WIRELESS DEVICE SAFETY & HEALTH CONCERNS

The University of Queensland is currently in the process of deploying over 3500 new Wireless Access Points (WAPs) across multiple UQ campuses. Predominately placed within building ceiling cavities, but also within offices, hallways, on roofs and even mounted on light poles, they form an important part of UQ’s ability to supply staff and students with the network connectivity expected of a leading educational institution.

Because of our extensive use of wireless technology, the University of Queensland would like to address the issues of health and safety in relation to use of and proximity to Wi-Fi (802.11n) technology.

WAPs work by way of short range two way radio communications (commonly called Wi-Fi) with appropriate devices (for example laptops) – sending and receiving data to allow access to networks and the internet.

‘Wi-Fi’ was first used in 1991, and used commercially in 1999. It transmits data in the same way that a radio does, simply at a slightly higher (faster) frequency, and is just as safe to use. It is the same frequency (2.4 GHz & 5 GHz) that is used in Bluetooth and many home entertainment systems.

Generally speaking, mobile phones and other low power portable devices are designed to operate within 20cm of the human body. Larger wireless devices such as desktop computers and WAPs are designed to be used at greater distances from the body. UQ’s 802.11n Cisco Wireless Access Points fall into the latter category, and are designed to be placed at a distance of 20cm or greater from the human body.

IMPACT ON HEALTH

Studies by a range of independent and government experts show absolutely no health risks associated with wireless devices when used in a correct and safe manner.

The World Health Organization states “Considering the very low exposure levels and research results collected to date, there is no convincing scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects.”

It goes on to state “In fact, due to their lower frequency, at similar RF (Radio Frequency) exposure levels, the body absorbs up to five times more of the signal from FM radio and television than from base stations... Further, radio and television broadcast stations have been in operation for the past 50 or more years without any adverse health consequence being established” ¹

Closer to home, a 2007 study by Australian company RadHaz Consulting charted EMF (Electromagnetic Field) levels measured in a typical home as a % of the WHO recommendations for general public exposure. Home Wi-Fi measured more than 40,000 times below WHO recommended limits for general public exposure. That’s better than baby monitors, AM and FM radio! ²
The CISCO Wireless Access Points which are heavily utilised in UQ networks comply with both US IEEE/ANSI C95.1–2005 human exposure standards for wireless devices and also with ARPANSA’s (Australian Radiation Protection and Nuclear Safety Agency) Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields — 3 kHz to 300 GHz (2002). UQ’s Cisco wireless devices generally operate at power levels 5 or 6 times lower than that of standard cell phones.

The World Health Organization (WHO) puts this whole issue into perspective:

“In the area of biological effects and medical applications of non-ionizing radiation approximately 25,000 articles have been published over the past 30 years. Despite the feeling of some people that more research needs to be done, scientific knowledge in this area is now more extensive than for most chemicals.

Based on a recent in-depth review of the scientific literature, the WHO concluded that current evidence does not confirm the existence of any health consequences from exposure to low level electromagnetic fields.”

Studies by the University of Queensland corroborate these findings.

In December 2010 the University of Queensland contracted RADHAZ consulting to measure radiation levels from wireless access points at several locations across the St Lucia Campus. RADHAZ consulting is a NATA (National Association of Testing Authorities) approved radiation testing specialist.

They tested points in Offices, a lecture theatre and UQ’s main library.

“The maximum (all existing services) cumulative RF EME level measured was found to be less than 0.00073% of the allowable ARPANSA General Public Exposure Limit with WiFi system contributing to less than 0.00071% of the ARPANSA General Public Exposure Limit.

The measured levels from the WiFi system was found to be well below the limits set by ARPANSA in their Radiation Protection Standard RPS3 and so conforms to the OH&S requirements for this type of device.”

PROXIMITY TO WIRELESS DEVICES

With over 3500 Wireless Access Points currently being installed across many of UQ’s campuses, chances are high that most people will come within proximity of a wireless device in the course of their work / study. Certainly for effective Wireless access, many points have been installed in or close to offices and lecture theatres.

In order to comply with FCC radio frequency (RF) exposure limits, UQ recommends that WAP’s should be located at a minimum of 20 cm from the body of all persons.

IMPACT ON MEDICAL DEVICES

There have been concerns about cellular telephones and their potential impact on medical devices. Many hospitals ban such phones from emergency rooms or other sensitive areas. Again, this has led some to question whether wireless networking devices can be used in proximity to medical equipment.
To address these concerns, Cisco wireless networking devices are specifically designed to reduce emissions that could interfere with medical devices. Cisco radio module products meet both the FCC and European Commission emission levels required for devices operating in a medical environment, specifically the EN 55011 emission standards.

Independent hospital tests, as well as further Cisco research, has shown that Cisco 2.4-GHz wireless network devices do not interfere with or degrade the performance of heart pacemakers, even when operated at close proximity to these devices. Tests have additionally shown that Cisco WLAN systems do not degrade the performance of MRI machines. This research is continuing on Cisco 5-GHz devices. Initial tests are yielding similar results.\(^5\)

**POWER SAFETY INFORMATION**

Students and staff are advised that if they intend to plug their laptops into power points on campus, UQ will not be liable for any damage that may occur to their personal equipment. Students and staff are advised to use a surge protector/power filter at all times.

**REFERENCES**


4. RF EME WIFI Survey University of Queensland Dec 2010 [https://projects.its.uq.edu.au/sites/PhoenixWelcomePage/Project%20Documents/RF%20EME%20WIFI%20Survey%20University%20of%20Queensland%20Dec%202010.pdf](https://projects.its.uq.edu.au/sites/PhoenixWelcomePage/Project%20Documents/RF%20EME%20WIFI%20Survey%20University%20of%20Queensland%20Dec%202010.pdf)


**FURTHER READING**

3. ARPANSA Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields - 3 kHz to 300 GHz (2002)
5. RF EME WIFI Survey University of Queensland Dec 2010