

ORNL INSTRUMENT EVALUATION SUMMARY

Eberline RO-20

Description: The RO-20 is a five-range portable instrument that utilizes a vented ion chamber to measure beta-gamma radiation. The ranges are 5 mR/hr (0 - 5 mR/hr), 50 mR/hr (0 - 50 mR/hr), 500 mR/hr (0 - 500 mR/hr), 5 R/hr (0 - 5 R/hr), and 50 R/hr (0 - 50 R/hr).

Summary Date: March 26, 2002

Ranges Evaluated: 5 mR/hr

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).
2. This evaluation was performed on three RO-20s randomly selected from a new procurement.

RADIATION RESPONSE

Probe Surface Sensitivity: N/A

ELECTRONIC AND MECHANICAL REQUIREMENTS

Line Noise: N/A

INTERFERING RESPONSES TEST RESULTS

Radio Frequency/Microwave: Each RO-20 had acceptable results when exposed to a scan from 100 kHz to 1000 MHz at 20 Volts/meter modulated at 1 kHz 80%.

Magnetic Fields: No susceptibilities were indicated when exposed to a 10 gauss DC field and a 60 Hz AC field in two orientations.

ENVIRONMENTAL FACTORS

Temperature: In general, each instrument had acceptable results when exposed to temperatures from -10 to 50 °C ($+14$ to 122 °F).

Temperature Shock: Results obtained indicate that RO-20s are susceptible to rapid changes in temperature from 22 to -10 °C. No out of tolerance readings were obtained when exposed to the other rapid changes of -10 to 22 , 22 to 50 , and 50 to 22 °C, although some susceptibility to these changes exists. Specific information is available on the test report.

Humidity: Each instrument had acceptable results when exposed to a relative humidity level of 95% (non-condensing) for twenty-four hours, and upon return to 40% for 4 hours at 30 ± 2 °C.

Vibration: Not performed.