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THE REGULATORY ROUNDUP

Topic: Safety Code 6; ISED Tower Consultation; Victory in Parkland County Alberta

In the "Regulatory Roundup" column in each issue of *The Canadian Amateur* magazine, I will provide an overview of our regulatory priorities and also discuss some topics of interest.

Safety Code 6

Heath Canada, a federal government agency, publishes Safety Code 6.

"The purpose of this code is to specify maximum levels of human exposure to RF fields at frequencies between 3 kHz and 300 GHz, to prevent adverse human health effects in both controlled and uncontrolled environments."

The standards in Safety Code 6 are "based on… national and international exposure limits."

This Health Canada standard is based on a wide-ranging review of scientific literature and the standards developed in many other countries.

The Canadian standards are, in effect, identical to those of other developed countries. This makes sense as there is nothing uniquely Canadian about the effects of RF on the human body.

Safety Code 6 is currently available in English at

- https://publications.gc.ca/collections/Collection/H46-2-99-237E.pdf

In French, the document is known as "Code de sécurité 6" and it can be found online at:

- https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/ewh-semt/alt_formats/pdf/consult/_2014/safety_code_6-code_securite_6/final-finale-fra.pdf

The standards in Safety Code 6 apply to Amateur Radio and to all other kinds of radio use. Proof of Safety Code 6's relevance to Amateur Radio comes in our exams.

There are 10 possible questions on Safety Code 6 in the Basic exam. Every person attempting the Basic exam will get one of those 10 questions.

The exam questions focus on some important concepts:

- There are two established heath effects that can arise from exposure to RF: heating tissue and nerve stimulation.
- The greatest risk of these effects is from 48 MHz to 300 MHz. There are risks in other parts of the spectrum, but the risks are greater at these VHF frequencies.
- The code applies to all transmissions: there are no exemptions for low-power devices or handheld radios.
- The code does not specify power levels in watts; it uses measurements of field strength to set compliance limits.

Key Factors

The key factors that determine the effect of RF on the human body are: frequency, power, duration of exposure and distance. These are all accounted for in Safety Code 6 and in the two RF exposure calculators that you will see in subsequent paragraphs.

Your Microwave Oven

In our homes, we all have an obvious example of how RF can heat tissue: your microwave oven is basically a transmitter in a Faraday Cage. That transmitter operates at 2.45 GHz in one of the Industrial, Scientific and Medical (ISM) bands. It runs about 1,000 watts input and that's enough to heat your food. Humans are made of meat so our tissues can heat up just as well as your leftover chicken korma.

Multiple Measures

Safety Code 6 is complicated. It sets standards that are hard to understand and harder to measure. By the document's own admission, "direct measurements… are often only feasible under laboratory conditions." None of us live in laboratory conditions so we must come up with the best practical ways of measuring RF exposure to determine our compliance with the code.

For every standard set in Safety Code 6, there are two versions: one for "controlled environments" and another for "uncontrolled environments".

"Controlled environments" are areas where informed and trained personnel are the only ones present. This may apply to you when you are building, testing and experimenting with your equipment. The Code allows for higher exposure levels in these controlled conditions.

"Uncontrolled environments" are locations where uninformed and unaware members of the public may be present. These more stringent standards may apply to Radio Amateurs operating from their home stations, when mobile or operating from portable locations.

What Should I Do?

In most cases, the stations established by Radio Amateurs are unlikely to exceed the limits in Safety Code 6. However, it might be worth your time to take a few minutes to assess your own station. Someday you may find yourself facing a cranky neighbour alleging that your transmissions are a public menace. An honest evaluation of your station may serve to prepare you for just such an interaction. You may want to keep a roll of tin foil handy so you can make them a hat.

If you ever plan to erect an antenna system tall enough to require consultation with your neighbours, Innovation, Science and Economic Development Canada (ISED) policy requires to you to assess your proposed antenna system's compliance with Safety Code 6.

Under ISED's current policy, if you want to put up an antenna system greater that 15 metres in height, you will be required to inform your neighbours and affirm that you will comply with Safety Code 6.

Online Calculators

Whatever your motivations for making an assessment, there are two online calculators you can use to make your own assessment of your current station or to model an antenna system you intend to erect.

- Radio Society of Great Britain (RSGB): https://rsgb.services/public/software/emccalculator/,
- American Radio Relay League (ARRL): https://www.arrl.org/rf-exposure-calculator

Both are easy to use and designed to accommodate station configurations popular with Radio Amateurs.

The RSGB calculator is shown in Figure 1. The yellow spaces are where you enter data or select from a drop-down menu of possibilities. The blue spaces will show calculations made by this application.

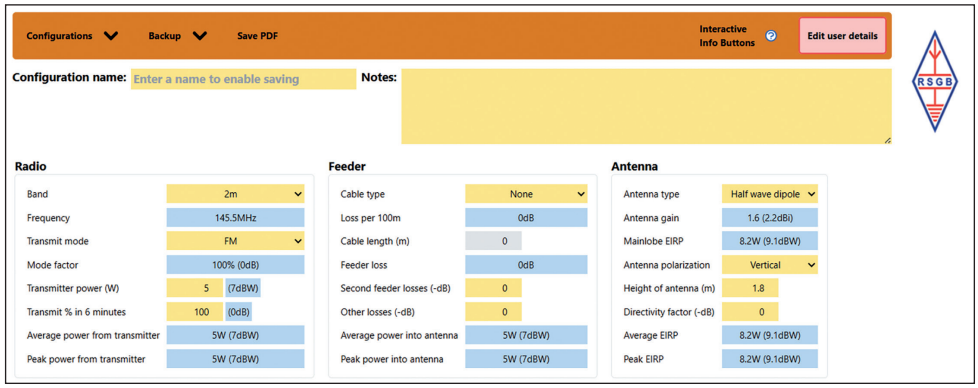
Both the RSGB and the ARRL calculators allow you to download results as a PDF. It may be worth keeping copies handy for that cranky neighbour.

Both calculators will give you a practical result telling you how far away from your antennas people should be to minimize the risk of either nerve stimulation or tissue heating from your transmissions.

Of the two, I found the RSGB calculator provides a more intuitive result. I have used the calculator to model three common configurations one might see in an Amateur's station:

A) A half-wave vertical for two metres (144 MHz), running 25 watts of FM or Digital Voice. In this scenario, your antenna is three metres (about 10 feet) above the ground. It is fed with 10 metres of RG-213 coax.

Figure 1: Radio Society of Great Britain (RSGB) calculator



B) A three-element yagi for 20 metres (14 MHz) running 500 watts SSB. In this scenario, your antenna is 15 metres (about 49 feet) above the ground. It is fed with 25 metres (about 82 feet) of RG-213 coax.

C) A half-wave horizontal dipole for 80 metres (3.5 MHz) running 250 watts CW. In this scenario, your antenna is 10 metres (about 33 feet) above the ground. It is fed with 25 metres (about 82 feet) of RG-213 coax.

In all of these scenarios, I assumed transmissions for 50% of every six-minute period.

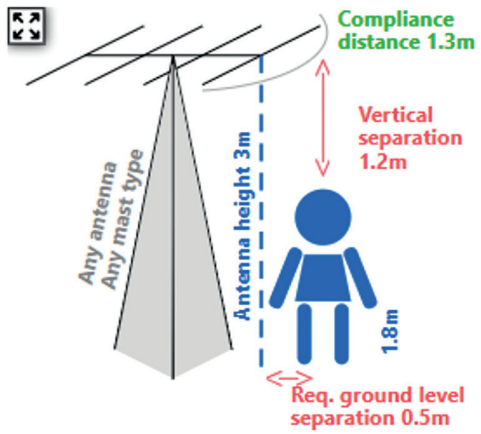
Scenario A (Figure 2): 145 MHz FM 25 watts half-wave vertical 3 metres (about 10 feet) above ground. If people are at least 1.3 metres (about 4 feet 3 inches) away from your antenna while transmitting, this configuration is compliant with the standard in Safety Code 6 for "uncontrolled environments."

Scenario B (Figure 3): 14 MHz SSB 500 watts three-element horizontal Yagi 15 metres (about 49 feet) above ground. If people are at least 3 metres (about 10 feet) away from your antenna while transmitting, this configuration is compliant with the standard in Safety Code 6 for "uncontrolled environments."

Figure 2:

ITU-T K.52 (ICNIRP 2020 Limits)

ITU-T K.52 Documentation- Note: Calculator Limitations

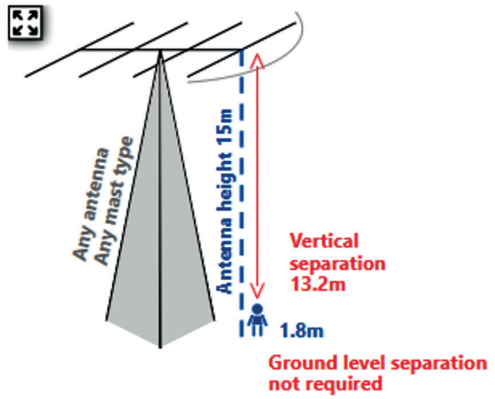


Compliance distance	1.3m
Vertical separation	1.2m
Required separation at ground level	0.5m

ITU-T K.52 (ICNIRP 2020 Limits)

ITU-T K.52 Documentation- Note: Calculator Limitations

Figure 3:

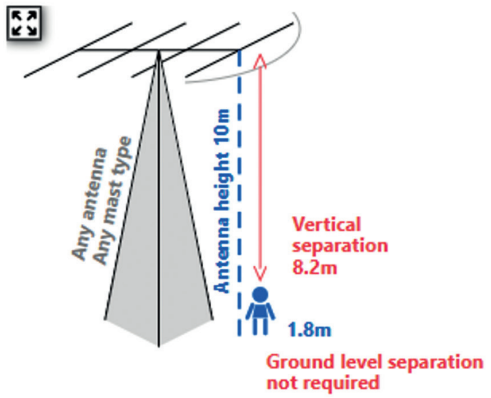


Compliance distance	3m
Vertical separation	13.2m
Required separation at ground level	0m

ITU-T K.52 (ICNIRP 2020 Limits)

ITU-T K.52 Documentation- Note: Calculator Limitations

Figure 4:



Compliance distance	2.6m
Vertical separation	8.2m
Required separation at ground level	0m

Scenario C (Figure 4): 3.5 MHz CW 250 watts half-wave horizontal dipole 10 metres (about 33 feet) above ground. If people are at least 2.6 metres (about 8 feet 6 inches) away from your antenna while transmitting, this configuration is compliant with the standard in Safety Code 6 for "uncontrolled environments."

That wasn't too hard, was it?

Assessing your station's compliance with Safety Code 6 is not that difficult. In most cases, Amateur activities are completely compliant. There may be circumstances where you may want to modify your antenna or your power level to ensure you are compliant. It's in your best interest to make the assessment to ensure your health, your family's health and even the health of that cranky neighbour.

ISED Tower Consultation

In the May/June 2026 issue of TCA, you may have read about ISED's proposed changes to their policy on antenna systems. The proposed changes were intended to make it easier and faster for commercial interests to put up towers and the changes will be good for Radio Amateurs too.

Radio Amateurs of Canada worked with the Fédération des clubs radioamateurs du Québec (RAQI) to develop a joint response. We also created sample letters in English and French to make it easy for Radio Amateurs and clubs to comment: https://www.rac.ca/ised-proposes-changes-to-tower-policy/

RAC also contributed to the comments of the Radio Advisory Board of Canada (RABC) on this consultation. I'm pleased to say that on most of the questions ISED addressed in their consultation, RAC and RABC's interests are in complete alignment.

The deadline for replies on the comments of others has been extended until September 22 so there is still time for you and your club to send in any comments. To date, more than 300 individuals and 90 clubs, businesses and organizations have provided feedback. ISED will then review the comments they receive and will finalize the changes to this important policy in the coming months. RAC will issue a news bulletin when the amended policy is published and information will be included in this column and on the RAC website.

Victory in Parkland County, Alberta

Mern Scheidl, VA6MER/VA6MR, reported an important victory for Amateurs west of Edmonton in Parkland County.

On May 15, an amended by-law came into effect that "removes all county control and approval of federally regulated communications equipment." Mern indicated that before these amendments, Parkland County tried "to control every aspect of an Amateur Radio operator's station including towers, antennas, feedlines etc."

The key section of Parkland County's amended by-law is in section 5.60, subsection 1.2, which states: "The placement of telecommunication towers and equipment is federally regulated and exempt from municipal control and approval. Parkland County may review applications for telecommunications towers and may issue a letter of support (concurrence) or non-support (non-concurrence) to the service provider."

Congratulations to Mern and other Radio Amateurs in Parkland who fought the good fight and achieved a great success.