

**MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND
ENERGY**

MATERIALS MANAGEMENT DIVISION

IONIZING RADIATION RULES FOR RADIOACTIVE MATERIAL

(By authority conferred on the director of the department of environment, great lakes, and energy by section 13521 of 1978 PA 368, MCL 333.13521, Executive Reorganization Order No. 1996-1, MCL 330.33101, and Executive Reorganization Order No. 2019-6, MCL 324.99923)

PART 11. PARTICLE ACCELERATOR INSTALLATIONS

R 325.5431 Purpose and scope.

Rule 431. (1) This part establishes procedures for the licensing or registration of particle accelerators, a classification system for particle accelerator installations and use, and radiation safety requirements for persons utilizing all types of particle accelerators except those specifically exempted from this part.

(2) This part applies to all licensees and registrants who use particle accelerators for any purpose other than those exempted under Rule 432.

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

History: 1979 AC; 2016 MR 10, Eff. May 25, 2016.

R 325.5432 Definitions.

Rule 432. (1) "Particle accelerator" or "accelerator", as used in this part, means a radiation machine designed for or capable of accelerating electrically charged particles, such as electrons, protons, or deuterons, with an electrical potential in excess of 1 MeV. Radiation machines designed and used exclusively for the production of electron beams or x- radiation for any of the following purposes, except those capable of producing radioactive material in excess of exempt quantities listed in schedule B of Rule 147, are excluded from this definition:

- (a) The diagnosis or treatment of patients.
- (b) Industrial radiography.
- (c) Examination of the microscopic structure of materials.
- (d) Manufacturing process control.
- (e) Research and development.
- (f) Demonstration of scientific principles for educational purposes.

(2) "Radiation protection supervisor" means 1 specific individual appointed by the licensee or registrant who has been delegated the responsibility and authority to govern the operation of the

accelerator in such a manner as to comply with the provisions of this part and part 5 and to enforce any written procedures approved by the department.

History: 1979 AC; 2016 MR 10, Eff. May 25, 2016.

LICENSE OR REGISTRATION

R 325.5435 General provisions.

Rule 435. Except as otherwise provided in these rules, a person shall not manufacture, produce, own, receive, acquire, possess, use, transport, transfer, or dispose of a research, production, processing, or treatment particle accelerator capable of producing radioactive material in excess of exempt quantities listed in schedule B of Rule 147 unless authorized in a specific license issued pursuant to part 2.

History: 1979 AC; 2016 MR 10, Eff. May 25, 2016.

R 325.5437 Rescinded.

History: 1979 AC; 2016 MR 10, Eff. May 25, 2016.

R 325.5438 Rescinded.

History: 1979 AC; 2016 MR 10, Eff. May 25, 2016.

R 325.5439 Rescinded.

History: 1979 AC; 2016 MR 10, Eff. May 25, 2016.

R 325.5440 Rescinded.

History: 1979 AC; 2016 MR 10, Eff. May 25, 2016.

R 325.5441 Rescinded.

History: 1979 AC; 2016 MR 10, Eff. May 25, 2016.

R 325.5442 Rescinded.

History: 1979 AC; 2016 MR 10, Eff. May 25, 2016.

SAFETY REQUIREMENTS FOR THE USE OF PARTICLE ACCELERATORS

R 325.5445. General provisions.

Rule 445. (1) Rules 445 to 455 establish radiation safety requirements for the use of particle accelerators. The provisions of such rules are in addition to, and not in substitution for, other applicable provisions of these rules.

(2) A licensee or registrant shall be responsible for assuring that all requirements of this part are met.

History: 1979 AC; 2016 MR 10, Eff. May 25, 2016.

R 325.5446 Limitations.

Rule 446. The radiation safety committee or the radiation protection supervisor may terminate the operations at an accelerator facility or of a class D operation if this action is deemed necessary to protect health and minimize danger to public health and safety or property.

History: 1979 AC; 2016 MR 10, Eff. May 25, 2016.

R 325.5447 Shielding.

Rule 447. (1) The design and shielding specifications for an accelerator shall be submitted and approved before issuance of a license by the department. After construction and installation, the radiation safety of the installation shall be established by a protection survey conducted in accord with Rule 221. A written report of the initial survey shall be submitted to the department and approved in writing before continued operation of the accelerator.

(2) Each accelerator installation shall be provided with such primary or secondary barriers as are necessary to assure compliance with Rules 203, 205, and 211.

History: 1979 AC; 2016 MR 10, Eff. May 25, 2016.

R 325.5448 Rescinded.

History: 1979 AC; 2016 MR 10, Eff. May 25, 2016.

R 325.5450 Equipment control and operations.

Rule 450. (1) A building housing a fixed particle accelerator shall not be left unattended without locking the building or portions thereof in some manner that will prevent unauthorized entry into the control room or target room, or any access to areas that may contain induced radioactivity resulting from accelerator operation.

(2) A mobile or portable particle accelerator shall not be left unattended without locking the room or building in which it is housed in some manner that will prevent its removal by

unauthorized persons.

(3) Access to or possession of keys or combinations used to comply with the requirements of this rule shall be limited to specific authorized persons approved by the radiation protection supervisor.

History: 1979 AC; 2016 MR 10, Eff. May 25, 2016.

R 325.5452 Radiation surveys.

Rule 452. (1) A licensee or registrant shall maintain at each accelerator installation appropriate calibrated and operable portable radiation monitoring instruments to make physical radiation surveys as required by this part and part 5.

(2) Portable radiation monitoring instruments shall be capable by design, calibration, and operation of measuring the intensity of the various types and energies of radiation produced by the accelerator. These instruments shall be tested for proper operation at the beginning of each day they are to be used and calibrated at intervals not to exceed 3 months.

(3) During repair or calibration of a radiation monitoring instrument, a spare calibrated and operable instrument shall be provided or accelerator operations which require the instrument shall be terminated until required instrumentation is available.

(4) A radiation protection survey shall be performed and documented in accord with Rule 221 when changes have been made in shielding, operation, equipment, or occupancy of adjacent areas, and periodically to check for unknown changes and malfunctioning equipment.

(5) Whenever applicable, periodic surveys shall be made to determine the amount of airborne 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 health physics consultant or the radiation protection supervisor of the accelerator facility and approved by the department.

(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.

History: 1979 AC; 2016 MR 10, Eff. May 25, 2016.

R 325.5454 Ventilation systems.

Rule 454. (1) An accessible airborne radioactivity area shall be provided with ventilation adequate to reduce airborne radioactivity to concentrations that do not exceed the limits specified in column 1, table I of Rules 261 to 269.

(2) A licensee or registrant shall not vent, release, or otherwise discharge concentrations of radioactive material from an airborne radioactivity area to an uncontrolled area that exceed the limits specified in table II of Rules 261 to 269 except as authorized pursuant to subrule (2) of Rule 238(2) of part 5. For purposes of this subrule, concentrations may be averaged over a period not greater than 1 year.

History: 1979 AC; 2016 MR 10, Eff. May 25, 2016.

R 325.5455 Special precautions.

Rule 455. A licensee or registrant shall not permit dismantling, repair, or servicing of any portion of the accelerator or changing of target materials by any persons unless such persons have been approved for such activity by the radiation protection supervisor. The radiation protection supervisor shall determine that such persons are the following:

- (a) Qualified by training or experience to conduct such activities safely with respect to potential radiation hazards.
- (b) Knowledgeable regarding the potential hazards of induced radioactivity.
- (c) Provided with appropriate monitoring instruments and dosimeters.
- (d) Informed of any special procedures or precautions necessary to protect themselves and others from radiation exposure or spread of contamination.

History: 1979 AC; 2016 MR 10, Eff. May 25, 2016.