

# ORNL INSTRUMENT EVALUATION SUMMARY

## Ludlum Model 12-15 Neutron Counter

**Description:** The Ludlum Model 12-15 neutron counter is a portable instrument that uses a moderated BF<sub>3</sub> tube to measure neutron radiation.

**Ranges Tested:** X1 and X10

**Report Date:** February 28, 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 Fields:** No susceptibilities were indicated during exposure to a scan from 100 kHz to 1000 MHz at 20 ( $\pm 2$ ) volts/meter amplitude modulated with 1 kHz at 80%.

**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:** Gamma (<sup>137</sup>Cs) at ~10 R/hr. Responses were observed from the ratemeter and digital readout. No response was indicated using the ratemeter when exposed to the gamma field. Digital readout responses were taken over a ten-minute interval indicating a 3 to 5 cpm response when exposed to the gamma field. Specific information is available on the test report.

## **ENVIRONMENTAL FACTORS**

**Temperature:** No susceptibilities were indicated during exposure to temperatures from -10 to +50 °C (+14 to +122 °F).

**Temperature Shock:** Minimal susceptibilities were indicated when exposed to rapid temperature changes from 22 to -10. No susceptibilities were indicated when exposed to changes of -10 to 22, 22 to 50, and 50 to 22 (°C). Additional information is available in the specific 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  $25 \pm 2$  °C.

**Vibration:** Not performed.