

## **Position Statement on Wi-Fi Radiation Concerns**

Members of the Buffalo State College community may find themselves spending extensive amounts of time in buildings in which wireless networks (Wi-Fi) have been established. Due to recent information in the public media regarding work in a Wi-Fi environment and exposure concerns expressed by the college community, the Radiation Safety Committee has created this position statement regarding the safety of working in a Wi-Fi environment.

This discussion provides information concerning the current consensus in the scientific and medical community about the hazards of exposure to wireless network radiation, the status of regulations governing such fields, and the results of radiation surveys associated with Wi-Fi networks.

### **General Conclusion**

It is the general consensus of the scientific community that the level of RF exposure due to wireless networks is so low compared to the many other RF sources in the modern environment that health concerns from Wi-Fi exposure are not an issue. We can reasonably conclude that the wireless networks present at Buffalo State College do not present a hazard to persons working or otherwise spending time in College buildings. WiFi statement comments are based on current scientific evidence, and subject to change as newer data become available from future studies on human health effects of WiFi from RF exposure.

### **Radiation Emitted by Wireless Networks**

Wireless networks use radio waves to transmit information between wired router stations and the wireless adapter cards in laptop computers. The radio waves emitted by Wi-Fi networks are typically at frequencies of 2.4 Gigahertz (GHz) or 5.8 GHz - well within that portion of the electromagnetic spectrum defined to be radio frequency (RF) radiation. This radiation is much lower in energy than ionizing radiation (e.g. the type of radiation emitted by x-ray machines), and the biological effects associated with exposure are much different and more minimal.

### **Potential Hazards**

The long-recognized and well understood adverse biological effect resulting from exposure to high levels of radio waves is tissue and cell heating. However, such heating occurs only at high levels and very close proximity. More recently concerns have been raised about whether there may be effects, including carcinogenicity, at RF levels below those levels that produce detectably harmful heating. Many studies have been conducted to determine whether there is a causal relationship between low-level radiofrequency exposure and harmful effects such as cancer.

Most of the studies conducted to date have been on RF emissions from mobile phones, which are held close to the head and can have high power levels. The close distance between the mobile phone and the head and the higher power levels involved with mobile phone use lead to a considerably higher level of exposure for frequent mobile phone users compared to the potential exposure of persons working in areas in which Wi-Fi systems exist. Epidemiological studies conducted by national and international health safety agencies and studies reported in the peer-reviewed literature have consistently failed to

demonstrate convincing evidence of any adverse health effects from RF exposure below the regulatory limits and guidelines cited below. The references at the end of this discussion provide more detailed information regarding these studies and their conclusions.

## **Regulations and guidelines**

Exposure limits for radiofrequency radiation have been established by the Federal Communications Commission (FCC), Occupational Health & Safety Agency (OSHA), Centers for Disease Control (CDC), and the World Health Organization (WHO). Additionally, the Institute of Electrical and Electronics Engineers (IEEE) and the International Commission on Non-Ionizing Radiation Protection (ICNIRP) have established guidelines for exposure to RF radiation. Wi-Fi networks at Buffalo State comply with all FCC and OSHA established exposure limits.

## **RF Field Levels due to Wireless Networks**

Various references (see below) are available to provide information about surveys of RF field levels associated with wireless networks. For example, a published paper entitled "Radiofrequency Exposure from Wireless LANS Utilizing Wi-Fi Technology" discusses a study in which measurements were conducted at 55 sites in four countries, and measurements were conducted under conditions that would result in the higher end of exposures from such systems. An excerpt from the abstract states "...In all cases, the measured Wi-Fi signal levels were very far below international exposure limits (IEEE C95.1-2005 and ICNIRP) and in nearly all cases far below other RF signals in the same environments." Details of this survey can be found in the references at the end of this statement.

Another survey report is available online which provides the results of a survey performed at a school in Australia. The survey included RF field measurements of 22 Wireless Access Points with various transmit power levels and access mode configurations and in classrooms, meeting rooms and other open areas to measure ambient RF levels in the environment. The Hazard Survey concluded that "All measurements were found to be well below the general public reference level with the maximum reading measured from the wireless network of only 5% of the general public reference level. The maximum environmental reading was 0.0049% of the general public reference levels and the maximum reading when 10 cm from the school notebook computers was only 1% of the general public reference level."

## **References and Resources**

The following references provide additional information regarding the effects and hazards of exposure to RF fields and provide information about RF exposure guidelines, standards, regulations and surveys:

Federal Communications Commission (FCC). [Radio Frequency Safety](#)

Occupational Safety and Health Administration (OSHA). [Radiofrequency and Microwave Radiation Standard](#)

World Health Organization (WHO). [Electromagnetic Fields and Public Health: Base Stations and Wireless Technologies](#). Fact Sheet No. 304; 2006

Centers for Disease Control (CDC). [EMF \(ELECTRIC AND MAGNETIC FIELDS\)](#)

UK Health Protection Agency. [Wi-Fi Position Statement](#)

UK Health Protection Agency. [Exposure to electromagnetic fields from wireless computer networks \(Wi-Fi\) - report on results](#). September 2011

Foster, KR, Radiofrequency Exposure from Wireless LANS Utilizing Wi-Fi Technology, Health Physics 92: 280-289; 2007.

Australian Radiation Protection and Nuclear Safety Agency. [Maximum Exposure Levels to Radiofrequency Fields - 3 kHz to 300 GHz](#). Radiation Protection Series Publication No. 3; 2002.

International Commission for Non-Ionizing Radiation Protection. [Epidemiology of Health Effects of Radiofrequency Exposure](#). Environmental Health Perspectives; 2004

Princeton – Radiation Safety. [Non-ionizing Radiation Web Page](#)