## ABSTRACT

We are surrounded on a daily basis by radiation, some harmless, others potentially lethal, but mostly in small enough amounts that it poses little immediate danger to biological tissue. However, gamma radiation which is an extremely harmful and penetrating ionising radiation, is a by product of, or is used in, many modern industrial and medical processes and this poses serious health risks to those in the proximity of these sources.

Ionising radiation is used extensively in areas such as environmental monitoring, food irradiation, diagnostic and therapeutic medical procedures, and aerospace and military applications [1a]. Terrorist attacks are an ever present threat and as such we must be equipped to handle any type of possible attack, including exposure to ionising radiation. Gamma radiation presents a serious biological threat, the ability to detect it and measure absorbed dose is therefore of great importance, and necessitates the use of sensitive and accurate devices for these functions. It is therefore obvious that there is a need for cost-effective affordable alternatives to existing commercially available real-time gamma radiation dosimeters.

The purpose of the research presented here is to develop a system capable of real-time measurement of this ionising gamma radiation using novel thick and thin film sensors. These Sensors, whose electrical properties are altered by the presence of ionising radiation, have been previously developed by the AMT Ireland research group at the University of Limerick.

This system employs the Anderson Current Loop to measure the affects on Sensors due to exposure to gamma radiation. The Anderson Loop is a simple, easy to design and inexpensive circuit component. This is a novel application of the Anderson Loop and hence a novel dosimeter system