SUBJECT/TITLE: INTEGRITY OF RADIATION PROTECTION EQUIPMENT

PURPOSE: Define procedure to ensure integrity of radiation protection equipment.

DEFINITION: Radiation Protection Equipment (RPE) includes lead aprons and thyroid shields.

POLICY: All Radiation Protection Equipment will be evaluated annually or a visual defect is detected.

PROCEDURE:

1. The clinical chief technologist or manager for each area will assure that equipment is evaluated and will maintain a record of each piece of equipment in their area.

2. RPE will be individually marked with a unique identification number.

3. All RPE will be physically examined for defects such as tears, perforations and thinning creases on an annual basis or upon request from staff.

4. There are three methods of RPE evaluation that may be used.

   Visual/Tactile Inspection requires careful inspection of the apron to determine integrity of equipment.
   - Lay RPE out on a flat surface and visually check all of the seams and the outer and inner covers for any visible damage.
   - Check the belts and fastening devices to confirm there are in good shape and work correctly.
   - Feel the surface of the apron for any lumps, cracks, or evidence of separation from the seams or sagging.
   - If any defects are discovered, the apron should be inspected using radiographic or fluoroscopic equipment.

   Fluoroscopic Inspection should be performed on remotely operated equipment, if available.
   - Lay out item on table.
• Examine entire item using the lowest technique factors that yield a satisfactory image.
• Do not use automatic brightness control, as this will result in unnecessary radiation exposure to personnel and wear on the tube.
• Shielded areas will appear dark and defects, seams and stitching will appear light.

Radiographic Inspection should be performed on remotely operated equipment, if available.
• Lay out item on table.
• Examine entire item using 70 KV and 5 MAS.
• Shielded areas will appear dark and defects, seams and stitching will appear light.

CT Inspection:
• Lay out item on table (may be able to inspect multiple aprons with one scan).
• Perform topogram scan (scout) and review for defects.
• Example technique: 80 kVp and 50 mA.

5. RPE that does not pass physical inspection must be inspected using fluoroscopic or CT equipment before returning to service.

6. If RPE passes inspection, record date of inspection on log sheet and return to service.

7. Criteria for rejection:
• Any defect in thyroid shield (visual or radiographic)
• Any defect over a critical organ (eg; gonads or thyroid)

Table below gives more specific information related to type of apron and site of defect.

<table>
<thead>
<tr>
<th>Table 2. Maximum tolerable tear length (cm) $H = 100$ mSv.</th>
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<td>Rejection criterion</td>
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(reference 3)
8. Lead is a toxic hazardous waste. Defective RPE must be collected by EHS for disposal. All defective equipment will be taken out of service and destroyed according to HPO policy and notation will be made on the inventory log sheet.

Refer to HPO policy: Managing selected waste types. 
http://www.uiowa.edu/%7Ehpo/manuals/wastman/wastman.pdf

References:

