TRANSPORT CONTAINER SHIELDING TEST PROCEDURE

Design Approval	D W Rogers D W Rogers (signature) date: 20/06/2008
Quality System Approval	B S Patel B S Patel (signature) date: 23 June 2008
Date implemented	31 JUL 2008
Controlled file number	

1.0 PURPOSE AND SCOPE

The purpose of this procedure is to survey and quantify the shielding performance of transport containers for gamma emitting nuclides. The results may be used for manufacturing quality control using the pass/fail criteria or, without them, for design validation.

2.0 REFERENCES

TS-R-1 : Regulations for the Safe Transport of Radioactive Material, current edition, IAEA, Vienna.

3.0 EQUIPMENT

3.1 INSTRUMENTATION

- Package monitor (gamma), minimum range 1 - 2,000 µSv/h.
- Finger probe (gamma), maximum detector dia 40 mm., minimum range 50 - 2,000 µSv/h.
- Beta/ Gamma contamination probe (optional).

3.2 OTHER EQUIPMENT

- Transport container.
- Total content activity not less than 33% of licensed capacity, unless otherwise specified, in the form normally carried and evenly distributed inside the container.
- Metre rule.

4.0 PROCEDURE

4.1 SAFETY

- This procedure carries the risk of collecting a large radiation dose if it is not conducted in the right sequence.
- Barrier off an area around the container sufficiently large to maintain perimeter doserates at levels acceptable to personnel not involved in this operation.
- Ensure all operations comply with your local safety rules and procedures.

4.2 DESCRIPTION

Unless otherwise specified the test is performed in three parts on the fully assembled package:

- As soon as practicable after the container is loaded approach container cautiously and monitor for unusually high radiation readings. If safe to continue, scan entire surface, including base, for short paths and hot spots. Pay particular attention to areas of potential design/manufacturing weakness such as drain points, clearances between interlocking components, likely positions of casting defects etc. Record peak readings.
- Only when it has been established that all dose levels are within permitted limits record measurements at regular intervals along four vertical equi-spaced lines from top to bottom and their joining lines across top and bottom faces.
- Survey at one metre from surface, including base, and record maximum levels.

4.3 NOTES

- Perform the test in as low a background radiation area as possible.

- Containers with depleted uranium shielding should also have their surface doserates in the centre of each side and the top surface recorded when unloaded.

4.5 PASS/FAIL CRITERIA

This is only applicable when the procedure is applied as a manufacturing acceptance test. When the results are scaled up linearly to the maximum licensed content activity:

- Maximum surface dose rate must not exceed 2.0 mSv/h (TS-R-1).
- Maximum dose rate at one metre from the surface must not exceed 100 μSv/h (TS-R-1).
- In the event of a FAIL result label flask clearly "Failed QC" or "Quarantine" unless otherwise specified.

5.0 DOCUMENTATION

5.1 CHECKLIST

To ensure all operations are adequately planned it is recommended that a checklist be used. This should contain all key instructions together with the data logging requirements, pass/fail criteria and space for observations.

5.2 RECORDS

- Complete report as the test progresses.
- Quote all activities in content activity, not output, referenced to the day of the test.
- Record all pertinent observations, if necessary taking photographs.
- Ensure completed report is reviewed and countersigned by either a test witness or your supervisor.
- Unless otherwise specified file report in manufacturing dossier or maintenance log.