

MEMORANDUM

TO: Jukka Perento
Tapio Technologies

FROM: Bill Slocumb
Georgia Department of Natural Resources

DATE: May 25, 1993

SUBJECT: Radiation Measurements for Quality Assurance Purposes on the Tapio Paper Variability Analyzer

The American National Standard N538, Classification of Industrial Ionizing Radiation Gauging Devices states in Appendix-B, Quality Assurance and Control, under the topic "Responsibilities" that persons performing the Quality function should be responsible for monitoring the performance of, and record keeping associated with, prototype testing, and verifying that gauge production models meet the stated radiation numerical classification.

On page 10 of ANSI N538 Standard under the topic Beta and Electromagnetic Radiation Measurements, it is stated that dose rate measurements shall be made under two conditions "dose rate (7mg/cm²)" and "dose rate (300mg/cm²)". The first condition approximates what is commonly referred to as the dose rate to the "skin" of the body. The second condition applies to the dose rate to the "whole body, gonads, active blood-forming organs, head and trunk, or lens of the eye," and assumes that the lenses of the eyes are not protected by any type of eye shields. For these measurements, an external absorber shall be placed over the window of the survey meter as necessary. For measurement of dose rate (7 mg/cm²), the total thickness of window and absorber shall be no greater than 7mg/cm². For measurement of dose rate (300mg/cm²), the total thickness of window and absorber shall be no greater than 300 mg/cm². For the external absorbers, a material such as polyethylene with a low effective atomic number (specific gravity approximately 1.0) shall be used.

Thus, in order to meet the quality assurance criteria described in the first paragraph above Tapio would need to perform the required radiation measurements on each gauge using both the 7mg/cm² and 300mg/cm² window thicknesses.