

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: March 9, 2001

General Comments:

1. Confidence intervals used to ascertain whether results are conclusive or inconclusive are determined using the 0.95 quantile of the student's t distribution (95% confidence interval).

RADIATION RESPONSE

Probe Surface Sensitivity: N/A

ELECTRONIC and MECHANICAL REQUIREMENTS and TESTS

Line Noise: N/A

INTERFERING RESPONSES TEST RESULTS

Radio Frequency/Microwave Fields: No susceptibilities were indicated during exposure to a scan from 100 kHz to 1000 MHz at 20 (± 2) volts/meter amplitude modulated with 1 kHz at 80%, and at 1800 and 2450 MHz.

Electric Fields: Not performed.

Magnetic Fields: Acceptable when exposed to 10 Gauss and 60 Hz AC in two orientations relative to the field lines.

Interfering Ionizing Radiations: Not performed.

ENVIRONMENTAL FACTORS

Temperature: Changes in temperature caused response problems with two of the three units tested. Problems were observed at temperatures above and below 22 °C.

Temperature Shock: In general, the RSO-5 exhibited response abnormalities when exposed to rapid temperature changes of 22 to -10, -10 to 22, 22 to 50, and 50 to 22 (in °C). Response changes were more apparent when exposed to a rapid change from 22 to -10 °C. Specific information may be obtained by reviewing the temperature shock test report.

Humidity: Acceptable results when exposed to a relative humidity level of 95% (non-condensing) for eight hours, and upon return to 40% for 4 hours at 25 ± 2 °C.

Vibration: Not performed.

Ambient Pressure: Not performed.