ORNL
INSTRUMENT EVALUATION SUMMARY

Bicron RSO-5

Description: The Bicron RSO-5 is a portable dose rate instrument that uses a vented ion chamber to measure beta-gamma radiation. The RSO-5 has four ranges of operation, 0 - 5, 0 - 50, and 0 - 500 mR/hr, and 0 - 5 R/hr.

Ranges Tested: 5 and 50 mR/hr

Report Date: September 21, 1995

General Comments:

1. Readings on the 5 mR/hr range were somewhat erratic due to the level of radiation used to test the range. Unless otherwise noted, this was considered normal.

RADIATION RESPONSE

Probe Surface Sensitivity: N/A

ELECTRONIC and MECHANICAL REQUIREMENTS and TESTS

Line Noise: N/A

INTERFERING RESPONSES TEST RESULTS

Radio Frequency Fields: Acceptable from 0.3 to 2 MHz and 140 MHz at 50 volts/meter for each range tested. The 50 mR/hr range was acceptable for the 2 MHz to 35 MHz scan. Response abnormalities were observed on one instrument during the scan at 16.5, 24.3, and 34.1 MHz.

Microwave Fields: Acceptable at 2.45 GHz on each range tested. One instrument had a low mean response at 915 MHz on the 5 mR/hr range and went to 0 on the 50 mR/hr range. The intensity of each field was 0.4 Watts/meter^2 (915 MHz) and 2.0 Watts/meter^2 (2.45 MHz).

Electric Fields: Acceptable when exposed to electrostatic (5000 volts/meter), 60 and 400 Hz (100 volts/meter).

Magnetic Fields: Acceptable when exposed to 10 Gauss.

Interfering Ionizing Radiations: Not performed.

ENVIRONMENTAL FACTORS

Temperature: Acceptable at temperatures > -10 °C and < 50 °C (14 °F to 122 °F) when operated in the 5 mR/hr range. Acceptable at temperatures ³ -10 °C and < 50 °C when operated in the 50 mR/hr range.

Temperature Shock: In general, the RSO-5 exhibited response abnormalities when exposed to rapid temperature changes. One of the three tested was acceptable throughout the test on the 5 mR/hr range. Two of the three tested remained acceptable for the duration of the test on the 50 mR/hr range. Specific information may be obtained by reviewing the temperature shock test report.

Humidity: Acceptable from 40% to 95% relative humidity (RH) when operated in the 50 mR/hr range. When operated in the 5 mR/hr range, one of the instruments tested had lower than acceptable responses at 95% RH and another instrument had higher than acceptable responses at 95% RH.

Ambient Pressure: Acceptable from 525 to 795 mmHg when corrected for pressure. (20.66 inHg to 31.3 inHg).