DOE's Proposed Standard for Internal Dosimetry. Judith D. Foulke[1] and Daniel J. Strom[2]
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Abstract -- Beginning in 1987, the U.S. Department of Energy (DOE) convened an expert group on internal dosimetry. Since then, this group has developed guidance for internal dosimetry programs and provided input to the regulatory process in the DOE. Their work has most recently appeared in DOE's proposed *Standard for Internal Dosimetry.* The proposed Standard is available at http://www.doe.gov/html/techstds/tsdrafts/tsdrafts.html. The user then scrolls down to Project No. SAFT-0057, Internal Dosimetry.

The proposed Standard provides technical guidance on internal dosimetry practices, and relies heavily on other published material that is widely available. The proposed standard details the documentation needed for programs. It describes the design of individual monitoring programs, which may include bioassay and or air sampling programs, and describes reference and derived reference levels, and investigation and derived investigation levels. A detailed section presents technical aspects of personnel monitoring for exposure to the short-lived progeny of radon and thoron. Criteria are presented for individual participation in monitoring programs, that is, routine, special, termination, and confirmatory bioassay monitoring and breathing zone air monitoring. Detection and confirmation of intakes are discussed, including the use of workplace and bioassay data, and statistical methods for decisions are presented. Internal dose evaluation is discussed in detail, including default assumptions, interpretation of bioassay data, calculation of doses from bioassay and workplace data, simplified methods for small doses, and uncertainties. Management of internal dose is discussed, including routine dose management, dose limitation, and accidental dose control. Records and reports are discussed, including, the various quantities needed for exposures due to progeny of radon and thoron. Medical response to suspected or confirmed intakes is discussed, with treatments of needs, the role of the health physicist, treatment criteria, treatment protocols, impact of decorporation or other therapy on dosimetry, and counseling of workers. Finally, quality assurance recommendations are given. An appendix contains a review of equilibrium factors for radon and thoron progeny.

The proposed Standard references the *Internal Dosimetry Technical Basis Manuals* from some of the DOE sites. We hope to publish these on the World Wide Web.

DOE has always relied first and foremost on bioassay measurements for personnel dosimetry. However, requirements of personnel dosimetry cannot always be met by routine or even special bioassay programs. Since the goal of a personnel dosimetry program is to detect intakes throughout a calendar year resulting in a total of 1 mSv committed effective dose equivalent, three distinct situations exist: 1) routine bioassay programs are adequate; 2) vigorous workplace monitoring used to trigger special bioassay is adequate; and 3) no practical bioassay program is adequate. Examples of the three situations are monitoring for tritium, plutonium, and radon progeny, respectively. With the appearance of ANSI/HPS N13.30 Performance Standard for Radiobioassay Programs, and the proposed DOE Laboratory Accreditation Program (DOELAP) for Radiobioassay, bioassay is becoming as rigorous and accountable as external dosimetry has been for over a decade. However, we see no comparable rigor on the horizon for air sampling when used for personnel dosimetry to supplement bioassay or in place of bioassay.

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