

## **Dosimetry Measurements and Pathological Analysis Specific to the Radar and the Cellular Phone**

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### Introduction

Since a few years, contradictory statements have been circulating in the Belgian and international press about the possible harmful effects of radar radiation on the personnel manning the batteries or firing units of the air defence system HAWK.

With the expanding use of electromagnetic energy, the public is becoming increasingly aware of and about the potential hazards of electromagnetic fields.

Continuing disparity in the safety standards worldwide and the lack of knowledge of electromagnetic field's non-thermal effects on biological systems have contributed to the confusion that presently exists.

### Study

In order to assess the problem, the Belgian Minister of Defence instructed the Armed Forces to set up a study. The Department of Optronics and Microwaves of the Royal Military Academy is also involved in this research programme.

The study is structured around three axes of effort :

1. The build up of a data base of the peak and mean emitter radiated power received by the battery or firing unit personnel per hour of presence on the peacetime Belgian Army's HAWK and Belgian Air Force's NIKE air defence sites as a function of its regular task. The Royal Military Academy has also acquired a radiation hazard meter, which is capable to measure the power density (in  $\text{mW}/\text{cm}^2$ ), which is in fact nothing else than the magnitude of the vector of Poynting :  $S = E \times H$ . The department of Optronics and Microwaves has performed power measurements on such a site.
2. An epidemiological analysis based on the medical records of the personnel from the HAWK firing units and the NIKE batteries in order to detect any statistically significant correlation with the appearance of specific diseases like leukemia and Hodgkin.
3. An experimental study on animals. Hundred rats have been irradiated during a considerable long period under non-thermal conditions. Power density and frequency are chosen in a way also similar to the emitting properties of the cellular phone. Another part of the group received 'real' radar radiation (also long term, non-thermal). In the next few weeks, some of them will already be examined on the presence of specific symptoms (cancer, ...) due to this irradiation.

### Results

The first results of the study are expected in the month of April, 2000.