

GIS GMP-002 Preventative Maintenance Procedure

PART 1: ANSI CATEGORY I:

The Irradiator make and models on which this license authorizes service work and that apply to this procedure are:

1. J.L. Shepherd Mark 1 Series (Registration Number CA 598-D-104-S)
2. J.L. Shepherd Model 484 (Registration Number CA 598-D-113-S)
3. J.L. Shepherd Model 89 (Registration Number CA 598-D-108-S)
4. J.L. Shepherd Model 143 (Registration Number CA-598-D-103-S)
5. J.L. Shepherd Model 109 (Registration Number CA 598-D-116-S)
6. CIS-US Model IBL 437 (Registration Number MA 0219-D-813-S)
7. Gammacell 40 (Registration Number NR-1307-D-101-S or NR-0169-D-132-U)
8. Gammacell 1000 & 3000 (Registration Number NR-1307-D-102-S or NR-0220-D-840-S)
9. Eberline 1000B (Registration Number NR-8105-D-805-S)
10. Gammacell 220 (Registration Number NR 0220-D-831-S or NR-8135-D-804-S)
11. Gammacell 200 (Registration Number NR-8003-D-802-S)
12. Gammator Model M, M34, M38, G50, G100, G150 and G 200 (Registration Number NR-0880-D-806-S)
13. J.L. Shepherd Model Gammacell 220R (Registration Number CA 598-D-118-S)
14. J.L. Shepherd Model 142-MA (Registration Number CA 598-D-131-S)
15. J.L. Shepherd Model 149 Series (Registration Number CA 598-D-109-S)
16. J.L. Shepherd Model Mark IV Dosimeter Irradiator (Registration Number CA 598-D-105-S)

Prerequisites:

1. Verify work procedure is authorized via AP-004.
2. Verify Irradiator make and model is authorized.
3. Determine identities of all personnel involved in the job.
4. Determine adequacy of training and experience.
5. Determine adequacy of dosimetry.
6. Determine availability of equipment and instrumentation. Wherever possible, replacement parts will be obtained from the manufacturer. Replacement parts will be in conformance with the parts that have been identified in the sealed source and device registration and in agreement with the manufacturer's recommendation. Any non-manufacturer supplied replacement components or the use of materials (e.g, lubricants) other than those specified or recommended by the manufacturer will be evaluated to ensure that they do not degrade the engineering safety analysis performed and accepted as part of the device registration before they are used.
7. Verify ready availability of GIS EMP-001 for use in emergency procedures.

If these operations are not performed properly with attention to radiation safety principles, the irradiator may not operate as designed and personnel performing these tasks could receive radiation doses exceeding NRC limits. Only personnel with documented training on the Category I model being serviced can perform work on the device; personnel will follow appropriate procedures consistent with the manufacturer's written instructions and recommendations that address radiation safety concerns at all times.

Preventative maintenance will be completed with the Irradiator Inspection/Performance Test Report. Test of all items listed in the specific Irradiator Inspection/Performance Test Report will be identified as OK with a yes or no. Any items that are deficient will be corrected and noted in the comment section. A typical procedure for preventative maintenance of Category I irradiators is outlined below:

1. Perform a dose rate survey with the highest contact and 30 cm reading.
2. Perform a leak test prior to working on the device.
3. Test all electrical components for tight connections and relay operability. Test switches independently to ensure switches used in the safety system have not failed closed. Check timers against a calibrated stopwatch for accuracy.
4. Check mechanical components for wear and replace as needed. Drive motors, bearings, chains, sprockets and set screws will be checked, lubricated and or adjusted as needed.
5. Check pneumatic systems for leakage (internal and external); if multiple sources are used then system will be checked for unison.
6. Operate the device 35 times or sufficient amount of times to ensure proper operation.
7. Any items that cannot be corrected will be noted. If failed items are part of the safety system, the device will be tagged out of service until the problem is corrected. Determine if the failure could cause a substantial safety hazard per 10 CFR part 21.21. Notify facility RSO and regulatory authorities as needed: Make notifications per Table 8 in the Radiation Safety Manual (10 CFR part 30.50) and 10 CFR 21.21 as applicable.
8. Upon completion of service visit, provide a copy of the Irradiator Inspection/Test Report to the customer. Communicate any problems or recommendations.

PART 2: ANSI CATEGORY II:

The irradiator make and models on which this license authorizes service work and that apply to this procedure are:

1. J.L. Shepherd Model 28 (Registration Number CA 598-D-106-S)

2. J.L. Shepherd Model 81-8, 81-8EXT, 81-10, 81-12, 81-12EXT, 81-14, 81-16, 81-18, 81-20, 81-22, 81-24, 81-26 (Registration Number CA 598-D-115-S)
3. J.L. Shepherd Model 142 (Registration Number CA 598-D-114-S)
4. J.L. Shepherd Model 78-2M (Registration Number CA 598-D-107-S)

Prerequisites:

1. Verify work procedure is authorized via AP-004.
2. Verify Irradiator make and model is authorized.
3. Determine identities of all personnel involved in the job.
4. Determine adequacy of training and experience.
5. Determine adequacy of dosimetry.
6. Determine availability of equipment and instrumentation. Wherever possible, replacement parts will be obtained from the manufacturer. Replacement parts will be in conformance with the parts that have been identified in the sealed source and device registration and in agreement with the manufacturer's recommendation. Any non-manufacturer supplied replacement components or the use of materials (e.g, lubricants) other than those specified or recommended by the manufacturer will be evaluated to ensure that they do not degrade the engineering safety analysis performed and accepted as part of the device registration before they are used.
7. Verify ready availability of GIS EMP-001 for use in emergency procedures.

If these operations are not performed properly with attention to radiation safety principles, the irradiator may not operate as designed and personnel performing these tasks could receive lethal radiation doses. Only personnel with documented training on the Category II model being serviced can perform work on the device; personnel will follow appropriate procedures consistent with the manufacturer's written instructions and recommendations that address radiation safety concerns at all times.

Preventative maintenance will be completed with the Irradiator Inspection/Performance Test Report. Test of all items listed in the specific Irradiator Inspection/Performance Test Report will be identified as OK with a yes or no. Any items that are deficient will be corrected and noted in the comment section. A typical procedure for preventative maintenance of Category II irradiators is outlined below:

1. Verify that the source is in the stored position (green light illuminated) then remove the key from the control panel; disconnect the air supply or electrical power to the source drive so the source cannot move.
2. Perform a dose rate survey as the irradiator room is entered; the survey instrument will be kept on while in the area at all times.
3. Perform a leak test prior to working on the device.
4. Insert the beam plug; this shielding will remain in place until the service work is completed.

5. Test all electrical components for tight connections and relay operability. Test switches independently to ensure switches used in the safety system have not failed closed. Check timers against a calibrated stopwatch for accuracy.
6. Test all safety interlocks independently to ensure proper operation such as scram switches, set-up switch, photo-cells, door switches, audible and visual alarms, etc.
7. Check mechanical components for wear and replace as needed. Cables, drive motors, bearings, chains, sprockets and set screws will be checked, lubricated and or adjusted as needed.
8. Check pneumatic systems for leakage (internal and external).
9. Reconnect the air or electrical supply and operate the device 35 times or sufficient amount of times to ensure proper operation.
10. Any inspection items that cannot be corrected will be noted. If failed items are part of the safety system, the device will be tagged out of service until the problem is corrected. Determine if the failure could cause a substantial safety hazard per 10 CFR part 21.21. Notify facility RSO and regulatory authorities as needed: Make notifications per Table 8 in the Radiation Safety Manual (10 CFR part 30.50) and 10 CFR 21.21 as applicable.
11. Upon completion of service visit, provide a copy of the Irradiator Inspection/Test Report to the customer. Communicate any problems or recommendations.