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Implementation and Interpretation of the Interference-Causing Equipment Standard for Digital Apparatus, ICES-003

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Canada

Introduction

This *Electromagnetic Compatibility Advisory Bulletin 3* (EMCAB-3), Issue 4 serves as a guide to compliance with Industry Canada's Interference-Causing Equipment Standard 003, Issue 4, *Digital Apparatus* (ICES-003). For ease of use and interpretation, the information contained in EMCAB-003 is presented in a question-and-answer format.

The Issue 4 of ICES-003 replaces ICES-003, Issue 3. It includes changes arising from the adoption by the Canadian Standards Association of CISPR Pub. 22, 1997 (3rd edition) with the Canadian modifications of August, 2002, as a National Standard of Canada designated CAN/CSA-CISPR 22-02. In the interest of furthering Canadian harmonization with international standards, ICES-003, Issue 4 incorporates by reference CAN/CSA-CISPR 22-02 as the mandatory standard for compliance testing.

The present EMCAB-3, Issue 4 has been released in order to address the above changes to ICES-003.

Frequently Asked Questions about ICES-003, Issue 4

Q 1. What devices are considered to be "digital apparatus"?

- A. The definition of digital apparatus provided in ICES-003 states: "...‘digital apparatus’ means an electronic apparatus that generates and uses timing signals at a rate in excess of 10,000 pulses per second...". Practically, this means any device which contains a microprocessor running at a 10 kHz clock rate or greater.

By extension, any device which must be attached to this apparatus in order to perform its intended function is also included as a part of the apparatus. Therefore, computer peripherals are considered to be digital apparatus and include such things as floppy disk drives and other data storage devices, terminals, keyboards, printers and video monitors. However, a device such as a mouse or joystick which contains only non-digital circuitry or a simple circuit for signal conversion (e.g. an integrated circuit for analogue to digital conversion) is considered a passive, add-on device, and is not subject to the requirements for digital apparatus.

Radio apparatus (i.e. any device containing a radio receiver or transmitter) is specifically excluded. As an example, VCRs and stereo system components which contain digital circuitry **and a tuner** would be excluded from the definition, but stand-alone tape drives or compact disc players containing digital circuitry would be included.

I.S.M. (industrial, scientific or medical) radio frequency generators, though they may contain digital circuitry, are excluded from the definition of digital apparatus and are not subject to ICES-003. They are instead subject to another Interference-Causing Equipment Standard, ICES-001, which pertains specifically to I.S.M. radio frequency generators.

Q 2. I understand that some devices which are digital apparatus are exempted from the application of ICES-003. Which items are exempted?

A. There are eleven categories of digital apparatus which are exempted from the application of ICES-003. These are:

1. Digital apparatus in a transportation vehicle;
2. Digital apparatus used as an electronic control by a public utility or in an industrial plant;
3. Digital apparatus used in a power system by a public utility or in an industrial plant;
4. Digital apparatus used as test equipment in an industrial, commercial or medical environment, such as oscilloscopes, frequency counters and spectrum analyzers;
5. Digital apparatus used as a medical computing device, under the direction of a qualified health care practitioner;
6. Digital apparatus used in central office telephone equipment operated by a telecommunications common carrier;
7. Digital apparatus used in motor-driven appliances or electric heating devices, providing that they operate at conventional domestic power line voltages (less than 150 V to ground) and do not draw more than 20 A steady state current (in the case of a motor) or 50 A (in the case of a heating device). Power tools are limited to 2 kW input power to qualify for this exemption.

Examples of devices that are exempted in this category include sewing machines, food processors, electric ranges and hot plates, microwave ovens, oil or gas furnaces and associated fans and pumps, vacuum cleaners, electric drills, saws, sanders and buffers, and other similar domestic appliances.

8. Digital apparatus having a power consumption of less than 6 nW during operation;
9. Digital apparatus in which both the highest frequency generated and the highest frequency used are less than 1.705 MHz and which are incapable of operation while connected to the AC power lines. Devices having provision for operation while connected to AC power lines via battery eliminators, AC adaptors or battery chargers, or while connected indirectly to the AC power lines through another device, do not qualify for this exemption.
10. Digital apparatus used **solely** for purposes of demonstration and exhibition. This, however, is subject to special conditions, which are explained in Question 13.
11. Digital apparatus used as prototype units.

Q 3. What are the requirements under ICES-003 regarding the approval of digital apparatus for use in Canada?

- A. There are three basic requirements under ICES-003, all of which must be satisfied before digital apparatus can legally be used in or imported into Canada. First, a representative type or sample of the digital apparatus must be tested to ensure that it meets the Class A or Class B limits (whichever are appropriate). Second, a copy of the test report, showing the date the measurements were completed, must be retained by the manufacturer or importer for a period of five years from that date. Third, notification of compliance in the form of a written notice to the end user must accompany each unit of digital apparatus.

Q 4. How should the Department be advised of a device's compliance?

- A. It is not necessary to advise the Department of a device's compliance. ICES-003 only requires that a copy of the test report be maintained on file by the manufacturer of a Canadian-made product or by the importer of a product made outside Canada for a period of five years from the date of completion of the tests (which must be indicated in the report), and that the copy be made available to the Department upon request.

Q 5. What are the test requirements of ICES-003?

- A. Digital apparatus must be tested in accordance with the method specified in CSA Standard CAN/CSA-CISPR 22-02, which is an adoption with modification of CISPR 22:1997 (third edition). This CSA standard is mandated through incorporation by reference in ICES-003, Issue 4.

Note: Digital apparatus tested for compliance with CISPR 22: 1993, second edition (plus amendments 1 and 2) need not be retested and will be considered to have met ICES-003, Issue 4 requirements until further notice.

Q 6. Who may carry out the necessary tests?

- A. Any suitably equipped laboratory or organization can perform the tests. There are no restrictions as long as the specified test methodology is followed. It is the responsibility of the manufacturer of a Canadian-made product or the importer of a product made elsewhere to ensure the validity of the test results.

Q 7. What are the labelling requirements?

- A. Each unit of digital apparatus is required to be provided with a written notice indicating compliance with ICES-003. The notice **must** be in the form of a label that is affixed to the unit.

(Question 8 deals with cases where a label cannot feasibly be affixed to a device.) While this notice may be combined with that required by the FCC, it must clearly indicate compliance with Canadian ICES-003. ICES-003, Issue 4 provides a suggested wording for the notice, which is reproduced in Question 9 of this bulletin.

The requirement to affix a label is not mandatory for models of digital apparatus whose compliance testing was completed before April 1, 1995. These are permitted to comply with the labelling requirements of ICES-003 Issue 1, which remained in effect until March 31, 1995. The labelling requirements of ICES-003, Issue 1 state that a written notice indicating compliance must accompany each unit, and it may be either in the form of a label that is affixed to the device, or in the form of a statement printed in the user manual.

Q 8. Are there any provisions for equipment that can't be labelled?

- A. If because of insufficient space or other constraints it is not feasible to affix a label to the equipment, it will be permissible to print the notice of compliance in the user manual. (For these purposes, a user manual may be in machine-readable format, such as a floppy disk.) Examples of other constraints which would be considered as making labelling unfeasible are those where the label would cause the device to malfunction or prevent its operation. The effect of a label on the appearance of the device is not a valid constraining factor. Within these considerations, the manufacturer or importer is expected to judge the requirement. The Department may be contacted for interpretation in questionable cases.

Q 9. What wording must be used for the notice on the compliance label?

- A. ICES-003 requires only that the notice indicate that the device in question complies with the appropriate Class A or Class B requirements for digital apparatus under **Industry Canada standard ICES-003**. No specific wording for this notice is required. However, the following suggested text is provided, in English and in French, in the Annex of ICES-003:

"This Class (*) digital apparatus complies with Canadian ICES-003."

"Cet appareil numérique de la classe (*) est conforme à la norme NMB-003 du Canada."

* Insert here either "A" or "B", whichever is applicable.

Q 10. Must the notice be in both English and French?

- A. The requirements of ICES-003 will be satisfied by the appearance of the notice in either English or French (the two official languages of Canada). However, it is the responsibility of the manufacturer or importer to determine whether the notice should appear in one or the other, or both, of the official languages, based upon the intended market, company marketing policies, and any other applicable provincial or federal regulations.

Q 11. Does equipment already approved under the FCC requirements need to be retested?

- A. At present, the FCC permits compliance with Part 15 either by meeting the limits prescribed in Part 15 itself or by meeting the limits prescribed in CISPR 22, which is incorporated by reference in Part 15.

Formerly, until the replacement of ICES-003, Issue 3 with ICES-003, Issue 4 in February, 2004, compliance could be attained either by meeting the limits in CISPR 22 or alternatively, the limits in CSA C108.8, the two standards incorporated by reference in ICES-003, Issue 3. The limits in C108.8 were equivalent to the limits given in Part 15.

In 2003, C108.8 was abolished by the CSA. This development prompted the publication of ICES-003, Issue 4, which references only CISPR 22 as the sole standard prescribing limits. This means that devices compliant with Part 15 through meeting the limits given in Part 15 itself (instead of the alternative CISPR 22 limits) may fail to meet the CISPR 22 limits prescribed by ICES-003, Issue 4.

However, given several years' experience with devices compliant with the limits in Part 15 or C108.8 operating without causing interference, Industry Canada will until further notice continue its policy of accepting FCC Part 15 compliance toward compliance with ICES-003. That is, if you have FCC approval (either by meeting the limits set out in Part 15 or in the version of CISPR Publication 22 referenced in Part 15), the equipment need not be retested. The only additional requirements are:

- to attach a note to the report of the test results for FCC compliance, indicating that these results are deemed satisfactory evidence of compliance with **Industry Canada Interference-Causing Equipment Standard ICES-003**;
- to maintain these records on file for the requisite five-year period; and
- to provide the device with a notice of compliance in accordance with Questions 7 to 10.

This process will, of course, be subject to reconsideration should the FCC requirements be changed.

Note: In cases of interference incidents or disputes resulting in enforcement activity by Industry Canada (see Question 16), compliance of the subject device will be validated against the limits specified by the version of ICES-003 in force on the date shown in the test report when the measurements were completed. For equipment tested prior to June 1, 2004, the limits given in either CSA C108.8 or CSA-CISPR 22, as appropriate, will be used to validate compliance. For equipment tested on or after June 1, 2004, only the limits given in CSA-CISPR 22 will be used.

Q 12. Does digital apparatus that had previously complied with ICES-003 have to re-comply if it undergoes a retrofit or modification?

- A. When a model of equipment already in compliance with ICES-003 is retrofitted with a component (such as a printed circuit board) that is itself subject to ICES-003, the component must comply with ICES-003. The retrofitted equipment will then remain in compliance with ICES-003 without the need to retest the entire assemblage. The equipment will not, for compliance purposes, be considered a different model from before the retrofit.

When a model of equipment that was in compliance with ICES-003 when the model was first introduced is modified with circuitry or components not themselves subject to compliance with ICES-003 but which may change the electromagnetic emission characteristics of the equipment, it will be considered, for compliance purposes, as a new model and must be retested for compliance with ICES-003.

For both of the above cases, the requirements for compliance labelling will be in accordance with the rules explained in Question 7.

Q 13. I understand that non-compliant digital apparatus can be exhibited at trade shows only under certain conditions. What are these conditions?

- A. The conditions which must be met in order to legally exhibit non-compliant digital apparatus at trade shows are, firstly, to include in the associated shipping documentation a declaration such as the following:

"This equipment is a prototype unit which is intended for purposes of product development, evaluation, demonstration or exhibition only. It has not been tested for compliance with the Industry Canada Interference-Causing Equipment Standard ICES-003, and therefore it cannot be leased, sold, or offered for sale in Canada."

"Cet équipement est un prototype conçu uniquement pour le développement, l'évaluation, la démonstration ou l'exposition de produits. Il n'a pas subi les essais de conformité avec le norme sur le matériel brouilleur NMB-003 de l'Industrie Canada et ne peut donc pas être loué, vendu ou mis en vente au Canada."

Secondly, a sign bearing a statement identical to the above, printed in block letters large enough to be easily readable at a distance of approximately two metres (six feet), must be prominently displayed with the equipment at the location of the exhibit. The choice of language(s) for the sign should be made in accordance with the guidance provided in Question 10.

Q 14. ICES-003 is included in the Industry Canada Category II Equipment Standards List. What is the significance of this?

- A. The Category I and Category II Equipment Standards Lists are defined in the *Radiocommunication Regulations*, which give effect to the Interference-Causing Equipment Standards, including ICES-003. All equipment subject to the *Radiocommunication Regulations* are either Category I Equipment or Category II Equipment. Equipment designated as being in Category I is subject to a process of certification by Industry Canada. If it passes the certification process, the equipment is awarded a Technical Acceptance Certificate or TAC, signifying that it has been authorized by Industry Canada for operation in Canada. **On the other hand, Category II Equipment, which includes all interference-causing equipment, does not require a TAC, but is only required to comply with the applicable Industry Canada standards such as ICES-003 for the case of digital apparatus.**

Q 15. What happens if a digital apparatus which meets the limits still causes interference?

- A. When a unit of digital apparatus causes interference to radiocommunication, the *Radiocommunication Regulations* dictate that it must be suppressed or its operation terminated in order to eliminate the interference, whether or not it has met the emission limits. This also applies to the exempted equipment described in Question 2.

Q 16. How will ICES-003 be enforced?

- A. Most enforcement activity will result from the interference investigation process, and will be tempered by experience regarding the apparent success of ICES-003 in reducing radio interference. The radio inspector investigating an interference complaint may also elect to investigate whether the unit or another like it meets the limits prescribed in ICES-003 and take whatever follow-up action is appropriate.

Q 17. What is the penalty for non-compliance?

- A. For each occurrence of an offence, the *Radiocommunication Act* provides for penalties which are, in the case of an individual, a fine not exceeding \$5,000 and/or imprisonment for a term not exceeding one year, or in the case of a corporation, a fine not exceeding \$25,000. Where an offence is committed or continued, the person who committed the offence is liable to be convicted for a separate offence for each day on which the offence is committed or continued.

Q 18. How can I get a copy of Interference-Causing Equipment Standard 003, Issue 4, *Digital Apparatus*?

- A. ICES-003, Issue 4 is available on the Spectrum Management and Telecommunications Web site at the following address: <http://strategis.ic.gc.ca/epic/internet/insmt-gst.nsf/en/sf00020e.html>.

Q 19. How can I get a copy of the CSA standard CAN/CSA-CISPR 22- 02 referenced in ICES-003, Issue 4?

- A. This CSA standard is referenced to identify the limits, and the instrumentation and method of measurement that must be employed. It may be ordered from:

Canadian Standards Association
Standards Sales
178 Rexdale Boulevard
Rexdale, ON
Canada
M9W 1R3
Telephone: (416) 747-4044

Q 20. Who can I contact for further information regarding ICES-003, Issue 4?

- A. Those seeking further information regarding implementation and interpretation of ICES-003, Issue 4 may contact the following:

Industry Canada
Spectrum Engineering Branch
[EMC Analysis and Consultation](#)
365 Laurier Avenue
Ottawa, ON
K1A 0B1
Telephone: (613) 990-4699
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