

## **EURO-GPR CODE OF PRACTICE FOR THE USE OF GPR SYSTEMS IN POTENTIALLY SENSITIVE RADIO ENVIRONMENTS**

### **1.0 Introduction**

The modern world relies upon a wide variety of radio systems for many diverse activities from systems upon which the safety of life depends, through communications and broadcasting to many other activities. The many diverse systems operate successfully together because the compatibility issue for each has been carefully considered in terms of the context of the radio spectrum. Systems usually operate successfully together, but on occasions because of exceptional situations interference may occur.

In this context GPR systems are no different from other radio systems. The radiation emitted from GPR systems has been carefully evaluated as part of the licensing process, and it is most unlikely that GPR systems will interfere with other radio systems. This Code of Practice has been drafted to ensure that even these unlikely events are effectively managed and GPR users made aware of them and appropriate procedures adopted.

### **2.0 Sensitive Radio Environments**

The most sensitive radio environments are those where the safety of life, or similar function may be threatened if interference occurs to a radio system. Generally the areas of most concern are: -

- i. airfields
- ii. prisons
- iii. defence establishments
- iv. hospitals

When within 0.2 km of these and other sensitive locations, GPR operators should be particularly aware of the potential for interference and may be required to lodge details of the equipment and measurements to be used prior to being given clearance to operate.

In other locations the GPR operator may not be aware of the presence of other systems, but should observe the recommendations of this Code of Practice at all times. For example, aircraft “en route” systems are not adjacent to airfields and may be screened by trees. Similarly a low flying aircraft may pass over at any time.

### **3.0 Recommended Practice**

GPR systems are designed to radiate low level signals into earth materials, typically the ground or, for example, the concrete, brick or stone of a civil engineering or building structure. The overall objective of the recommended practice is to ensure that the radiation is directed into these materials and does not unnecessarily leak into the air.

In order to realise this requirement care must be observed in the operation of GPR equipment. There are also requirements upon the administration of operations to allow potential interference incidents to be further investigated.

The design of GPR equipment is also important in the minimisation of the risk of interference. While manufacturers have to meet set quantitative performance standards, it may be helpful to the user to understand equipment design goals.

The required operating practice will now be presented in terms of operator practice, site use log, and product design goals.

### **3.1 Operator Practice**

At all times operators should ensure that they minimise the chances of stray radiation by: -

- i. only keeping the GPR system or its transmitter switched on when actually carrying out measurements.
- ii. whenever practical ensuring that the GPR antenna is in contact with a layer of absorptive earth material of sufficient thickness and properties to absorb and dissipate the GPR's low level radiation.

### **3.2 Site Use Log**

A log should be kept of every occasion upon which the radar is used. The log should include the map reference of the location, details of the equipment employed particularly antenna details and the time and date of operations.

Ideally the log should be kept in electronic format, for example Microsoft Excel, and should be readily available for transmission to Euro-GPR, to allow any concerns over potential involvement of GPR equipment in interference events to be investigated. (Details of present procedures may be obtained from the Euro-GPR Secretariat).

### **3.3 Product Design Goals**

Manufacturers should ensure that GPR equipments are wherever possible designed to limit the possibility of interference to other radio systems and interference to the GPR systems from other radio equipments. Specifically: -

- i. Manufacturers should, wherever possible, design antennas to limit the radiation emitted in directions other than into the test material.
- ii. Manufacturers should design equipment to minimise the risk of inadvertent radiation occurring. This may be via the mechanical design of the equipment, the operating procedures defined by software or simple devices such as proximity or tilt sensors.
- iii. Manufacturers should include the means for the time and date of all GPR measurements made to be recorded to aid the preparation of the site log indicated above.

## **4.0 Conclusions**

GPR systems have been used for many years by EuroGPR members and there are no confirmed instances of interference during that time. Users should at all times operate GPR equipment in accordance with the manufacturer's recommendations and this Code of Practice to ensure this situation continues.

## **5.0 Issue Date**

This Code of Practice was updated on 23<sup>rd</sup> July 2004.