



Innovation, Science and  
Economic Development Canada

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Développement économique Canada

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# Decision on revisions to the Interference- Causing Equipment Standard (ICES)-005, Lighting Equipment

## Intent

Through the release of this paper, Innovation, Science and Economic Development Canada (ISED) announces the decisions resulting from the review process regarding proposed changes to ICES-005, *Lighting Equipment* (the Consultation).

## Background

The Minister of Innovation, Science and Economic Development, through the [Department of Industry Act](#), the [Radiocommunication Act](#) and the [Radiocommunication Regulations](#) is responsible for spectrum management including the establishment of technical requirements and technical standards regarding interference-causing equipment.

In December 2015, ISED published ICES-005, issue 4, *Lighting Equipment*, which aligned with the international CISPR 15 Edition 8.1, 2015-03, [Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment](#). In April 2018, ISED released a [draft version of the consultation](#), which was published through the Radio Advisory Board of Canada (the RABC), proposing a number of modifications to ICES-005, issue 4. The proposed modifications included:

- specifying ballast and dimmers as specific examples of modules within the scope of ICES-005
- clarifying requirements for lighting equipment for airfield runways, recreational vehicles, or boats/vessels for purposes other than traffic signaling
- clarifying requirements where matters are covered in ICES-Gen, [General Requirements for Compliance of Interference-Causing Equipment](#)
- proposing a six-month transition period from the date of publication of the new version of ICES-005

## Ballasts and dimmers

In 2015, the addition of “modules exclusively for use with lighting equipment and which are marketed independently” was intended to align ICES-005 with CISPR 15, which is a standard that has been adopted by numerous countries around the world including Japan, Republic of Korea, Republic of China (Taiwan), Australia and the European Union. This alignment also intended to address the harmful interference issues from LED devices to Canadian public safety radiocommunication systems. The Consultation specifically proposed including ballasts and dimmers as examples of modules. Modules can generate high levels of radio frequency emissions if not properly designed, and therefore interfere with radiocommunication services. In a 2014 departmental study on lighting equipment, emissions from triac-based dimmers (a three-terminal semiconductor device that will conduct in either direction when triggered by a positive or negative signal at the gate electrode) obtained from the Canadian market reached levels as high as 40 dB above the CISPR 15 conducted emission limits.

Comments on the draft version of ICES-005, issue 5 were received from the RABC, Lutron Electronics Inc., Hydro Ottawa, Electro-Federation Canada (EFC), National Electrical Manufacturers Association (NEMA) and Bluesky Strategy Group Inc. (on behalf of Lutron Electronics).

RABC members such as Cisco, the Province of Ontario, Nav Canada and Vidéotron expressed concerns about interference to licensed systems and Wi-Fi devices from lighting equipment.

Lutron Electronics, Bluesky Strategy Group, Hydro Ottawa, EFC and NEMA, all commented that the addition of dimmers came as a surprise to the industry. Arguments against the inclusion of dimmers in the scope of ICES-005 include:

- minimal interference complaints regarding dimmers
- the appropriateness of incorporating CISPR standards for devices functioning on the North American 60Hz/120V electrical grid where possible modifications may be required to the *Canadian Electrical Code* in order to compensate for larger form factors needed for the additional filtering components
- the lack of harmonization between Canadian and U.S. requirements

ISED also had further discussions with NEMA and EFC who then submitted additional comments in writing about the dimmer issue and the consultation process.

In light of the arguments received, ISED initiated another technical study on triac-based dimmers. All dimmers, which were tested, failed ICES-005 technical requirements, potentially highlighting a broader issue with dimmers on the Canadian market. In response to the claim that CISPR standards are not appropriate for devices functioning on 60 Hz/120 V electrical grid, approximately 40% of subject matter experts within the CISPR 15 committee are from countries with similar electrical power specifications to North America. Moreover, countries that have developed the CISPR standards have already adopted CISPR 15 and included it as part of their regulation. On a global market assessment of dimmers, ISED did not find significant differences in terms of size or price of these devices in different countries. Furthermore, dimmers destined for international markets with similar form factor were tested, and found in compliance with the CISPR 15 limits.

Triac-based dimmers are currently defined as “incidental radiators” under the United States (U.S.) FCC Part 15 rules, for which no testing requirement is mandated. Notwithstanding the above departmental findings and positions, ISED recognizes that minimizing regulatory differences with key trading partners such as the U.S. is important to reduce any technical barriers to trade. Imposing technical requirements on dimmers in Canada, given the regulatory differences with the U.S., could create a disparity and that could negatively impact the North American dimmer market.

After carefully considering all of the material and submissions, ISED will not include the triac circuitry of dimmers, which typically operates at 60 Hz, in the scope of ICES-005.

It should be noted that, even though the triac circuitry of dimmers will not be included in the scope of ICES-005, manufacturers need to be cognizant of their regulatory responsibility to design devices that do not create harmful interference with radiocommunication services. Furthermore, under the *Radiocommunication Act*, ISED is able to remove dimmers from the Canadian market if they cause interference through enforcement actions, if deemed necessary.

However, circuitry operating above 9 kHz can cause significant noise, and dimmers or other lighting equipment with these types of components must meet the applicable technical standard(s) in ICES-005. The U.S. FCC also mandates similar requirements.

Ballast devices, which supply power to a lamp or tube, typically have an operating frequency in the range of 20 kHz to 200 kHz, were added in order to provide a specific example of modules under the scope of ICES-005. Submissions were not received on the use of ballast as an example. Therefore, ISED will amend ICES-005 accordingly.

ISED may revisit the scope of ICES-005 to ensure the appropriate interference protection measures are in place to protect the radio frequency spectrum through future consultations.

### **Airfield, recreational vehicle and boat lighting**

The Consultation proposed clarifying requirements for lighting equipment for airfield runways, recreational vehicles and boats/vessels for purposes other than traffic signaling to prevent harmful interference from these devices. Comments were not received on this proposal, therefore ISED will amend ICES-005 as indicated.

### **ICES-Gen requirements**

The Consultation proposed adding clarification detailing that, in addition to ICES-005, the requirements of ICES-Gen, specifically the general requirements for compliance of interference-causing equipment, shall apply. However, where a requirement in ICES-Gen contradicts a requirement in this standard, ICES-005 shall take precedence. Comments were not received on this proposal, therefore ISED will amend ICES-005 as indicated.

### **Transition period**

ISED proposed a transition period of six months from the date of publication of the new standard for stakeholders affected by the new standards. During this time, compliance with either the current ICES-005, issue 4 or ICES-005, issue 5 would be accepted. After the expiry, all products manufactured, imported, distributed, leased, offered for sale, or sold in Canada would have to comply with ICES-005, issue 5. Comments were not received on this proposal, therefore ISED will amend ICES-005 as indicated.

### **Next steps**

ISED will update the current ICES-005, issue 4 in accordance with this decision and issue ICES-005, issue 5, which will be available on the [Spectrum Management and Telecommunications](#) website.

**Copies and information**

All spectrum-related documents referred to in this paper are available on the [Spectrum Management and Telecommunications](#) website.

For further information concerning the decision outlined in this document or related matters, contact:

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