SARINTORN SUWANNAPONG, FLIGHT LIEUTENANT : DEVELOPMENT OF A RADON AND THORON MEASURING DEVICE USING NTD. THESIS ADVISOR : ASSIST.PROF. NARES CHANKOW, 80 PP.

The objective of this thesis was to develop a technique and a device for radon and thoron measurements by using a nuclear track detector (NTD). For this purpose, the Kodak LR 115 cellulose nitrate film was used. Discrimination of radon and thoron was done based on the differences in their diffusion lengths which were dependent upon their half-lives. The diffusion lengths were determined from relative track density on the films which were placed at different distances from radium-226 and thorium oxide. It was found that in 50 cm the radon track density was reduced to 85.42 % at room temperature (27 - 30 °C) whereas the thoron track density was reduced to 0.38, 2.29 and 0 % at room temperature (27 - 30 °C), 22 °C and 40 °C respectively. The device consisted of a 70 cm long and 8 cm diameter PVC pipe with the top end closed and the bottom end opened. Two pieces of 2 cm x 3 cm cellulose nitrate films were placed inside the pipe. The first film was attached to the top end for radon track registration and the other was attached to the grid near the open end for radon and thoron track registration. The bottom film was 50 cm away from the top one.

The device was tested for radon and thoron measurement by using radium-226, thorium oxide, monazite and uranium ore. Field test was also carried out, and the radon and thoron track densities were found to be in the range of 11,700 to 24,200 and 1,800 to 10,950 tracks/cm^2, respectively. A spark counter was also used in track counting. It showed that the number of counts was directly proportional to the track density obtained from an optical microscope.