element

WHITEPAPER

ISED CANADA: RSS-102 ISSUE 6 STANDARD UPDATE

UNDERSTANDING THE TRANSITION FROM RSS-102 ISSUE 5 TO ISSUE 6

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AN INTRODUCTION TO ISED CANADA

From 15th December 2024, radio equipment marketed or sold into Canada must be compliant with Issue 6 of RSS-102.

Radio equipment marketed or sold into Canada must be certified with ISED Canada, the Canadian equipment authorisation regulator. Most commonly this is done via an industry-based Certification Body (CB), such as Element.

This certification requirement applies to any radio transmitter operating above 9 kHz, including Wi-Fi, Bluetooth® wireless technology, 2G/3G/4G/5G cellular, remote controls, RFID, wireless power transfer (WPT), automotive radio, etc.

For Canada, radio transmitter equipment is certified to Radio Standards Specifications (RSS). These RSS have an 'issue' number which may change, and all radio equipment must be re-assessed to meet the latest issue of the RSS, if the manufacturer wishes to keep marketing or selling that equipment into Canada.

This is quite unlike other regions, for example in the USA, equipment is certified to the FCC's rules which rarely change. In the EU, the manufacturer declares compliance with a Directive which rarely changes, based on testing to standards which change often.

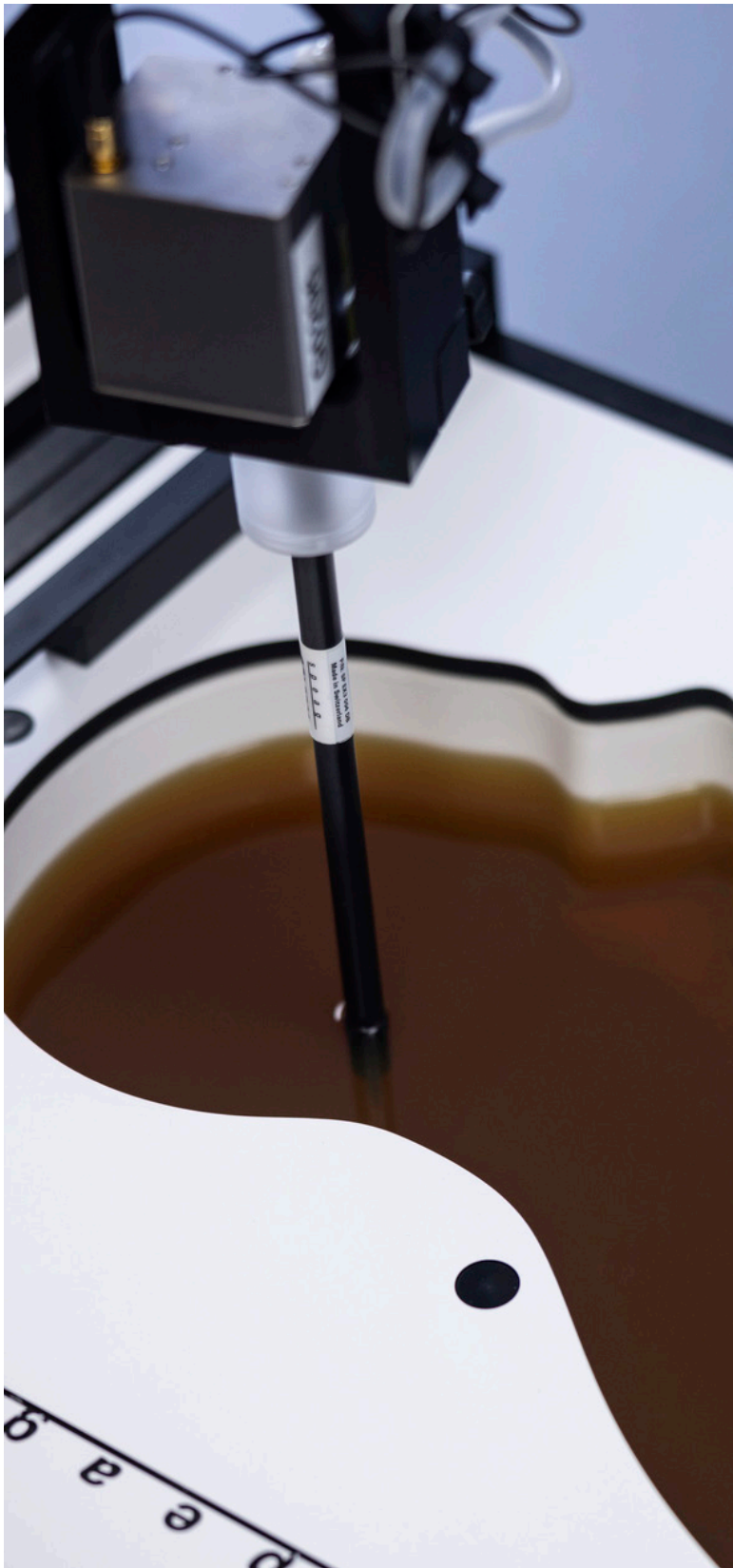
Radio equipment is certified to the issue number of the RSS which is valid at the time of certification, but each subsequent unit marketed or sold into Canada must be compliant with the latest issue of each applicable RSS. In this way, Canadian authorizations feel like the FCC because they are based on certification, but also feel like the EU's CE marking because the manufacturer must constantly re-assess their radio equipment when the standards change.

All radio equipment manufacturers apply at least three RSS when certifying their products:

- There is always an RSS applicable to their specific radio, such as RSS-210 for low power short-range devices like RFID, or RSS-247 for equipment such as Wi-Fi and Bluetooth.
- There is RSS-102, covering RF exposure requirements, applicable to all radio transmitters.
- There is RSS-GEN, covering the general requirements for equipment authorization, applicable to all radio transmitters.

So, in the example of a Bluetooth device, the manufacturer needs to show that their product complies with the latest versions of RSS-247, RSS-102, and RSS-GEN. As they continue to sell or market their devices in Canada, they must keep their eyes on these standards and re-assess their radio equipment if any of these standards increment to a new issue number.

In some cases, this reassessment leads to additional testing and/or an update to the equipment certification, whereas in other cases, it is possible for the manufacturer to update their paperwork without further testing or amendment to the certification. The manufacturer must research the changes in the RSS to establish which route or actions apply.



UNDERSTANDING THE CHANGES TO RSS-102 ISSUE 6

WHAT'S HAPPENED?

RSS-102, the RF exposure requirements which apply to all radio transmitter equipment, has been updated from issue 5 to issue 6. RSS-102 issue 6 was published on 15th December 2023 with a 12-month transition period. Therefore, any radio equipment marketed or sold into Canada must be compliant with RSS-102 issue 6, by 15th December 2024.

Any equipment certified in 2024 was most likely certified to RSS-102 issue 6, although manufacturers should check that. Any equipment certified to RSS-102 issue 5 (or earlier) must be reassessed before 15th December 2024, if the manufacturer wishes to keep selling or marketing the product into Canada.

USEFUL TERMINOLOGY

Based on the frequency and operation of the transmitter, one or more of the following will apply to each radio equipment:

- Radio equipment transmitting in the range 3 kHz to 10 MHz require an assessment of Nerve Stimulation (NS) levels.
- Radio equipment transmitting in the range 100 kHz to 6 GHz, used within 20 cm of the body, require an assessment of Specific Absorption Rate (SAR) levels.
- Radio equipment transmitting above 6 GHz, used within 20 cm of the body, require an assessment of Adaptive Power Density (APD) levels.
- Radio equipment transmitting above 6 GHz require an assessment of Incident Power Density (IPD) levels.
- Radio equipment used at more than 20 cm from the body in normal use is assessed for Field Reference Levels (FRL) based on radiated fields. This was referred to as 'RF exposure evaluation' in previous versions of RSS-102.

Most of the requirements are based around a "test exemption threshold". This term relates to the aspects of a product which trigger a physical test, or a test exemption. Based on the output power, transmit frequency, configuration of transmitter, distance from the user or bystander, a test at a test lab may be needed, or it may be exempt from testing, and this combination of factors are known as the "test exemption threshold".

KEY CHANGES

From 15th December 2024, the following changes will be required for all radio equipment marketed or sold within Canada to ensure compliance with the updated RSS-102 issue 6 standard.

In most cases when a standard changes, be it a Canadian RSS or ICES, or a European EN standard, the gap analysis process from old to new version is quite simple. However, in this case, RSS-102 has undergone such a significant rewrite that it is not an easy task.

The layout and structure of the entire document has changed and importantly, some test or technical assessment sections have changed too.

- For some devices, the test exemption thresholds have changed. This may mean a relaxation, such as a low-frequency device which required an NS test in the past may be exempt from it in the future. It may mean a tougher requirement, such that a SAR test may now be needed on a device which was previously exempt.
- For example, the most common type of equipment certified for use in Canada is 2.4 GHz Bluetooth or Wi-Fi equipment. The SAR test exemption threshold has been reduced (a lower power level) for these devices, such that more equipment will require SAR testing. For a manufacturer of a Bluetooth device transmitting around 5 dBm (between 3 mW and 4 mW), it could mean that the device was exempt from SAR testing at the time of certification but requires a SAR test now, to comply with RSS-102 issue 6.
- There are also changes for some types of equipment. For example, wireless power transfer (WPT) equipment has a specific section in the new RSS-102 issue 6, which did not exist in RSS-102 issue 5.
- RSS-102 issue 6 introduces a term known as the Total Exposure Ratio (TER), for equipment with more than one transmitter where the transmitters can transmit at the same time. This is a new section dedicated to the combined assessment of multiple transmitters with different parameters. For example, a low-frequency RFID requiring NS and a higher-frequency Wi-Fi or cellular requiring SAR. Or a Wi-Fi device used at more than 20 cm from a person combined with a higher frequency IPD assessment. Previously there was no clear way to evaluate the combined effect of multiple transmitters assessed in different ways, but this requirement is defined in RSS-102 issue 6.
- For Radio module manufacturers, the requirement to document the RF exposure warnings and safe user separation distances in the installation instructions has been modified.

***Note**: This is a non-exhaustive summary of some of the changes involved in the update to RSS-102 issue 6.*

> "...a SAR test may now be needed on a device which was previously exempt."

Michael Derby
Technical Director

UNDERSTANDING THE CONSEQUENCES FOR PRODUCTS CERTIFIED TO ISSUE 5

The simple answer is that every manufacturer of radio equipment must do something. to remain compliant from 15th December 2024.

The manufacturer will perform an evaluation of their product to RSS-102 issue 6 to determine whether the product meets the new requirements, based on the work they did at the time of certification.

Below are two scenarios from a manufacturer's evaluation:

- The manufacturer's product evaluation to RSS-1022 issue 6 shows that no new testing is required and their existing assessment to RSS-102 issue 5 is sufficient. In this case, the manufacturer may not need to visit a test lab or contact a certification body.
- The manufacturer's product evaluation to RSS-102 issue 6 shows that additional testing is needed, and they need to send their product to an accredited RF exposure test lab. This would also involve contacting a Certification Body (CB), to update their ISED Canada certification.

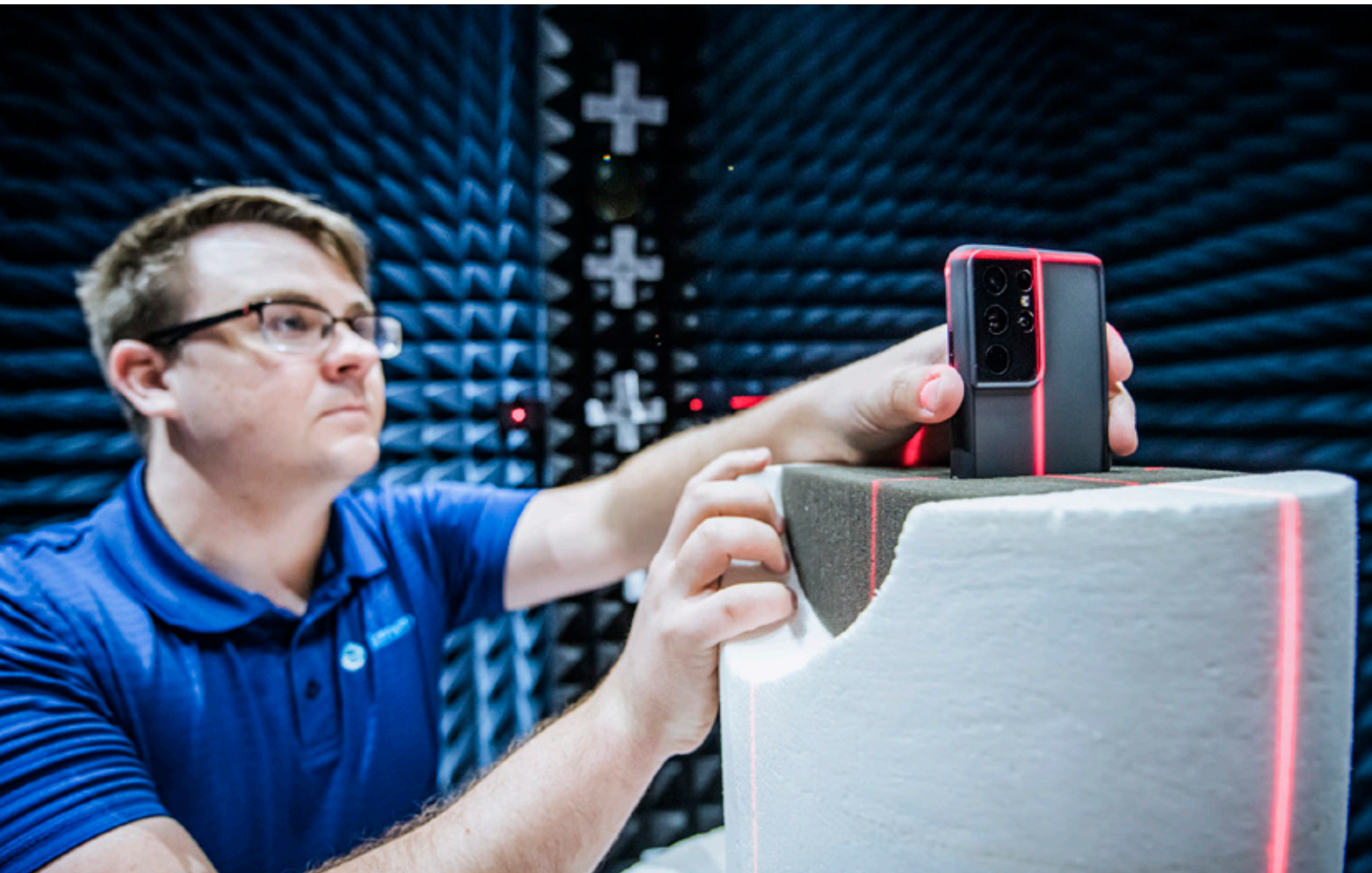
In all cases, the manufacturer must have the confidence and evidence that their product meets RSS-102 issue 6, if they continue to market or sell those products into Canada after 15th December 2024, regardless of when the product was originally certified. This applies equally to radio modules as to final equipment.

It is important to note that after 15th December 2024, any time a manufacturer tries to process a change to their certification such as a Permissive Change, or a Multiple Listing (Change in ID), or add a new model number to their product range, they will be expected to provide their evidence of compliance with RSS-102 issue 6.

Also important to note, is that after 15th December 2024, all market surveillance activities in Canada will be to the requirements of RSS-102 issue 6 because it is assumed that all devices entering or marketed in Canada after that date have been correctly assessed.

WHO IS AFFECTED?

Any manufacturer of radio transmitter equipment being marketed or sold into Canada, whether that's new equipment or existing equipment that already has an ISED Certification



NEXT STEPS

The next step for a manufacturer:

1. Check your ISED Canada certification, by reviewing the latest version of the certificate you received from a Certification Body (CB).

2. If the ISED certificate references RSS-102 issue 6 for all models of the products you market or supply to Canada, then you can relax and continue to do business. Of course, always keep your eyes open for future changes to any of the RSS listed on your ISED certificate, including the version of RSS-GEN that applied at the time of certification.

3. If the ISED certificate references RSS-102 issue 5 or earlier for any model of the products you market or supply to Canada, then you need to reassess your product to RSS-102 issue 6.

4. The first step of the reassessment is to identify whether anything has changed for you. Here are some simplified examples:

    a. If your product was previously exempt from RF exposure testing and continues to be exempt from RF exposure testing under RSS-102 issue 6, you document this, and your work is done. You should check your user manual statements and other admin requirements are also aligned with RSS-102 issue 6.

    b. If your product was previously not exempt from RF exposure testing and therefore you did RF exposure testing already (such as NS or SAR, including combined transmitters) as part of your certification, you check that your existing test results continue to be valid, you document this, and your work is done. You should check your user manual statements and other admin requirements are also aligned with RSS-102 issue 6.

    c. If your product was previously exempt from RF exposure testing under RSS-102 issue 5 but is no longer exempt from RF exposure testing under RSS-102 issue 6, you schedule the testing at an RF exposure test lab listed on the ISED Canada website and contact a Certification Body (CB) to have your certification file updated.

FREQUENTLY ASKED QUESTIONS

Some common questions we have received from manufacturers and our answers:

Q: If the reassessment shows that we do not need to change our testing, do we still need to go to a certification body to update our certificate?

A: It is only mandatory to go to a certification body to update your certificate if the assessment itself has significantly changed. For example, if the technical requirements have changed for your product and therefore new testing has been performed.

Q: If the reassessment shows that no change to the testing is needed, and an update to the certification is not needed, how do we prove that we did the reassessment?

A: In these cases, there is some integrity and trust that the manufacturer has done the right thing. By continuing to sell your products after 15th December 2024, you are stating that your product meets RSS-102 issue 6. In the future, you will be required to provide evidence of RSS-102 issue 6 compliance if you make component changes to your product, or you change the critical software in your product, or change the model number, re-brand the product, or allow someone else to put their certification number on your product. You are expected to show evidence of compliance to RSS-102 issue 6 if requested by ISED Canada during routine market surveillance activities.

Q: For the initial reassessment, is it necessary to have a formal assessment by a company like Element?

A: It is not legally mandatory to have a formal assessment by an external company when determining whether re-testing or re-certification is necessary. However, the process can be complex. Some manufacturers do like to have an independent assessment and a clear document from regulatory compliance experts.

Q: Why do we need to re-assess our product for Canada when standards change? We thought certification was a one-time thing like it is with the FCC in the USA!

A: It is important to understand what your product is certified to. In the USA, the product is tested to ANSI standards and certified to the FCC rules. It is very rare that the FCC rules change but if they do, a reassessment for the FCC is needed, as happened for 5 GHz Wi-Fi a few years ago. In Canada, the product is tested to ANSI standards and certified to the RSS documents. Those RSS documents are updated when ISED Canada considers it necessary, and since the radio is certified to the RSS, the manufacturer must reassess to the latest version. A change to the ANSI standard does not trigger a reassessment.

Q: Is there always a transition period when ISED Canada update an RSS document?

A: In the past, the transition periods did not exist, which was a challenge for manufacturers. In recent years, ISED Canada has introduced transition periods in the new RSS (and ICES, for non-radio equipment and non-radio parts). Small changes often have a 6-month transition period whereas larger changes have a 12-month transition period. RSS-102 issue 6 has a 12-month transition period from 15th December 2023 to 15th December 2024.

HOW CAN ELEMENT HELP?

Element supports manufacturers of electrical equipment containing radio technologies or modules, providing end-to-end Advisory, Testing, Inspection, and Certification (ATIC) and Global Market Access (GMA) solutions, globally. Our local teams of global experts support customers to seamlessly transition their products to new editions of their relevant standards, making the compliance process straightforward.

For support with the transition from RSS-102 Issue 5 to Issue 6, we can help you in three main ways:

1. Our Advisory Services department can perform the reassessment to RSS-102 issue 6 for you. Normally we would call this a gap analysis, but the changes to RSS-102 are so extensive that it is more like a new assessment. This assessment to RSS-102 issue 6, to establish if the existing product meets the latest standard, is a role a manufacturer is legally permitted to do themselves and it is not mandatory to use an external company for this. However, we do understand that the RF exposure requirements are confusing, and RSS-102 is a complicated document, therefore we are available to help and provide this assessment service for any manufacturer, regardless of whether we did the original testing or certification of the product.
2. We are an ISO 17025 accredited test lab, listed with ISED Canada for RF exposure testing and assessments. If it is determined that RF exposure testing is needed an accredited lab must perform the testing. We can perform the tests in one of our accredited labs in the USA, UK, EU and Korea. We can perform these RF exposure tests, regardless of whether we did the original test or certification of the product.
3. We are an ISO 17065 accredited Certification Body (CB), listed with ISED Canada for RF exposure certification. If it is determined that new RF exposure data exists and an update to the product certification is needed, we can perform the update to the ISED Canada certification. We can perform this certification update, regardless of whether we did the original testing, the new testing, or the original certification of the product.

To learn more about how our global teams of specialists can help your business, contact us today to discuss your testing and compliance requirements.

RELATED SERVICES

- Advisory services
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- Safety testing
- SAR testing
- Radio testing
- EMC testing
- Protocol testing (Matter & Zigbee)
- Cyber Security
- Global Market Access (GMA)

> “By continuing to sell your products after 15th December 2024, you are stating that your product meets RSS-102 issue 6.”
>
> **Michael Derby**
> Technical Director

ABOUT ELEMENT

Element is a leading global provider of Testing, Inspection, and Certification (TIC) services on a wide range of products, materials, processes and services and products for a diverse set of end markets, where failure in service is simply not an option.

270+

Laboratories located in 30 countries within the Americas, Europe, Middle East, Africa, Asia, and Australia

9000+

Employees and Engaged Experts worldwide, ready to help you meet your testing requirements

1000+

Accreditations and approvals. An independent endorsement of the quality of service we deliver

55000+

Customers served worldwide in a diverse range of market-leading scientific, technical, and engineering industries

Michael Derby has been in the product development and approvals business for more than 35 years. His present area of expertise is helping manufacturers get radio equipment onto the market.

As a Technical Director in Element's Connected Technology & Mobility group, Michael provides support on all topics related to radio equipment tests, certification, and authorization. He is responsible for new initiatives and growth within Element, identifying new opportunities, finding solutions, setting up new services, and training staff.

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