

**DAYTON X-RAY COMPANY**  
Dayton, Ohio

Application for  
NRC QA Program Approval

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Dayton X-Ray Company  
Dayton, Ohio

## **11.0 Description of Quality Assurance Program for Type B Quantity Shipments of Radioactive Material**

### **11.1 Organization**

- a. Dayton X-Ray Company pursuant to 10 CFR 71.12 and 10 CFR 71.51(a) is responsible for a QA program for Type B quantity shipments and transportation of radioactive material. Fabrication and design of Type B packages are not included.
- b. Chart 8A depicts the organizational structure.
  - 1) The Radiation Safety Officer is responsible for administration of the program, training of personnel, procurement of manufacturer's certifications, maintaining packaging and shipping documents, retention of records and program audits.
  - 2) Radiographers are responsible for handling, storing, shipping and transporting radioactive packages; and they are responsible for inspections, surveys and maintenance reports.
  - 3) Assistant radiographers have no quality assurance program responsibility.

### **11.2 Quality Assurance Program**

- a. Radiographers are trained to inspect radiography devices prior to use or shipment according to the manufacturer's recommendations; and prepare packages for shipment in company vehicles and by common carriers. This training is an integral part of the formal training and on-the-job training which is required of radiographers and approved under the NRC Materials License issued to Dayton X-Ray Company.
- b. The QA program will be viable, requiring management approval, and the program encompasses specific requirements stated in the package approval for use, and general radiation safety and shipping requirements.
- c. Manufacturer's certifications will be requested and maintained on all NRC Type B packages manufactured and procured after January 1, 1979.

### **11.3 Document Control**

- a. Packaging, shipping, inspecting and handling instructions from the manufacturers shall be maintained for each model Type B Protection package.
- b. The RSO shall insure that the shipment and transportation of Type B packages is conducted in accordance with the above documents.

#### 11.4 Handling, Shipping, Transporting and Storage

- a. Packaging - Radiography devices shall be packaged as follows (in accordance with the manufacturers' instructions):

Gamma Century Series	USA/9135/B(U) or USA/6717/B(U)
Gamma C-10	USA/6717/B(U)
Gamma Gammatron 50A	USA/9126/B(U)
Technical Operations Model 741	USA/9027/B(U)
Technical Operations Model 660	USA/9033/B(U)
Technical Operations Model 650	USA/9032/B(U)
Eon Corporation Model 64-764	DOT 7A Type A

The package must be inspected to determine that it is the appropriate specification, in good physical condition and is properly sealed. The above package may be placed in another container or overpack.

#### b. Markings

- 1) Proper shipping name and identification number  
RADIOACTIVE MATERIAL, SPECIAL FORM, N.O.S. UN2974
- 2) Package Identification  
e.g. USA/9135/B(U) TYPE B  
Outside container in lieu of package identification  
INSIDE PACKAGE COMPLIES WITH PRESCRIBED SPECIFICATION
- 3) Consignor's name and address  
DAYTON X-RAY COMPANY  
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- 3) Gross weight if in excess of 110 pounds

#### c. Labels

- 1) Two radioactive labels must be on opposite sides of the package or outside container such that the maximum surface radiation level and transport index do not exceed the limits specified in the following table:

LABEL	SURFACE MAXIMUM mrem/hr	TRANSPORT INDEX
Radioactive White I	0.5	---
Radioactive Yellow II	50	1.0
Radioactive Yellow III	Above 50	Above 1.0

The information on the labels may be appropriate maximum limiting values.

- 2) When a radioactive material package is offered for transportation to a common carrier the surface radiation level must not exceed 200 mrem/hr and the transport index must not exceed 10.0.
- 3) One CARGO AIRCRAFT ONLY label must be affixed to the package when offered for transportation by air.



d. Placards and Signs

- 1) RADIOACTIVE placard - Vehicle or dark room in which radioactive material is transported will be identified with RADIOACTIVE placards visible on four sides of the vehicle when transporting a Radioactive Yellow III labeled package.
- 2) CAUTION - RADIOACTIVE MATERIAL sign with radiation symbol may be placed on dark room whenever radioactive material is transported inside, although it is not required during transportation. (If the dark room is used for temporary storage at a job site and the camera is not packaged for transportation, then a CAUTION - RADIOACTIVE MATERIAL sign must be placed on the dark room.)

e. Radiation Survey

- 1) Survey the outside of the vehicle to be certain that radiation levels do not exceed 200 mR/hr at any exterior surface or 10 mR/hr at 2 meters (6.6 feet) from any exterior surface during transport. When the vehicle is used for storage of the radiography devices the radiation levels must not exceed 2 mR/hr or 100 mR in seven days at any accessible exterior surface.
- 2) If the cab is to be occupied by individuals without personnel monitoring the maximum radiation level at any normally occupied position must not exceed 2 mR/hr.

f. Shipping papers

- 1) Shipping papers must be accessible to the driver when at the controls and evident to anyone entering the cab when the driver is not present or incapacitated.
- 2) Shipping papers must contain the following information:
  - a) Proper shipping name and identification number  
e.g. RADIOACTIVE MATERIAL, SPECIAL FORM, N.O.S. UN2974
  - b) Radionuclide and activity  
e.g. Iridium 192 120 Ci
  - c) Labels applies and transport index  
e.g. Radioactive Yellow III 1.2 TI
  - d) Package Identification  
e.g. USA/9135/B(U)
  - e) CARGO AIRCRAFT ONLY when offered for transportation by air.
  - f) Certification statement when offered for transportation by a common carrier.
  - g) When offered for transportation by air the following statement must be added to the certification statement:  
This shipment is within the limitations prescribed for ~~passenger-aircraft~~/cargo aircraft only.

- g. Security - Always keep the locked camera in a locked dark room or a locked vehicle. Keys to the dark room and vehicle must remain with the driver at all times. Secure the camera to prevent movement during transport.
- h. Radiography personnel will determine the completeness of package inspections and presence of manufacturer's certifications before shipment.

#### 11.5 Inspections, Surveys and Maintenance Reports

- a. Inspections and surveys are performed daily prior to use by radiographers on Type B packages pursuant to the approved Dayton X-Ray Company operating and emergency procedures. Equipment and packaging requiring maintenance is brought to the attention of the RSO by radiographers when equipment is returned to permanent storage after a job. Records of maintenance performed on Type B packaging is maintained for at least two years pursuant to 10 CFR 34.28.
- b. Quarterly inspections and maintenance of Type B packages will be performed by the RSO and reports maintained for two years pursuant to the requirements of 10 CFR 34.28.

#### 11.6 Quality Assurance Records

- a. Utilization logs, shipment records, package surveys and quarterly inspection records will be maintained for at least two years in accordance with the requirements of 10 CFR Part 20 and Part 34.
- b. Training records of personnel are maintained for at least three years in accordance with the requirements of 10 CFR Part 34.
- c. Procedures and instructions for equipment and packaging are maintained by the Radiation Safety Officer for the duration of possession of the equipment and packaging.

#### 11.7 Audits

- a. Radiographers receive an unannounced audit in the field at least quarterly by the RSO.
- b. The audit determines if a radiographer is performing the daily inspection of the equipment, including Type B packages, prior to use; and that the radiographer is properly preparing the Type B packages for transportation. A checklist of items included in the audit is used, and a record of the audit is maintained for at least two years pursuant to 10 CFR 34.11(e).
- c. Any deficiencies revealed by the audits are brought to the attention of the radiographer and corrected.

DAYTON X-RAY COMPANY  
Dayton, Ohio

ORGANIZATIONAL CHART

