

This rule was filed as 20 NMAC 3.1 Subpart 9.

**TITLE 20 ENVIRONMENTAL PROTECTION**  
**CHAPTER 3 RADIATION PROTECTION**  
**PART 9 RADIATION SAFETY REQUIREMENTS FOR PARTICLE ACCELERATORS**

20.3.9.1 ISSUING AGENCY: Environmental Improvement Board.  
[Recompiled 11/27/01]

20.3.9.2 SCOPE:

A. This Subpart [20.3.9 NMAC] establishes procedures for the registration and the use of particle accelerators.

B. In addition to the requirements of Subpart 9 [20.3.9 NMAC], all registrants are subject to the requirements of Subparts 1, 2, 4, and 10 of these regulations. Registrants engaged in industrial radiographic operations are subject to the requirements of Subpart 5 [20.3.5 NMAC] and registrants engaged in the healing arts are subject to the requirements of Subparts 6 and 7 [20.3.6 and 20.3.7 NMAC] of these regulations. Registrants engaged in the production of radioactive material are subject to the requirements of Subpart 3 [20.3.3 NMAC].  
[5-3-95;20.3.9.2 NMAC--Rn, 20 NMAC 3.1.9.900, Recompiled 11/27/01]

20.3.9.3 STATUTORY AUTHORITY: [RESERVED]

20.3.9.4 DURATION: [RESERVED]

20.3.9.5 EFFECTIVE DATE: [RESERVED]

20.3.9.6 OBJECTIVE: [RESERVED]

20.3.9.7 DEFINITIONS: [RESERVED]

20.3.9.8 to 20.3.9.900 [RESERVED]

20.3.9.901 REGISTRATION REQUIREMENTS: No person shall receive, possess, use, transfer, own 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 Subpart 2 [20.3.2 NMAC].

[5-3-95; 20.3.9.901 NMAC--Rn, 20 NMAC 3.1.9.901, Recompiled 11/27/01]

20.3.9.902 GENERAL REQUIREMENTS FOR THE ISSUANCE OF A REGISTRATION FOR PARTICLE ACCELERATORS: In addition to the requirements of Subpart 2 [20.3.2 NMAC], a registration application for use of a particle accelerator will be approved only if the Department determines that:

A. the applicant is qualified by reason of training and experience to use the accelerator in question for the purpose requested in accordance with Subparts 4, 9, and 10 [20.3.4 NMAC, 20.3.9 NMAC and 20.3.10 NMAC] of these regulations in such a manner as to minimize danger to public health and safety or property;

B. the applicant's proposed or existing equipment, facilities, and operating and emergency procedures are adequate to protect health and minimize danger to public health and safety or property;

C. the issuance of the registration will not be inimical to the health and safety of the public, and the applicant satisfies any applicable special requirements in Section 903 [20.3.9.903 NMAC] of these regulations;

D. the applicant has appointed a radiation safety officer;

E. the applicant and the applicant's staff have substantial experience in the use of particle accelerators for the intended uses;

F. the applicant has established a radiation safety committee to approve, in advance, proposals for uses of particle accelerators, whenever deemed necessary by the Department; and

G. the applicant has an adequate training program for particle accelerator operators.

[5-3-95; 20.3.9.902 NMAC--Rn, 20 NMAC 3.1.9.902, Recompiled 11/27/01]

20.3.9.903 HUMAN USE OF PARTICLE ACCELERATORS: In addition to the requirements set forth in Subpart 2 [20.3.2 NMAC], a registration for use of a particle accelerator in the healing arts will be issued only if:

A. Whenever deemed necessary by the Department, 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;

B. 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]

C. The individual designated on the application as the user must be a physician.  
[5-3-95; 20.3.9.903 NMAC--Rn, 20 NMAC 3.1.9.903, Recompiled 11/27/01]

#### 20.3.9.904 GENERAL PROVISIONS:

A. These regulations establish radiation safety requirements for the use of particle accelerators. The provisions of Section 904 [20.3.9.904 NMAC] through Section 911 [20.3.9.911 NMAC] are in addition to, and not in substitution for, other applicable provisions of these regulations.

B. The registrant shall be responsible for assuring that all requirements of Subpart 9 [20.3.9 NMAC] are met.  
[5-3-95; 20.3.9.904 NMAC-- Rn, 20 NMAC 3.1.9.904, Recompiled 11/27/01]

#### 20.3.9.905 LIMITATIONS:

A. No registrant shall permit any person to act as a particle accelerator operator until such person:  
(1) has been instructed in radiation safety and shall have demonstrated an understanding thereof;  
(2) has received copies of and instruction in Subpart 9 [20.3.9 NMAC] and the applicable requirements of Subparts 4 [20.3.4 NMAC] and 10 [20.3.10 NMAC], pertinent registration conditions and the registrant's operating and emergency procedures, and shall have demonstrated understanding thereof; and  
(3) has demonstrated competence to use the particle accelerator, related equipment, and survey instruments which will be employed in his assignment.

B. 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.  
[5-3-95; 20.3.9.905 NMAC-- Rn, 20 NMAC 3.1.9.905, Recompiled 11/27/01]

#### 20.3.9.906 SHIELDING AND SAFETY DESIGN REQUIREMENTS:

A. A qualified expert, specifically accepted by the Department, 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 and when the accelerator operates at design levels.

B. Each particle accelerator installation shall be provided with such primary and secondary barriers as are necessary to assure compliance with Section 405 to Section 412 [20.3.4.405 NMAC to 20.3.4.412 NMAC].  
[5-3-95; 20.3.9.906 NMAC--Rn, 20 NMAC 3.1.9.906, Recompiled 11/27/01]

#### 20.3.9.907 PARTICLE ACCELERATOR CONTROLS AND INTERLOCK SYSTEMS:

A. Instrumentation, readouts and controls on the particle accelerator control console shall be clearly identified and easily discernible.

B. 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.

C. Except where the main control console and the only entrance are adjacent, when an interlock system has been tripped, it shall 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.

D. Each safety interlock shall be on a circuit which shall allow its operation independently of all other safety interlocks.

E. 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.

F. A scram button or other emergency power cutoff switch shall be located and easily identifiable in all high radiation areas. Such cutoff switch shall include a manual reset so that the accelerator cannot be restarted from the accelerator control console without resetting the cutoff switch.

[5-3-95, 20.3.9.907 NMAC--Rn, 20 NMAC 3.1.9.907, Recompiled 11/27/01]

#### 20.3.9.908 WARNING DEVICES:

A. All locations designated as high radiation areas, and entrances to such locations, shall be equipped with easily observable flashing or rotation warning lights that operate when, and only when, radiation is being produced.

B. 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.

C. Barriers, temporary or otherwise, and pathways leading to high radiation areas shall be identified in accordance with Section 427 [20.3.4.427 NMAC].

[5-3-95, 20.3.9.908 NMAC--Rn, 20 NMAC 3.1.9.908, Recompiled 11/27/01]

#### 20.3.9.909 OPERATING PROCEDURES:

A. Particle accelerators, when not in operation, shall be secured to prevent unauthorized use.

B. 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.

C. 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 at the accelerator facility.

D. Electrical circuit diagrams of the accelerator, and the associated interlock systems, shall be kept current and maintained for inspection by the Department and available to the operator at each accelerator facility.

E. If, for any reason, it is necessary to intentionally bypass a safety interlock or interlocks, such action shall be:

- (1) Authorized by the radiation safety committee and radiation safety officer;
- (2) Recorded in a permanent log and a notice posted at the accelerator control console; and
- (3) Terminated as soon as possible.

F. A copy of the current operating and the emergency procedures shall be maintained at the accelerator control panel.

[5-3-95; 20.3.9.909 NMAC-- Rn, 20 NMAC 3.1.9.909, Recompiled 11/27/01]

#### 20.3.9.910 RADIATION MONITORING REQUIREMENTS:

A. 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, when in use, and calibrated at intervals not to exceed one year, and after each servicing and repair.

B. A radiation protection survey shall be performed and documented by a qualified expert specifically approved by the Department when changes have been made in shielding, operation, equipment, or occupancy of adjacent areas.

C. 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 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.

D. All area monitors shall be calibrated at intervals not to exceed one year and after each servicing and repair.

E. Whenever applicable, periodic surveys shall be made to determine the degree of contamination in target and other pertinent areas.

F. All area surveys shall be made in accordance with the written procedures established by a qualified expert, or the radiation safety officer of the particle accelerator facility.

G. Records of all radiation protection surveys, calibration results, instrumentation tests, and smear results shall be kept and on file at each accelerator facility.

[5-3-95; 20.3.9.910 NMAC--Rn, 20 NMAC 3.1.9.910, Recompiled 11/27/01]

#### 20.3.9.911 VENTILATION SYSTEMS:

A. Adequate ventilation shall be provided in areas where airborne radioactivity may be produced.

B. A registrant, as required by Section 433 [20.3.4.433 NMAC], shall not vent, release or otherwise discharge airborne radioactive material to a restricted area which exceed the limits specified in Subpart 4, 461 [20.3.4.461 NMAC], Table II, except as authorized pursuant to Section 434 [20.3.4.434 NMAC]. For purposes of this paragraph, concentrations may be averaged over a period not greater than one year. Every reasonable effort should be made to maintain releases of radioactive material to unrestricted areas as far below these limits as is reasonably achievable.

[5-3-95; 20.3.9.911 NMAC--Rn, 20 NMAC 3.1.9.911, Recompiled 11/27/01]

20.3.9.912-999 [RESERVED]

HISTORY of 20.3.9 NMAC:

Pre-NMAC History: The material in this Part was derived from that previously filed as follows: EIB 73-2, Regulations for Governing the Health and Environmental Aspects of Radiation filed on 7-9-73; EIB 73-2, Amendment 1, Regulations for Governing the Health and Environmental Aspects of Radiation filed on 4-17-78; EIB RPR-1, Radiation Protection Regulations filed on 4-21-80; EIB RPR-1, Amendment 1, Radiation Protection Regulations filed on 10-13-81; EIB RPR-1, Amendment 2, Radiation Protection Regulations filed on 12-15-82; and EIB RPR-1, Radiation Protection Regulations filed on 3-10-89.

History of Repealed Material: [Reserved]

Other History: EIB RPR 1, Radiation Protection Regulations, filed 03-10-1989 renumbered and reformatted to 20 NMAC 3.1, Radiation Materials And Radiation Machines, filed 04-03-1995. 20 NMAC 3.1, Radiation Materials And Radiation Machines, filed 06-17-1999 internally renumbered and reformatted replaced 20 NMAC 3.1, filed 04-03-1995. The material in this Part was derived from that previously filed as: 20 NMAC 3.1.Subpart 9, Radiation Safety Requirements for Particle Accelerators, filed 06-17-99 recompiled as 20.3.9 NMAC, effective 11/27/01.