ORNL
INSTRUMENT EVALUATION SUMMARY

Eberline/LANL TA-55 Alpha Air Monitor

Description: The Eberline/LANL TA-55 Alpha CAM is a solid-state detector based continuous alpha air monitor. The TA-55 CAM uses a single-channel analyzer to determine airborne alpha activity and indicates response using a logarithmic meter.

Ranges Tested: N/A

Report Date: March 22, 2002

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: No response changes were indicated or alarms activated during and after exposure to combination wave and ring wave pulses at 2kV amplitude.

Power Line Variations: No response changes were observed when the TA-55 CAM was operated at 103 and 129 VAC relative to results obtained at the reference voltage of 117 VAC.

Conducted Radio Frequency: Response changes were indicated (reduced count rates) at various frequencies from 1.7 to 4.96 MHz during exposure to a 140 dB (μV) amplitude modulated (1 kHz at 80%) frequency scan from 100 kHz to 80 MHz. This test was done in the RF chamber with the power cable suspended in the center of the chamber.

INTERFERING RESPONSES TEST RESULTS

Radio Frequency/Microwave: Substantial susceptibilities were indicated from approximately 170 to 520 MHz during the scan from 100 kHz to 1000 MHz at 20 (±2) volts/meter. Susceptibility was indicated by decreases and increases in the indicated response and by over-range high readings. Specific results and frequencies are available upon request.

Electric Fields: Not performed.

Magnetic Fields: No response abnormalities were observed when exposed to a 10 Gauss DC field

and 60 Hz (1.26 Gauss) AC field in two orientations.

Interfering Ionizing Radiations: Not performed.

ENVIRONMENTAL FACTORS

Temperature: The CAM went slightly out of tolerance (confidence interval) when exposed to an ambient temperature of +40 ºC (104 ºF). The unit was in tolerance at other temperatures over a range from -10 to 50 ºC (+14 to +122 ºF).

Temperature Shock: Not performed

Humidity: The unit tested went out-of-tolerance high during exposure to 95% relative humidity at 30 ± 2 ºC. The response went low upon return to 40% RH.

Vibration: Not performed.