

**Radiation-generating Equipment Committee (REC)**  
**January 8, 2010**  
**Minutes**

**MEMBERS PRESENT**

Lawrence Osher, Chair  
Chuck Wissuchek  
Thomas Hangartner  
Ruth Hackworth  
Nina Mayr  
Mary Ann Accorinti

**MEMBERS ABSENT**

Kerry Krugh, Vice Chair  
Kathryn Gardner  
Jack Dukes  
Teresa Yates  
Nina Kowalczyk  
Brenda Johnson  
Sally Baden

**GUESTS**

Jill Paessun, Mt. Carmel Health System  
Susan Suchan, Mt. Carmel Health System  
Thavendra Rajah, Mt Carmel  
Nelundu Gupta, James Cancer

**ODH ATTENDEES**

Margie Wanchick  
James Castle  
David Lipp

-----  
The Radiation-generating Equipment Committee (REC) meeting was called to order by chairperson, Larry Osher at 10:20 a.m. The meeting was held at the Ohio Department of Health (ODH) in the Basement Training Room A at 35 Chestnut Street, Columbus, Ohio. The Sign-in Sheet serves as the Roll Call and official record of attendance.

**Past Minutes:** The committee reviewed the November 20, 2009 minutes. Tom Hangartner made a motion to accept the minutes as written; Ruth Hackworth seconded it, and the members present unanimously approved the motion.

**Old Business:**

Status of Rules

Margie Wanchick distributed a January 2010 new version of the X-ray Rule Status Log for the new Chapter 3701:1-67 therapy rules. Margie noted that the following draft rules need to be reviewed by the committee within the next two months to ensure that the draft rules will be out for public comment in April. The committee could continue to work on the Electronic Brachytherapy and Other Uses of Electronically-produced radiation for therapy while the other ten rules are on the web for public comment since these two rules are brand new and were not included in the current 66-14 and 66-15 therapy rules. The public comments will need to be reviewed in a May meeting. The final drafts from REC will be sent for approval at the June RAC meeting.

**New Business:**

The committee reviewed draft **rule 67-08 Shielding and Safety Design Requirements** and corresponding **Appendix A – Information on Radiation Shielding Required for Plan Reviews**. The committee recommended that paragraph (B) be changed to clarify that any installation after the effective date will require a facility design, and that a new paragraph (C) be added to specify another facility design be conducted when workload increases beyond the maximum for which the original facility design was used. One change in Appendix A was recommended for paragraph I.C. to clarify that areas struck by a secondary beam must be provided also. The edited version will become a permanent part of these minutes.

**Radiation-generating Equipment Committee (REC)**  
**January 8, 2010**  
**Minutes**

The committee reviewed draft **rule 67-09 Quality Assurance for Radiation Therapy Simulation Systems**. The committee recommended that paragraph (B) be modified to reflect the same language used in the current 66-14 rule so that the quality assurance, as listed in the AAPM reports, is not required but rather used as a basis. The rationale was stated that all the QA requirements listed in the AAPM reports are impossible to comply with. The edited version will become a permanent part of these minutes. Chuck Wissuchek asked if anyone knew whether there were quality assurance requirements for image quality in the radioactive material rules for nuclear medicine. He further explained: Given that the x-ray regulations have a good deal of regulations invested into their rules, it seems to make sense that the nuclear medicine images should also be held to some standards. No one at the table knew of any rules applicable to the subject. Therefore, the members decided to make a recommendation to Susan Hiatt, chair of RMC, to raise the question and to formally recommend that the RMC add the subject for consideration at a future RMC or RAC meeting.

The committee started a review of rule **67-05 Technical Requirements for Therapy Equipment Operating at Less than 500 kV**. The committee accepted the draft language in paragraphs (A)(1) to (A)(11). With time running out, the committee decided to continue the rest of this rule review at the next meeting.

**Added Old Business:**

The committee recommended editing of paragraph (F) of draft rule 67-03 as follows:

*(F) If the results of the surveys required by paragraphs (A) to (D) of this rule indicate any radiation levels in excess of the respective limits, the handler shall not operate the unit for patient care until the excessive radiation levels are corrected and the correction documented by the qualified medical physicist.*

Margie indicated that she would check on the impact these changes would have relative to the intent and interpretation of the existing language which was taken directly from the SSR.

**Future Meeting Dates: February 5, 2010 and March 5, 2010**

**Adjourn:** The meeting was adjourned at approximately 3:00 p.m.

**DRAFT January 20, 2010**

**3701:1-67-08** Shielding and safety design requirements.

- (A) Therapy equipment subject to rule 3701:1-67-05 and 3701:1-67-06 shall be provided with such primary and/or secondary barriers as are necessary to ensure compliance with rules 3701:1-38-12 and 3701:1-38-13 of the Administrative Code.
- (B) As of the effective date of this rule, facility design information for all installations of therapy equipment shall be conducted by a qualified medical physicist and submitted to the department prior to actual installation of the therapy equipment. The minimum facility design information that must be submitted is contained in the appendix to this rule.
- (C) For existing installations, if the current workload exceeds the maximum workload for which the facility was designed, then a survey shall be performed in accordance with rule 3701:1-67-03 of the Administrative Code.

|

## Appendix

## Information on Radiation Shielding Required for Plan Reviews

In accordance with paragraph (B) of rule 3701:1-67-08 of the Administrative Code, the following shielding requirements shall be met.

- I. For all therapy equipment:
  - A. Basic facility information shall include: registration name and number, telephone number, and the name of the individual responsible for preparation of the shielding plan; name and telephone number of the facility supervisor; and the street address and room number of the therapy equipment facility. The plan should also indicate whether this is a new structure or a modification to existing structure.
  - B. All wall, floor, and ceiling areas struck by the useful beam shall have primary barriers.
  - C. Secondary barriers shall be provided in all wall, floor, and ceiling areas struck by secondary beam.
- II. Therapy equipment up to 150 kV (photons only).

In addition to the requirements listed in Section I above, registrants handling therapy equipment which produce only photons with a maximum energy less than or equal to 150 kV shall submit shielding plans which contain, as a minimum, the following additional information:

- A. Equipment specifications, including the manufacturer and model number of the therapy equipment, as well as the maximum technique factors;
- B. Maximum design workload for the facility including total weekly radiation output (expressed in gray (rad) or air kerma at 1 meter) the total beam-on time per day or week, the average treatment time per patient, along with the anticipated number of patients to be treated per day or week;
- C. A facility blueprint/drawing indicating: scale [0.25 inch = 1 foot is typical]; direction of North; normal location of the therapeutic radiation machine's radiation port(s); the port's travel and traverse limits; general direction(s) of the useful beam; locations of any windows and doors; and the location of the therapeutic radiation machine control panel. If the control panel is located inside the therapy equipment treatment room, the location of the operator's booth shall be noted on the plan and the

## Appendix

operator's station at the control panel shall be behind a protective barrier sufficient to ensure compliance with rules 3701:1-38-12 and 3701:1-38-13 of the Administrative Code;

- D. The structural composition and thickness or lead/concrete equivalent of all walls, doors, partitions, floor, and ceiling of the room(s) concerned;
  - E. The type of occupancy of all adjacent areas inclusive of space above and below the room(s) concerned. If there is an exterior wall, show distance to the closest area(s) where it is likely that individuals may be present; and
  - F. At least one example calculation which shows the methodology used to determine the amount of shielding required for each physical condition [i.e.: primary and secondary/leakage barriers, restricted and unrestricted areas, entry door(s)] and shielding material in the facility:
    - 1. If commercial software is used to generate shielding requirements, identify the software used and the version/ revision date.
    - 2. If the software used to generate shielding requirements is not in the open literature, please also submit quality control sample calculations to verify the result obtained with the software.
- III. Therapy equipment operating over 150 kV.

In addition to the requirements listed in Section I above, registrants handling therapy equipment that produce photons with a maximum energy in excess of 150 kV and/or electrons shall submit shielding plans which contain, as a minimum, the following additional information:

- A. Equipment specifications including the manufacturer and model number of the therapy equipment, and gray (rad) at the isocenter and the energy(s) and type(s) of radiation produced [i.e.: photon, electron]. The target to isocenter distance shall be specified;
- B. Maximum design workload for the facility including total weekly radiation output [expressed in gray (rad) at 1 meter], total beam-on time per day or week, the average treatment time per patient, along with the anticipated number of patients to be treated per day or week;
- C. Facility blueprint/drawing [including both floor plan and elevation views] indicating relative orientation of the therapeutic radiation machine, scale [0.25 inch = 1 foot is typical], type(s), thickness and minimum density of shielding material(s), direction of North, the locations and size of all

## Appendix

penetrations through each shielding barrier [ceiling, walls and floor], as well as details of the door(s) and maze;

- D. The structural composition and thickness or concrete equivalent of all walls, doors, partitions, floor, and ceiling of the room(s) concerned;
- E. The type of occupancy of all adjacent areas inclusive of space above and below the room(s) concerned. If there is an exterior wall, show distance to the closest area(s) where it is likely that individuals may be present;
- F. Description of all assumptions that were in shielding calculations including, but not limited to, design energy [i.e.: room may be designed for 6 MV unit although only a 4 MV unit is currently proposed], workload, presence of integral beam-stop in unit, occupancy and use(s) of adjacent areas, fraction of time that useful beam will intercept each permanent barrier [walls, floor and ceiling] and "allowed" radiation exposure in both restricted and unrestricted areas; and
- G. At least one example calculation which shows the methodology used to determine the amount of shielding required for each physical condition [i.e.: primary and secondary/leakage barriers, restricted and unrestricted areas, small angle scatter, entry door(s) and maze] and shielding material in the facility:
  - (1) If commercial software is used to generate shielding requirements, also identify the software used and the version/ revision date; and
  - (2) If the software used to generate shielding requirements is not in the open literature, also submit quality control sample calculations to verify the result obtained with the software.

## IV. Neutron Shielding

In addition to the requirements listed in Section III above, registrants handling therapy equipment that are capable of operating above 10 MV shall submit shielding plans which contain, as a minimum, the following additional information:

- A. The structural composition, thickness, minimum density and location of all neutron shielding material;
- B. Description of all assumptions that were used in neutron shielding calculations including, but not limited to, neutron spectra as a function of

## Appendix

energy, neutron fluence rate, absorbed dose and dose equivalent (due to neutrons) in both restricted and unrestricted areas;

- C. At least one example calculation which shows the methodology used to determine the amount of neutron shielding required for each physical condition [i.e.: restricted and unrestricted areas, entry door(s) and maze] and neutron shielding material utilized in the facility:
    - (1) If commercial software is used to generate shielding requirements, also identify the software used and the version/ revision date; and
    - (2) If the software used to generate shielding requirements is not in the open literature, also submit quality control sample calculations to verify the result obtained with the software.
  - D. The method(s) and instrumentation that will be used to verify the adequacy of all neutron shielding installed in the facility.
- V. References
- A. NCRP Report 49, "Structural Shielding Design and Evaluation for Medical Use of X Rays and Gamma Rays of Energies Up to 10 MeV" (1976).
  - B. NCRP Report 79, "Neutron Contamination from Medical Electron Accelerators" (1984).
  - C. NCRP Report 144, "Radiation Protection for Particle Accelerator Facilities" (2003).
  - D. NCRP Report 151, "Structural Shielding Design and Evaluation for Megavoltage X and Gamma-Ray Radiotherapy Facilities. (2006).

**3701:1-67-09** Quality Assurance for Radiation Therapy Simulation Systems.

- (A) Quality assurance for a conventional or virtual simulator shall be conducted by a qualified medical physicist.
- (B) Quality assurance as required by paragraph (A) of this rule shall:
  - (1) Include acceptance testing and periodic verification of system performance; and
  - (2) Be performed in accordance with "Comprehensive QA for Radiation Oncology: Report of AAPM Radiation Therapy Committee Task Group No.40: AAPM Report No. 46" for a conventional simulator; or
  - (3) Be performed in accordance with "Quality assurance for computed tomography simulators and the computed tomography-simulation process: Report of the AAPM Radiation Therapy Committee Task Group No. 66: AAPM Report No. 83" for a virtual simulator.

Insert Source of where the reports can be obtained

Margie to discuss "basis" for AAPM reports