Progress Report on Radionuclide Metrology (2003-2005)

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Information for CCRI Section II Members

1. Activity measurement

- **Standardisation**. Three radionuclides were standardised in the last two years. ^{241}Am ($4\pi\alpha$-γ coincidence counting method), ^{125}I (sum-peak coincidence counting method) and ^{68}Ge/^{68}Ga (calibrated gamma spectrometer) have been chosen.
- **BIPM CCRI(II) key comparisons**. We participated in the CCRI(II) key comparisons ^{241}Am and ^{125}I.
- **SIR (IRS).** The OMH participated in the IRS (SIR) program of BIPM with ^{134}Cs.
- **Calibration.** Calibration of secondary standard ionisation chamber (type: Centronic, IG12) was carried on with the above mentioned radionuclides.

2. Extension of the national activity standard

- A new gamma spectrometer has been installed as part of the national activity standard. The main parameters of the detector: Type: ORTEC GEM45P-PLUS (PopTop), resolution (FWHM) at 1.33 MeV 1.9 keV, relative efficiency 45 %. The calibration of this spectrometer is an ongoing work using point sources and large volume marinelli vessel (for gases).
- New electronic units of primary standard are a pulse generator (ORTEC Model 419) and two timing single-channel analysers (ORTEC Model 551).

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

- **RCRMs**. 158 radioactive certified reference materials (RCRMs) were prepared and distributed in the last two years. Types of this RCRMs were: solid, liquid, large volume, large surface and gas. The radionuclides are covered by the 74 CMC' lines of OMH.
- **Metrology supervision**. The OMH carried out the periodical metrology supervision of 49 radionuclide calibrators and 425 pieces of surface contamination monitors.
- **Type test**. Type test of an equipment that is used to check the released noble gases (^{41}Ar, ^{135}Xe, ^{133}Xe, ^{85}Kr^{m}) have been performed for the nuclear power plant in Paks.

4. Future works

- Standardisation of ^{192}Ir radionuclide.

- Participation in the key comparisons of BIPM CCRI(II) and IRS (SIR) program.
- Carry on the calibration of the new gamma spectrometer.
- Calibration of the secondary standard ionisation chamber (IG-12) for ^{18}F in frame of international activity.