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| **RS 3400 Irradiator Maintenance** |
| **Purpose** | To ensure the irradiation using the RS 3400 irradiator meets expected criteria and that the instrument is maintained in an operation state, according to manufacturer’s instructions |
| **Policy Statements** | * A radiation survey is conducted to provide assurance that radiation emitted from the cabinet x-ray system shall not exceed and exposure of 0.2 millirroentgens in one hour at any point five centimeter outside the external surface.
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| **Materials** | **Equipment** | **Supplies** |
| Radiation Survey Meter | Soft cloth with mild soap |
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| **Procedure** |  |
|  | **Step** | Action |
| Monthly | 1 | Clean the outside of the irradiator and the canisters.**NOTES:*** Do not allow cleaners or water to drip into panels or chamber.
* Only use a damp cloth with mild soaps.
 |
|  | 2 | Inspect the door interlock mechanism. * Verify that the interlock tongue attached to the chamber door has no obvious faults such as cracks or missing hardware.
* Verify that the interlock tongue inserts into the door interlock freely and properly.
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|  | 3 | Inspect the power cord. Verify the cord is not frayed and the insulation is not cut. |
|  | 4 | Document monthly maintenance on TSf 17.10.2 QC and Maintenance of Blood Bank Equipment |
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|  | **Step** | Action |
| Semiannually | 1 | Timer Check:* Run the irradiator for the set cycle time
* Record results on the TSf 17.21.1.1 RS 3400 Timer Verification
* Acceptable results $\pm $ 2 seconds
 |
|  | 2 | Dosimetry:* Follow instructions provided from vendor.
* Return package to vendor as stated in the instruction. The vendor will process the dosimeters and results will be mailed within 7-10 days.
* Reports will be reviewed by the TS Tech Specialist
* Pace does mapping report in RS 3400 QC Notebook

Acceptable range: a minimum of 1500 Rads in any region.

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| **If** | **Then** |
| The does is <1500 Rads in any region | * Suspend Operations
* Refer to TS 17.26 backup procedure
* Contact RadSource
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**NOTE:** Dosimetry will be performed every 6 months. A package containing blood phantoms with instructions on running them through a cycle will be sent. |
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| Annual Radiation Survey | **Step** | **Action** |
|  | 1 | Start the irradiation cycle.**Note**: The chamber should be empty. |
|  | 2 | Position the radiation survey meter so that the detector area faces the surface of the machine and the readout is visible. |
|  | 3 | Move the radiation detector approximately 2 inches from the surface of the machine. |
|  | 4 | Move the detector from left to right, then move the detector down approximately 2 inches and slowly sweep from right to left again using a slow sweeping motion. Continue the sweeping motions until the upper half of the machine has been surveyed. Repeat steps 3 and 4 on the rear, left and right of the machine.**NOTE:** Since the x-ray source inside the chamber is at the center of the chamber, it is necessary to carefully survey the complete outline of the door and the entire door itself |
|  | 5 | While performing the above stops note the highest reading observed on form TSf 17.21.1.2 RS 3400 Irradiator Radiation Survey

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| **If** | **Then** |
| All reading observed are below the maximum allowed | The survey is passed and “Yes” must be circled in the table next “Survey Passed?”. |
| While performing the survey any reading exceeds the cabinet emissions requirement | Immediately stop the machine by pressing the E-Sop button, document the results and notify technical specialist |

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|  | 6 | Document yearly maintenance on TSf 17.10.2 QC and Maintenance of Blood Bank Equipment |
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|  | **Step** | **Action** |
| Performed by Qualified Service Technicians only | 1 | Inspect and service the following annually during the scheduled preventative maintenance (PM):* Coolant level
* Canister holder mounts and bearings
* Water connections
* HV cable
* Safety ground check
* Chamber door hinge
 |
|  | 2 | Replace the following items biannually during the scheduled PM:* Dose sensor
* Rotator motor
* Door interlock switch
* Flow and temp sensor
 |
|  | 3 | Replace the following items every 3 years during the scheduled PM:* Timer display
* HV cable
* Vacuum power supply replacement
* Water pump
* Door magnet and control assembly
* Key switch
* Incandescent display light bulbs
 |
|  | 4 | Inspect and service the following every 4 years during the scheduled PM:X-ray source |
|  | 5 | Replace the following items every 5 years during the scheduled PM:* Access door sensor
* Control PCB
* Dose Monitor PCB
* Mains Relay
* Solid stat relay for generator power
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| **References** | 1. RS 3400 Operator’s Manual, Revision: 7, Rad Source Technologies, Inc.
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| **Approval****Workflow** | Transfusion Service/Lab Director |
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| **Historical Record** | **Version** | **Written/Revised by:** | **Effective Date:** | **Summary of Revisions** |
| 1 | S. Cassidy | 03/01/2021 | Initial Version |