Report of SIM Laboratories to the CCRI (section I, dosimetry)
Prepared by Lisa R. Karam, Acting Chair, SIM MWG6 (ionizing radiation)
Presented by Stephen Seltzer, representative from the NIST
April 2005

Dosimetry (section I):

Comparisons Several comparisons have had SIM participation in the last two years. Specifically, the NRC (Canada) and NIST (USA) have participated in EUROMET-RI(I)-S2 (extrapolation chamber measurements of the absorbed-dose rate in tissue for beta radiation in ionizing radiation) while NRC, NIST and IRD-LNMRI (Brazil) and the CNEA (Argentina) are all participating in the latest EUROMET (813) comparison of air kerma and absorbed dose to water measurements of Co-60 radiation in radiotherapy (NIST is coordinating participation of the NRC, LNMRI, CNEA-CEA to reduce turn-around time). NRC is also participating in EUROMET-RI(I)-S2 (beta rays) and NIST in EUROMET 365 (beta-ray ophthalmic applicators) – NIST has expressed an interest in a comparison of the dosimetry of ophthalmic applicators involving at least the SSDL of Mexico, and possibly Brazil (similar to the EUROMET protection-beta comparison that PTB is now running, but probably involving more laboratories). NIST has also completed its yearly high-dose dosimetry comparison with the NPL. The NRC is participating in EUROMET project 605 comparing standards for high-energy x-ray absorbed dose. The IRD-LNMRI has participated in a comparison with the BIPM in 2003, and is currently participating with the IAEA (involving air kerma and absorb dose to water); results are expected in the not too distant future.

There is an on-going question regarding the old SIM-RI(I)-K1 and K4 comparisons (involving NRC, NIST, CNEA and IRD-LNMRI). NRC has been in contact with Ken Shortt regarding these SIM comparisons, which have never been published. It was suggested that Ken Shortt's presentation at an AAPM meeting might be considered as adequate publication of the results, but we doubt that this is good enough. Unfortunately, no one has been able to find the time to finish this up. At present, we are not sure that it can be resuscitated in a way that would make it acceptable to present to the CCRI to be added to Appendix B as a supplementary comparison. At this point, we're trying to resolve "ownership" of the results.

Discussed proposals for future comparisons Discussions are underway of possible SIM comparisons of ophthalmic-applicator dosimetry (involving at least the SSDL of Mexico and possibly Brazil) and one akin to the current EUROMET protection-beta comparison that PTB is now running, which would probably involve a lot more labs have been ongoing at NIST, while the ININ has suggested SIM comparisons for radiotherapy (air-kerma rate and absorbed-dose rate to water for Co-60), brachytherapy (reference air-kerma rate for Cs-137), and for personal-dose-equivalent rate penetrating for Cs-137 with ionization chamber PTW-T34035 and for x ray according to ISO-4037-1:N60. The CNEA has expressed an interest in participating in an absorbed-dose comparison for high dose (industrial) range, Co-60, for SIM laboratories in 2006, as has IRD-LNMRI. More

specific discussions will have to occur for any of these comparisons to go beyond the proposal stage.

Status of CMCs CMCs in dosimetry have been accepted and posted from NRC and NIST. We are still waiting for some responses from EUROMET and APMP on their acceptance of the remaining CMCs for ININ, IRD, and CNEA. Latest versions of these CMCs have been resent to EUROMET and APMP for review, and will be submitted to the JCRB as soon as possible.

Quality Systems The NRC has been through internal audit (successfully) and has some additions/changes to make in the next two months. They will then apply for an external audit (hopefully in the fall/winter 2005). The QS for NIST is complete for services (SRMs currently underway), and NIST was able to self declare in October 2004. The ININ QS is still in progress and, to date, is about 60 % complete. The LNMRI Quality System has been implemented and was peer reviewed in 2004; approval was received by the SIM Quality System Task Force (SIM-QSTF) in 2004 (and an action plan prepared for 2004-2005). In October 2004, CNEA received certification of accreditation by the Argentinean Accreditation Organism (OAA) for calibration of dosimeters used in radiotherapy, in terms of air kerma (Co-60 and orthovoltage X-ray beams) and in terms of absorbed dose to water (Co-60); the Head of the SSDL of Norway, Hans Bjerke, Ph.D., acted as technical expert for the accreditation.