This part provides special requirements for analytical x-ray equipment. The requirements of this part are in

*Scientific Committee on Radiation Dosimetry of the American Association of Physicists in Medicine (Physics in Medicine and Biology, Vol. 16, No. 3, 1971, pp. 379-396).

addition to, and not in substitution for, applicable requirements in other parts of these regulations.
Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1)(2), 381, 386 FS. History—New 1-1-77.

10D-56.832 Definitions.

(1) "Analytical x-ray equipment" means equipment used for x-ray diffraction or fluorescence analysis.

(2) "Analytical x-ray system" means a group of local and remote components utilizing x-rays to determine the elemental composition or to examine the microstructure of materials. Local components include those that are struck by x-rays such as radiation source housings, port and shutter assemblies, collimators, sample holders, cameras, goniometers, detectors and shielding. Remote components include power supplies, transformers, amplifiers, readout devices, and control panels.

(3) "Fail-safe characteristics" mean a design feature which causes beam port shutters to close, or otherwise prevents emergence of the primary beam, upon the failure of a safety or warning device.

(4) "Normal operating procedures" means operating procedures for conditions suitable for analytical purposes with shielding and barriers in place. These do not include maintenance but do include routine alignment procedures. Routine and emergency radiation safety considerations are part of these procedures.

(5) "Open-beam configuration" means an analytical x-ray system in which an individual could accidently place some part of his body in the primary beam path during normal operation.

(6) "Primary beam" means ionizing radiation which passes through an aperture of the source housing by a direct path from the x-ray tube or a radioactive source located in the radiation source housing.
Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1)(2), 381, 386 FS. History—New 1-1-77.

10D-56.833 Equipment Requirements.

(1) Safety Device. A device which prevents the entry of any portion of an individual's body into the primary x-ray beam path or which causes the beam to be shut off upon entry into its path shall be provided on all open-beam configurations. A registrant may apply to the Agency for an exemption from the requirement of a safety device. Such application shall include:

(a) A description of the various safety devices that have been evaluated.

(b) The reason each of these devices cannot be used, and

(c) A description of the alternative methods that will be employed to minimize the possibility of an accidental exposure, including procedures to assure that the operator and others in the area will be informed of the absence of safety devices.

(2) Warning Devices. Open-beam configurations shall be provided with a readily discernible indication of:

(a) X-ray tube status (ON-OFF) located near the radiation source housing, if the primary beam is controlled in this manner; and/or

(b) Shutter status (OPEN-CLOSED) located near each port on the radiation source housing, if the primary beam is controlled in this manner.

Warning devices shall be labeled so that their purpose is easily identified. On equipment installed six months or more after the effective date of these regulations, warning devices shall have fail-safe characteristics.

(3) Ports. Unused ports on radiation source housings shall be secured in the closed position in a manner which will prevent casual opening.

(4) Labeling. All analytical x-ray equipment shall be labeled with a readily discernible sign or signs bearing the radiation symbol and the words:

(a) "CAUTION-HIGH INTENSITY X-RAY BEAM," or words having a similar intent, on the x-ray source housing; and

(b) "CAUTION RADIATION — THIS EQUIPMENT PRODUCES RADIATION WHEN ENERGIZED," or words having a similar intent, near any switch that energizes an x-ray tube if the radiation source is an x-ray tube; or

(c) "CAUTION-RADIOACTIVE MATERIAL," or words having a similar intent, on the source housing if the radiation source is a radionuclide.

(5) Shutters. On open-beam configurations installed six months or more after the effective date of these regulations, each port on the radiation source housing shall be equipped with a shutter that cannot be opened unless a collimator or a coupling has been connected to the port.

(6) Warning Lights. An easily visible warning light labeled with the words "X-RAY ON," or words having a similar intent, shall be located:

(a) near any switch that energizes an x-ray tube and shall be illuminated only when the tube is energized; or

(b) in the case of a radioactive source, near any switch that opens a housing shutter, and shall be illuminated only when the shutter is open.

On equipment installed six months or more after the effective date of these regulations, warning lights shall have fail-safe characteristics.

(7) Radiation Source Housing. Each x-ray tube housing shall be so constructed that with all shutters closed the leakage radiation measured at a distance of 5 cm from its surface is not capable of producing a dose in excess of 2.5 mrem in one hour at any specified tube rating. If radioactive sources are used, corresponding dose limits shall not exceed two (2) mrem per hour.

(8) Generator Cabinet. Each x-ray generator shall be supplied with a protective cabinet which limits leakage radiation measured at a distance of 5 cm from its surface such that it is not capable of producing a dose in excess of 0.5 mrem in one hour.
Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1)(2), 290.11, 290.12(2), 381, 386 FS. History—New 1-1-77.

10D-56.834 Area Requirements.

(1) Radiation Levels. The local components of an analytical x-ray system shall be located and arranged and shall include sufficient shielding or access control such that no radiation levels exist in any area surrounding the local component group which could result in a dose to an individual present therein in excess of the dose limits given in

10D-56.436 FAC of these regulations. For systems utilizing x-ray tubes, these levels shall be met at any specified tube ratings:

(2) Surveys. Radiation surveys, as required by 10D-56.439 FAC, of all analytical x-ray systems sufficient to show compliance with 10D-56.834(1) FAC shall be performed:

(a) Upon installation of the equipment;

(b) Following any change in the initial arrangement, number, or type of local components in the system;

(c) Following any maintenance requiring the disassembly or removal of a local component in the system;

(d) During the performance of maintenance and alignment procedures if the procedures require the presence of a primary x-ray beam when any local component in the system is disassembled or removed; and

(e) Any time a visual inspection of the local components in the system reveals an abnormal condition.

(f) Whenever personnel monitoring devices show a significant increase over the previous monitoring period or the readings are approaching the Radiation Protection Guides (radiation dose limits).

Radiation survey measurements shall not be required if a registrant can demonstrate compliance to the satisfaction of the Agency with 10D-56.834(1) FAC.

(3) Posting. Each area or room containing analytical x-ray equipment shall be conspicuously posted with a sign or signs bearing the radiation symbol and the words "CAUTION — X-RAY EQUIPMENT," or words having a similar intent.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1), 381, 386 FS. History—New 1-1-77.

10D-56.835 Operating Requirements.

(1) Procedures. Normal operating procedures shall be written and available to all analytical x-ray equipment operators. No person shall be permitted to operate analytical x-ray equipment in any manner other than that specified in the procedures.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1), 290.11, 290.12(2), 381, 386 FS. History—New 1-1-77.

10D-56.836 Personnel Requirements.

(1) Instruction. No person shall be permitted to operate or maintain analytical x-ray equipment unless such person has received instruction in and demonstrated competence as to:

(a) Identification of radiation hazards associated with the use of the equipment;

(b) Significance of the various radiation warning and safety devices incorporated into the equipment, or the reasons they have not been installed on certain pieces of equipment and the extra precautions required in such cases;

(c) Proper operating procedures for the equipment;

(d) Symptoms of an acute localized exposure; and

(e) Proper procedures for reporting an actual or suspected exposure.

(2) Personnel Monitoring. Finger or wrist dosimetric devices shall be provided to and shall be used by:

(a) Analytical x-ray equipment workers using systems having an open-beam configuration and not equipped with a safety device; and

(b) Personnel maintaining analytical x-ray equipment if the maintenance procedures require the presence of a primary x-ray beam when any local component in the analytical x-ray system is disassembled or removed.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1), 290.11, 290.12(2), 381, 386 FS. History—New 1-1-77.

PART 9
RADIATION SAFETY REQUIREMENTS FOR PARTICLE ACCELERATORS

10D-56.931 Purpose and Scope.

(1) This part establishes procedures for the registration and the use of particle accelerators.

(2) In addition to the requirements of this part, all registrants are subject to the requirements of Part 1, Part 2, Part 4, and Part 10. Registrants engaged in industrial radiographic operations are also subject to the requirements of Part 5 and registrants engaged in the healing arts are also subject to the requirements of Part 6 and/or Part 7 of these regulations. Registrants engaged in the production of radioactive material are subject to the requirements of Part 3.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.10(1)(2), 381, 386 FS. History—New 1-1-77.

PART 9A
REGISTRATION PROCEDURE

10D-56.932 Registration Requirements. No person shall receive, possess, use, transfer, or acquire a particle accelerator except as authorized in a registration issued pursuant to these regulations or as otherwise provided for in these regulations. The general procedures for registration of particle accelerator facilities are included in Part 2 of these regulations.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.12(2), 381, 386 FS. History—New 1-1-77.

10D-56.933 General Requirements for the Issuance of a Registration for Particle Accelerators. In addition to the requirements of Part 2, a registration application for use of a particle accelerator will be approved only if the Agency determines that:

(1) The applicant is qualified by reason of training and experience to use the accelerator in question for the purpose requested in accordance with this Part and Part 4 and Part 10 of these regulations in such a manner as to minimize danger to public health and safety or property;

(2) The applicant's proposed equipment, facilities, operating and emergency procedures are adequate to protect health and minimize danger to public health and safety or property;

(3) The issuance of the registration will not be inimical to the health and safety of the public, and the applicant satisfies any applicable special requirement in 10D-56.934 FAC of this regulation;

(4) The applicant has appointed a radiation safety officer;

(5) The applicant and/or his staff has

substantial experience in the use of particle accelerators for the intended uses;

(6) The applicant has established a radiation safety committee to approve, in advance, proposals for uses of particle accelerators, whenever deemed necessary by the Agency; and

(7) The applicant has an adequate training program for particle accelerator operators.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.12(2), 381, 386 FS. History—New 1-1-77.

10D-56.934 Human Use of Particle Accelerators. Particle accelerators which make use of by-product x-rays produced by the accelerated particles, as the therapeutic radiation, shall be subject to the same regulations with regard to shielding, operator protection, surveys and calibration as indicated in Part 6, 10D-56.638(2), (3)(a) through (d). Supplementary to the calibration requirements, monthly spot check exposure rate (or dose) measurements, with a suitable radiation meter (or other device related to radiation output), shall be conducted of a typical operating set up and compared to values calculated from the calibration curves (or tables). Should a greater than 5% departure be indicated between the spot check measurement and calculated dose values then a full re-calibration shall be performed. Records of the calibrations and the monthly spot checks shall be maintained by the registrant. In addition to the requirements set forth in Part 2, a registration for use of any particle accelerator in the healing arts will be issued only if:

(1) Whenever deemed necessary by the Agency, the applicant has appointed a medical committee of at least three members to evaluate all proposals for research, diagnostic, and therapeutic use of a particle accelerator. Membership of the committee should include physicians expert in internal medicine, hematology, therapeutic radiology, and a person experienced in depth dose calculations and protection against radiation;

(2) The individuals designated on the application as the users have substantial training and experience in deep therapy techniques or in the use of particle accelerators to treat humans, and

(3) The individual designated on the application as the user is a physician.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

PART 9B
RADIATION SAFETY REQUIREMENTS FOR THE USE OF PARTICLE ACCELERATORS

10D-56.935 General Provisions.

(1) This subpart establishes radiation safety requirements for the use of particle accelerators. The provisions of this subpart are in addition to, and not in substitution for, other applicable provisions of the regulations.

(2) The registrant shall be responsible for assuring that all requirements of this part are met.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

10D-56.936 Limitations.

(1) No registrant shall permit any person to act as a particle accelerator operator until such person:

(a) Has been instructed in radiation safety and shall have demonstrated an understanding thereof;

(b) Has received copies of and instruction in this part and the applicable requirements of Part 4 and Part 10, pertinent registration conditions and the registrant's operating and emergency procedures, and shall have demonstrated understanding thereof; and

(c) Has demonstrated competence to use the particle accelerator, related equipment, and survey instruments which will be employed in his assignment.

(2) Either the radiation safety committee or the radiation safety officer shall have the authority to terminate the operations at a particle accelerator facility if such action is deemed necessary to protect health and minimize danger to public health and safety or property.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

10D-56.937 Shielding and Safety Design Requirements.

(1) A qualified person shall be consulted in the design of a particle accelerator installation and called upon to perform a radiation survey when the accelerator is first capable of producing radiation.

(2) Each particle accelerator installation shall be provided with such primary and/or secondary barriers as are necessary to assure compliance with 10D-56.432 FAC and 10D-56.436 FAC.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

10D-56.938 Particle Accelerator Controls and Interlock Systems.

(1) Instrumentation, readouts and controls on the particle accelerator control console shall be clearly identified and easily discernible.

(2) All entrances into a target room or other high radiation area shall be provided with interlocks that shut down the machine under conditions of barrier penetration.

(3) When an interlock system has been tripped, it shall only be possible to resume operation of the accelerator by manually resetting controls at the position where the interlock has been tripped, and lastly at the main control console. The approval of such plans shall not preclude the requirement of additional modifications should a subsequent analysis of operating conditions indicate the possibility of an individual receiving a dose in excess of the limits prescribed in 10D-56.432, 10D-56.435 and 10D-56.436.

(4) Each safety interlock shall be on a circuit which shall allow its operation independently of all other safety interlocks.

(5) All safety interlocks shall be fail-safe, i.e., designed so that any defect or component failure in the interlock system prevents operation of the accelerator.

(6) A scram button or other emergency power cutoff switch shall be located and easily identifiable in all high radiation areas. Such a cutoff switch shall include a manual reset so that the accelerator cannot be restarted from the accelerator control console without resetting the cutoff switch.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.12(2), 381, 386 FS. History—New 1-1-77.

10D-56.939 Warning Devices.

(1) All locations designated as high radiation areas, and entrances to such locations shall be equipped with easily observable flashing or rotating warning lights that operate when and only when, radiation is being produced.

(2) Except in facilities designed for human exposure, each high radiation area shall have an audible warning device which shall be activated for 15 seconds prior to the possible creation of such high radiation area. Such warning device shall be clearly discernible in all high radiation areas and all radiation areas.

(3) Barriers, temporary or otherwise, and pathways leading to high radiation areas shall be identified in accordance with 10D-56.441 FAC.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.12(2), 381, 386 FS. History—New 1-1-77.

10D-56.940 Operating Procedures.

(1) Particle accelerators, when not in operation, shall be secured to prevent unauthorized use.

(2) Only a switch on the accelerator control console shall be routinely used to turn the accelerator beam on and off. The safety interlock system shall not be used to turn off the accelerator beam except in an emergency.

(3) All safety and warning devices, including interlocks, shall be checked for proper operability at intervals not to exceed three months. Results of such tests shall be maintained for inspection by the Agency at the accelerator facility.

(4) Electrical circuit diagrams of the accelerator, and the associated interlock systems, shall be kept current and available to the operator at each accelerator facility, and maintained for inspection by the Agency.

(5) If, for any reason, it is necessary to intentionally bypass a safety interlock or interlocks, such action shall be:

(a) Authorized by the radiation safety committee and/or radiation safety officer;

(b) Recorded in a permanent log and notice posted at the accelerator control console; and

(c) Terminated as soon as possible.

(6) A copy of the current operating and the emergency procedures shall be maintained at the accelerator control panel.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 290.12(2), 381, 386 FS. History—New 1-1-77.

10D-56.941 Radiation Monitoring Requirements.

(1) There shall be available at each particle accelerator facility, appropriate portable monitoring equipment which is operable and has been calibrated for the appropriate radiations being produced at the facility. Such equipment shall be tested for proper operation daily and calibrated at intervals not to exceed one year, and after each servicing and repair.

(2) A radiation protection survey shall be performed and documented by a qualified person when changes have been made in shielding, operation, equipment, or occupancy of adjacent areas.

(3) Radiation levels in all high radiation areas shall be continuously monitored. The monitoring devices shall be electrically independent of the accelerator control and interlock systems and capable of providing a remote and local readout with visual and/or audible alarms at both the control panel and at entrance to high radiation areas, and other appropriate locations, so that people entering or present become aware of the existence of the hazard.

(4) All area monitors shall be calibrated quarterly.

(5) Whenever applicable, periodic surveys shall be made to determine the amount of airborne particulate radioactivity present in areas of airborne hazards.

(6) Whenever applicable, periodic smear surveys shall be made to determine the degree of contamination in target and other pertinent areas.

(7) All area surveys shall be made in accordance with the written procedures established by a qualified person, or the radiation safety officier of the particle accelerator facility.

(8) Records of all radiation protection surveys, calibration results, instrumentation tests, and smear results shall be kept current and on file at each accelerator facility for inspection by the Agency.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

10D-56.942 Ventilation Systems.

(1) Adequate ventilation shall be provided in areas where airborne radioactivity may be produced.

(2) A registrant as required by 10D-56.437 FAC, shall not vent, release or otherwise discharge airborne radioactive material to an uncontrolled area which exceed the limits specified in Part 4, Appendix A — Table II, except as authorized pursuant to 10D-56.447 FAC or 10D-56.437(2) FAC. For purposes of this paragraph, concentrations may be averaged over a period not greater than one month. Every reasonable effort should be made to maintain releases of radioactive material to uncontrolled areas, as far below these limits as practicable.

Specific Authority 290.10 FS. Law Implemented 290.051(1)(3), 381, 386 FS. History—New 1-1-77.

PART 10
NOTICES, INSTRUCTIONS AND REPORTS TO WORKERS: INSPECTIONS

10D-56.1031 Purpose and Scope. This part establishes requirements for notices, instructions and reports by licensees or registrants to individuals engaged in work under a license or registration and options available to such individuals in connection with Agency inspections of licensees or registrants to ascertain compliance with the provisions of the Act and regulations, orders and licenses issued thereunder regarding radiological working conditions. The regulations in this part apply to all persons who receive, possess, use, or transfer material licensed by or registered with the Agency pursuant to the regulations in Part 2 and Part 3.

Specific Authority 290.10 FS. Law Implemented 290.051, 290.15(1)(c), 381, 386 FS. History—New 1-1-77.

10D-56.1032 Posting of Notices to Workers.

(1) Each licensee or registrant shall post current copies of the following documents: (a) the regulations in this part and in Part 4; (b) the license, certificate of registration, conditions or documents incorporated into the license by reference and amendments thereto; (c) the operating procedures applicable to work under the license or registration; (d) any notice of violation involving radiological working conditions, proposed imposition of civil penalty, or order issued pursuant to Part 1, and any response from the licensee or registrant.

(2) If posting of a document specified in 10D-56.1032(1)(a), (b) or (c) FAC is not practicable, the licensee or registrant may post a notice which describes the document and states where it may be examined.

(3) Agency Form RAD-1 "Notice to Employees" shall be posted by each licensee or registrant wherever individuals work in or frequent any portion of a restricted area.

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

(5) Agency documents posted pursuant to 10D-56.1032(1)(d) FAC shall be posted within 2 working days after receipt of the documents from the Agency; the licensee's or registrant's response, if any, shall be posted within 2 working days after dispatch from the licensee or registrant. Such documents shall remain posted for a minimum of 5 working days or until action correcting the violation has been completed, whichever is later.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—New 1-1-77.

10D-56.1033 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 material or of radiation in such portions of the restricted area; shall be instructed in the health protection problems associated with exposure to such radioactive material 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 Agency regulations and license for the protection of personnel from exposure to radiation or radioactive material occurring in such areas; shall be instructed of their responsibility to report promptly to the licensee or registrant any condition which may lead to or cause a violation of Agency regulations and licenses or unnecessary exposure to radiation or 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 10D-56.1034 FAC. The extent of these instructions shall be commensurate with potential radiological health protection problems in the restricted area.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—New 1-1-77.

10D-56.1034 Notifications and Reports to Individuals.

(1) 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 Agency regulations, orders, or license conditions, as shown in records maintained by the licensee or registrant pursuant to Agency regulations. Each notification and report shall: be in writing; include appropriate identifying data such as the name of the licensee or registrant, the name of the individual, and 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 Florida Department of Health and Rehabilitative Services regulations entitled Chapter 10D-56, Control of Radiation Hazards. You should preserve this report for further reference."

(2) At the request of any worker, each licensee or registrant shall advise such worker annually of the worker's exposure to radiation or radioactive material as shown in records maintained by the licensee or registrant pursuant to 10D-56.450(1) and (3) FAC.

(3) At the request of a worker formerly engaged in work controlled by the licensee or the registrant, each licensee or registrant 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 or registrant, 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 material licensed by, or radiation machines registered with the Agency; and shall include the dates and locations of work under the license or registration in which the worker participated during this period.

(4) When a licensee or registrant is required pursuant to 10D-56.453 FAC to report to the Agency any exposure of an individual to radiation or radioactive material, the licensee or the registrant shall also provide the individual a report on his exposure data included therein. Such reports shall be transmitted at a time not later than the transmittal to the Agency.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.12(2)(3), 381, 386 FS. History—New 1-1-77.

10D-56.1035 Presence of Representatives of Licensees or Registrants and Workers During Inspection.

(1) Each licensee or registrant shall afford to the Agency at all reasonable times opportunity to

inspect materials, machines, activities, facilities, premises, and records pursuant to these regulations.

(2) During an inspection, Agency inspectors may consult privately with workers as specified in 10D-56.1036 FAC. The licensee or registrant may accompany Agency inspectors during other phases of an inspection.

(3) If, at the time of inspection, an individual has been authorized by the workers to represent them during Agency inspections, the licensee or registrant 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.

(4) Each workers' representative shall be routinely engaged in work under control of the licensee or registrant and shall have received instructions as specified in 10D-56.1033 FAC.

(5) Different representatives of licensees or registrants 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 inspector.

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

(7) Notwithstanding the other provisions of this section, Agency inspectors are authorized to refuse to permit accompaniment by any individual who deliberately interferes with a fair and orderly inspection. With regard to any area containing proprietary information, the workers' representative for that area shall be an individual previously authorized by the licensee or registrant to enter that area.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.11, 381, 386 FS. History—New 1-1-77.

10D-56.1036 Consultation with Workers During Inspections.

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

(2) 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, these regulations, or license condition, or any unnecessary exposure of an individual to radiation from licensed radioactive material or a registered radiation machine under the licensee's or registrant's control. Any such notice in writing shall comply with the requirements of 10D-56.1037(1) FAC.

(3) The provisions of 10D-56.1036(2) FAC shall not be interpreted as authorization to disregard instructions pursuant to 10D-56.1033 FAC.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.11, 381, 386 FS. History—New 1-1-77.

10D-56.1037 Requests by Workers for Inspections.

(1) Any worker or representative of workers who believes that a violation of the Act, these regulations or license conditions exists or has occurred in work under a license or registration 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 Agency. 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 the workers. A copy shall be provided to the licensee or registrant by the Agency 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 Agency, except for good cause shown.

(2) If, upon receipt of such notice, the Administrator of the Radiological Health Program determines that the complaint meets the requirements set forth in 10D-56.1037(1) FAC, 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.

(3) No licensee or registrant 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 these regulations 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.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.11, 381, 386 FS. History—New 1-1-77.

10D-56.1038 Inspections Not Warranted; Informal Review.

(1) If the Agency determines, with respect to a complaint under 10D-56.1037 FAC that an inspection is not warranted because there are no reasonable grounds to believe that a violation exists or has occurred, the Agency 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 Department of Health and Rehabilitative Services who will provide the licensee or registrant with a copy of such statement by certified mail, excluding, at the request of the complainant, the name of the complainant. The licensee or registrant may submit an opposing written statement of position with the Department of Health and Rehabilitative Services who will provide the complainant with a copy of such

statement by certified mail. Upon the request of the complainant, the Department of Health and Rehabilitative Services may hold an informal conference in which the complainant and the licensee or registrant may orally present their views. An informal conference may also be held at the request of the licensee or registrant, but disclosure of the identity of the complainant will be made only following receipt of written authorization from the complainant. After considering all written or oral views presented, the Department of Health and Rehabilitative Services shall affirm, modify, or reverse the determination of the Agency and furnish the complainant and the licensee or registrant a written notification of its decision and the reason therefor.

(2) If the Agency determines that an inspection is not warranted because the requirements of 10D-56.1037(1) FAC 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 10D-56.1037(1) FAC.

Specific Authority 290.10 FS. Law Implemented 290.051(1), 290.11, 381, 386 FS. History—New 1-1-77.

381.512 Transportation of radioactive materials

(1) The department of health and rehabilitative services shall adopt reasonable rules and regulations governing the transportation of radioactive materials, which, in the judgment of the department, shall promote the public health, safety, or welfare and protect the environment.

(a) Such rules and regulations shall include, but shall not be limited to, provisions for the use of signs designating radioactive material cargo and for the packing, marking, loading, and handling of radioactive materials, and the precautions necessary to determine whether the material when offered is in proper condition for transport, and may include designation of routes in this state which are to be used for the transportation of radioactive materials.

(b) Such rules and regulations shall not include the equipment or operation of the carrier vehicle, nor shall they apply to transportation of radioactive material within the confines of an authorized facility of use.

(c) Such rules and regulations shall be compatible with, but not more restrictive than, those established by the United States Atomic Energy Commission, the United States Federal Aviation Agency, the United States Department of Transportation, the United States Coast Guard, or the United States Post Office.

(2) (a) Rules and regulations adopted by the department pursuant to subsection (1) may be enforced, within their respective jurisdictions, by any authorized representative of the division of health, the department of highway safety and motor vehicles, the department of transportation, and the public service commission.

(b) The division of health, through any authorized representative, is authorized to inspect any records of persons engaged in the transportation of radioactive materials during the hours of business operation when such records reasonably relate to the method or contents of packing, marking, loading, handling, or shipping of radioactive materials.

(c) The division of health, through any authorized representative, is authorized to enter upon and inspect the premises or vehicles of any person engaged in the transportation of radioactive materials during hours of business operation, with or without a warrant, for the purpose of determining compliance with the provisions of this section and the rules and regulations thereunder.

(3) Upon a finding by the division of health that any provision of this section, or the rules and regulations thereunder, are being violated or that any practice in the transportation of radioactive materials constitutes a clear and imminent danger to the public health, property, or safety, it may issue an order requiring correction.

(4) Violation of any of the provisions of this section or the rules and regulations thereunder shall constitute a misdemeanor and, upon conviction, shall be punishable according to law.

CHAPTER 79-254

Senate Bill No. 753

An act relating to state uniform traffic control; amending s. 316.302(1), Florida Statutes; providing that vehicles transporting hazardous material shall be marked in accordance with federal regulations; providing a penalty; providing an effective date.

Be It Enacted by the Legislature of the State of Florida:

Section 1. Subsection (1) of section 316.302, Florida Statutes, is amended to read:

316.302 Transportation of explosives, flammables, radioactive materials, etc.--

(1)(a) Any vehicle used for transporting any hazardous material as defined in subpart B Section 172 Title 49 C.F.R. shall be placarded in accordance with the rules and regulations of Title 49 C.F.R. Section 172.504.

(b) Any person transporting any hazardous material that has not been placarded as provided in subsection (1)(a) shall be guilty of a misdemeanor of the first degree, punishable as provided in s. 775.082 or 775.083.

(c) Any vehicle used for transporting any explosives as a cargo or part of a cargo upon the highways, roads or streets of this state shall be marked or placarded on the front, both sides and the rear, with the word "EXPLOSIVES" in letters not less than 6 inches high, or in lieu thereof shall conspicuously display upon an erect pole a red flag, not less than 540 square inches in area with the word "EXPLOSIVES" thereon in white letters not less than 6 inches high. Any vehicle used for transporting any flammable liquids as a cargo or part of a cargo upon the highways, roads or streets of this state shall be marked or placarded on each side and the rear with the word "GASOLINE," other name of fuel or flammable liquid carried or other applicable wording in letters of such height as required by rules and regulations made and promulgated by the Department of Insurance. Every such vehicle shall be equipped with not less than two fire extinguishers, filled and ready for immediate use, and placed at a convenient point on the vehicle so used. Any vehicle used for transporting any radioactive material as a cargo or part of a cargo upon the highways, roads, or streets of this state but not regulated as to such transportation by federal authority shall be marked or placarded with such words and symbols of identification as may be prescribed by the regulations of the Department of Insurance. The Department of Insurance is authorized in accordance with chapter 633 to make and promulgate such additional rules and regulations governing the transportation of explosives, flammable liquids, and other dangerous articles, including radioactive materials, by vehicles upon the highways, roads, and streets as it shall deem advisable for the protection of the public, and all such rules and regulations shall have the full force and effect of law. As to radioactive materials, it shall promulgate rules and regulations no less restrictive than those imposed by federal authority for similar interstate transportation.

Section 2. This act shall take effect October 1, 1979.

Approved by the Governor June 28, 1979.

Filed in Office Secretary of State June 29, 1979

RULES
OF THE
DEPARTMENT OF HEALTH AND
REHABILITATIVE SERVICES
HEALTH PROGRAMS
CHAPTER 10D-63
TRANSPORATION OF RADIOACTIVE MATERIALS

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10D-63.01 Purpose.
Specific Authority 381.512 FS. Law Implemented 381.512 FS. History—New 10-20-72, Revised 7-20-73, Repromulgated 1-1-74, Repealed by 20.19, F.S., 1-1-77.

10D-63.02 Scope.
Specific Authority 381.512 FS. Law Implemented 381.512, 381.512(1)(a), (1)(b), (1)(c) FS. History—New 10-20-72, Revised 7-20-73, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-63.03 Limitation of Personnel Exposure to Radiation.
Specific Authority 381.512 FS. Law Implemented 381.512(1), 290.12(3), 381.512(2)(a), (2)(b), (2)(c) FS. History—New 10-20-72, Revised 7-20-73, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-63.04 Notification of Certain Shipments.
Specific Authority 381.512 FS. Law Implemented 381.512(1), (1)(a), (1)(c), (2)(a) FS. History—New 10-20-72, Revised 7-20-73, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-63.05 Carrier's Responsibilities.
Specific Authority 381.512 FS. Law Implemented 381.512(1), (1)(a), (1)(c), (2)(a) FS. History—New 10-20-72, Revised 7-20-73, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-63.06 Inspections.
Specific Authority 381.512 FS. Law Implemented 381.512(1), (1)(a), (2)(a), (2)(b), (2)(c), (3),(4) FS. History—New 10-20-72, Revised 7-20-72, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-63.07 Communications.
Specific Authority 381.512 FS. Law Implemented 381.512 FS. History—New 10-20-72, Revised 7-20-73, Repromulgated 1-1-75, Repealed by 20.19, F.S., 1-1-77.

10D-63.08 Reserved

10D-63.09 Reserved

10D-63.10 Reserved

10D-63.11 Purpose. This chapter establishes the rules as authorized by Florida Statutes 381.512 which vest authority in the Department of Health and Rehabilitative Services (DHRS) to formulate regulations for the safe transport of radioactive materials within the State of Florida, which shall be binding upon all shippers, carriers and modes of transport as described in section 10D-63.12.
Specific Authority 381.512 FS. Law Implemented 381.512 FS. History—New 1-1-77.

10D-63.12 Scope.

(1) These regulations shall apply to the packaging and transportation of radioactive material by air, land or water.

(2) Transport shall be deemed to include any operation incidental to the whole course of carriage, such as loading, unloading and storage.

(3) These regulations do not apply within establishments in which the radioactive material is produced, used or stored other than in the course of transport.

(4) Compliance with these regulations, which deal only with the hazards arising from the radioactive properties of the material, shall not obviate the need for compliance with other applicable transport regulations relevant to other hazardous properties which the material may possess.

(5) Shipments of radioactive materials made by or under the direction or supervision of the U.S. Nuclear Regulatory Commission, the U.S. Energy Research and Development Administration, or the Department of Defense and for the purpose of national security, are exempt from these regulations. Shipments of special nuclear material transported in accordance with the requirements of Title 10 Part 73 CFR and other nuclear safeguard requirements are exempt from these regulations.

(6) No person shall transport any radioactive material outside of the confines of his plant or other location of use, or deliver any radioactive material to a carrier for transportation, nor shall any carrier accept any radioactive material for transport, without compliance with the applicable requirements of the regulations, appropriate to the mode of transport, of the U.S. Department of Transporation in 49 CFR Parts 100-199, insofar as such regulations related to packaging of radioactive material, marking and

labeling of packages, loading and storage of packages, placarding of the transporting vehicle, monitoring requirements and accident reporting.
Specific Authroity 381.512 FS. Law Implemented 381.512, 381.512(1)(a), (1)(b), (1)(c) FS. History—New 1-1-77.

10D-63.13 Limitation of Personnel Exposure to Radiation.

(1) Private carrier personnel shall not be exposed to a radiation dose equivalent in excess of the limits specified below.

	Rems in Any One Calendar Quarter
Whole body; head and trunk; active blood-forming organs; lens of eyes; and gonads	1¼
Hands and forearms; feet and ankles	18¾
Skin of body	7½

(2) Private carrier personnel may be permitted to receive a dose equivalent greater than that permitted under subsection (1) of this section, provided:

(a) During any calendar quarter the dose equivalent to the whole body shall not exceed 3 rems; and

(b) The dose equivalent to the whole body shall not exceed 5(N-18) rems where "N" equals the individual's age in years at his last birthday. When the previous occupational history of an individual is not definitely known, it shall be assumed that he has already received the full dose equivalent permitted by the formula 5(N-18).

(3) Common or contract carrier personnel shall not receive a radiation dose equivalent in excess of 10 percent of the limits specified in subsection 10D-63.13(1) unless they are employees of a carrier specialized in the transport of radioactive materials.

(4) Periodic assessments should be carried out to ensure that the maximum levels of exposure for the various categories of persons are not being exceeded. Radiation surveys shall be undertaken when there is reason to suspect that these levels are being approached.

(5) Personnel shall receive necessary instructions concerning the hazards involved and the precautions to be observed.
Specific Authority 381.512 FS. Law Implemented 381.512(1), 290.12(3), 381.512(2)(a), (2)(b), (2)(c) FS. History—New 1-1-77.

10D-63.14 Notification of Certain Shipments.

(1) All shipments of radioactive material as defined in 49 CFR 173.389 (a)(3) and (b) shall require prior written notification by the shipper to the DHRS — Radiological Health Program. This notification shall be made ten days prior to shipment and all necessary information regarding the following items shall be included:

(a) U.S. DOT specification number, special permit number or package identification as required by U.S. DOT regulations, and authorized gross wieght;

(b) Proposed mode of transport and proposed route;

(c) Any special loading, unloading and other handling procedures;

(d) Consignee's name and address;

(e) Proposed date of transport.

(2) The DHRS — Radiological Health Program may designate routes, hours for driving, check points on route or other radiation safety precautions on all shipments requiring noticication under subsection 10D-63.14(1).
Specific Authority 381.512 FS. Law Implemented 381.512(1), (1)(a), (1)(c), (2)(a) FS. History—New 1-1-77.

10D-63.15 Carrier's Responsibilities.

(1) Package Failure:

(a) In addition to the incident reporting requirements of 49 CFR, Parts 100-199, any carrier transporting radioactive material in the State of Florida shall immediately notify DHRS — Radiological Health Program (section 10D-63.17) in the event of a real or suspected breach of containment.
Specific Authority 381.512 FS. Law Implemented 381.512(1), (1)(a), (1)(c), (2)(a) FS. History—New 1-1-77.

10D-63.16 Inspections.

(1) Any authorized representative of the DHRS is authorized to inspect any record of persons engaged in the transportation of radioactive materials where such records reasonably relate to packaging, marking, labeling and shipping of radioactive materials.

(2) Any authorized representative of DHRS is authorized to enter upon and inspect the premises, and transport vehicles of any person engaged in the transportation of radioactive materials for the purpose of determining compliance with the provisions of 381.512 Florida Statutes.

(3) The DHRS may investigate the cause and circumstances of every event occurring in this state as described in paragraph 10D-63.15(1)(a).

(4) Upon a finding by the DHRS that any provision of the act and regulations thereunder is being violated, or that any practice in the transportation of the radioactive materials constitutes a clear and imminent danger to the public health and safety, it may issue an order requiring immediate correction.

(5) Violation of any of the provisions of this act or the rules and regulations promulgated thereunder shall constitute a misdemeanor and, upon conviction, shall be punishable according to law.
Specific Authority 381.512 FS. Law Implemented 381.512(1), (1)(a), (2)(a), (2)(b), (2)(c), (3), (4) FS. History—New 1-1-77.

10D-63.17 Communications. All communications or reports concerning these regulations should be addressed to the Department of Health and Rehabilitative Services, Radiological Health Program, 1323 Winewood Boulevard, Building 1, Tallahassee, Florida 32301. Immediate notification shall be by telephone or telegraph.
Specific Authority 381.512 FS. Law Implemented 381.512 FS. History—New 1-1-77.

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