

FAILURE OF RADIUM NEEDLE LEAK TESTING PROCEDURES

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Abstract—The extreme personnel health hazard due to radium contamination associated with the use of radium needles and tubes in the medical profession was recognized several decades ago. Chief among the concerns was, and remains, the need to detect those needles which are likely to leak radium. The most widely used procedures rely on the collection of radon gas, a daughter product of radium, which emanates from openings too small for radium salt to pass through. Such tests are frequently required by law at six-month intervals. Results of such tests can be misleading unless the exposure of the needles or tubes to liquids is known. Liquids which are likely to have been in contact with radium needles and tubes include washing and sterilizing solutions. In this paper, long term observations of radon leak rate modification by liquids are presented for about a dozen radium needles and tubes. Other methods for predicting needle and tube failure are discussed including subjection to elevated temperatures under controlled conditions.

* Operated by the University of Chicago for the United States Atomic Energy Commission.