



July 31, 2018

Canadian Nuclear Safety Commission
280 Slater Street, P.O. Box 1046, Station B
Ottawa, ON
K1P 5S9

Re: **Comments on the Draft Dosimetry, Volume II: Technical and Management System Requirements for Dosimetry Services, REGDOC-2.7.2, Volume II**

Thank you for allowing stakeholders and the public to review, and to provide comments on the new draft dosimetry regulatory document, *Technical and Management System Requirements for Dosimetry Services*.

The Radiation Safety Institute of Canada is a licenced dosimetry service with the Canadian Nuclear Safety Commission (CNSC), licence number 07992-7-22.5. Under our licence, the Institute provides dosimetry services for the measurement of occupational exposures from the inhalation of radon progeny and long-lived radioactive dust using personal alpha dosimeter technology.

We have performed a detail review of the draft document and offer the following comments for consideration. Comments are provided by draft document section number for those sections relevant to the Institute.

5 Technical Requirements – Dosimetry Services for Radon Progeny and Radon Gas

No comments

6 Technical Requirements – Dosimetry Services for Intakes of Airborne Radioactive Material

6.3 Accuracy for airborne radioactive material measurements

The draft document includes the following addition with regards to sampler air flow rate stability and measurement,

The airflow rate should be verified on each day of air sampler use. If the airflow rate changes by more than $\pm 5\%$ during the collection of a sample, the flow rate used for dosimetry purposes should be the average of the initial and final airflow rates.

It is noted that the Personal Alpha Dosimeter (PAD) utilized under our dosimetry service does not provide a regulated air flow rate. The battery-operated PAD provides a nominal air flow rate of 4 l/h to within $\pm 10\%$ and is capable of operating for 12 hours continuously before requiring recharging.

Under our dosimetry program workers wear the PAD either on their belt (hip) or within the breathing zone during work shifts which is typically 11 hours. Data has been provided by the Radiation Safety Institute of

Canada previously that, for areas such as uranium mines and mills, the air sampled at belt level is representative of breathing zone air. As soon as the PAD is removed from the specially designed charging system, it begins to operate without worker intervention and will continue to operate continuously while being worn. At the end of the work shift, the PAD is removed and returned to the charging system to charge. When removed from, or placed in the charging system, the PAD automatically turns on/off respectively.

PAD air flow rates are measured by trained site personnel once per week using a calibrated mass flow meter and in accordance with detailed work procedures provided by the Institute. The average air flow rate is utilized in the calculation of worker inhalation exposures to long-lived radioactive dust. In instances where insufficient air flow information has been collected, no dosimetry results are provided by the Institute. It is noted that under our program, PAD air flow rates are not collected daily.

As submitted to the CNSC during the initial licensing of our dosimetry service, numerous type testing study results were provided verifying the ability of the PAD to measure LLRD activity concentrations in agreement with other standard sampling techniques including open-faced filter sampling, cyclones and cascade impactors. Our PAD air flow rate measurement frequency requirements have been in place since 2001 when the dosimetry service was first licensed by the CNSC.

While it is possible to collect PAD air flow rates daily, this would be extremely labour intensive for site personnel as hundreds of PADs may be worn daily at a given work site.

We are requesting clarification on the requirements for daily sampler air flow rate measurements and how this might apply to the PAD. We would suggest the following modification to the text:

*The airflow rate should, **if feasible**, be verified on each day of air sampler use **and, at minimum, once per week**. If the airflow rate changes by more than $\pm 5\%$ during the collection of a sample, the flow rate used for dosimetry purposes should be the average of the initial and final airflow rates.*

7 Management System Requirements

No comments

Appendix G: Independent Test Specifications for Radon Progeny and Radon Gas

No comments

Appendix H: Example Calculations for Minimum Measurable Concentration and Counting Uncertainty

No comments

Appendix I: Specifications for Dose Records

No comments

Appendix J: Reference Calibration Centres

It is noted that in April 2017, the Radiation Safety Institute of Canada Radon Calibration Laboratory was accredited by the American Association of Radon Scientists and Technologists (AARST) National Radon Proficiency Program (NRPP) as a reference radon calibration facility (certificate number SC-1005). By extension, the radon chamber is also accredited under the Canadian NRPP. The Institute achieve accreditation with the support of Health Canada. As a national reference facility, we perform instrument type/performance testing, quality control testing, and instrument calibrations for passive and active radon gas measurement detectors in Canada.

Within the chamber, we are able to generate a wide range of radon gas concentrations using NIST traceable radon gas flow through sources (140 Bq/m³ to 100,000 Bq/m³). We can inject aerosols into the chamber to generate a wide range of radon progeny concentrations (< 0.1 WL to > 10 WL). Radon gas and radon progeny concentrations are monitored using industry standard reference systems. To maintain our accreditation, we perform annual Lucas Cell intercomparisons with Bowser-Morner.

The radon chamber is also used by the Institute to type test and for quality control of its Personal Alpha Dosimetry Service. Independent testing of the Institute's PAD continues to be performed at Bowser-Morner.

The Institute requests the CNSC give consideration for the Institute to become an independent Canadian radon gas and radon progeny calibration facility under REGDOC -2.7.2, Volume II for dosimetry services that use grab sampling techniques to determine exposure of workers to radon progeny and radon gas. Thus, in addition to listing Bowser-Morner, Inc in section J.3, we suggest the following addition:

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