COMPOSITIONAL QUALIFICATION OF RADIATION PROTECTION IN NEUTRON RADIOTHERAPY ROOM WITH 50 MeV CYCLOTRON

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ABSTRACT

For the independent hospital use of radiotherapy facility, a 50 MeV cyclotron had been installed in the Korea Cancer Center Hospital, Seoul, Korea, for the purpose of neutron therapy of the cancer patients, which had been started on November 1986, as well as production of short half life radioisotopes, It is clear that radiation protection must be required more attention in the hospital than in the non-hospital institute because there are a plenty of people unlimited to enter the facility who are unoriented and untrained in radiation protection, i.e. patients and relatives.

The authors analyzed radiation safety of the neutron treatment room, machine control area and patient waiting section in KCCH-cyclotron as follows;

1) Leakage mapping of the neutron gantry room
2) Measurement of gamma activation of equipments including patient couch, collimator of gantry and additional devices necessary for the treatment
3) Detection of air activation in the gantry room after neutron exposure
4) Measurement of T-1/2 and T-1/10 of clearing time of room radioactivity of gamma and neutron
5) Measurement of total accumulated exposure to the personnel for an appropriate time
6) Detection of patient exposure rate on the body out of treatment field and tissue activation within primary treatment region to identify unuseful irradiation to normal organ of patient
7) Finally, discussion of compositional qualification of radiation safety of the treatment room area and conclusion of adequate arrangement to the personnel and patients.