Progress Report on Radionuclide Metrology (2005-2007)

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Information for CCRI Section II Members

1. Organisation

By order of Hungarian Government, 260/2006(XII.20), according to the ongoing reorganisation program of the Hungarian civil service, the OMH has merged into the Hungarian Trade Licensing Office, MKEH; http://www.mkeh.gov.hu controlled by the Ministry of Economy and Transport. With the 1st January 2007 the legal successor of the OMH became the MKEH. The Metrology Department of MKEH having three sections with the same infrastructure of laboratories and calibration service running at the same location, meet the requirements to function as the Hungarian NMI, maintaining the national measuring standards, MRA business etc. The Metrology Department has remained 30 scientific staff members including the 6 dealing with ionising radiation.

2. Activity measurement

- **Standardization**. Six radionuclides were standardised in the last two years:
  - ^{54}Mn ($4\pi(X,e_A)$-γ-coincidence counting method),
  - ^{186}Re, ^{166}Ho, ^{177}Lu, ^{201}Tl and ^{153}Sm (calibrated Ge spectrometer, secondary standard).
- **SIR (IRS).** The OMH participated in the IRS (SIR) program of BIPM with ^{54}Mn.
- **Calibration.** Calibration of the secondary standard ionisation chamber (type: Centronic, IG12) was carried on with the above mentioned radionuclides. Two secondary standards (semiconductor spectrometers) have been recalibrated using ^{85}Sr and relative efficiency values of ^{56}Co radionuclides. The recalculated new efficiency curves enable a wider energy range (from xxx up to 3 MeV) for activity measurements.
- **Software.** A new software have been installed (HyperLab, developed by HyperLabs Software, Hungary) for evaluation of gamma spectrums. The extensive test of this software is an ongoing program.

3. Legal metrology and the distribution of radioactive certified reference sources

- **RCRMs**. 165 radioactive certified reference materials (RCRMs) being a variety of solid, liquid, large volume and large surface have been prepared and distributed in the last two years. These are covered by the 74 CMC' lines of MKEH

- **Metrology supervision**. The MKEH (OMH) carried out the periodical metrology supervision of 31 radionuclide calibrators and about 500 pieces of surface contamination monitors.
- **Type test and verification**. Two hand-foot and clothing contamination monitor and one whole body contamination monitor type tests were performed. The national type test and verification regulation of different contamination monitors have been revised according to the IEC 60325(2002-06) and IEC 61098(2003-11) standards.

4. Education of staff member

A physicist of our staff participated on "Training-Workshop on Standardisation of Radionuclides" organised by VERMI at Varna, Bulgaria in2006.

5. Quality assurance

The Certification Body, SGS Hungaria Kft, during the scheduled assessment of the Metrology Department of the MKEH did not find any non-conformities on the basis of ISO 9001:2000 at the Radioactivity Laboratory in February 2007.

6. Future works

- Standardisation of ^{56}Co and ^{18}F radionuclides.
- Participation in the key comparisons of BIPM CCRI(II) and IRS (SIR) program.
- Calibration of the secondary standard ionisation chamber (IG-12) for ^{18}F in frame of SIR.
- Preparation of natural matrix-based RCRM.

7. Publications

G. Ratel, C. Michotte, U. Wätjen, H. Janβen, L. Szücs, N.Coursol, and Y. Hino: Activity measurements of radionuclide ^{134}Cs for the IRMM, Geel, PTB, Germany, OMH, Hungary, LNE-LNHB, France and the NMIJ, Japan in the ongoing comparison BIPM.RI(II)-K1.Cs-134 **Metrologia 42**. **Technical Supplement, 2005.**