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Document No. 4482

**DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL**

Chapter 61

Statutory Authority: 1976 Code Sections 13-7-10, 13-7-40 and 13-7-45 et seq.

61-65. Particle Accelerators (Title C)

**Synopsis:**

This comprehensive amendment to R.61-65 will update the Regulation pertaining to Particle Accelerators and facilities that utilize Particle Accelerators. General areas of this revision include, clarifying and simplifying the regulations, adding new definitions as required and deleting regulations that are no longer applicable. Specific areas include the added requirement for ventilation systems for Particle Accelerators that create radioactive material, clarifying required and/or accepted interlock systems, and clarifying the requirements and responsibilities of the Radiation Safety Officer. In addition, amendments include amending the fee structure in accordance with the governing statute. Also stylistic changes were made for clarity, readability, grammar, punctuation, definitions, references, codification and overall improvement of the text of the regulation.

A Notice of Drafting for this regulation amendment was published in the *State Register* on July 25, 2014.

See Section-by-Section discussion below and the Statements of Need and Reasonableness and Rationale herein for more detailed information on these amendments.

Section-by-Section Discussion of Revisions:

The table of contents was changed to reflect the proposed regulations.

The language “TITLE C,” located after the table of contents and before the text of PART I, was deleted due to redundancy. The title of the regulation is stated at the beginning of the document and has not changed.

R.61-65 RHC 1.1

The title of this section was revised by adding the text “Purpose and” and by deleting the “.” between “RHC 1.1” and “Purpose and Scope.” The content of this section was revised to include persons who transfer particle accelerators and to clarify that these regulations apply to industrial use particle accelerators. Regulations for human use particle accelerators are addressed in R.61-64, X-Rays (Title B). The content of this section was moved from RHC 1.1 to RHC 1.1.2.

R.61-65 RHC 1.1.1

This subsection was added to clarify all applicable situations in which these regulations apply and to the types of particle accelerators covered by these regulations.

R.61-65 RHC 1.1.2

This subsection was moved from RHC 1.1 to RHC 1.1.2 and reworded for clarity.

R.61-65 RHC 1.1.3

This subsection was added to clarify which regulations apply to whom. This ensures the registrant will be aware of and subject to parts of R.61-64, X-Rays (Title B) and R.61-63, Radioactive Materials (Title A).

R.61-65 RHC 1.2

This section was changed from “Definitions of Terms as Used in This Part” to “Definitions” and revised grammatically by deleting the “.” between “RHC 1.2” and “Definitions.” This section was moved from RHC 1.2 to Part VIII “Definitions.” Definitions for the regulation were moved to Part VIII for easy reference. The title of this section was replaced with “Prohibited Use” and revised grammatically by deleting the “.” between “RHC 1.2” and “Prohibited Use.”

R.61-65 RHC 1.2.1

This subsection was revised to update the definition for “Accelerator facility” as outlined by R.61-64, X-Rays (Title B). This subsection was moved from RHC 1.2.1 to RHC 8.1 to be contained in Part VIII “Definitions.” This subsection was replaced with provisions clarifying lawful possession and use of particle accelerators.

R.61-65 RHC 1.2.2

This subsection was revised to update the definition for “Act” as outlined by R.61-64, X-Rays (Title B). This subsection was moved from RHC 1.2.2 to RHC 8.2 to be contained in Part VIII “Definitions.” This subsection was replaced by moving the updated wording from RHC 4.7 to RHC 1.2.2.

R.61-65 RHC 1.2.3

This subsection was revised to update the term “Agency” to “Department” and to update the definition to reflect the current title of DHEC. This subsection was moved from RHC 1.2.3 to RHC 8.7 to be contained in Part VIII “Definitions.” This subsection was replaced with provisions clarifying the use of sources of radiation. This allows the Department to prevent harm to public health.

R.61-65 RHC 1.2.4

This subsection was deleted in its entirety. The defined term “Calendar quarter” is not present in the regulations. This subsection was replaced with provisions clarifying the conditions in which a particle accelerator and connected equipment must be placed in operation and used. This subsection was also replaced with additional provisions clarifying conditions requiring a person to be registered with the Department.

R.61-65 RHC 1.2.5

This subsection was revised to update the definition for “Occupational dose” as outlined by R.61-64, X-Rays (Title B). This subsection was moved from RHC 1.2.5 to RHC 8.18 to be contained in Part VIII “Definitions.”

R.61-65 RHC 1.2.6

This subsection was revised to update the definition for “Particle Accelerator” as outlined by R.61-64, X-Rays (Title B). This subsection was moved from RHC 1.2.6 to RHC 8.21 to be contained in Part VIII “Definitions.”

R.61-65 RHC 1.2.7

This subsection was revised to update the definition for “Person” as outlined by R.61-64, X-Rays (Title B). This subsection was moved from RHC 1.2.7 to RHC 8.22 to be contained in Part VIII “Definitions.”

R.61-65 RHC 1.2.8

This subsection was revised to update the definition for “Personnel monitoring program” as outlined by R.61-64, X-Rays (Title B). This subsection was moved from RHC 1.2.8 to RHC 8.23 to be contained in Part VIII “Definitions.”

R.61-65 RHC 1.2.9

This subsection was revised to update the definition for “Radiation” as outlined by R.61-64, X-Rays (Title B). This subsection was moved from RHC 1.2.9 to RHC 8.26 to be contained in Part VIII “Definitions.”

R.61-65 RHC 1.2.10

This subsection was revised to update the term “Radiation protection officer” to “Radiation safety officer” and to update the definition as outlined by R.61-64, X-Rays (Title B). This subsection was moved from RHC 1.2.10 to RHC 8.28 to be contained in Part VIII “Definitions.”

R.61-65 RHC 1.2.11

This subsection was revised to update the definition for “Restricted area” as outlined by R.61-64, X-Rays (Title B). This subsection was moved from RHC 1.2.11 to RHC 8.32 to be contained in Part VIII “Definitions.”

R.61-65 RHC 1.2.12

This subsection was moved from RHC 1.2.12 to RHC 8.35 to be contained in Part VIII “Definitions.”

R.61-65 RHC 1.2.13

This subsection was revised to update the definition for “Survey” as outlined by R.61-64, X-Rays (Title B). This subsection was moved from RHC 1.2.13 to RHC 8.36 to be contained in Part VIII “Definitions.”

R.61-65 RHC 1.2.14

This subsection was deleted in its entirety. The defined term “These regulations” is not defined in the regulations.

R.61-65 RHC 1.2.15

This subsection was revised to update the definition for “Unrestricted area” as outlined by R.61-64, X-Rays (Title B). This subsection was moved from RHC 1.2.15 to RHC 8.39 to be contained in Part VIII “Definitions.”

R.61-65 RHC 1.2.16

This subsection was deleted in its entirety. The defined term “Whole body” is not present in the regulations.

R.61-65 RHC 1.3

This section was deleted in its entirety. This section is addressed in Part VIII “Definitions.” This section was replaced by RHC 1.4 and revised grammatically by deleting the “.” between “RHC 1.3” and “Inspections.”

R.61-65 RHC 1.3.1

This subsection was revised to update the definition for “Dose” as outlined by R.61-64, X-Rays (Title B). This subsection was moved from RHC 1.3.1 to RHC 8.8 to be contained in Part VIII “Definitions.” This subsection was replaced by moving RHC 1.4.1 to RHC 1.3.1 with updated wording.

R.61-65 RHC 1.3.2

This subsection was deleted in its entirety. The defined term “rad” is addressed in RHC 8.32. This subsection was replaced by moving RHC 1.4.3 to RHC 1.3.2 with updated wording.

R.61-65 RHC 1.3.3

This subsection was revised to update the definition for “Rem” (to include the table) as outlined by R.61-64, X-Rays (Title B). This subsection was moved from RHC 1.3.3 to RHC 8.31 to be contained in Part VIII “Definitions.” This subsection was replaced with provisions clarifying the Department’s right to enter property and the conditions thereof.

R.61-65 RHC 1.3.3.1

This subsection subitem was moved from RHC 1.3.3.1 to RHC 8.31 in the form of a table.

R.61-65 RHC 1.3.3.2

This subsection subitem was moved from RHC 1.3.3.2 to RHC 8.31 in the form of a table.

R.61-65 RHC 1.3.3.3

This subsection subitem was moved from RHC 1.3.3.3 to RHC 8.31 in the form of a table.

R.61-65 RHC 1.3.4

This subsection was deleted in its entirety. The defined term “roentgen” is not present in the regulations. This subsection was replaced with provisions clarifying the Department’s exception to the Health Information Portability and Accountability Act.

R.61-65 RHC 1.4

This section was moved from RHC 1.4 to RHC 1.3. This section was replaced by moving RHC 1.5 to RHC 1.4 and revised grammatically by deleting the “.” between “RHC 1.4” and “Tests and Surveys.”

R.61-65 RHC 1.4.1

This subsection was updated by replacing instances of “Agency” with “Department” and moved from RHC 1.4.1 to RHC 1.3.1. This subsection was replaced by moving RHC 1.5.1 to RHC 1.4.1.

R.61-65 RHC 1.4.2

This subsection was updated for clarity and moved from RHC 1.4.2 to RHC 1.8.3. This subsection was replaced by moving RHC 1.5.2 to RHC 1.4.2.

R.61-65 RHC 1.4.2.1

This subsection subitem was moved from RHC 1.5.2.1 to RHC 1.4.2.1.

R.61-65 RHC 1.4.2.2

This subsection subitem was moved from RHC 1.5.2.2 to RHC 1.4.2.2.

R.61-65 RHC 1.4.2.3

This subsection subitem was moved from RHC 1.5.2.3 to RHC 1.4.2.3.

R.61-65 RHC 1.4.2.4

This subsection subitem was moved from RHC 1.5.2.4 to RHC 1.4.2.4.

R.61-65 RHC 1.4.3

This subsection was updated by replacing instances of “Agency” with “Department” and moved from RHC 1.4.3 to RHC 1.3.2. This subsection was replaced with provisions clarifying documentation and availability requirements.

R.61-65 RHC 1.4.4

This subsection was added to clarify requirements surrounding radiation survey instruments. Periodic maintenance, operational checks, and user training ensure proper operation of the instrument for the detection of radiation.

R.61-65 RHC 1.4.4.1

This subsection subitem was added to clarify radiation survey instrument capability. This ensures the user is receiving accurate measurements when measuring a radiation field.

R.61-65 RHC 1.4.4.2

This subsection subitem was added to clarify the maintenance schedule for radiation survey instruments. This ensures proper operation of the instrument, thereby providing accurate measurements.

R.61-65 RHC 1.4.4.2.1, RHC 1.4.4.2.2, RHC 1.4.4.2.3, and RHC 1.4.4.2.4

These subsection subitems were added to clarify calibration requirements for radiation survey instruments. These requirements help ensure instruments provide users with accurate measurements.

R.61-65 RHC 1.4.4.2.5

This subsection subitem was added to clarify calibration documentation maintenance. This helps ensure the availability of records for review.

R.61-65 RHC 1.4.4.3

This subsection subitem was added to clarify the availability of the radiation survey instrument manufacturer’s instructions. This provides the user with the necessary information for the proper use of the instrument.

R.61-65 RHC 1.4.4.3.1, RHC 1.4.4.3.2, RHC 1.4.4.3.3

These subsection subitems were added to clarify radiation survey instrument operation, training, and documentation requirements These help to ensure the user of the instrument is familiar with the manufacturer’s instructions and his/her competence is documented for review.

R.61-65 RHC 1.4.4.3.4

This subsection subitem was added to clarify requirements for operational checks on radiation survey instruments. This helps the operator ensure the instrument is operable prior to using it to measure radiation and may prevent unnecessary exposure to the user.

R.61-65 RHC 1.4.5

This subsection was added to clarify record retention for calibrations and instrumentation checks. This helps ensure records are maintained for review by the Department.

R.61-65 RHC 1.5

This section was moved from RHC 1.5 to RHC 1.4. This section was replaced by moving RHC 1.6 to RHC 1.5 and revised grammatically by deleting the “.” between “RHC 1.5” and “Exemptions.”.

R.61-65 RHC 1.5.1

This subsection was moved to RHC 1.4.1. This subsection was replaced by moving RHC 1.6.1 to RHC 1.5.1.

R.61-65 RHC 1.5.2

This subsection was updated by replacing instances of “Agency” with “Department” and moved to RHC 1.4.2. This subsection was replaced with provisions clarifying conditions for granting an exemption.

R.61-65 RHC 1.5.2.1

This subsection subitem was moved from RHC 1.5.2.1 to RHC 1.4.2.1. This subsection was replaced with provisions clarifying conditions for granting an exemption.

R.61-65 RHC 1.5.2.2

This subsection subitem was moved from RHC 1.5.2.2 to RHC 1.4.2.2. This subsection was replaced with provisions clarifying conditions for granting an exemption.

R.61-65 RHC 1.5.2.3

This subsection subitem was moved from RHC 1.5.2.3 to RHC 1.4.2.3. This subsection was replaced with provisions clarifying conditions for granting an exemption.

R.61-65 RHC 1.5.2.4

This subsection subitem was moved from RHC 1.5.2.4 to RHC 1.4.2.4.

R.61-65 RHC 1.6

This section was moved from RHC 1.6 to RHC 1.5. This section was replaced by moving RHC 1.7 to RHC 1.6 and revised grammatically by deleting the “.” between “RHC 1.6” and “Additional Requirements.”

R.61-65 RHC 1.6.1

This subsection was revised by updating requirements for “Exemptions” as outlined in R.61-64, X-Rays (Title B) and by replacing instances of “Agency” with “Department”. This subsection was moved from RHC 1.6.1 to RHC 1.5.1. This subsection was replaced by moving RHC 1.7.1 to RHC 1.6.1.

R.61-65 RHC 1.6.2

This subsection was added to clarify authorization to inspect and investigate potential health hazards. This allows the Department to evaluate potential health hazards caused by the operation of radiation installations.

R.61-65 RHC 1.6.3

This subsection was added to clarify the information required for the Department to review a request to operate equipment not currently covered in the regulations. This allows the Department to evaluate potentially harmful equipment prior to being operated.

R.61-65 RHC 1.6.4

This subsection was moved from RHC 3.3.1 to RHC 1.6.4 with revised requirements.

R.61-65 RHC 1.6.4.1

This subsection subitem was moved from RHC 4.3.1.1 to RHC 1.6.4.1.

R.61-65 RHC 1.6.4.2

This subsection subitem was moved from RHC 4.3.1.2 to RHC 1.6.4.2 with revised requirements.

R.61-65 RHC 1.6.4.3

This subsection subitem was moved from RHC 4.3.1.3 to RHC 1.6.4.3.

R.61-65 RHC 1.6.4.4

This subsection subitem was moved from RHC 4.3.1.4 to RHC 1.6.4.4 with revised requirements.

R.61-65 RHC 1.7

This section was moved from RHC 1.7 to RHC 1.6. This section was replaced by moving RHC 1.8 to RHC 1.7 and revised grammatically by deleting the “.” between “RHC 1.7” and “Violations.”.

R.61-65 RHC 1.7.1

This subsection was updated by replacing instances of “Agency” with “Department” and moved from RHC 1.7.1 to RHC 1.6.1. This subsection was replaced by moving RHC 1.71 with RHC 1.8.1.

R.61-65 RHC 1.7.2

This subsection was added to clarify notification requirements following a violation. This allows the person 20 days to respond to each violation with a plan of action to correct the violation.

R.61-65 RHC 1.7.3

This subsection was added to clarify corrective action requirements. This allows the person 60 days to correct the violation and notify the Department in writing.

R.61-65 RHC 1.7.4

This subsection was added to clarify the authority of the Department to identify and act upon violations of the Act and regulations.

R.61-65 RHC 1.7.5

This subsection was added to clarify the assessing of civil penalties by the Department. This allows the Department to impose civil penalties.

R.61-65 RHC 1.8

This section was moved from RHC 1.8 to RHC 1.7. This section was replaced with provisions for the enforcement of the Act and these regulations. This allows the Department to take action if a registrant fails to comply with regulations.

R.61-65 RHC 1.8.1

This subsection was updated by replacing instances of “Agency” with “Department” and moved from RHC 1.8.1 to RHC 1.7.1. This subsection was replaced with provisions outlining action that will be taken by the Department in the event the Act or these regulations have been violated. This allows the Department to take action if a registrant fails to comply with regulations.

R.61-65 RHC 1.8.1.1

This subsection subitem was added to clarify the action the Department will take upon discovery of a violation. This provides the registrant with written notification of the violation.

R.61-65 RHC 1.8.1.1.1

This subsection subitem was added to clarify contents of the written notification. This provides the registrant with a listing of each regulation found to be in violation.

R.61-65 RHC 1.8.1.1.2

This subsection subitem was added to clarify contents of the written notification. This provides the registrant with a reason the violation is listed.

R.61-65 RHC 1.8.1.1.3

This subsection subitem was added to clarify the way in which the registrant is to respond to the written notification. This helps to ensure the Department is aware of corrective action being taken to correct violations.

R.61-65 RHC 1.8.1.1.4

This subsection subitem was added to clarify the establishment of a time frame by the Department for the registrant to submit an action plan. This helps to ensure the violations are corrected in a timely manner.

R.61-65 RHC 1.8.1.2

This subsection subitem was added to clarify action to be taken by the Department in the event the registrant fails to comply with the written notification. This allows the Department to enforce the Act and regulations through additional enforcement actions.

R.61-65 RHC 1.8.1.3

This subsection subitem was added to clarify steps to be taken by the Department in the event further enforcement actions are pursued. This helps ensure continuity when pursuing enforcement actions.

R.61-65 RHC 1.8.1.3.1

This subsection subitem was added to list a step that may be taken by the Department in the event further enforcement actions are pursued. This helps ensure continuity when pursuing enforcement actions.

R.61-65 RHC 1.8.1.3.1.1, RHC 1.8.1.3.1.2, RHC 1.8.1.3.1.3, and RHC 1.8.1.3.1.4

These subsection subitems were added to list possible results of an administrative order being issued. This helps ensure continuity when pursuing enforcement actions.

R.61-65 RHC 1.8.1.3.2 and RHC 1.8.1.3.3

These subsection subitems were added to list steps that may be taken by the Department in the event further enforcement actions are pursued. This helps ensure continuity when pursuing enforcement actions.

R.61-65 RHC 1.8.2

This subsection was added to clarify the conditions in which the Department may impound a source of radiation. This reduces risk or further risk to the health of the individuals involved.

R.61-65 RHC 1.8.3

This subsection was added by moving RHC 1.4.2 to RHC 1.8.3.

R.61-65 RHC 1.9

This section was revised grammatically by deleting the “.” between “RHC 1.9” and “Records.”

R.61-65 RHC 1.9.1

This subsection was updated to include provisions concerning the availability and disposal of records. This helps ensure records are available for Department review.

R.61-65 RHC 1.9.2

This subsection was added to clarify the information required to be maintained by the registrant. This helps ensure records are available for Department review.

R.61-65 RHC 1.9.2.1

This subsection subitem was added to clarify the information required to be maintained by the registrant. This information allows the Department to verify equipment onsite.

R.61-65 RHC 1.9.2.2

This subsection subitem was added to clarify the information required to be maintained by the registrant. This information allows the Department to verify the completion of required tests and surveys and the registration status of those persons performing them.

R.61-65 RHC 1.9.2.3

This subsection subitem was added to clarify the information required to be maintained by the registrant. This allows the registrant to verify correspondence with the Department.

R.61-65 RHC 1.9.3

This subsection was added to clarify the information required to be maintained by the registrant. This allows the Department to verify inventory onsite.

R.61-65 RHC 1.9.4

This subsection was added to clarify record accuracy requirements. This prevents false statements from being made on the records required to be maintained by the registrant.

R.61-65 RHC 1.10

This section was revised grammatically by deleting the “.” between “RHC 1.10” and “Communications.”

R.61-65 RHC 1.10.1

This subsection was revised to update instances of “Agency” to “Department” and the current contact information for the Bureau of Radiological Health.

R.61-65 RHC 1.10.2

This subsection was added to clarify provisions for providing false information to the Department. This helps ensure information provided to the Department is accurate.

R.61-65 RHC 1.11

This section was moved from RHC 1.11 to RHC 2.7. This section was replaced with provisions for the administration of civil penalties. This provides guidelines for the administration of civil penalties.

R.61-65 RHC 1.11.1

This subsection was revised by replacing the term “accelerator” with “particle accelerator” and deleting the phrase “in accordance with a schedule of fees issued by the Department.” Statements concerning vendor and out-of-state facility fees and the due date of the registration fee were also added. The fees will remain the same as outlined in Part II of R.61-64, X-Rays (Title B) and is not in addition to current fees. This subsection was moved from RHC 1.11.1 to RHC 2.7.1. This subsection was replaced with provisions clarifying the criteria used in the assessment of civil penalties.

R.61-65 RHC 1.11.1.1

This subsection subitem was added to list the criteria used in the assessment of civil penalties. This allows the Department to consider the severity of the violation when assessing civil penalties.

R.61-65 RHC 1.11.1.2

This subsection subitem was added to list the criteria used in the assessment of civil penalties. This allows the Department to consider previous compliance history when assessing civil penalties.

R.61-65 RHC 1.11.1.3

This subsection subitem was added to list the criteria used in the assessment of civil penalties. This allows the Department to consider the amount assessed to deter future violations when assessing civil penalties.

R.61-65 RHC 1.11.1.4

This subsection subitem was added to list the criteria used in the assessment of civil penalties. This allows the Department to consider efforts to correct the violation when assessing civil penalties.

R.61-65 RHC 1.11.1.5

This subsection subitem was added to list the criteria used in the assessment of civil penalties. This allows the Department to consider any other factors when assessing civil penalties.

R.61-65 RHC 1.11.2

This subsection was moved from RHC 1.11.2 to RHC 2.7.4. This subsection was replaced with provisions clarifying the severity levels in which the violations will be categorized. This allows the Department to categorize the severity levels of the violations based on the categories presented within the subsection subitems that follow.

R.61-65 RHC 1.11.2.1

This subsection subitem was added to clarify the major violation category. This violation category is the most severe and is considered when determining civil penalty amounts using the penalty matrix.

R.61-65 RHC 1.11.2.2

This subsection subitem was added to clarify the moderate violation category. This violation category is less severe than the major category and is considered when determining civil penalty amounts using the penalty matrix.

R.61-65 RHC 1.11.2.3

This subsection subitem was added to clarify the minor violation category. This violation category is the least severe and is considered when determining civil penalty amounts using the penalty matrix.

R.61-65 RHC 1.11.2.4

This subsection subitem was added to clarify the way in which a violation will be characterized. This allows the Department to best characterize a violation or group of violations on a case by case basis.

R.61-65 RHC 1.11.3

This subsection was reworded for clarity and moved from RHC 1.11.3 to RHC 2.7.2. This subsection was replaced with provisions clarifying factors that may influence adjustments to the values listed in the penalty matrix. This allows the Department to apply adjustments based on factors presented within the subsection subitems that follow.

R.61-65 RHC 1.11.3.1

This subsection subitem was added to clarify provisions concerning a factor that may influence adjustments to the values listed in the penalty matrix. This allows the Department to apply adjustments based on the conditions presented within this subsection subitem.

R.61-65 RHC 1.11.3.2

This subsection subitem was added to clarify provisions concerning a factor that may influence adjustments to the values listed in the penalty matrix. This allows the Department to apply adjustments based on the conditions presented within this subsection subitem.

R.61-65 RHC 1.11.3.3

This subsection subitem was added to clarify provisions concerning a factor that may influence adjustments to the values listed in the penalty matrix. This allows the Department to apply adjustments based on the conditions presented within this subsection subitem.

R.61-65 RHC 1.11.3.4

This subsection subitem was added to clarify provisions concerning a factor that may influence adjustments to the values listed in the penalty matrix. This allows the Department to apply adjustments based on the conditions presented within this subsection subitem.

R.61-65 RHC 1.11.3.5

This subsection subitem was added to clarify provisions concerning a factor that may influence adjustments to the values listed in the penalty matrix. This allows the Department to apply adjustments based on the conditions presented within this subsection subitem.

R.61-65 RHC 1.11.3.6

This subsection subitem was added to clarify the nature of the factors and the violations when considering the assessment of civil penalties. This allows the Department to consider all factors when assessing civil penalties.

R.61-65 RHC 1.11.4

This subsection was reworded for clarity and moved from RHC 1.11.4 to RHC 2.7.3. This subsection was replaced with provisions clarifying the schedule that will be used to issue civil penalties. This provides the Department with a matrix when considering the assessment of civil penalties.

R.61-65 RHC 1.11.4.1

This subsection subitem was added to present the penalty matrix that will be used when assessing civil penalties. This provides the Department with a standard when considering the assessment of civil penalties.

R.61-65 RHC 1.11.4.2

This subsection subitem was added to clarify the authority of the Department to impose civil penalties. This provides conditions that may cause civil penalties to be issued.

R.61-65 RHC 1.11.4.2.1

This subsection subitem was added to clarify a condition that may cause civil penalties to be issued by the Department. These conditions present a significant health hazard and should be deterred.

R.61-65 RHC 1.11.4.2.2

This subsection subitem was added to clarify a condition that may cause civil penalties to be issued by the Department. These conditions present a significant health hazard and should be deterred.

R.61-65 RHC 1.11.4.2.3

This subsection subitem was added to clarify a condition that may cause civil penalties to be issued by the Department. These conditions present a significant health hazard and should be deterred.

R.61-65 RHC 1.11.4.2.4

This subsection subitem was added to clarify a condition that may cause civil penalties to be issued by the Department. These conditions present a significant health hazard and should be deterred.

R.61-65 RHC 1.11.5

This subsection was reworded for clarity and moved from RHC 1.11.5 to RHC 2.7.5.

R.61-65 PART II

The title of this part was deleted in its entirety and replaced by moving RHC 4.2 to Part II. The new title was bolded and capitalized for stylistic purposes.

R.61-65 RHC 2.1

The title of this section was revised grammatically by deleting the “.” between “RHC 2.1” and “Purpose and Scope.” The content of this section was deleted in its entirety. The content of this section is addressed in Part III of R.61-64, X-Rays (Title B). The content of this section was replaced with revised requirements moved from RHC 4.1 to RHC 2.1.

R.61-65 RHC 2.1.1

This subsection was added to clarify each person responsible for registering industrial use particle accelerators and facilities. This allows the Department to track potential radiation producing machines.

R.61-65 RHC 2.1.2

This subsection was moved from RHC 4.8.1 to RHC 2.1.2 and revised for stylistic purposes.

R.61-65 RHC 2.2

The title of this section was deleted in its entirety and replaced with “Exemptions.” The title of this section was revised grammatically by deleting the “.” between “RHC 2.2” and “Exemptions.”

R.61-65 RHC 2.2.1

This subsection was deleted in its entirety. This subsection is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Occupational Dose Limits for Adults (Part III).” This subsection was replaced with revised requirements moved from RHC 4.12.1 to RHC 2.2.1.

R.61-65 RHC 2.2.2

This subsection was deleted in its entirety. Registrants are not permitted to exceed current federal occupational dose limits. This subsection was replaced with revised requirements moved from RHC 4.12.2 to RHC 2.2.2.

R.61-65 RHC 2.2.2.1

This subsection subitem was deleted in its entirety. Registrants are not permitted to exceed current federal occupational dose limits.

R.61-65 RHC 2.2.2.2

This subsection subitem was deleted in its entirety. Registrants are not permitted to exceed current federal occupational dose limits.

R.61-65 RHC 2.2.2.3

This subsection subitem was deleted in its entirety. Registrants are not permitted to exceed current federal occupational dose limits.

R.61-65 RHC 2.2.3

This subsection was deleted in its entirety. Registrants are not permitted to exceed current federal occupational dose limits. This subsection was replaced with text explaining any facility that falls under federal jurisdiction is exempt from registration.

R.61-65 RHC 2.2.4

This subsection was moved from RHC 4.12.3 to RHC 2.2.4 and revised for clarity.

R.61-65 RHC 2.3

This section was deleted in its entirety. Occupational dose limits for minors is addressed in Part III of R.61-64, X-Rays (Title B). This section was replaced with “Facility Registration Approval” and revised grammatically by deleting the “.” between “RHC 2.3” and “Facility Registration Approval.”

R.61-65 RHC 2.3.1

This subsection was added to require any facility planning to install a particle accelerator to follow the provisions required by RHC 2.3.1.1 through RHC 2.3.1.3.

R.61-65 RHC 2.3.1.1

This subsection subitem was added to require the facility to submit information necessary to register.

R.61-65 RHC 2.3.1.1.1

This subsection subitem was added to clarify the necessary information to be submitted in order to register the facility.

R.61-65 RHC 2.3.1.1.2

This subsection subitem was added to clarify the necessary information to be submitted in order to register the facility.

R.61-65 RHC 2.3.1.1.3

This subsection subitem was added to clarify the necessary information to be submitted in order to register the facility.

R.61-65 RHC 2.3.1.1.4

This subsection subitem was added to clarify the necessary information to be submitted in order to register the facility.

R.61-65 RHC 2.3.1.1.5

This subsection subitem was added to clarify the necessary information to be submitted in order to register the facility.

R.61-65 RHC 2.3.1.1.6

This subsection subitem was added to clarify the necessary information to be submitted in order to register the facility.

R.61-65 RHC 2.3.1.2

This subsection subitem was added stating a facility registration approval will be issued upon review and approval of the information required by RHC 2.3.1.1.

R.61-65 RHC 2.3.1.3

This subsection subitem was added to require a facility to be issued a facility registration approval prior to installing a particle accelerator. The facility must be registered before equipment can be registered.

R.61-65 RHC 2.4

This section was deleted in its entirety. Dose limits for individual members of the public is addressed in Part III of R.61-64, X-Rays (Title B). The title of this section was replaced with “Equipment Registration Requirements, Users of Particle Accelerators” and revised grammatically by deleting the “.” between “RHC 2.4” and “Equipment Registration Requirements, Users of Particle Accelerators.” The content of this section was deleted in its entirety. The radiation symbol is addressed in Part III of R.61-64, X-Rays (Title B).

R.61-65 RHC 2.4.1

This subsection was deleted in its entirety. Dose limits for individual members of the public is addressed in Part III of R.61-64, X-Rays (Title B). This subsection was replaced with requirements clarifying persons possessing a particle accelerator must register the machine within thirty days of acquisition.

R.61-65 RHC 2.4.1.1

This subsection subitem was deleted in its entirety. Dose limits for individual members of the public is addressed in Part III of R.61-64, X-Rays (Title B). This subsection subitem was replaced with text clarifying the issuance of a registration sticker upon registration of a particle accelerator and that it is to be placed on the control panel.

R.61-65 RHC 2.4.1.2

This subsection subitem was deleted in its entirety. Dose limits for individual members of the public is addressed in Part III of R.61-64, X-Rays (Title B). This subsection subitem was replaced with text requiring the removal of the registration sticker if the particle accelerator is removed from the facility. The sticker in invalid if the equipment is removed from the facility.

R.61-65 RHC 2.4.1.3

This subsection subitem was added to allow vendors to confirm the registration of both the facility and the particle accelerator by verifying an accurate registration sticker is present. This allows vendors to ensure they are following the requirements of RHC 2.5.3.

R.61-65 RHC 2.4.2

This subsection was deleted in its entirety. Dose limits for individual members of the public is addressed in Part III of R.61-64, X-Rays (Title B). This subsection was replaced with text clarifying the requirements for re-registration of particle accelerators. This allows the Department to keep accurate records of equipment at any given facility.

R.61-65 RHC 2.4.3

This subsection was added to clarify the requirements for reporting changes of status with the facility and particle accelerator. This gives the facility ample time to report changes in registration status and allows the Department to keep accurate records of equipment at any given facility.

R.61-65 RHC 2.4.4

This subsection was added to clarify the responsibility of the registrants to verify the vendor providing service is registered. This prevents unregistered vendors from furnishing services to registrants without the proper knowledge of state regulations.

R.61-65 RHC 2.5

The title of this section was deleted in its entirety. The radiation symbol is addressed in Part III of R.61-64, X-Rays (Title B). The title of this section was replaced with “Vendor Registration and Obligation” and revised grammatically by deleting the “.” between “RHC 2.5” and “Vendor Registration and Obligation.”

R.61-65 RHC 2.5.1

This subsection was deleted in its entirety. The radiation symbol is addressed in Part III of R.61-64, X-Rays (Title B). This subsection was replaced with text clarifying the persons required to register as a vendor. This ensures the registration of any vendor performing services to registrants.

R.61-65 RHC 2.5.1.1

This subsection subitem was replaced with text allowing in-house personnel to be exempt from the registration requirement. This allows qualified experts employed by the facility to perform services for particle accelerators in that facility only.

R.61-65 RHC 2.5.1.1.1

This subsection subitem was added to further clarify the conditions to be exempt from the registration requirement.

R.61-65 RHC 2.5.1.1.2

This subsection subitem was added to further clarify the conditions to be exempt from the registration requirement.

R.61-65 RHC 2.5.1.2

This subsection subitem was added to require the maintenance of documentation for in-house service personnel. This allows the Department to review the records during inspections.

R.61-65 RHC 2.5.2

This subsection was added to require registered vendors to provide notification of particular services provided in the state.

R.61-65 RHC 2.5.2.1

This subsection subitem was added to clarify the information required with the notifications.

R.61-65 RHC 2.5.2.2

This subsection subitem was added to clarify the information required with the notifications.

R.61-65 RHC 2.5.2.3

This subsection subitem was added to clarify the information required with the notifications.

R.61-65 RHC 2.5.2.4

This subsection subitem was added to clarify the way in which and how often the vendor is required to provide notification.

R.61-65 RHC 2.5.3

This subsection was added to clarify conditions to be met before vendors may provide services or supplies to registrants. This prevents vendors from providing services to unregistered persons.

R.61-65 RHC 2.5.4

This subsection was added to require vendors to retain records. This allows the Department to review the records when necessary.

R.61-65 RHC 2.5.4.1

This subsection subitem was added to clarify the records required to be retained by vendors. This allows the Department to review the records when necessary.

R.61-65 RHC 2.5.4.2

This subsection subitem was added to clarify the records required to be retained by vendors. This allows the Department to review the records when necessary.

R.61-65 RHC 2.5.4.3

This subsection subitem was added to clarify the records required to be retained by vendors. This allows the Department to review the records when necessary.

R.61-65 RHC 2.5.4.4

This subsection subitem was added to clarify the records required to be retained by vendors. This allows the Department to review the records when necessary.

R.61-65 RHC 2.5.5

This subsection was added to clarify conditions for disposal of the records required to be retained by vendors. This allows the Department to review the records when necessary.

R.61-65 RHC 2.5.6

This subsection was added to clarify requirements for the maintenance of operable instruments used by the vendor and retaining records of the maintenance. This allows the Department to review the records when necessary.

R.61-65 RHC 2.5.6.1

This subsection subitem was added to clarify calibration frequencies for survey meters. This will help to prevent surveys from being performed with equipment that is out of calibration.

R.61-65 RHC 2.6

The title of this section was deleted in its entirety. Caution signs are addressed in Part III of R.61-64, X-Rays (Title B). The title of this section was replaced with “Modification, Revocation, Termination of Registrants” and revised grammatically by deleting the “.” between “RHC 2.6” and “Modification, Revocation, Termination of Registrants.” The content of this section was deleted in its entirety. Personnel monitoring is addressed in Part IV “Personnel Monitoring Requirements” of these regulations.

R.61-65 RHC 2.6.1

This subsection was deleted in its entirety. Posting requirements are addressed in Part III of R.61-64, X-Rays (Title B). This subsection was replaced to clarify the terms and conditions of registrations. This allows the Department to change the registration status of registrants under particular circumstances.

R.61-65 RHC 2.6.1.1

This subsection subitem was deleted in its entirety. Posting requirements are addressed in Part III of R.61-64, X-Rays (Title B). This subsection subitem was replaced with text clarifying conditions that may affect registration statuses. This allows the Department to change registration statuses based on changes to the Act.

R.61-65 RHC 2.6.1.2

This subsection subitem was deleted in its entirety. Posting requirements are addressed in Part III of R.61-64, X-Rays (Title B). This subsection subitem was replaced with text clarifying conditions that may affect registration statuses. This allows the Department to change registration statuses based on adopted regulations.

R.61-65 RHC 2.6.1.3

This subsection subitem was added to clarify conditions that may affect registration statuses. This allows the Department to change registration statuses based on orders issued by the Department.

R.61-65 RHC 2.6.2

This subsection was revised to update the definition for “Radiation Area” as outlined by R.61-64, X-Rays (Title B). This subsection was moved from RHC 2.6.2 to RHC 8.27 to be contained in Part VIII “Definitions.” This subsection was replaced to clarify conditions that may affect registration statuses. This allows the Department to revoke, suspend, or modify any registration under certain conditions.

R.61-65 RHC 2.6.2.1

This subsection subitem was added to clarify conditions that may affect registration statuses. This allows the Department to revoke, suspend, or modify any registration for supplying material false statements or any statement of fact.

R.61-65 RHC 2.6.2.2

This subsection subitem was added to clarify conditions that may affect registration statuses. This allows the Department to revoke, suspend, or modify any registration because of any statement or other means that would warrant a refusal of registration.

R.61-65 RHC 2.6.2.3

This subsection subitem was added to clarify conditions that may affect registration statuses. This allows the Department to revoke, suspend, or modify any registration for violations of any terms and conditions that apply.

R.61-65 RHC 2.6.3

This subsection was revised to update the definition for “High radiation area” as outlined by R.61-64, X-Rays (Title B). This subsection was moved from RHC 2.6.3 to RHC 8.11 to be contained in Part VIII “Definitions.” This subsection was replaced with text stating a revocation may be appealed pursuant to applicable law. This allows the registrant to appeal revocation of registration.

R.61-65 RHC 2.6.4

This subsection was deleted in its entirety. Posting requirements are addressed in Part III of R.61-64, X-Rays (Title B). This subsection was replaced with provisions clarifying the registration modification, revocation, and suspension process.

R.61-65 RHC 2.6.4.1

This subsection subitem was added to clarify steps to be taken prior to making changes to a registrant’s registration status. This provides the registrant with notification prior to action being taken.

R.61-65 RHC 2.6.4.2

This subsection subitem was added to clarify steps to be taken prior to making changes to a registrant’s registration status. This provides the registrant an opportunity to demonstrate compliance prior to action.

R.61-65 RHC 2.6.5

This subsection was added to clarify the process of terminating a registration. This allows the registrant to provide a written request to terminate a registration.

R.61-65 RHC 2.6.6

This subsection was added to clarify the application of the provisions in Part II. This ensures both machines and vendors are covered.

R.61-65 RHC 2.7

The title of this section “Personnel Monitoring” was moved from RHC 2.7 to RHC 4.1. The title of this section was replaced by moving RHC 1.11 to RHC 2.7. The title of this section was revised grammatically by deleting the “.” between “RHC 2.7” and “Annual Fees.”

R.61-65 RHC 2.7.1

This subsection was deleted in its entirety. Personnel monitoring is addressed in Part IV “Personnel Monitoring Requirements” of these regulations. This subsection was replaced by moving RHC 1.11.1 to RHC 2.7.1 with revised language and is not in addition to current fees.

R.61-65 RHC 2.7.2

This subsection was deleted in its entirety. Personnel monitoring is addressed in Part IV “Personnel Monitoring Requirements” of these regulations. This subsection was replaced by moving RHC 1.11.3 to RHC 2.7.2. This subsection was moved for convenience and is not in addition to current fees.

R.61-65 RHC 2.7.3

This subsection was deleted in its entirety. Personnel monitoring is addressed in Part IV “Personnel Monitoring Requirements” of these regulations. This subsection was replaced by moving RHC 1.11.4 to RHC 2.7.3. This subsection was added for convenience and is not in addition to current fees.

R.61-65 RHC 2.7.4

This subsection was deleted in its entirety. Personnel monitoring is addressed in Part IV “Personnel Monitoring Requirements” of these regulations. This subsection was replaced by moving RHC 1.11.2 to RHC 2.7.4. This subsection was moved for convenience and is not in addition to current fees.

R.61-65 RHC 2.7.5

This subsection was added by moving RHC 1.11.5 to RHC 2.7.5. This subsection was moved for convenience and is not in addition to current fees.

R.61-65 RHC 2.7.6

This subsection was added to clarify the schedule of fees that will be used to determine annual fees due. This subsection was added for convenience and is not in addition to current fees.

R.61-65 RHC 2.8

The title of this section was deleted in its entirety. Records of personnel monitoring is addressed in Part IV “Personnel Monitoring Requirements” of these regulations.

R.61-65 RHC 2.8.1

This subsection was deleted in its entirety. Records of personnel monitoring is addressed in Part IV “Personnel Monitoring Requirements” of these regulations.

The footnote denoted as “1” referencing RHC 2.8.1 was deleted in its entirety. The Department does not supply this form to registrants.

R.61-65 RHC 2.9

This section was deleted in its entirety. This section is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Notification of Incidents (Part III).”

R.61-65 RHC 2.9.1

This subsection was deleted in its entirety. This subsection is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Notification of Incidents (Part III).”

R.61-65 RHC 2.9.1.1

This subsection subitem was deleted in its entirety. This subsection subitem is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Notification of Incidents (Part III).”

R.61-65 RHC 2.9.2

This subsection was deleted in its entirety. This subsection is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Notification of Incidents (Part III).”

R.61-65 RHC 2.9.2.1

This subsection subitem was deleted in its entirety. This subsection subitem is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Notification of Incidents (Part III).”

R.61-65 RHC 2.9.3

This subsection was deleted in its entirety. This subsection is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Notification of Incidents (Part III).”

R.61-65 RHC 2.10

This section was deleted in its entirety. This section is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Reports of Exposures and Radiation Levels Exceeding the Limits (Part III).”

R.61-65 RHC 2.10.1

This subsection was deleted in its entirety. This subsection is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Reports of Exposures and Radiation Levels Exceeding the Limits (Part III).”

R.61-65 RHC 2.10.1.1

This subsection subitem was deleted in its entirety. This subsection subitem is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Reports of Exposures and Radiation Levels Exceeding the Limits (Part III).”

R.61-65 RHC 2.10.1.2

This subsection subitem was deleted in its entirety. This subsection subitem is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Reports of Exposures and Radiation Levels Exceeding the Limits (Part III).”

R.61-65 RHC 2.10.1.3

This subsection subitem was deleted in its entirety. This subsection subitem is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Reports of Exposures and Radiation Levels Exceeding the Limits (Part III).”

R.61-65 RHC 2.10.1.4

This subsection subitem was deleted in its entirety. This subsection subitem is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Reports of Exposures and Radiation Levels Exceeding the Limits (Part III).”

R.61-65 RHC 2.10.2

This subsection was deleted in its entirety. This subsection is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Reports of Exposures and Radiation Levels Exceeding the Limits (Part III).”

R.61-65 RHC 2.11

This section was deleted in its entirety. This section is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Notices, Instructions, and Reports to Workers: Inspections (Part X).”

R.61-65 RHC 2.11.1

This subsection was deleted in its entirety. This subsection is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Notices, Instructions, and Reports to Workers: Inspections (Part X).”

R.61-65 RHC 2.11.2

This subsection was deleted in its entirety. This subsection is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Notices, Instructions, and Reports to Workers: Inspections (Part X).”

R.61-65 RHC 2.11.3

This subsection was deleted in its entirety. This subsection is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Notices, Instructions, and Reports to Workers: Inspections (Part X).”

The footnote denoted as “2” referencing RHC 2.11.3 was deleted in its entirety. This form is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Notices, Instructions, and Reports to Workers: Inspections (Part X).”

R.61-65 RHC 2.11.4

This subsection was deleted in its entirety. This subsection is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Notices, Instructions, and Reports to Workers: Inspections (Part X).”

R.61-65 RHC 2.11.5

This subsection was deleted in its entirety. This subsection is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Notices, Instructions, and Reports to Workers: Inspections (Part X).”

R.61-65 RHC 2.11.6

This subsection was deleted in its entirety. This subsection is addressed in R.61-64, X-Rays (Title B) as referenced through Appendix A “Notices, Instructions, and Reports to Workers: Inspections (Part X).”

R.61-65 PART III

The title of this part was changed from “RADIATION SAFETY REQUIREMENTS FOR PARTICLE ACCELERATORS” to “RADIATION SAFETY REQUIREMENTS FOR RADIATION SAFETY OFFICERS AND OPERATORS.” The new title was bolded and capitalized for stylistic purposes.

R.61-65 RHC 3.1

The title of this section was deleted in its entirety and replaced with “Minimum Personnel Radiation Safety Requirements for Radiation Safety Officers and Operators.” The content of this section was deleted in its entirety. The intent of the scope of this part is contained in the title of this section.

R.61-65 RHC 3.1.1

This subsection was added to establish training requirements for acting as a Radiation Safety Officer. This ensures that Radiation Safety Officers are properly qualified.

R.61-65 RHC 3.1.1.1

This subsection subitem was added to clarify training requirements for acting as a Radiation Safety Officer. This ensures that Radiation Safety Officers are properly qualified.

R.61-65 RHC 3.1.1.2

This subsection subitem was added to clarify training requirements for acting as a Radiation Safety Officer. This ensures that Radiation Safety Officers are properly qualified.

R.61-65 RHC 3.1.1.3

This subsection subitem was added to clarify training requirements for acting as a Radiation Safety Officer. This ensures that Radiation Safety Officers are properly qualified.

R.61-65 RHC 3.1.2

This subsection was added to establish training requirements for operators. This ensures that operators are properly qualified.

R.61-65 RHC 3.1.2.1

This subsection subitem was added to clarify training requirements for operators. This ensures that operators are properly qualified.

R.61-65 RHC 3.1.2.2

This subsection subitem was added to clarify training requirements for operators. This ensures that operators are properly qualified.

R.61-65 RHC 3.1.2.3

This subsection subitem was added to clarify training requirements for operators. This ensures that operators are properly qualified.

R.61-65 RHC 3.1.2.4

This subsection subitem was added to clarify training requirements for operators. This ensures that operators are properly qualified.

R.61-65 RHC 3.1.3

This subsection was moved from RHC 3.3.5 to RHC 3.1.3 and revised for simplicity.

R.61-65 RHC 3.2

This section was deleted in its entirety. Definitions are contained in Part VIII “Definitions” of these regulations. This section was replaced by moving RHC 3.7 to RHC 3.2 and revised grammatically by deleting the “.” between “RHC 3.2” and “Minimum Subjects to be Covered in Training Radiation Safety Officers and Operators.”

R.61-65 RHC 3.2.1

This subsection was deleted in its entirety. The defined term “Emergency Procedure” is addressed in RHC 8.19. This subsection was replaced with revised requirements moved from RHC 3.3.4 to RHC 3.2.1.

R.61-65 RHC 3.2.1.1

This subsection subitem was moved from RHC 3.7.1 to RHC 3.2.1.1 and revised grammatically.

R.61-65 RHC 3.2.1.1.1

This subsection subitem was moved from RHC 3.7.1.1 to RHC 3.2.1.1.1 and revised for simplicity.

R61-65 RHC 3.2.1.1.2

This subsection subitem was moved from RHC 3.7.1.2 to RHC 3.2.1.1.2 and revised for clarity.

R.61-65 RHC 3.2.1.1.3

This subsection subitem was moved from RHC 3.7.1.3 to RHC 3.2.1.1.3 with revised requirements.

R.61-65 RHC 3.2.1.1.4

This subsection subitem was moved from RHC 3.7.1.4 to RHC 3.2.1.1.4 with revised requirements.

R.61-65 RHC 3.2.1.1.5

This subsection subitem was moved from RHC 3.7.1.5 to RHC 3.2.1.1.5 with revised requirements.

R.61-65 RHC 3.2.1.1.5.1

This subsection subitem was added to list the required instruction of operators in controlling radiation dose with working time. This ensures that operators have proper radiation safety training in basic ALARA “As Low As Reasonably Achievable” principles.

R.61-65 RHC 3.2.1.1.5.2

This subsection subitem was added to list the required instruction of operators in controlling radiation dose with working distances. This ensures that operators have proper radiation safety training in basic ALARA “As Low As Reasonably Achievable” principles.

R.61-65 RHC 3.2.1.1.5.3

This subsection subitem was moved from RHC 3.7.1.5.1 to RHC 3.2.1.1.5.3.

R.61-65 RHC 3.2.1.2

This subsection subitem was added to list the required instruction of operators in the use of radiation detection instrumentation. This ensures that operators have proper training in radiation detection instruments.

R.61-65 RHC 3.2.1.2.1

This subsection subitem was added to list the required instruction of operators in the use of radiation detection instrumentation. This ensures that operators have proper training in radiation detection instruments.

R.61-65 RHC 3.2.1.2.1.1

This subsection subitem was added to list the required instruction of operators in the use of radiation detection instrumentation. This ensures that operators have proper training in radiation detection instruments.

R.61-65 RHC 3.2.1.2.1.2

This subsection subitem was added to list the required instruction of operators in the use of radiation detection instrumentation. This ensures that operators have proper training in radiation detection instruments.

R.61-65 RHC 3.2.1.2.1.3

This subsection subitem was added to list the required instruction of operators in the use of radiation detection instrumentation. This ensures that operators have proper training in radiation detection instruments.

R.61-65 RHC 3.2.1.2.2

This subsection subitem was added to list the required instruction of operators in the use of radiation detection instrumentation. This ensures that operators have proper training in radiation detection instruments.

R.61-65 RHC 3.2.1.2.3

This subsection subitem was moved from RHC 3.7.2 to RHC 3.2.1.2.3 and revised for clarity.

R.61-65 RHC 3.2.1.2.3.1

This subsection subitem was added to list the required instruction of operators in the use of specific types of personnel monitoring equipment. This ensures that operators have proper training in radiation detection instruments.

R.61-65 RHC 3.2.1.2.3.2

This subsection subitem was added to list the required instruction of operators in the use of specific types of personnel monitoring equipment. This ensures that operators have proper training in radiation detection instruments.

R.61-65 RHC 3.2.1.3

This subsection subitem was moved from RHC 3.7.3 to RHC 3.2.1.3 with revised requirements.

R.61-65 RHC 3.2.1.4

This subsection subitem was moved from RHC 3.7.4 to RHC 3.2.1.4 and revised for organizational purposes.

R.61-65 RHC 3.2.1.5

This subsection subitem was moved from RHC 3.7.5 to RHC 3.2.1.5 and revised for organizational purposes.

R.61-65 RHC 3.2.2

This subsection was deleted in its entirety. The defined term “Maintenance Personnel” is not defined in these regulations.

R.61-65 RHC 3.2.3

This subsection was revised to update the definition for “Operating Procedures” as outlined by R.61-64, X-Rays (Title B) and moved from RHC 3.2.3 to RHC 8.19 to be contained in Part VIII “Definitions.”

R.61-65 RHC 3.2.4

This subsection was revised by changing the reference within the definition from RHC 3.7 to RHC 3.2. This subsection was moved from RHC 3.2.4 to RHC 8.20 to be contained in Part VIII “Definitions.”

R.61-65 RHC 3.3

This section was deleted in its entirety. The intent of this section is addressed throughout this regulation. The title of this section was replaced with “Operating and Emergency Procedures” and revised grammatically by deleting the “.” between “RHC 3.3” and “Operating and Emergency Procedures.”

R.61-65 RHC 3.3.1

This subsection was revised to specify the facility’s responsibility to appoint a Radiation Safety Officer who is responsible for radiation protection at the facility. This subsection was moved from RHC 3.3.1 to RHC 1.3.2. This subsection was replaced to require registrants to have written operating and emergency procedures. This ensures personnel are aware of and instructed in the operating and emergency procedures of the facility.

R.61-65 RHC 3.3.1.1

This subsection subitem was added to clarify items that must be included in the operating and emergency procedures. This ensures personnel are aware of and instructed in the handling of particle accelerators so as not to exceed occupational exposure limits.

R.61-65 RHC 3.3.1.2

This subsection subitem was added to clarify items that must be included in the operating and emergency procedures. This ensures personnel are aware of and instructed in how and when to conduct radiation surveys.

R.61-65 RHC 3.3.1.3

This subsection subitem was added to clarify items that must be included in the operating and emergency procedures. This ensures personnel are aware of and instructed in how to control radiation areas.

R.61-65 RHC 3.3.1.4

This subsection subitem was added to clarify items that must be included in the operating and emergency procedures. This ensures personnel are aware of and instructed in how to secure particle accelerators when not in use.

R.61-65 RHC 3.3.1.5

This subsection subitem was added to clarify items that must be included in the operating and emergency procedures. This ensures personnel are aware of and instructed in the use of personnel monitoring.

R.61-65 RHC 3.3.1.6

This subsection subitem was added to clarify items that must be included in the operating and emergency procedures. This ensures personnel are aware of and instructed in handling exposed personnel.

R.61-65 RHC 3.3.1.7

This subsection subitem was added to clarify items that must be included in the operating and emergency procedures. This ensures personnel are aware of and instructed in minimizing exposure in case of an accident.

R.61-65 RHC 3.3.1.8

This subsection subitem was added to clarify items that must be included in the operating and emergency procedures. This ensures personnel are aware of and instructed in notifying the proper persons in the event of an accident.

R.61-65 RHC 3.3.1.9

This subsection subitem was added to clarify items that must be included in the operating and emergency procedures. This ensures personnel are aware of and instructed in maintaining records.

R.61-65 RHC 3.3.2

This subsection was deleted in its entirety. The Radiation Safety Officer is responsible for the operating and emergency procedures by default since the Radiation Safety Officer is responsible for the entire radiation safety program at the facility in accordance with RHC 1.3.2 of these regulations.

R.61-65 RHC 3.3.3

This subsection was deleted in its entirety. Familiarity to operating and emergency procedures is addressed in RHC 3.2.1.5. Availability of operating and emergency procedures is addressed in RHC 6.3.7.

R.61-65 RHC 3.3.4

This subsection was revised to include the requirement that operators must be trained in and demonstrate an understanding of the topics listed in RHC 3.2.1.1 through RHC 3.2.1.5 and moved from RHC 3.3.4 to RHC 3.2.1.

R.61-65 RHC 3.3.5

This subsection was revised for simplicity and moved from RHC 3.3.5 to RHC 3.1.3.

R.61-65 RHC 3.3.6

This subsection was revised to delete “or open entrances to High Radiation Areas.” Controlling access to radiation areas is addressed in RHC 3.3.1.3. This subsection was moved from RHC 3.3.6 to RHC 6.3.1.

R.61-65 RHC 3.3.7

This subsection was deleted in its entirety. This requirement is addressed in R.61-64, X-Rays (Title B).

R.61-65 RHC 3.3.8

This subsection was revised to clarify steps that must be taken to operate a particle accelerator with an interlock that is intentionally bypassed. This subsection was moved from RHC 3.3.8 to RHC 6.3.6.

R.61-65 RHC 3.4

The title of this section was revised from “Equipment Controls” to “Particle Accelerator Controls and Interlock Systems” and moved from RHC 3.4 to RHC 6.1. The title of this section was replaced with “Authority and Responsibility for the Radiation Safety Officer” and revised grammatically by deleting the “.” between “RHC 3.4” and “Authority and Responsibility for the Radiation Safety Officer.”

R.61-65 RHC 3.4.1

This subsection was revised to specify the instrumentation, readouts and controls on the particle accelerator must be clearly identified and easily discernible. This subsection was moved from RHC 3.4.1 to RHC 6.1.1. This subsection was replaced to clarify what registrants must allow so that the Radiation Safety Officer may perform the duties set forth in these regulations. This gives the appointed Radiation Safety Officer the authority and opportunity to perform required duties.

R.61-65 RHC 3.4.1.1

This subsection subitem was added to clarify duties that the registrant must allow the Radiation Safety Officer to perform. This gives the appointed Radiation Safety Officer the authority and opportunity to identify radiation safety problems.

R.61-65 RHC 3.4.1.2

This subsection subitem was added to clarify duties that the registrant must allow the Radiation Safety Officer to perform. This gives the appointed Radiation Safety Officer the authority and opportunity to provide corrective actions to radiation safety problems.

R.61-65 RHC 3.4.1.3

This subsection subitem was added to clarify duties that the registrant must allow the Radiation Safety Officer to perform. This gives the appointed Radiation Safety Officer the authority and opportunity to stop unsafe operations.

R.61-65 RHC 3.4.1.4

This subsection subitem was added to clarify duties that the registrant must allow the Radiation Safety Officer to perform. This gives the appointed Radiation Safety Officer the authority and opportunity to verify corrective actions are being are put into practice.

R.61-65 RHC 3.4.2

This subsection was revised to include specific devices that may be used to secure the control of the particle accelerator. This subsection was moved from RHC 3.4.2 to RHC 6.1.2. This subsection was replaced with the requirement of establishing investigative limits with respect to annual occupational exposure limits. This requires the registrant to document, investigate and correct the radiation safety practices of personnel whose dose exceeds the limits set in place by the Radiation Safety Officer.

R.61-65 RHC 3.4.3

This subsection was revised to include the condition that the interlocks shut down the machine if a barrier leading to a high radiation area is penetrated. This prevents exposure to personnel who may penetrate the barrier during operation. This subsection was moved from RHC 3.4.3 to RHC 6.1.3.

R.61-65 RHC 3.4.4

This subsection was revised to require the tripped interlock to be reset at its location before the particle accelerator is reset at the main control panel. This prevents the operator from overriding the tripped scram button from the control panel. This subsection was moved from RHC 3.4.4 to RHC 6.1.7.

R.61-65 RHC 3.4.5

This subsection was revised to include the requirement making it necessary to reset a scram button manually before being allowed to restart the particle accelerator from the main control panel. This prevents the operator from overriding the tripped scram button from the control panel. This subsection was moved from RHC 3.4.5 to RHC 6.1.8.

R.61-65 RHC 3.4.6

This subsection was moved from RHC 3.4.6 to RHC 6.1.5.

R.61-65 RHC 3.4.7

This subsection was revised to include the need for the electrical circuit diagrams to be available to the operators and to the Department for review. This subsection was moved from RHC 3.4.7 to RHC 6.3.5.

R.61-65 RHC 3.4.8

This subsection was revised by removing the requirement stating that registrants shall check and service all safety and warning devices after 500 hours of operation, not to exceed six months. Instead these devices shall be checked at least on a quarterly basis. This interval was established by the Conference of Radiation Control Program Directors in the Suggested State Regulations for Control of Radiation. This subsection was also changed to require the results of the testing to be available to the Department for review. This subsection was moved from RHC 3.4.8 to RHC 6.3.4.

R.61-65 RHC 3.5

The title of this section was revised to add the word “Requirements” to the end of “Radiation Monitoring.” The title of this section was revised grammatically by deleting the “.” between “RHC 3.5” and “Radiation Monitoring Requirements.” and moved from RHC 3.5 to RHC 6.4.

R.61-65 RHC 3.5.1

This subsection was revised to include the requirement for all portable monitoring equipment to be operable and appropriately calibrated for the radiation energy levels encountered at the facility annually or after servicing and repair. This prevents inaccurate readings from equipment that is not calibrated properly. This subsection was moved from RHC 3.5.1 to RHC 6.4.1.

R.61-65 RHC 3.5.2

This subsection was revised to require high radiation areas to be monitored continuously with monitors that are electrically independent of the accelerator control and interlocks. The monitor must allow readings to be observed at the control panel. This ensures the operator is aware of the radiation levels in the monitored area while at the control panel. This subsection was moved from RHC 3.5.2 to RHC 6.4.3.

R.61-65 RHC 3.5.2.1

This subsection subitem was revised to require any entrance into a high radiation area be equipped with an indicator light indicating radiation is being produced instead of indicating when a predetermined limit has been met. This ensures personnel are aware that radiation is being produced. This subsection subitem was moved from RHC 3.5.2.1 to RHC 6.2.1.

R.61-65 RHC 3.5.2.2

This subsection subitem was revised to require the use of a radiation monitor with an audible alarm when entering a target room or any high radiation area. This prevents excess radiation exposure to the operator upon entering the high radiation area. This subsection subitem was moved from RHC 3.5.2.2 to RHC 6.4.4.

R.61-65 RHC 3.5.2.3

This subsection subitem was revised to require the use of a radiation monitor with an audible alarm when entering a target room or any high radiation area. This prevents excess radiation exposure to the operator upon entering the high radiation area. This subsection subitem was moved from RHC 3.5.2.3 to RHC 6.4.4.

R.61-65 RHC 3.5.2.4

This subsection subitem was deleted in its entirety. Monitors approved by the Department are those monitors that satisfy these regulations.

R.61-65 RHC 3.5.3

This subsection was deleted in its entirety. Monitoring of individuals in restricted areas is addressed in RHC 4.1.2 of these regulations.

R.61-65 RHC 3.6

The title of this section was deleted in its entirety. Radiation surveys are addressed in RHC 6.4 “Radiation Monitoring Requirements” of these regulations.

R.61-65 RHC 3.6.1

This subsection was deleted in its entirety. This subsection is addressed in RHC 6.4 “Radiation Monitoring Requirements” of these regulations.

R.61-65 RHC 3.6.2

This subsection was revised to include additional circumstances requiring a radiation survey. This subsection was moved from RHC 3.6.2 to RHC 6.4.2.

R.61-65 RHC 3.6.3

This subsection was revised and broken up into several separate subsections for clarity. The statement that required frequency of radiation protection surveys was reworded for clarity and moved from RHC 3.6.3 to RHC 6.4.2. The statements concerning records of the survey was revised to include a diagram of the area along with the use of quantified results while conforming to the registrant’s written procedures and moved from RHC 3.6.3 to RHC 6.4.4 through RHC 6.4.6.

R.61-65 RHC 3.7

The title of this section was revised from “Minimum Subjects to be Covered in Training of Particle Accelerator Operators” to “Minimum Subjects to be Covered in Training Radiation Safety Officers and Operators” and moved from RHC 3.7 to RHC 3.2.

R.61-65 RHC 3.7.1

This subsection was revised grammatically by changing the “.” at the end of the subsection to a “:” and moved from RHC 3.7.1 to RHC 3.2.1.1.

R.61-65 RHC 3.7.1.1

This subsection subitem was revised to encompass beta, gamma, and x-radiation into ionizing radiation for simplicity and moved from RHC 3.7.1.1 to RHC 3.2.1.1.1.

R.61-65 RHC 3.7.1.2

This subsection subitem was revised to include the base units of radiation dose, rem and Sievert. This subsection subitem was moved from RHC 3.7.1.2 to RHC 3.2.1.1.2.

R.61-65 RHC 3.7.1.3

This subsection subitem was revised to include the hazards of any exposure to radiation and moved from RHC 3.7.1.3 to RHC 3.2.1.1.3.

R.61-65 RHC 3.7.1.4

This subsection subitem was revised to include all sources of radiation and moved from RHC 3.7.1.4 to RHC 3.2.1.1.4.

R.61-65 RHC 3.7.1.5

This subsection subitem was revised to specify general methods of controlling radiation dose and moved from RHC 3.7.1.5 to RHC 3.2.1.1.5.

R.61-65 RHC 3.7.1.5.1

This subsection subitem was moved from RHC 3.7.1.5.1 to RHC 3.2.1.1.5.3.

R.61-65 RHC 3.7.1.5.2

This subsection subitem was deleted in its entirety. Training in interlock systems is addressed in RHC 3.2.1.3.

R.61-65 RHC 3.7.1.5.3

This subsection subitem was deleted in its entirety. Operating and emergency procedures training is addressed in RHC 3.2.1.5.

R.61-65 RHC 3.7.1.5.4

This subsection subitem was deleted in its entirety. Radiation detection instrumentation training is addressed RHC 3.2.1.2.

R.61-65 RHC 3.7.2

This subsection was revised to include specific types of personnel monitoring equipment to be discussed during training and moved from RHC 3.7.2 to RHC 3.2.1.2.3.

R.61-65 RHC 3.7.3

This subsection was revised to include training in interlock systems of particle accelerators and moved from RHC 3.7.3 to RHC 3.2.1.3.

R.61-65 RHC 3.7.4

This subsection was revised for organizational purposes and moved from RHC 3.7.4 to RHC 3.2.1.4.

R.61-65 RHC 3.7.5

This subsection was revised for organizational purposes and moved from RHC 3.7.5 to RHC 3.2.1.5.

R.61-65 RHC 3.7.6

This subsection was deleted in its entirety. It is the responsibility of the registrant to determine the amount of on-the-job training required for each operator to be competent in the use of the particle accelerators at the facility.

R.61-65 RHC 3.7.7

This subsection was deleted in its entirety. An operator’s assistant or helper is considered to be an operator under these regulations and is therefore required to be trained in accordance to these regulations.

R.61-65 RHC 3.8

This section was deleted in its entirety. The intent of this section is addressed in RHC 3.1.3. Maintenance personnel are required to have the same training as particle accelerator operators.

R.61-65 RHC 3.8.1

This subsection was deleted in its entirety. The intent of this subsection is addressed in RHC 3.1.3. Maintenance personnel are required to have the same training as particle accelerator operators.

R.61-65 RHC 3.8.2

This subsection was deleted in its entirety. The intent of this subsection is addressed in RHC 3.1.3. Maintenance personnel are required to have the same training as particle accelerator operators.

R.61-65 RHC 3.8.2.1

This subsection subitem was deleted in its entirety. The intent of this subsection subitem is addressed in RHC 3.1.3. Maintenance personnel are required to have the same training as particle accelerator operators.

R.61-65 RHC 3.8.2.2

This subsection subitem was deleted in its entirety. The intent of this subsection subitem is addressed in RHC 3.1.3. Maintenance personnel are required to have the same training as particle accelerator operators.

R.61-65 RHC 3.8.2.3

This subsection subitem was deleted in its entirety. The intent of this subsection subitem is addressed in RHC 3.1.3. Maintenance personnel are required to have the same training as particle accelerator operators.

R.61-65 RHC 3.8.2.4

This subsection subitem was deleted in its entirety. The intent of this subsection subitem is addressed in RHC 3.1.3. Maintenance personnel are required to have the same training as particle accelerator operators.

R.61-65 RHC 3.8.3

This subsection was deleted in its entirety. The intent of this subsection is addressed in RHC 3.1.3. Maintenance personnel are required to have the same training as particle accelerator operators.

R.61-65 PART IV

The title of this part was changed from “REGISTRATION OF PARTICLE ACCELERATORS” to “PERSONNEL MONITORING REQUIREMENTS.” The new title was bolded and capitalized for stylistic purposes.

R.61-65 RHC 4.1

The title of this section was deleted in its entirety and replaced with “Personnel Monitoring.” The content of this section was revised to specify the registration of the control and tube of the particle accelerator and the facility and moved from RHC 4.1 to RHC 2.1.

R.61-65 RHC 4.1.1

This subsection was added to outline requirements for operators and Radiation Safety Officers to wear personnel monitoring equipment.

R.61-65 RHC 4.1.2

This subsection was added to include all provisions of Part III of R.61-64, X-Rays (Title B) in the requirements for personnel monitoring in accordance with these regulations.

R.61-65 RHC 4.2

This section was revised by deleting the “s.” at the end of “Registration Procedures.” and bolded for stylistic purposes. This section was moved from RHC 4.2 to Part II.

R.61-65 RHC 4.2.1

This subsection was deleted in its entirety. Registration procedures are addressed in Part II of these regulations.

R.61-65 RHC 4.3

This section was deleted in its entirety. The Radiation Safety Officer is addressed in RHC 1.3.2.

R.61-65 RHC 4.3.1

This subsection was revised to clarify that the individual responsible for radiation safety is the Radiation Safety Officer and moved from RHC 4.3.1 to RHC 1.3.2.

R.61-65 RHC 4.3.1.1

This subsection subitem was moved from RHC 4.3.1.1 to RHC 1.3.2.1.

R.61-65 RHC 4.3.1.2

This subsection subitem was revised to require the Radiation Safety Officer to develop and implement a radiation safety program instead of simply recommend a program. This subsection subitem was moved from RHC 4.3.1.2 to RHC 1.3.2.2.

R.61-65 RHC 4.3.1.3

This subsection subitem was moved from RHC 4.3.1.3 to RHC 1.3.2.3.

R.61-65 RHC 4.3.1.4

This subsection subitem was revised grammatically and to make the Radiation Safety Officer responsible for giving radiation safety instructions. This subsection subitem was moved from RHC 4.3.1.4 to RHC 1.3.2.4.

R.61-65 RHC 4.4

This section was deleted in its entirety. The Department does not provide the registrant with a Notice of Registration.

R.61-65 RHC 4.5

This section was deleted in its entirety. Report of change is addressed in Part II of R.61-64, X-Rays (Title B).

R.61-65 RHC 4.5.1

This subsection was deleted in its entirety. Report of change is addressed in Part II of R.61-64, X-Rays (Title B).

R.61-65 RHC 4.6

This section was deleted in its entirety. Registrants are not required to re-register equipment with the Department.

R.61-65 RHC 4.6.1

This subsection was deleted in its entirety. Registrants are not required to re-register equipment with the Department.

R.61-65 RHC 4.7

This section was updated for clarity and moved from RHC 4.7 to RHC 1.2.2.

R.61-65 RHC 4.7.1

This subsection was deleted in its entirety. Prohibited advertisement is addressed in Part I of R.61-64, X-Rays (Title B).

R.61-65 RHC 4.8

This section was deleted in its entirety. Applicable provisions are addressed in RHC 2.1.2.

R.61-65 RHC 4.8.1

This subsection was revised for stylistic purposes and moved from RHC 4.8.1 to RHC 2.1.2.

R.61-65 RHC 4.9

This section was deleted in its entirety. Facilities with particle accelerators are required to register as a facility. This is not an alternate registration to be maintained in lieu of equipment registration. Acquiring a Facility Registration Approval is addressed in RHC 2.3.

R.61-65 RHC 4.9.1

This subsection was deleted in its entirety. Facilities with particle accelerators are required to register as a facility. This is not an alternate registration to be maintained in lieu of equipment registration. Acquiring a Facility Registration Approval is addressed in RHC 2.3.

R.61-65 RHC 4.9.1.1

This subsection subitem was deleted in its entirety. Facilities with particle accelerators are required to register as a facility. This is not an alternate registration to be maintained in lieu of equipment registration. Acquiring a Facility Registration Approval is addressed in RHC 2.3.

R.61-65 RHC 4.9.1.2

This subsection subitem was deleted in its entirety. Facilities with particle accelerators are required to register as a facility. This is not an alternate registration to be maintained in lieu of equipment registration. Acquiring a Facility Registration Approval is addressed in RHC 2.3.

R.61-65 RHC 4.9.1.3

This subsection subitem was deleted in its entirety. Facilities with particle accelerators are required to register as a facility. This is not an alternate registration to be maintained in lieu of equipment registration. Acquiring a Facility Registration Approval is addressed in RHC 2.3.

R.61-65 RHC 4.9.1.4

This subsection subitem was deleted in its entirety. Facilities with particle accelerators are required to register as a facility. This is not an alternate registration to be maintained in lieu of equipment registration. Acquiring a Facility Registration Approval is addressed in RHC 2.3.

R.61-65 RHC 4.9.1.5

This subsection subitem was deleted in its entirety. Facilities with particle accelerators are required to register as a facility. This is not an alternate registration to be maintained in lieu of equipment registration. Acquiring a Facility Registration Approval is addressed in RHC 2.3.

R.61-65 RHC 4.9.1.6

This subsection subitem was deleted in its entirety. Facilities with particle accelerators are required to register as a facility. This is not an alternate registration to be maintained in lieu of equipment registration. Acquiring a Facility Registration Approval is addressed in RHC 2.3.

R.61-65 RHC 4.10

This section was deleted in its entirety. Exemptions from the registration of particle accelerators are addressed in RHC 2.2.4

R.61-65 RHC 4.11

This section was deleted in its entirety. The U.S Atomic Energy Commission was abolished by the Energy Reorganization Act of 1974.

R.61-65 RHC 4.11.1

This subsection was deleted in its entirety. The U.S Atomic Energy Commission was abolished by the Energy Reorganization Act of 1974.

R.61-65 RHC 4.11.2

This subsection was deleted in its entirety. The U.S Atomic Energy Commission was abolished by the Energy Reorganization Act of 1974.

R.61-65 RHC 4.11.3

This subsection was deleted in its entirety. The U.S Atomic Energy Commission was abolished by the Energy Reorganization Act of 1974.

R.61-65 RHC 4.11.4

This subsection was deleted in its entirety. The U.S Atomic Energy Commission was abolished by the Energy Reorganization Act of 1974.

R.61-65 RHC 4.12

This subsection was deleted in its entirety. Equipment that is exempt from these regulations is addressed in RHC 2.2.

R.61-65 RHC 4.12.1

This subsection was revised to include the exemptions of any video display terminal and computer monitor when used without modification. This subsection was moved from RHC 4.12.1 to RHC 2.2.1.

R.61-65 RHC 4.12.2

This subsection was revised to clarify conditions required in order for other electronic equipment to be exempt from registration. The dose equivalent rate must be averaged over a ten square centimeter area and be less that 0.5 mR per hour at 5 cm at any accessible surface. This allows for a more consistent measurement so that a more accurate determination of qualifying for exemption from registration can be made. This subsection was moved from RHC 4.12.2 to RHC 2.2.2.

R.61-65 RHC 4.12.3

This subsection was revised to clarify the intent of the regulation by adding “are exempt from the requirements of this Part” to the end and moved from RHC 4.12.3 to RHC 2.2.4.

R.61-65 PART V

This part was added to designate shielding and safety design requirements. Proper shielding is required to protect all persons in the area from radiation in excess of designated limits set forth by these regulations. The title of this part was bolded and capitalized for stylistic purposes.

R.61-65 RHC 5.1

This section was added to require shielding for particle accelerators. Proper shielding is required to protect all persons in the area from radiation in excess of designated limits set forth by these regulations.

R.61-65 RHC 5.1.1

This subsection was added to require a qualified expert to be consulted in the design of a particle accelerator and to perform a radiation safety survey once the equipment is able to produce radiation. A qualified expert will possess the knowledge to supply the proper shielding to protect all persons in the area from radiation in excess of designated limits set forth by these regulations. The radiation safety survey will verify that the particle accelerator is properly shielded.

R.61-65 RHC 5.1.2

This subsection was added to ensure that each particle accelerator that is installed is supplied with the proper amount of primary and secondary shielding. This will allow all persons in the area to be protected from radiation in excess of designated limits set forth by these regulations.

R.61-65 PART VI

This part was added to organize requirements for particle accelerator controls and interlock systems. The title of this part was bolded and capitalized for stylistic purposes.

R.61-65 RHC 6.1

This section was moved from RHC 3.4 to RHC 6.1 and revised for clarity.

R.61-65 RHC 6.1.1

This subsection was moved from RHC 3.4.1 to RHC 6.1.1 and revised for clarity.

R.61-65 RHC 6.1.2

This subsection was moved from RHC 3.4.2 to RHC 6.1.2 and revised for clarity.

R.61-65 RHC 6.1.2.1

This subsection subitem was added to list an option for securing the controls of the particle accelerator. The controls should be secured to prevent unauthorized use.

R61-65 RHC 6.1.2.2

This subsection subitem was added to list an option for securing the controls of the particle accelerator. The controls should be secured to prevent unauthorized use.

R.61-65 RHC 6.1.3

This subsection was moved from RHC 3.4.3 to RHC 6.1.3 with revised requirements.

R.61-65 RHC 6.1.4

This subsection was added to require safety interlocks to be electrically independent of all other safety interlocks. This requirement prevents all safety interlocks from failing if only one fails.

R.61-65 RHC 6.1.5

This subsection was moved from RHC 3.4.6 to RHC 6.1.5.

R.61-65 RHC 6.1.6

This subsection was added to require safety interlocks to be designed such that any defect or failure will not allow the particle accelerator to operate. This prevents the particle accelerator from operating without working safety interlocks in place.

R.61-65 RHC 6.1.7

This subsection was moved from RHC 3.4.4 to RHC 6.1.7 with revised requirements.

R.61-65 RHC 6.1.8

This subsection was moved from RHC 3.4.5 to RHC 6.1.8 with revised requirements.

R.61-65 RHC 6.2

This section was added to require warning devices be in place in particle accelerator facilities. This will ensure that all persons are aware of high radiation areas.

R.61-65 RHC 6.2.1

This subsection was moved from RHC 3.5.2.1 to RHC 6.2.1 with revised requirements.

R.61-65 RHC 6.2.2

This subsection was added to require an audible warning device to be activated for 15 seconds before the creation of a high radiation area. This will ensure that all persons are aware of the potential for the area to become a high radiation area.

R.61-65 RHC 6.2.3

This subsection was added to require barriers and pathways leading to high radiation areas to be posted in accordance with R.61-64, X-Rays (Title B). This will ensure that all high radiation areas are posted in such a way that all persons will be aware of the barriers of the high radiation area.

R.61-65 RHC 6.3

This section was added to require particular methods to be carried out during the operation of particle accelerators. Following the required methods of operation will ensure the particle accelerator is operated with all safety features in place.

R.61-65 RHC 6.3.1

This subsection was moved from RHC 3.3.6 to RHC 6.3.1 with revised requirements.

R.61-65 RHC 6.3.2

This subsection was added to ensure particle accelerators are secured when not in operation. This prevents unauthorized use of the particle accelerator.

R.61-65 RHC 6.3.3

This subsection was added to ensure that the operator does not use the interlocks to turn off the power to the machine as a standard practice. Interlocks are in place as a precautionary measure to ensure the machine is shielded properly during operation. Using the interlocks improperly along with a malfunction causing an interlock to fail to cut the power of the machine could result in an operator receiving excess exposure. This prevents the operator from counting on the interlock system to turn the machine off.

R.61-65 RHC 6.3.4

This subsection was moved from RHC 3.4.8 to RHC 6.3.4 with revised requirements.

R.61-65 RHC 6.3.5

This subsection was moved from RHC 3.4.7 to RHC 6.3.5 with revised requirements.

R.61-65 RHC 6.3.6

This subsection was moved from RHC 3.3.8 to RHC 6.3.6 and revised for clarity.

R.61-65 RHC 6.3.6.1

This subsection subitem was added to clarify the need to gain authorization from the Radiation Safety Officer or Radiation Safety Committee to intentionally bypass an interlock. This prevents the operation of a particle accelerator with intentionally bypassed interlocks without the consent of the person responsible for radiation safety at the facility.

R.61-65 RHC 6.3.6.2

This subsection subitem was added to clarify the need for a permanent log to be kept noting authorizations to operate a particle accelerator with interlocks intentionally bypassed. This allows the Radiation Safety Officer or Radiation Safety Committee and the Department to review the log for radiation safety practices. This subsection subitem also clarifies that a notice must be posted at the accelerator control console notifying personnel of the situation. This posting notifies persons in the area of the potential for excess radiation in the area.

R.61-65 RHC 6.3.6.3

This subsection subitem was added to clarify that the operation of a particle accelerator with interlocks intentionally bypassed must be terminated as soon as possible. This prevents extended use of the particle accelerator without all safety precautions in place.

R.61-65 RHC 6.3.7

This subsection was added to require a copy of the operating and emergency procedures be maintained at the control panel. This ensures that the proper procedures will be readily available to the operators and therefore followed as is required.

R.61-65 RHC 6.4

This section was moved from RHC 3.5 to RHC 6.4 and revised for clarity.

R.61-65 RHC 6.4.1

This subsection was moved from RHC 3.5.1 to RHC 6.4.1 with revised requirements.

R.61-65 RHC 6.4.2

This subsection was moved from RHC 3.6.3 to RHC 6.4.2 and reworded for clarity.

R.61-65 RHC 6.4.2.1

This subsection subitem was added to ensure that all surveys are done in accordance with the facility’s written operating procedures established by a qualified expert or the Radiation Safety Officer. This ensures consistency between surveys and ensures the surveys are done properly in accordance with a qualified expert or the Radiation Safety Officer.

R.61-65 RHC 6.4.2.2

This subsection subitem was added to require the survey to include a diagram of the machine and the surrounding area. This ensures consistency in surveying particular points in the area so that comparisons can be made and any changes in radiation levels will be easily noticed. This will allow the person surveying the area to investigate the reason for the elevation in radiation and correct to the problem if necessary.

R.61-65 RHC 6.4.2.3

This subsection subitem was added to require survey results to be recorded as quantified units of radiation. This ensures a more accurate representation of the radiation levels measured at each point of the radiation survey while preventing terms like “okay” and “within limits” from being used.

R.61-65 RHC 6.4.3

This subsection was moved from RHC 3.5.2 to RHC 6.4.3 with revised requirements.

R.61-65 RHC 6.4.4

This subsection was moved from RHC 3.5.2.2 and RHC 3.5.2.3 with revised requirements.

R.61-65 RHC 6.4.5

This subsection was added to require that all area monitors and survey instruments be calibrated annually and after each service or repair. This ensures that the equipment used to measure radiation is accurate and prevents possible excess exposure to personnel.

R.61-65 RHC 6.4.6

This subsection was added to require the users of the radiation survey instruments to check the instrument for proper operation each day it is used by using a dedicated check source. This allows the user to be sure the instrument is functioning properly before each use. This will prevent false readings of “zero” in areas where radiation is present.

R.61-65 RHC 6.4.7

This subsection was added to require the registrant to perform periodic surveys to determine the amount of airborne particulate radioactivity present. This will prevent personnel from ingesting excess radioactive particulate in the air surrounding the particle accelerator.

R.61-65 RHC 6.4.8

This subsection was added to require the registrant to perform periodic smear surveys to determine the degree of contamination on surfaces. This allows the registrant to be aware of surface contamination and possible leakage causing any excess contamination.

R.61-65 RHC 6.4.9

This subsection was added to require the registrant to retain records of all radiation protection surveys, calibrations, and instrumentation tests for five years. This subsection also requires the records to be maintained at the facility for inspection by the Department. This ensures the records required during the inspection of the facility by the Department are available.

R.61-65 PART VII

This part was added to address requirements for ventilation systems at particle accelerator facilities. This will prevent personnel from being exposed to excess radioactive material. The title of this part was bolded and capitalized for stylistic purposes.

R.61-65 RHC 7.1

This section was added to address requirements for ventilation systems at particle accelerator facilities. This will prevent personnel from being exposed to excess radioactive material.

R.61-65 RHC 7.1.1

This subsection was added to require registrants to provide a ventilation system to ensure that personnel entering an area with airborne radioactivity will not be exposed in excess of the limits specified in R.61-63, Radioactive Materials (Title A).

R.61-65 RHC 7.1.2

This subsection was added to require registrants to refrain from venting, releasing or discharging airborne radioactive material to an unrestricted area which exceeds the limits specified in R.61-63, Radioactive Materials (Title A). This is to ensure that the release of radioactive materials to unrestricted areas is as low as reasonably achievable. This will prevent personnel in unrestricted areas from being excessively exposed to radioactive material.

R.61-65 PART VIII

This part was added to organize all necessary definitions into one part for convenience. The title of this part was bolded and capitalized for stylistic purposes.

R.61-65 RHC 8.1

This section was moved from RHC 1.2.1 to RHC 8.1 and revised to update.

R.61-65 RHC 8.2

This section was moved from RHC 1.2.2 to RHC 8.2 and revised to update.

R.61-65 RHC 8.3

This section was added to define “Adult” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.4

This section was added to define “Annually” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.5

This section was added to define “Calibration” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.5.1

This subsection was added to clarify the definition of “Calibration” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.5.2

This subsection was added to clarify the definition of “Calibration” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.6

This section was added to define “Dedicated check source” as a source of radiation with a known value used to ensure a survey instrument is operational and responding to the levels of radiation in which it is designed to measure.

R.61-65 RHC 8.7

This section was added to define “Department” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.8

This section was moved from RHC 1.3.1 to RHC 8.8 and revised to update.

R.61-65 RHC 8.9

This section was added to define “Facility” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.10

This section was added to define “Healing arts” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.11

This section was moved from RHC 2.6.3 to RHC 8.11 and revised to update.

R.61-65 RHC 8.12

This section was added to define “Individual” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.13

This section was added to define “Industrial use particle accelerator” as any particle accelerator used for nonhuman applications.

R.61-65 RHC 8.14

This section was added to define “Interlock” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.15

This section was added to define “Investigative limits” as a preset administrative level of radiation exposure over a set time established by the Radiation Safety Officer or the Radiation Safety Committee, used to prevent an individual from exceeding annual occupational exposure limits.

R.61-65 RHC 8.16

This section was added to define “’Limits’ or ‘Dose Limits’” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.17

This section was added to define “‘Monitoring,’ ‘radiation monitoring’ or ‘radiation protection monitoring’” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.18

This section was moved from RHC 1.2.5 to RHC 8.18 and revised to update.

R.61-65 RHC 8.19

This section was moved from RHC 3.2.3 to RHC 8.19 and revised to update.

R.61-65 RHC 8.20

This section was moved from RHC 3.2.4 to RHC 8.20 and revised for accuracy.

R.61-65 RHC 8.21

This section was moved from RHC 1.2.6 to RHC 8.21 and revised to update.

R.61-65 RHC 8.22

This section was moved from RHC 1.2.7 to RHC 8.22 and revised to update.

R.61-65 RHC 8.23

This section was moved from RHC 1.2.8 to RHC 8.23 and revised to update.

R.61-65 RHC 8.24

This section was added to define “Protective barrier” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.24.1

This subsection was added to clarify a type of protective barrier and to define “Primary protective barrier” as outlined by R.61-64, X-Rays (Title B) with the removal of the phrase “other than the patient.” The removal of this phrase allows the definition to apply to nonhuman use particle accelerator installations.

R.61-65 RHC 8.24.2

This subsection was added to clarify a type of protective barrier and to define “Secondary protective barrier” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.25

This section was added to define “Qualified expert” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.26

This section was moved from RHC 1.2.9 to RHC 8.26 and revised to update.

R.61-65 RHC 8.27

This section was moved from RHC 2.6.2 to RHC 8.27 and revised to update.

R.61-65 RHC 8.28

This section was moved from RHC 1.2.10 to RHC 8.28 and revised to update.

R.61-65 RHC 8.29

This section was added to define “Registrant” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.30

This section was added to define “Registration” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.31

This section was moved from RHC 1.3.3 to RHC 8.31 and revised to update.

R.61-65 RHC 8.32

This section was moved from RHC 1.2.11 to RHC 8.32 and revised to update.

R.61-65 RHC 8.33

This section was added to define “Revocation” as a facility’s registration is withdrawn and is required to cease operation of all particle accelerators until such time as the Department deems necessary.

R.61-65 RHC 8.34

This section was added to define “Smear survey” as a survey performed to measure the amount of removable contamination.

R.61-65 RHC 8.35

This section was moved from RHC 1.2.12 to RHC 8.35.

R.61-65 RHC 8.36

This section was moved from RHC 1.2.13 to RHC 8.36 and revised to update.

R.61-65 RHC 8.37

This section was added to define “Target” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.38

This section was added to define “Test” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.39

This section was moved from RHC 1.2.15 to RHC 8.39 and revised to update.

R.61-65 RHC 8.40

This section was added to define “Vendor” as outlined by R.61-64, X-Rays (Title B).

R.61-65 RHC 8.41

This section was added to define “Very high radiation area” as outlined by R.61-64, X-Rays (Title B).

R.61-65 Appendix A

This appendix was added to refer registrants to additional requirements outlined by R.61-64, X-Rays (Title B). The topics listed are those that will most likely be referenced by a registrant. This list is not meant to limit additional requirements found in R.61-64, X-Rays (Title B). The title of this appendix was bolded for stylistic purposes.

**Instructions:** Replace R.61-65. Particle Accelerators (Title C) in entirety with this amendment.

**Text:**

61-65. Particle Accelerators (Title C).

Statutory Authority: 1976 Code Section 13-7-10 et seq.

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Appendix A

PART IGENERAL PROVISIONS

RHC 1.1 Purpose and Scope.

1.1.1 These regulations establish procedures for the registration and the use of particle accelerators.

1.1.2 Except as otherwise specifically provided, these regulations apply to all persons who develop, manufacture, receive, possess, use, transfer, own, or acquire any industrial use particle accelerator.

1.1.3 In addition to the requirements of this Regulation, all registrants are subject to the requirements of Parts I, II, III, VIII, and X of R.61-64, X-Rays (Title B). Registrants engaged in the healing arts are subject to the requirements of Part VI of R.61-64, X-Rays (Title B). Registrants whose operations result in the production of radioactive material are also subject to the requirements of R.61-63, Radioactive Materials (Title A).

RHC 1.2 Prohibited Use.

1.2.1 It shall be unlawful to use, receive, own, or possess a particle accelerator unless the facility is registered with the Department and is operated in compliance with all applicable provisions.

1.2.2 No person, in any advertisement, shall refer to the fact that any particle accelerator facility, particle accelerator, or any activity under these regulations has been approved by the Department.

1.2.3 The use of any source of radiation may be prohibited when it is determined by the Department to be detrimental to public health and safety.

1.2.4 No person shall make, sell, lease, transfer, lend, repair, or install a particle accelerator or the supplies used in connection with such equipment unless such supplies or equipment, when properly placed in operation and properly used will meet the requirements of these regulations. Also, such persons shall be registered with the Department in accordance with RHC 2.5

RHC 1.3 Inspections.

1.3.1 Each registrant shall afford, at all reasonable times, the Department or its duly authorized representative the opportunity to inspect particle accelerators and the premises and facilities wherein such particle accelerators are used or stored.

1.3.2 Each registrant shall make available to the Department or its authorized representative for inspection, upon reasonable notice, records maintained pursuant to these regulations.

1.3.3 The Department shall have the right to enter at all reasonable times upon any private or public property, except property under the jurisdiction of the federal government, for the purpose of determining whether there is compliance with the provisions of the Act and regulations issued by the Department pursuant thereto.

1.3.4 The Department is authorized by law to enter and inspect property in order to determine compliance with Department regulations. Such entry and inspection falls under the health oversight activities exception of the Health Information Portability and Accountability Act (HIPAA). Therefore, when protected health information is necessary for determining compliance with Department regulations, protected health information may be used and disclosed to the Department without the subject's authorization.

RHC 1.4 Tests and Surveys.

1.4.1 Each registrant shall make or cause to be made such surveys as are necessary for him to comply with these regulations.

1.4.2 Each registrant shall perform, upon instructions from the Department, or shall permit the Department to perform, such reasonable tests as the Department deems appropriate or necessary including, but not limited to, tests of:

1.4.2.1 Particle accelerators;

1.4.2.2 Facilities wherein particle accelerators are used or stored;

1.4.2.3 Radiation detection and monitoring instruments; and

1.4.2.4 Other equipment and devices used in connection with utilization or storage of particle accelerators.

1.4.3 Results of such tests and surveys shall be submitted to the Department upon request.

1.4.4 Radiation Survey Instruments.

1.4.4.1 The radiation survey instrument used shall have a minimum operation range consistent with the radiation field being measured.

1.4.4.2 Each radiation survey instrument shall be maintained annually.

1.4.4.2.1 Each radiation survey instrument shall be calibrated at intervals not to exceed 12 months and after each instrument servicing and repair.

1.4.4.2.2 Each radiation survey instrument shall be calibrated such that accuracy within 20 percent traceable to a national standard can be demonstrated.

1.4.4.2.3 Each radiation survey instrument shall be calibrated at two or more widely separated points, other than zero, on each scale.

1.4.4.2.4 Each radiation survey instrument shall be calibrated according to manufacturer's specifications.

1.4.4.2.5 Records of these calibrations shall be maintained for inspection by this Department.

1.4.4.3 The registrant shall make available to survey instrument users the manufacturer's instructions of the survey instrument including any restrictions of the operating techniques required for the proper operation of the particular instrument.

1.4.4.3.1 The registrant shall adhere to the manufacturer's instructions in all respects.

1.4.4.3.2 The user shall be able to demonstrate familiarity and competence with these instructions.

1.4.4.3.3 Documentation must be maintained, indicating that the user has read and agrees to adhere to the operating instructions.

1.4.4.3.4 The operator shall check each survey instrument for proper operation with a dedicated check source each day of use to ensure the instrument is operating properly. Documentation of these checks shall be maintained for Department review.

1.4.5 Records of all calibrations and instrumentation checks shall be retained for five years or until the next Department inspection, whichever is later.

RHC 1.5 Exemptions.

1.5.1 The Department may, upon application by any user or upon its own initiative, grant such exemptions from the requirements of these regulations as it determines are authorized by law and will not result in undue hazard to life, health, or property. Applications for exemptions shall specify why such exemptions are necessary.

1.5.2 Before granting an exemption, the Department shall determine that there is reasonable and adequate assurance that:

1.5.2.1 The occupational dose to any individual adult will not exceed those specified in "Occupational Dose Limits for Adults" of R.61-64, X-Rays (Title B).

1.5.2.2 The dose to an individual member of the public will not exceed those specified in "Dose Limits for Individual Members of the Public" of R.61-64, X-Rays (Title B).

1.5.2.3 There is no significant hazard to life or property.

RHC 1.6 Additional Requirements.

1.6.1 The Department may, by rule, regulation, or order, impose upon any 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.

1.6.2 The Department is authorized to inspect and investigate the premises and operations and personnel of any radiation installation, whether or not such installation is required to be registered by the Department, for the purpose of studying and evaluating the health hazard(s) caused by the use and operation of such machines and material.

1.6.3 Equipment Not Covered In Regulations. Prior to operation of radiation producing equipment not specifically covered in these regulations, the facility and the vendor shall submit for review and approval to the Department a listing of manufacturer's specifications for the equipment, an analysis of exposure rates around the equipment, and written operating procedures describing how the equipment is to be used.

1.6.4 Radiation Safety Officer. The registrant shall designate an individual who will be responsible for radiation protection at the facility. Such individual shall:

1.6.4.1 Be qualified by training and experience concerning all hazards and precautions involved in operating the equipment for which he is responsible;

1.6.4.2 Develop and implement a program of radiation safety for effective compliance with the applicable requirements of these regulations;

1.6.4.3 Give instructions concerning hazards and safety practices to individuals who may be exposed to radiation from the particle accelerators;

1.6.4.4 Ensure that surveys are made, procedures are carried out, and radiation safety instructions are given as required by these regulations.

RHC 1.7 Violations.

1.7.1 The Department may obtain an injunction or other court order prohibiting any violation or 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 shall be guilty of a misdemeanor and, upon conviction, shall be punished by fine or imprisonment or both, as provided by the Act.

1.7.2 Any person found in violation of any regulation shall notify the Department, in writing, within 20 calendar days, from the date of citation with respect to action that has been taken or planned to correct the violation.

1.7.3 All violations shall be corrected within 60 calendar days from the date of citation. The Department shall be notified in writing of all action taken to correct the violations.

1.7.4 The Department is authorized to hold public hearings, compel attendance of witnesses, make findings of fact and determinations, and to assess fines and civil penalties relating to violations of the provisions of the Act or any regulation, temporary or permanent order, or final determination of the Department.

1.7.5 The Department may impose a civil penalty not to exceed Twenty-five Thousand Dollars ($25,000) on a person who violates a provision of the Act, rules, regulations, or orders issued. Each day of continued violation shall constitute a separate offense in computing the civil penalty. Civil penalties shall be assessed as specified in RHC 1.11.

RHC 1.8 Enforcement.

1.8.1 Upon determination by the Department that the Act or these regulations have been violated or that a public health risk exists, the Department will:

1.8.1.1 Provide written notification to the non-compliant registrant as soon as possible after violations are noted which:

1.8.1.1.1 Cites each section of the Act or regulations violated.

1.8.1.1.2 Specifies the manner in which the registrant failed to comply.

1.8.1.1.3 Requires submission of a timely and comprehensive corrective action plan, including a time schedule for completion of the plan.

1.8.1.1.4 Establishes a firm time schedule within which a corrective action plan must be submitted. The Department will approve the plan and proposed time schedule for its completion if the plan is adequate.

1.8.1.2 In cases where the registrant fails to comply with the conditions of the written notification, the Department will seek further enforcement action, appropriate penalties, and direct remedial relief.

1.8.1.3 If the registrant fails to comply with the requirements of the regulations within ten days, or in cases where there is an imminent hazard to human health and safety, the Department will take one or a combination of the following steps:

1.8.1.3.1 Issue an administrative order which:

1.8.1.3.1.1 Imposes an appropriate civil penalty; or

1.8.1.3.1.2 Requires corrective action; or

1.8.1.3.1.3 Impounds or orders the impounding of sources of radiation in accordance with the Act; or

1.8.1.3.1.4 Revokes the facility's registration in accordance with Part II; or

1.8.1.3.2 Requests the Department attorney or the attorney general to seek court action to enjoin violations and seek conviction for a simple misdemeanor; or

1.8.1.3.3 Take enforcement action that the Department feels appropriate and necessary and is authorized by law.

1.8.2 Under an actual or potential condition posing a risk to any individual comparable to a Major severity level violation, the Department may immediately impound or order the impounding of sources of radiation in accordance with the Act.

1.8.3 The Department may immediately impound or order the impounding of sources of radiation in the possession of any person who fails to comply with these regulations or provisions of the Act, or when the Department deems a situation to constitute an emergency.

RHC 1.9 Records.

1.9.1 Each registrant shall keep records showing the receipt, transfer, use, storage, and disposal of all particle accelerators and major components. These records shall be maintained by the registrant until disposal is authorized by the Department. All records shall be readily available at the facility for Department review. Additional record requirements are specified elsewhere in these regulations.

1.9.2 The registrant shall maintain the following information for each particle accelerator system for inspection by the Department:

1.9.2.1 Model and serial numbers of all tubes and controls;

1.9.2.2 Records of surveys, maintenance, and modifications performed on the particle accelerator(s), with the names of persons who performed such services. Records shall be maintained for five years or until the next Department inspection, whichever is later;

1.9.2.3 A copy of all correspondence with the Department regarding that particle accelerator system.

1.9.3 Each registrant shall maintain a current inventory listing that indicates the model number, serial number, and location and status of each control. The inventory listing shall be made available to the Department upon request.

1.9.4 All records required by these regulations shall be accurate and true.

RHC 1.10 Communications.

1.10.1 All communications and reports concerning these regulations and registrations filed thereunder, shall be addressed to the Department at:

SC Department of Health and Environmental Control

Bureau of Radiological Health

2600 Bull Street

Columbia, SC 29201

1.10.2 Material False Statements. It shall be unlawful to make a material false statement to the Department regarding information contained in the application for registration, information pertaining to an inspection or any other information required by any provision of these regulations.

RHC 1.11 Administration of Civil Penalties.

1.11.1 Assessment. Assessment of civil penalties shall be based on the following criteria:

1.11.1.1 The seriousness of the violation(s);

1.11.1.2 Previous compliance history;

1.11.1.3 The amount necessary to deter future violations;

1.11.1.4 Efforts to correct the violation; and

1.11.1.5 Any other mitigating or enhancing factors.

1.11.2 Severity Levels. The seriousness of violations shall be categorized by one of the following severity levels.

1.11.2.1 Major. Violations that are most significant and have a direct negative impact on occupational or public health and safety, or which represent a significant deviation from the requirements of this regulation.

1.11.2.2 Moderate. Violations that are of more than minor significance, but if left uncorrected, could lead to more serious circumstances, or which represent a moderate deviation from the requirements of this regulation.

1.11.2.3 Minor. Violations that are of minor safety significance, or which represent a minor deviation from the requirements of this regulation.

1.11.2.4 In each case, the severity of a violation will be characterized at the level best suited to the significance of the particular violation. In some cases, violations may be evaluated in the aggregate and a single severity level assigned for a group of violations.

1.11.3 Application. Adjustments to the values listed in RHC 1.11.4.1 under each severity level may be made for the presence or absence of the following factors:

1.11.3.1 Prompt Identification and Reporting. Reduction of a civil penalty may be given when a registrant identifies the violation and promptly reports the violation to the Department. In weighing this factor, consideration will be given to, among other things, the length of time the violation existed prior to discovery, the opportunity available to discover the violation, the ease of discovery and the promptness and completeness of any required report. No consideration will be given to this factor if the registrant does not take immediate action to correct the problem upon discovery.

1.11.3.2 Corrective Action to Prevent Recurrence. Recognizing that corrective action is always required to meet regulatory requirements, the promptness and extent to which the registrant takes corrective action, including actions to prevent recurrence, may be considered in modifying the civil penalty to be assessed. Unusually prompt and extensive corrective action may result in reducing the proposed civil penalty. On the other hand, the civil penalty may be increased if initiation of corrective action is not prompt or if the corrective action is only minimally acceptable. In weighing this factor, consideration will be given to, among other things, the timeliness of the corrective action, degree of registrant initiative, and comprehensiveness of the corrective action - such as whether the action is focused narrowly to the specific violation or broadly to the general area of concern.

1.11.3.3 Compliance History. Reduction of the civil penalty may be given for prior good performance in the general area of concern. In weighing this factor, consideration will be given to, among other things, the effectiveness of previous corrective action for similar problems, overall performance such as previous compliance history in the area of concern. For example, failure to implement previous corrective action for prior similar problems may result in an increase in the civil penalty.

1.11.3.4 Prior Notice of Similar Events. The civil penalty may be increased for cases where the registrant had prior knowledge of a problem as a result of a registrant audit, or specific industry notification, and had failed to take effective preventive steps.

1.11.3.5 Multiple Occurrences. The civil penalty may be increased where multiple examples of a particular violation are identified during the inspection period.

1.11.3.6 The above factors are additive. However, the civil penalty will not exceed twenty-five thousand dollars ($25,000) for any one violation. Each day of noncompliance shall constitute a separate violation.

1.11.4 The Department shall issue civil penalties according to the following schedule:

1.11.4.1 Penalty Matrix

|  |  |  |  |
| --- | --- | --- | --- |
| Deviation from Requirement:  Potential for Harm: | Major  (11-30) | Moderate  (4-10) | Minor  (1-3) |
| Major  (11-70) | $25,000-5,000 | $15,000-5,000 | $10,000-2,500 |
| Moderate  (6-10) | $10,000-2,500 | $7,500-1,000 | $5,000-500 |
| Minor  (0-5) | $5,000-1,000 | $3,000-500 | $2,500-250 |

Calculation of Base Penalty:

Each violation is assigned a relative point value as follows: Potential for Harm- 0-70, with 70 being maximum harm; Deviation from Requirement- 1-30, with 30 being the maximum deviation. Add the two values together, convert to a decimal value (15 to .15, for example), and multiply by the maximum per day per violation per civil penalty ($25,000). This is the base civil penalty per violation. The base penalty may be increased for repeat violations, multi-day penalties, or degree of recalcitrance, willfulness, negligence, or indifference.

Minimum Increase for Repeat Violations Found on Follow-up Inspections or Reinspections

Second Offense (First Follow-up Inspection or First Reinspection) 15%

Third Offense (Second Follow-up Inspection or Second Reinspection) 30%

Fourth Offense (Third Follow-up Inspection or Third Reinspection) 45%

Fifth and Subsequent Offenses 60%

Multi-Day Penalties:

Increase penalty 1% to 7% for each day of noncompliance.

Degree of Recalcitrance, Willfulness, Negligence, or Indifference:

Increase Penalty 10% to 50%.

1.11.4.2 The Department reserves the right to impose a civil penalty up to Twenty-five Thousand Dollars ($25,000) on a person who violates the regulations in such a manner so as to present an imminent hazard to human health and safety. The Twenty-five Thousand Dollar civil penalty may be levied for the following:

1.11.4.2.1 Two or more incidents of workers receiving excess radiation exposures, when such exposures are contrary to the occupational dose limits for adults as set forth in the provisions of Part III of R.61-64, X-Rays (Title B).

1.11.4.2.2 Two or more incidents of members of the general public, or non-radiation workers, receiving excess radiation exposures contrary to the dose limits for individual members of the public as set forth in the provisions of Part III of R.61-64, X-Rays (Title B).

1.11.4.2.3 Two or more incidents on two consecutive inspections of failing to perform required surveys, tests, checks, calibrations or evaluations. (RHC 1.4)

1.11.4.2.4 Four or more incidents in a one year period of making, selling, leasing, transferring, lending, assembling, or installing equipment without the equipment meeting all applicable regulations when properly placed in operation. (RHC 2.5.3)

PART II

REGISTRATION PROCEDURE

RHC 2.1 Purpose and Scope.

This part provides for the registration of industrial use particle accelerators (controls and tubes) and facilities.

2.1.1 Except as specifically exempted in RHC 2.2, each person who develops, manufactures, receives, possesses, uses, transfers, owns, or acquires any industrial use particle accelerator shall register the control and tubes of such machine with the Department in accordance with the requirements of this Part.

2.1.2 In addition to the requirements of this Part, all registrants are subject to the applicable provisions of other Parts of these regulations.

RHC 2.2 Exemptions.

2.2.1 Television receivers, video display terminals, and computer monitors, when used without modification to their internal or external construction, are exempt from the requirements of this Part.

2.2.2 Electronic equipment producing radiation incidental to its operation for other purposes is exempt from the registration requirements of this Part if dose equivalent rate averaged over an area of 10 square centimeters does not exceed 0.5 mrem per hour at 5 centimeters from any accessible surface of such equipment. The production, testing, or factory servicing of such equipment is not exempt.

2.2.3 Any facility where a federal agency has exclusive jurisdiction is exempt from the requirements of this Part.

2.2.4 Particle accelerators while in transit or storage incident thereto are exempt from the requirements of this Part.

RHC 2.3 Facility Registration Approval.

2.3.1 Any facility planning to install a particle accelerator (fixed or mobile) shall meet the following provisions:

2.3.1.1 Prior to installation of any particle accelerator, the facility where the installation will be shall submit to the Department the following information:

2.3.1.1.1 Facility Name, Location Address, and Mailing Address;

2.3.1.1.2 The name of the Radiation Safety Officer and the individual's qualifications to serve in such a capacity;

2.3.1.1.3 Type and make of particle accelerator to be installed;

2.3.1.1.4 Operating procedures as required by RHC 3.3;

2.3.1.1.5 A training plan as required by RHC 3.2;

2.3.1.1.6 The name, address, and contact person of the company selling and installing the equipment. If more than one company is involved in the sale and/or installation, then the above information shall be provided for all companies involved.

2.3.1.2 Upon review and approval of the above information, the Department shall issue a facility registration approval.

2.3.1.3 A facility shall not install or cause to be installed any particle accelerator until the Department has issued a facility registration approval.

RHC 2.4 Equipment Registration Requirements, Users of Particle Accelerators.

2.4.1 Initial Equipment Registration. Every person possessing a particle accelerator shall register the machine's control and tubes with the Department within 30 days of the date of acquisition. Registration shall be made on Form DHEC 819 furnished by the Department.

2.4.1.1 Upon registration of a control, the Department shall issue the facility a registration sticker to be placed on each control. The registration sticker shall be placed on the control panel in a clearly visible location.

2.4.1.2 When a control is removed from a facility, the facility shall remove the registration sticker.

2.4.1.3 A registration sticker on a control displaying the facility’s proper name shall be considered indicative of a facility’s and a control’s registration status, as required to be confirmed by RHC 2.5.3.

2.4.2 Renewal of Equipment Registration. The Department shall provide an annual re-registration statement to all registrants. The re-registration statements shall be reviewed, corrected, signed, and returned to the Department within 30 days.

2.4.3 Report of Change. The registrant shall report to the Department, within 30 days, any changes of status affecting any particle accelerator or facility. Report of a change of status shall be made in writing and forwarded to the Department.

2.4.4 Verification of Service Representative. Each registrant shall require any person furnishing particle accelerator servicing or services as described in this Part to provide evidence that he/she has been registered with the Department as a vendor in accordance with these regulations.

RHC 2.5 Vendor Registration and Obligation.

2.5.1 Each person who is a) engaged in the business of selling, leasing, or installing particle accelerators or machine components; or b) offering to sell, lease, or install particle accelerators or machine components; or c) engaged in the business of furnishing or offering to furnish any equipment services in South Carolina shall apply for registration as a vendor with the Department within 30 days following the effective dates of these regulations or thereafter prior to furnishing or offering to furnish any such services.

2.5.1.1 In-house personnel employed by a registered facility or corporation shall be exempt from the registration requirement, provided such personnel:

2.5.1.1.1 Shall meet the education, training, and experience requirements for the appropriate vendor Class and;

2.5.1.1.2 Shall exclusively service one facility or corporation.

2.5.1.2 Documentation of education, training, and experience for in-house service personnel shall be maintained by the facility or corporation and available for Department review.

2.5.2 Any person who sells, leases, transfers, lends, moves, assembles or installs particle accelerators in South Carolina shall notify the Department of the following within 30 days of the transaction:

2.5.2.1 The name and address of persons who have received the machine;

2.5.2.2 The manufacturer, control model and serial number, and tube(s) model and serial number of each particle accelerator transferred; and

2.5.2.3 The date of transfer of each particle accelerator.

2.5.2.4 Notification to the Department shall be made on DHEC Form 823. A DHEC 823 form shall be submitted to the Department each month by Class I and Class II vendors, as outlined in Part II "Registration of X-Ray Machines and Services" of R.61-64, X-Rays (Title B), regardless of whether a particle accelerator was sold that month.

2.5.3 No person shall make, sell, lease, transfer, lend, maintain, repair, assemble, reassemble, reinstall or install particle accelerators or the supplies used in connection with such machines unless such supplies and equipment, when properly placed in operation and used, meet the requirements of these regulations. Each vendor shall ensure that the facility it is providing with services or supplies is registered with the Department prior to providing services or supplies.

2.5.4 Each vendor shall maintain records for review by the Department. These records shall include, at a minimum:

2.5.4.1 All information required by RHC 2.5;

2.5.4.2 Tests performed at the time of installation to ensure that the equipment complies with these regulations. A copy of these results shall be provided to the registrant at the time of installation;

2.5.4.3 Records of any routine maintenance, repair, alterations, or reassembly of particle accelerators. Records of maintenance, repair, alterations, or reassemblies shall include the date that the service was performed and the legible signature of the person performing the service. A copy of these records shall be provided to the registrant at the time the service is provided;

2.5.4.4 Names of all employees and their dates of employment with the vendor. Records shall also be maintained of training provided to the employees during their term of employment.

2.5.5 All records required by this Part shall be maintained by the vendor for review by the Department. Training records shall be retained for personnel currently acting in any role as described in this Part. All other records shall be retained for five years. All records shall be accurate and factual.

2.5.6 Each vendor shall maintain sufficient calibrated and operable instruments to perform the testing appropriate to the class in which the vendor is registered. Instruments must be calibrated with sources consistent with the conditions under which they are used. Records shall be maintained of the calibrations performed on instrumentation used for testing.

2.5.6.1 Survey meters used for radiation area surveys shall be calibrated at intervals not to exceed 12 months and after each instrument servicing.

RHC 2.6 Modification, Revocation, Termination of Registrants.

2.6.1 The terms and conditions of all registrations are subject to amendment, revision, or modification and all registrations are subject to suspension or revocation by reason of:

2.6.1.1 Amendments to the Act;

2.6.1.2 Rules and regulations adopted pursuant to provisions of the Act; or

2.6.1.3 Orders issued by the Department.

2.6.2 Any registration may be revoked, suspended, or modified in whole or part:

2.6.2.1 For any material false statement in the application or in any statement of fact required by provisions of this Part;

2.6.2.2 Because of any statement of fact, any report, record, inspection, or other means which would warrant the Department to refuse to grant a registration on original application; or

2.6.2.3 For violations of, or failure to observe any of the terms and conditions of the Act, the registration, these regulations, or any order of the Department.

2.6.3 An order of revocation may be appealed pursuant to applicable law, including S.C. Code Title 44, Chapter 1; and Title 1, Chapter 23.

2.6.4 Except in cases of willfulness or those in which the public health, interest, or safety requires otherwise, prior to the institution of proceedings for modification, revocation, or suspension of a registrant, the Department shall:

2.6.4.1 Call to the attention of the registrant in writing the facts or conduct which may warrant these actions; and

2.6.4.2 Provide an opportunity for the registrant to demonstrate or achieve compliance with all regulations.

2.6.5 The Department may terminate a registration upon written request submitted by the registrant to the Department.

2.6.6 The provisions of this Part shall apply to both registration of particle accelerators and registration of particle accelerator services (vendors).

RHB 2.7 Annual Fees.

2.7.1 Any person issued or granted a registration for the possession and use of particle accelerator(s) shall pay an annual registration fee. Vendors and out-of-state facilities shall pay an annual flat fee. The annual registration fee shall be due on January 15 of each year.

2.7.2 Persons failing to pay the fees required by RHC 2.7.1 by March 15 of that year shall also pay a penalty of 50 Dollars. If the required fees are not paid by April 15 of that year, the registrant shall be notified by certified mail to be sent to his last known address that his registration is revoked, and that any activities permitted under the authority of the registration must cease immediately.

2.7.3 A registrant suspended for failure to pay the required fee under RHC 2.7.2 may be reinstated by the Department upon payment of the required fee, the penalty of 50 Dollars and an additional penalty of 100 Dollars, if the registrant is otherwise in good standing and presents to the Department a satisfactory explanation for his failure to pay the required fee.

2.7.4 Payment of fees shall be made in accordance with the instructions of a "Statement of Fees Due" issued annually by the Department.

2.7.5 Fees required by RHC 2.7.1 for a particle accelerator, out-of-state facility, or vendor registration which is issued during a calendar year shall be prorated for the remainder of that year based on the date of issuance of the registration.

2.7.6 Schedule of Fees. The fee schedule pursuant to Part II "Annual Fees" of R.61-64, X-Rays (Title B) shall be used by the Department to determine the annual fee due.

PART III

RADIATION SAFETY REQUIREMENTS FOR RADIATION SAFETY OFFICERS AND OPERATORS

RHC 3.1 Minimum Personnel Radiation Safety Requirements for Radiation Safety Officers and Operators.

3.1.1 No registrant shall permit any individual to act as a Radiation Safety Officer until such person:

3.1.1.1 Has been instructed in the subjects outlined in RHC 3.2 of this Part;

3.1.1.2 Has received copies of and instruction in these regulations and the registrant's operating and emergency procedures and shall have demonstrated understanding thereof; and

3.1.1.3 Has demonstrated competence to use the particle accelerator, related handling tools, and survey instruments that will be employed in the assignment.

3.1.2 No registrant shall permit any individual to act as an operator until such person:

3.1.2.1 Has been instructed in the subjects outlined in RHC 3.2 of this Part;

3.1.2.2 Has received copies of and instruction in these regulations and the registrant's operating and emergency procedures and shall have demonstrated understanding thereof; and

3.1.2.3 Has demonstrated competence to use, under the personal supervision of the Radiation Safety Officer, the particle accelerator, related handling tools, and survey instruments that will be employed in his assignment.

3.1.2.4 The registrant shall have all training procedures and testing documented in writing and available for the Department's review.

3.1.3 Maintenance personnel performing any activities involving a particle accelerator shall have minimum training as outlined in RHC 3.1.2 of this Part.

RHC 3.2 Minimum Subjects to be Covered in Training Radiation Safety Officers and Operators.

3.2.1 No registrant shall permit any individual to act as an operator of a particle accelerator until such individual has been instructed in radiation safety and shall have demonstrated an understanding in the following:

3.2.1.1 Fundamentals of Radiation Safety:

3.2.1.1.1 Characteristics of ionizing radiation;

3.2.1.1.2 Units of radiation dose (rem or Sievert);

3.2.1.1.3 Hazards of exposure to radiation;

3.2.1.1.4 Levels of radiation from sources of radiation;

3.2.1.1.5 Methods of controlling radiation dose;

3.2.1.1.5.1 Working time;

3.2.1.1.5.2 Working distances; and

3.2.1.1.5.3 Shielding.

3.2.1.2 Radiation Detection Instrumentation to be Used:

3.2.1.2.1 Use of radiation survey instruments;

3.2.1.2.1.1 Operation;

3.2.1.2.1.2 Calibration; and

3.2.1.2.1.3 Limitations.

3.2.1.2.2 Survey techniques; and

3.2.1.2.3 Use of personnel monitoring equipment:

3.2.1.2.3.1 Film badges or other approved dosimeters; and

3.2.1.2.3.2 Pocket dosimeters or pocket chambers, if applicable.

3.2.1.3 Operation and control of particle accelerators and interlock systems.

3.2.1.4 The requirements of pertinent state regulations.

3.2.1.5 The registrant’s written operating and emergency procedures.

RHC 3.3 Operating and Emergency Procedures.

3.3.1 The registrant shall have written operating and emergency procedures. These procedures shall include instruction in:

3.3.1.1 The handling and use of particle accelerators to be employed such that no person is likely to be exposed to radiation doses in excess of the occupational dose limits established in Part III "Standards for Protection Against Radiation" of R.61-64, X-Rays (Title B);

3.3.1.2 Methods and occasions for conducting radiation surveys;

3.3.1.3 Methods for controlling access to radiation areas;

3.3.1.4 Methods for locking and securing particle accelerators when not in use or in storage;

3.3.1.5 Personnel monitoring and the use of personnel monitoring equipment, including steps that must be taken by radiation personnel in the event a pocket dosimeter is found to be off-scale;

3.3.1.6 The proper handling of exposed personnel;

3.3.1.7 Minimizing exposure of individuals in the event of an accident;

3.3.1.8 The procedure for notifying proper persons in the event of an accident. This shall include the listing of names, addresses, and telephone numbers; and

3.3.1.9 Maintenance of records.

RHC 3.4 Authority and Responsibility for the Radiation Safety Officer.

3.4.1 The registrant shall provide the Radiation Safety Officer sufficient authority, organizational freedom, time, resources, and management prerogative, to:

3.4.1.1 Identify radiation safety problems;

3.4.1.2 Initiate, recommend, or provide corrective actions;

3.4.1.3 Stop unsafe operations; and

3.4.1.4 Verify implementation of corrective actions.

3.4.2 The registrant shall establish either monthly or quarterly investigative limits to ensure individuals will not exceed annual occupational exposure limits.

PART IV

PERSONNEL MONITORING REQUIREMENTS

RHC 4.1 Personnel Monitoring.

4.1.1 No registrant shall permit any individual to act as a Radiation Safety Officer or as an operator unless, at all times during radiographic operations, each such person wears a film badge, thermoluminescent dosimeter (TLD), or other dosimeter approved by the Department.

4.1.2 All provisions of Part III "Standards for Protection Against Radiation" of R.61-64, X-Rays (Title B) apply.

PART V

SHIELDING AND SAFETY DESIGN REQUIREMENTS

RHC 5.1 Shielding.

5.1.1 A qualified expert, acceptable to 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.

5.1.2 Each particle accelerator installation shall be provided with such primary and secondary barriers as are necessary to assure compliance with occupational dose limits as outlined in Part III "Standards for Protection Against Radiation" of R.61-64, X-Rays (Title B).

PART VI

PARTICLE ACCELERATOR CONTROLS AND INTERLOCK SYSTEMS

RHC 6.1 Particle Accelerator Controls and Interlock Systems.

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

6.1.2 Accelerator controls shall be equipped with one or more of the following:

6.1.2.1 A keyswitch or other device which will render the console inoperative when the key or device is removed or;

6.1.2.2 A password protected computer system.

6.1.3 Each entrance into a target room or other high radiation area shall be equipped with multiple safety interlocks that shut down the machine under conditions of barrier penetration.

6.1.4 Each safety interlock shall be on a circuit which shall allow it to operate independently of all other safety interlocks.

6.1.5 All shielding that is temporary, movable, or detachable shall be interlocked.

6.1.6 All safety interlocks shall be designed so that any defect or component failure in the safety interlock system prevents operation of the accelerator.

6.1.7 When a safety 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 safety interlock has been tripped and, lastly, at the main control console.

6.1.8 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.

RHC 6.2 Warning Devices.

6.2.1 Each location designated as a high radiation area, and each entrance to such location shall be equipped with easily observable warning lights that operate when, and only when, radiation is being produced.

6.2.2 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 devices shall be clearly discernible in all high radiation areas.

6.2.3 Barriers, temporary or otherwise, and pathways leading to high radiation areas shall be posted in accordance with Part III "Standards for Protection Against Radiation" of R.61-64, X-Rays (Title B).

RHC 6.3 Methods of Operation.

6.3.1 The name(s) of the operator, as outlined in Part III of these regulations, shall be displayed at the control of each particle accelerator. Only the operator(s) whose name is displayed shall operate the particle accelerator.

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

6.3.3 The safety interlock system shall not be used to turn off the accelerator beam except in an emergency.

6.3.4 All safety and warning devices, including interlocks, shall be checked for proper operation at intervals not to exceed three months. Results of such tests shall be maintained at the accelerator facility for inspection by the Department.

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

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

6.3.6.1 Authorized by the Radiation Safety Committee or Radiation Safety Officer;

6.3.6.2 Recorded in a permanent log and a notice posted at the accelerator control console; and

6.3.6.3 Terminated as soon as possible.

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

RHC 6.4 Radiation Monitoring Requirements.

6.4.1 There shall be available at each particle accelerator facility appropriate portable monitoring equipment which is operable and has been appropriately calibrated for the radiation energy levels being produced at the facility.

6.4.2 A radiation protection survey shall be performed and documented by a qualified expert, acceptable to the Department, at intervals not to exceed three months and when changes have been made in shielding, operation, equipment, workload, or occupancy of adjacent areas.

6.4.2.1 All surveys shall be made in accordance with the written procedures established by a qualified expert acceptable to the Department and the Radiation Safety Officer.

6.4.2.2 All surveys shall include a diagram of the machine and adjacent areas including, but not limited to, the operator’s area at the control panel.

6.4.2.3 All survey results shall be recorded using quantified units of radiation at each survey point.

6.4.3 Radiation levels in all high radiation areas shall be continuously monitored. The monitoring devices shall be electrically independent of the accelerator control and safety interlock systems and capable of providing a readout at the control panel.

6.4.4 Personnel entering a target room or high radiation area shall use a radiation monitor capable of producing an audible alarm or “chirp” in the presence of radiation. The alarm shall be fully functional and checked for operability in accordance with RHC 6.4.6.

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

6.4.6 The operator shall check each survey instrument for proper operation with a dedicated check source each day in which the instrument is used to ensure the instrument is operating properly.

6.4.7 Whenever applicable, periodic surveys shall be made to determine the amount of airborne particulate radioactivity present.

6.4.8 Whenever applicable, periodic smear surveys shall be made to determine the degree of contamination.

6.4.9 Records of all radiation protection surveys, calibrations, and instrumentation tests shall be maintained at the accelerator facility for inspection by the Department. The registrant shall retain these records for five years or until the next Department inspection, whichever is later.

PART VII

VENTILATION SYSTEMS

RHC 7.1 Ventilation Systems.

7.1.1 Ventilation systems shall be provided to ensure that personnel entering any area where airborne radioactivity may be produced will not be exposed to airborne radioactive material in excess of those limits specified in R.61-63, Radioactive Materials (Title A).

7.1.2 A registrant shall not vent, release, or otherwise discharge airborne radioactive material to an unrestricted area which exceeds the limits specified in R.61-63, Radioactive Materials (Title A). Every effort must be made to maintain releases of radioactive material to unrestricted areas as far below these limits as is reasonably achievable.

PART VIII

DEFINITIONS

8.1 "Accelerator facility" (See "Facility").

8.2 "Act" means Act No. 223, Atomic Energy and Radiation Control Act enacted by the 1967 Session South Carolina Legislature. [Section 13-7-40 et seq., S.C. Code of Laws (1976, as amended)].

8.3 "Adult" means an individual 18 or more years of age.

8.4 "Annually" means at intervals not to exceed 12 consecutive months.

8.5 "Calibration" means:

8.5.1 the response or reading of an instrument relative to a series of known radiation values over the range of the instrument; or

8.5.2 the strength of a source of radiation relative to a standard.

8.6 "Dedicated check source" means a source of radiation with a known value used to ensure a survey instrument is operational and responding to the levels of radiation in which it is designed to measure.

8.7 "Department" means the South Carolina Department of Health and Environmental Control.

8.8 "Dose" is a generic term which means absorbed dose, dose equivalent, effective dose equivalent, or total effective dose equivalent.

8.9 "Facility" means the location at which one or more particle accelerators are installed or located within one building, vehicle, or under one roof and are under the same administrative control.

8.10 "Healing arts" means any system, treatment, operation, diagnosis, prescription, or practice for the ascertainment, cure, relief, palliation, adjustment, or correction of any human disease, ailment, deformity, injury, or unhealthy or abnormal physical or mental condition.

8.11 "High radiation area" means any area, accessible to individuals, in which there exists radiation at such levels that the whole body could receive in any one hour, a dose in excess of 0.1 rem (mSv) in one hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.

8.12 "Individual" means any human being.

8.13 "Industrial use particle accelerator" means any particle accelerator used for nonhuman applications.

8.14 "Interlock" means a device for precluding access to a high radiation area by automatically reducing the exposure rate upon entry by personnel.

8.15 "Investigative limits" means a preset administrative level of radiation exposure over a set time, established by the Radiation Safety Officer or the Radiation Safety Committee, used to prevent an individual from exceeding annual occupational exposure limits.

8.16 "Limits" or "dose limits" means the permissible upper bounds of radiation doses.

8.17 "Monitoring", "radiation monitoring" or "radiation protection monitoring" means the measurement of radiation levels, concentrations, surface area concentrations or quantities of radioactive material and the use of the results of these measurements to evaluate potential exposures and doses.

8.18 "Occupational dose" means the dose received by an individual in a restricted area or in the course of employment in which the individual's assigned duties involve exposure to radiation, whether in the possession of the registrant or other person. Occupational dose does not include dose received from background radiation, as a patient from medical practices, from voluntary participation in medical research programs, or as a member of the general public.

8.19 "Operating procedures" means detailed written instructions including, but not limited to, use of the particle accelerator, use of shielding and barriers, quality assurance methods, occasions and methods for conducting area surveys, use of personnel monitoring devices, and alignment, calibration, or preventative maintenance of the particle accelerator. Routine and emergency radiation safety considerations are part of these procedures. Emergency procedures shall include methods of notifying proper persons in the event of an emergency, to include the listing of names, addresses and phone numbers.

8.20 "Operator" means a person qualified by training and experience as defined in RHC 3.2 to assume responsibility for the safe operation of a particle accelerator.

8.21 "Particle accelerator" means any machine capable of accelerating electrons, protons, deuterons, or other nuclear particles in a vacuum and discharging these particles into a medium external to the accelerating device.

8.22 "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 entities over which a federal government agency has exclusive jurisdiction.

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

8.24 "Protective barrier" means a barrier of radiation absorbing material(s) used to reduce radiation exposure. The types of protective barriers are as follows:

8.24.1 "Primary protective barrier" means the material, excluding filters, placed in the useful beam, to protect anyone from radiation exposure.

8.24.2 "Secondary protective barrier" means a barrier sufficient to attenuate the stray radiation to the required degree.

8.25 "Qualified expert" means an individual who has demonstrated to the satisfaction of the Department that such individual possesses the knowledge, training and experience to measure ionizing radiation, to evaluate safety techniques, and to advise regarding radiation protection needs.

8.26 "Radiation" means ionizing radiation, including gamma rays, x-rays, alpha particles, beta particles, high speed electrons, neutrons, high speed protons, and other atomic particles, but not sound or radio waves, or visible, infrared, or ultraviolet light.

8.27 "Radiation area" means any area accessible to individuals in which there exists radiation at such levels that the whole body could receive in any one hour, a dose in excess of 5 millirem (.05 mSv) at 30 centimeters from the radiation source or from any surface that the radiation penetrates.

8.28 "Radiation Safety Officer" means one who has the knowledge and responsibility to apply appropriate radiation protection regulations, and is approved in writing by the registrant.

8.29 "Registrant" means any person who is registered with the Department or is legally obligated to register with the Department pursuant to the Act and these regulations.

8.30 "Registration" means registering with the Department in accordance with these regulations and the Act.

8.31 "Rem" is the special unit of any of the quantities expressed as dose equivalent. The dose equivalent in rems is equal to the absorbed dose in rads multiplied by the quality factor (1 rem = 0.01 sievert). The quality factors for converting absorbed dose to dose equivalent are as follows:

QUALITY FACTORS AND ABSORBED DOSE EQUIVALENCIES

|  |  |  |
| --- | --- | --- |
| TYPE OF RADIATION | Quality Factor  (Q) | Absorbed Dose Equal to  a Unit Dose Equivalent\* |
| X-, gamma, or beta radiation | 1 | 1  a Unit Dose Equivalent |
| Alpha particles, multiple-charged particles, fission fragments, and heavy particles of unknown charge | 20 | 0.05 |
| Neutrons of unknown energy | 10 | 0.1 |
| High-energy protons | 10 | 0.1 |

\*Absorbed dose in rad equal to one rem or the absorbed dose in gray equal to one sievert.

8.32 "Restricted area" (controlled area) means any area, access to which is controlled by the registrant for purposes of protection of individuals from exposure to radiation. A "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.

8.33 "Revocation" means a facility’s registration is withdrawn and is required to cease operation of all particle accelerator equipment until such time as the Department deems necessary.

8.34 "Smear survey" means a survey performed to measure the amount of removable contamination.

8.35 "Source of radiation" means any radioactive material or any device or equipment emitting or capable of producing radiation.

8.36 "Survey" means an evaluation of the use 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.

8.37 "Target" means that part of a radiation head which by design intercepts a beam of accelerated particles with subsequent emission of other radiation.

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

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

8.40 "Vendor" means a person who is engaged in the business of selling, leasing, installing, or offering to sell, lease, or install particle accelerators or machine components or is engaged in the business of furnishing or offering to furnish particle accelerator services, which includes, but is not limited to, reinstalling, reassembling, leasing, servicing, maintenance, calibration, and repair of particle accelerator equipment, facility and shielding design, radiation surveys, instrument calibration, personnel dosimetry, processor cleaning and maintenance, and health physics consultations.

8.41 "Very high radiation area" means an area, accessible to individuals, in which radiation levels could result in an individual receiving an absorbed dose in excess of 500 rads (5 grays) in one hour at one meter from a radiation source or from any surface that the radiation penetrates. At very high doses received at high dose rates, units of absorbed dose (e.g., rads and grays) are appropriate, rather than units of dose equivalent (e.g., rems and sieverts).

Appendix A

For further requirements outlined for the following topics refer to R.61-64, X-Rays (Title B):

Registration Requirements-Servicing and Services (VENDORS) (Part II)

Out-of-state Facilities (Part II)

Radiation Dose Limits (Part III)

Control of Access to High and Very High Radiation Areas (Part III)

Caution Signs (Part III)

Posting Requirements (Part III)

Notification of Incidents (Part III)

Reports of Exposures and Radiation Levels Exceeding the Limits (Part III)

Notices, Instructions, and Reports to Workers: Inspections (Part X)

**Fiscal Impact Statement:**

There will be no increased costs to the State or its political subdivisions with the implementation of these amendments. This program is funded by the collection of fees from the regulated community as mandated by the Atomic Energy and Radiation Control Act. The Act requires the cost of running the program to be recovered through the collection of fees.

**Statement of Need and Reasonableness:**

This statement of need and reasonableness was determined by staff analysis pursuant to S.C. Code Section 1-23-115(C)(1)-(3) and (9)-(11).

DESCRIPTION OF REGULATION: R.61-65. Particle Accelerators (Title C).

Purpose: The amendment of R.61-65 is to update the regulation pertaining to particle accelerators and facilities that utilize particle accelerators.

Legal Authority: R.61-65. Particle Accelerators (Title C) is authorized by 1976 Code Section 13-7-45 et seq.

Plan for Implementation: Upon approval from the S.C. General Assembly and publication as a final regulation in the South Carolina *State Register*, a copy of R.61‑65 that includes these amendments, will be available electronically on the Department’s website under the Health Regulations Category at <http://www.scdhec.gov/Agency/RegulationsAndUpdates/LawsAndRegulations/> and subsequently in the Code of Regulations of the S.C. Code of Laws. Printed copies will be available for a fee from the Department’s Freedom of Information Office. Staff will educate the regulated community on the provisions of the Act and the requirements of the regulation.

DETERMINATION OF NEED AND REASONABLENESS OF THE REGULATION BASED ON ALL FACTORS HEREIN AND EXPECTED BENEFITS:

These revisions are needed in order to update the existing regulation due to changes in national standards of dosimetry. R.61-65 was last revised on July 27, 1984. The changes will clarify the requirements of facilities that utilize particle accelerators as well as state the responsibility of the radiation safety officer. The language changes will clarify many Sections and Parts of the regulation. This update will add new requirements that will promote greater health and safety to the public, delete requirements that are no longer applicable, and make stylistic and grammatical changes for clarity.

The changes are reasonable due to the fact that they will specify current national requirements of dosimetry and will be implemented with existing staff.

DETERMINATION OF COST AND BENEFITS:

This program is funded by the collection of fees from the regulated community as mandated by the Atomic Energy and Radiation Control Act. This Act requires the cost of running the program to be through the collection of fees. Fees are addressed and enforced through R.61-64. X-Rays (Title B). Pursuant to the implementation of the revised regulation, fees will be referenced in R.61-65 for convenience and clarification.

See Preliminary Fiscal Impact Statement above for cost to the State and its political subdivisions.

UNCERTAINTIES OF ESTIMATES:

There are no known uncertainties of estimates.

EFFECTS ON ENVIRONMENT AND PUBLIC HEALTH:

There is no anticipated effect upon the environment, provided that limits specified by R.61-65, Particle Accelerators (Title C), are adhered to. The amendments should have a positive effect upon the public health of the citizens of the state. The revision of R.61-65 will clarify the entire regulation.

DETRIMENTAL EFFECTS ON THE ENVIRONMENT AND PUBLIC HEALTH IF THE REGULATIONS ARE NOT IMPLEMENTED:

There are no anticipated detrimental effects on the environment if these changes are not implemented. The public health of the citizens would not be reduced over that which is present with the current regulations, however it would be increased with the added proposed requirements and clarifications.

**Statement of Rationale:**

As a result of the 2012, statutory five-year review of this regulation and due to advancing technologies, the Department has determined it necessary to substantially amend R.61-65. The revisions are intended to update the regulation based on current Departmental practices, national standards, and practices that will better promote safety to facilities that utilize particle accelerators. The language changes seek to clarify the regulation by making it more specific, better organized, and the intent more clear. In addition, revisions include amending the fee structure in accordance with the governing statute.