completed already and implemented also. IAEA/WHO has entrusted various EAGs to conduct experiments and generate data from ^{60}Co and other high-energy photon and electron beams from Linacs for the step (2) and (3). SSDL, BARC as a part of the project has conducted pilot studies for step (2) and (3) involving ^{60}Co beams. The paper gives the details of parameters studied and the results obtained from this study.

Sym-1-3

Developing postal dose audit system in Japan

Munefumi Shimbo
Saitama Medical School

The more radiation therapy technology developed, the more the quality control becomes important for the safe and effective cancer therapy. Unfortunately, in Japan, several radiotherapeutic accidents occurred within a few years. The accidents were mainly due to the shortage in knowledge to use recent technique such as treatment planning system. In Asia, especially in Japan, although the technique or modality has advanced, the QA/QC system fails to advance simultaneously. The number of facilities of radiation treatment is up to 700 in Japan. Postal dose audit system is the most powerful way to check the quality of those facilities. We would like to report the audit system which is going to be established in NIRS.
The glass dosimeter (GDR, Chiyoda technol Co.) and tough water phantom (Kyoto-kagaku Co.) are used for the dosimetric survey. GRD is a radiation-induced photoluminescence (RPL) detector. We adopted the detector because of the fine accuracy, less fading and the small size (1.5mm x 12mm) enough to have little effect of field flatness.
The methods is as follows.
1. A postal set of 30x30 tough water phantom and pieces which contain 3 glass elements are sent to a radiation therapy facility.
2. The facility staff are ordered to irradiate 1 Gy to the piece which contains glass elements under the condition of 10 cm depth in tough water phantom. 2 pieces are irradiated in one energy beam (6 elements for one energy beam).
3. Postal set are sent back to the NIRS and the data are read for analysis.
Both standard glass elements and background glass elements are also contained to the postal set. Standard elements are irradiated 1 Gy at NIRS and used for UV-ray calibration on glass dosimeter readout. Background elements are used to check the any unexpected irradiation done during the postal or facility irradiation process.

We made simulation tests of postal survey at NIRS using linac (6MV and 10MV) and Co-60 machines. Irradiation and analysis were done using the same way as postal survey. We got fine

results in which errors were almost within 1%. The standard deviation of outputs between glass dosimeter and ion chamber was about 1.2 % (N=180).
The value, 1.2 %, is sufficient enough to check the radiation output because the error will easily become less than 1 % by using multiple elements. We are now acting to start the postal survey check in Japan facilities using glass dosimeter system. In future, this system could be expanded from Japan to Asian countries.

Sym-1-4

Calibration System for Therapy-level Dosimeter in Japan

Suoh Sakata
Association of Nuclear Technology in Medicine

1. Traceability. National Institute of Advanced Industrial Science and Technology (AIST, the PSDL in Japan) delivers the standards of radiation dose to several SSDL and other institutions which work as dosimeter calibration center. Until 2003, dosimeters used in radiation therapy were calibrated by Dose Standard Center for Medical Treatment (DSC) that was organized by Japan Radiological Society. DSC was placed in 13 districts in whole area of Japan. The reference dosimeters of DSC were calibrated by the comparison with the secondary standard dosimeter owned by National Institute of Radiological Sciences (NIRS) which was one of the SSDL in Japan. Dosimeters used at users' sites should be traceable to the primary standard. However, steps to transfer the standard increase the uncertainty of the measurement at the user's site. In 2004, Association for Nuclear Technology in Medicine (ANTM) started a new calibration system for therapy-level dosimeter while DSC stopped calibration work. ANTM acts as a SSDL and calibrates dosimeters used in clinical institutions in whole Japan. It is expected that the uncertainty accompanying with standard transfer steps would be reduced.
2. Calibration of dosimeter by ANTM. Devices used in dosimeter calibration by ANTM are ^{60}Co irradiation unit and measuring instruments which were used in NIRS when NIRS worked as SSDL. These devices will be used in postal quality audit system which is planned to start in next year under the cooperation of NIRS and ANTM. The total number of dosimeters calibrated by ANTM from April/'04 to March/'05 was 564, and the total of ionization chambers was 1,188. 815 chambers had been calibrated before the calibration by ANTM. The interval of calibration was less than 2 years for about 80% of these chambers and the average of ratios of calibration factor was about 1.0. Japanese standard dosimetry protocol recommends that the frequency of chamber calibration should be once a year. It is expected that the number of calibration will increase in the future.