ORNL
INSTRUMENT EVALUATION SUMMARY

NRC Model CP-10A Ion Chamber

Description: The CP-10A is a three-range portable instrument that utilizes a vented ion chamber to measure beta-gamma radiation. The ranges are X 1 (0 - 100 mR/hr), X 10 (0 - 1000 mR/hr), and X 100 (0 - 10,000 mR/hr).

Ranges Evaluated: X 1 (0 to 100 mR/hr)

Report Date: December 16, 1996

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).

INTERFERING RESPONSES TEST RESULTS

Radio Frequency/Microwave Fields: No response abnormalities were observed when exposed to 140, 915, and 2450 MHz at 20 (+10, -0) volts/meter. During the scan evaluation from 0.1 to 1000 MHz, each instrument had observable susceptibilities at frequencies from 620 to 788 Mhz.

Electric Fields: No response abnormalities were observed during exposure to the electrostatic field (5000 volts/meter), and 60 and 400 Hz fields at 40 volts/meter.

Magnetic Fields: No response abnormalities were observed during exposure to the 10 Gauss (DC) or 1.26 Gauss (60 Hz AC) magnetic fields in both orientations used.

ENVIRONMENTAL FACTORS

Temperature: Each CP-10A was acceptable at temperatures from -10 °C to 40 °C (+14 °F to + 104 °F). All CP-10As went out-of-tolerance low at 50 °C (122 °F).

Temperature Shock: Instruments were evaluated after exposure to rapid temperature changes of 22 to -10, -10 to 22, 22 to 50, and 50 to 22 (in °C). All instruments indicated a susceptibility to rapid temperature changes of 22 to 50 °C.

Humidity: No response abnormalities were observed during and after exposure to 95% relative humidity at 22 ± 2 °C.

Vibration: No response abnormalities were observed after being vibrated at 15 and 28 Hz with an amplitude of 2 Gs in each of the three orientations used. Post-vibration results were also acceptable.