

## **Design and Implementation of a New Device for The Integral Measurement of Total Source-on Time for a High Dose Rate (HDR) Remote Afterloading Treatment**

Design and implementation of a new device used to manually measure the total integral time that a HDR Ir-192 source spends outside the safe will be presented. Most HDR units are equipped with a timer that measures the source-on interval, however, verification of the accuracy of this internal timer for each treatment has not been addressed. Most radiation therapy rooms have installed a radiation detector unit operating independent of the radiation producing device. One wall mounted sample of such device is simple Geiger Muller (GM) counter known as the "Primalert-35" made by Nuclear Associates<sup>TM</sup> that will illuminate when placed in radiation area. Using a digital timer known as "Veeder Root Timer<sup>TM</sup>" connected to the auxiliary output of a Primalert-35, we were able to visualize the signal and determine that it was a step function. We also found that auxiliary output is a 200 milli-second pulse when in alarm condition, and the timer could not track the pulse because of the oscillation of the signal. A circuit was then designed and added to the Primalert-35 unit to stretch the 200 ms pulse so that it appears to be a non-pulsing signal at a constant DC level. This allowed us to measure the time interval for as long as the Primalert-35 was active. This is an equivalent time for the source being out of the safe.