OAK RIDGE NATIONAL LABORATORY
INSTRUMENT EVALUATION SUMMARY
Bicron Micro Rem

Description: The Bicron Micro Rem is a five-range portable instrument that utilizes a plastic scintillation detector to measure exposure rates in µrem/hr. The ranges are X 0.1 (0 - 20 µrem/hr), X 1 (0 - 200 µrem/hr), X 10 (0 - 2000 µrem/hr), X 100 (0 - 20000 µrem/hr), and X 1000 (0 - 200000 µrem/hr).
Ranges Evaluated: X 0.1 and X 1
Report Date: November 16, 1995
General Comments:
1. Readings on the X 0.1 range were somewhat erratic due to the level of radiation required to test the range. This was expected and considered normal unless indicated otherwise.
2. Interfering ionizing radiation testing was performed on one range only.

RADIATION RESPONSE

Probe Surface Sensitivity: N/A.

ELECTRONIC and MECHANICAL REQUIREMENTS and TESTS

Line Noise: N/A

INTERFERING RESPONSES TEST RESULTS

Radio Frequency/Microwave: Results were acceptable during the frequency scan (0.3 to 35 MHz) and at 140 MHz when operated using the X 1 range. On the X 0.1 range, one instrument responded outside of the acceptable range (low) at 140 MHz. That same instrument was erratic during the test.

Results were acceptable on both ranges at 2.45 GHz at 2.0 Watts/meter2. A susceptibility to 915 MHz was indicated during exposure at 0.4 Watts/meter2. Specific information is available upon request.

Electric Fields: Results were acceptable for all instruments on the X 1 range when exposed to electrostatic (5000 volts/meter), and 60 and 400 Hz at 100 volts/meter. The X 0.1 range was not tested due to the background radiation levels in the test area.

Magnetic Fields: Results were acceptable when exposed to 10 Gauss (10 Oersted).

Interfering Ionizing Radiations: Each instrument was placed in a 1 Rem/hr neutron field from an unmoderated 238PuBe neutron source. Responses in µrem/hr were 4% to 4.5% of the neutron field. Manufacturer limits were not available.

ENVIRONMENTAL FACTORS

Temperature: Results were acceptable over the temperature range of -10 C to +50 C (14 F to 122 F).

Temperature Shock: All test results on the X 0.1 range were acceptable for three of the four instruments tested except for two readings slightly out of range when exposed to rapid temperature changes from 22 to -10, -10 to 22, 22 to 50, and 50 to 22 (in C). The fourth instrument responded high when shocked from 22 C to 50 C (72 F to 122 F). Except for one reading, all results were acceptable for the X 1 range.

Humidity: All instruments had 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 22 ± 2 C.
Ambient Pressure: : Results were acceptable over the test range of 525 mmHg to 795 mmHg (20.66 inHg to 31.3 inHg).
Vibration: Not Performed.