

A Look at Part 15 Interference Problems

By David A. Case NCE, NCT
Cisco Systems Inc.
Richfield, Ohio

It is surprising how much misinformation on interference from Part 15 unlicensed wireless systems and how these issues are addressed is actually out there. One only needs to read some of the comments filed by various services on how Part 15 radio devices, specifically WLAN, interfere with their systems.

Reading some of the responses and in conversations with various wireless manufacturers of licensed equipment, it seems that Part 15 devices are worse than the black plague. However, when one takes a good look at the problem, the actual issues become less frightening and actually manageable.

Basic Issue

For a majority of people working in the field of EMC on Part 15, if we are really lucky the work is restricted to lab work and making the systems comply. For most this seems the typical norm – test the system, do any engineering fixes to bring it into compliance, prepare the report and either issue a Declaration of Conformity or submit it for certification.

However, anyone doing wireless, whether Part 15 or one of the other parts of the FCC rules, knows that interference is a fact of life. The real issue is how to manage it.

For some reason, whether right or wrong, some believe that because it is a licensed service this means the interference can be managed whereas Part 15 cannot.

However, no one can explain to me how the FCC knows the culprit device because it is licensed. For example, I have seen wireless Part 24 handsets interfere with other licensed equipment when placed in close proximity to the other device. Even though the system operates on a licensed service, the device itself cannot interfere with other devices. Further, if the license is held by the service provider – not the user of the cell phone – how does the FCC know what device actually caused the interference?

The major difference between a licensed service and an unlicensed service from the interference perspective is that the licensed service is protected from unwanted harmful interference and the Part 15 device has no protection from interference.

Part 15

One needs to remember that under Part 15 of the rules, 1) one must not cause interference and 2) the device must accept interference. In other words, we cannot cause interference and must accept interference.

Do interference issues exist? Yes. For example, some of the telecom companies have banned or restricted WLAN devices from their switching stations because their equipment (Part 15 unintentional radiator devices) are subject to interference from WLAN devices. The problem is not the WLAN device but the fact that the industry standard the devices are tested to for immunity does not adequately test real-world transmitter fundamental emissions from a WLAN. Is the case an FCC issue? No because it involves only Part 15 equipment, and is being addressed by WLAN manufacturers and makers of the various telecom equipment manufacturers.

Post Product Audits

The first item most people are familiar with is the post grant audit done by the agency or TCB. The first audits are simply audits from TCBs who are required to do a number of post grant audits a year as part of their program.

The second type of audit is not so fun. This one generally starts with either having a competitor or consumer file a complaint. It should be noted that a vast majority of the audits done by the FCC are because of complaints filed by competitors or from problems reported by users in the field.

If the audit is of a Declaration of Conformity or

product that required verification, the FCC generally first wants to review the test report. Note that sending a test report dated after the date of the letter is probably the worse thing one can ever do, although some have done that. If the report looks satisfactory, that may be all that occurs, or they can request a product audit.

If the product is certified they will likely request a sample of the device for their testing. It must be a production product, never before tested or the box opened up.

If the device audited meets the requirements, then the issue becomes one of operation and/or installation. Depending on what is being interfered with will determine the FCC course of action.

If it is another Part 15 device, then the user is told to correct it himself or to turn off one device when he operates the other. The FCC will also send him their book on solving interference problems.

When it affects a license service such as an amateur radio service, the FCC may request more from the Part 15 user. However, if the licensee is also the one with the Part 15 device that is interfering, then he is told to fix it.

Field Issues

Though a post grant audit is far from fun, there are always worse things that come along. The first is addressing interference to the installed system. There are a number of causes for this, both internal to the system as well as external.

Internal causes in part are caused by some of

the issues addressed earlier in this article, others are from system installation. For example if an RLAN network is improperly set up, it could interfere with itself. Self-generated problems include poor antenna placement, bad coax cables, multi-path or reflected signals or even so simple as adjacent systems all programmed to the same channel set. These issues can generally be troubleshot somewhat easily.

The next issue is interference from a source outside the system. Depending on the source may make how to address it interesting. If it is another Part 15 system, say a RLAN system installed in a neighboring building, one has several options to address. The solution could be as simple as selecting another channel or reorienting your antennas. You may be able to work with the operator of the other system to work out interference issues. In either case, do not expect a lot of or any help from the FCC. The FCC does not get involved with Part 15 to Part 15 interference issues (except by sending out its famous book on resolving interference). The only result of the complaint may be to call either or both systems in for an audit.

The next issue is whether you receive interference from a Part 18 service while you are operating in an ISM band or receive any interference from any licensed service operating in the band you are using. As a Part 15 device, you must accept interference from these devices. Again there is action you can take, similar to interference from Part 15 devices. However, as with the issue in the previous paragraph, do not expect any help from the FCC.

DFS – TPC Requirements

Parameter	Value
DFS Detection Threshold	-64dBm for WAS devices with e.i.r.p. between 200mE and 1 W -62dBm for WAS with e.i.r.p. of less than 200mW
Channel Availability Check Time	60 sec prior to channel use
Non Occupancy Period	30 min
Channel Move Time	10 sec
Automatic Transmit Power Control (5470- 5725 MHz)	At least 3dB on average output power of device

One needs to remember that Part 15 devices cannot cause interference to any other services including amateur services. The FCC generally gives the Part 15 operator some time to resolve the issue, in most cases by selecting another frequency, reorienting antennas or lowering power to solve the situation. However, failure to act or if the problem is not solved could result in the Part 15 system being required to be off the air until the problem is resolved.

field complaint from VSAT operators who were being disrupted by radar detectors.

The FCC has also requested on occasion that a WISP operating Part 15 WLAN equipment stop operations until a specific interference problem has been fixed.

FCC Enforcement


Despite what some people think, the FCC has been in the enforcement business. The lab is leading the effort on this, with an increased number of samples as well as continuing to handle complaints.


Recently the FCC Enforcement Bureau went after a chain of stores selling uncertified radios that could be configured to be used in the CB bands. In first Report and Order 01-278, they required that radar detectors be certified (they were exempt as a receiver operating over 960MHz). This was to avoid a serious

Conclusion


So what is the real issue? First, despite being partly unlicensed the FCC has been addressing interference issues as they are reported. Its public records support the conclusion that Part 15 devices are not out there interfering with the world with no type of enforcement as some have us to believe.

They also fail to take into account the people in the field from the Part 15 manufacturers who address such issues as they arise. Is the situation perfect? Far from it, but it is not as chaotic as some people think or state in their public filings. Fear is a powerful motivator.





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