

# CGA Energy Nexus & Annual Technical Conference 2024

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## M301 Measurement Canada Specifications

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## Learning Objectives

An overview of MC specifications as relating to the natural gas industry

Upon completion of this session, learners will have gain better understanding of:

- Where do specifications fit in the EGI regulatory context
- How are specifications developed
- Types of specifications Measurement Canada develops and issues
- Specifications content
- Specification enforcement

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## Scope of the EGIA

- The measurement of electricity and gas is governed by the EGIA.
- All devices subject to verification under the EGIA are exempt from the WMA, as per 3(1).
- Requirements in the EGIA apply only to meters used in trade and to the people using them.
- There is no direct definition of trade in the EGIA. It is instead found in the definition of “meter”,
- found in section 2: *“making measurements of, or obtaining that basis of charge for, electricity or gas supplied to a purchaser”*
- It limits the applicability to meters used in the sale of electricity and gas. It does not cover electricity and gas meters used for other purposes (i.e. where there is no purchaser, or where the meter reading does not form the basis of the charge).

## Requirements related to trade measurement

- Legislative standards and requirements for trade devices are continually evaluated and amended to ensure they are:
- Relevant;
- Reflect the changing technology and new business practices;
- Minimize regulatory burden and costs of legislative compliance;
- Provide a positive environment for business growth, consumer and investor confidence, trade and innovation.

## Trade Measurement Requirement Structure

- the *Electricity & Gas Inspection Act and Regulations* provide the basic framework for the control of trade-related measurement to one uniform national standard.
- To expand on the fundamental measurement requirements contained in the Act, three further levels of documentation are authorized.
- The first level is the associated **Regulations** which are authorized by the Governor in Council in accordance with the Privy Council Office.

## Trade Measurement Requirement Structure

The second level is the **Measurement Specification**

- The role of measurement specifications is to establish the requirements that measuring devices and measurement methods must comply with to ensure a uniform standard of measurement is achieved.
- These specifications address such matters as device performance, installation and use, and the determination of measurement quantities. These specifications concentrate primarily on the metrological properties of devices, device installations and the conditions or influences which could adversely affect measurement accuracy.

## Trade Measurement Requirement Structure

The final level of documentation, the **Procedures** is the most specific.

- Measurement-related procedures are an extension of the measurement specifications.
- Whereas the Specifications define **what** requirements have to be met
- Procedures establish **how** to validly determine whether the requirements are being met.

## Trade Measurement Requirement Structure

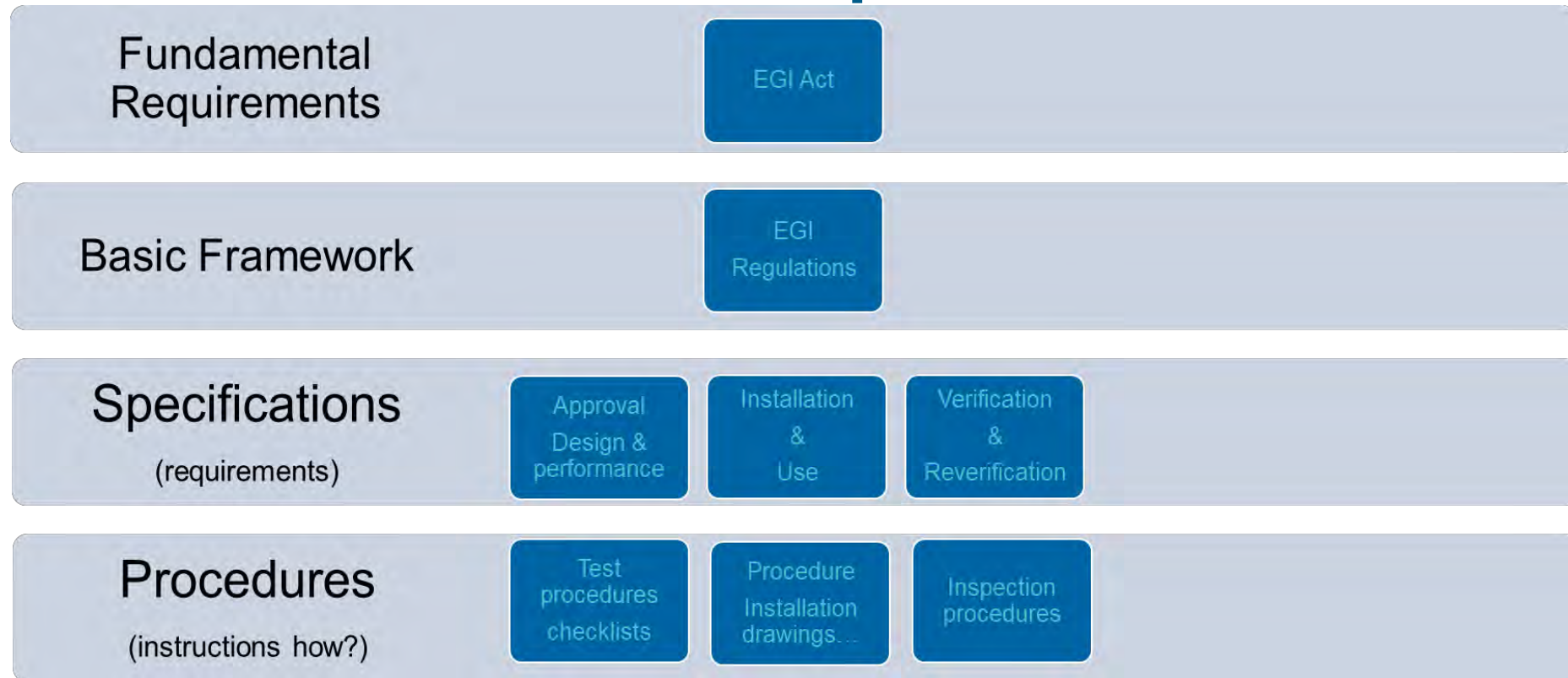
As a whole, the Measurement requirements set the desired goals and means for the control of every measurement-related activity, permitting compliance to be objectively and legally determined.



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## Trade Measurement Requirements Structure



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## Bulletins

Bulletins are used to communicate:

- Policies with respect to the administration and the application of legal requirements and to ensure compliance with the Electricity and Gas Inspection Act, its Regulations and related Specifications; and various programs for authorized service providers.
- Rulings and interpretations related to specific sections of the legislation administered and enforced by Measurement Canada.

Bulletins are not used to:

- Provide field inspection procedures, laboratory test procedures or calibration procedures;
- Establish requirements

Prior to being issued, bulletins are to go through appropriate internal consultation and, where necessary, external consultation. Once issued, they are to be implemented on the specified effective date.

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## Specifications

Something unique about the specifications under the EGIA compare the WMA;

- Approved directly by the President of Measurement Canada
- Does not need to be published in the Canada gazette

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## Specifications

The E&G Act says that Governor in Council can establish or make provisions for establishment of specifications

A 28 (1) The Governor in Council may make regulations for carrying out the purposes and provisions of this Act and, without limiting the generality of the foregoing, may make regulations

(a) establishing or providing for the establishment of

(i) specifications relating to design, composition, construction and performance to which any meter or class, type or design of meter shall conform before permission or approval as regards that meter or class, type or design of meter may be given pursuant to section 9, and

(ii) specifications relating to the installation and use of any meter or any class, type or design of meter;

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## Specifications

Then the E&G Regulations give the Director authority to establish specifications.

### PART III

#### Specifications, Permission, Approval, Revocation and Withdrawal

##### Specifications

12 (1) The director shall establish and make available on request the specifications relating to design, composition, construction and performance to which any meter or any class, type or design of meter shall conform before permission or approval with regard to that meter or such class, type or design of meter may be given pursuant to section 9 of the Act.

12(2) The director shall establish and make available on request the specifications relating to the installation and use of any meter or any class, type or design of meter.

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## Development of Specifications

Requirements for trade devices must be :

- Relevant;
- Reflect the changing technology and new business practices;
- Minimize regulatory burden and costs of legislative compliance; Provide a positive environment for business growth, consumer and investor confidence, trade and innovation.

To achieve this, they must be continually evaluated and amended

## Development of Specifications

The need for new specification or to revise a specification may come from:

- Trade Sector Review exercise
- Discussions at the GPAC (IRP and JWG)
- Request from a manufacturer who has developed a device based on a new technology. (GEN-38)
- Harmonisation with other international STD or recommendations
- Issues arising in the field

In all cases, some level of consultation is performed before issuing a Specification or any modifications to it.

- Ensure stakeholder and interested parties are not negatively impacted
- Transparency...

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## Consultation

- Some level of consultation is needed depending on the scope and potential effect of the changes

### **S-G-03–Specifications for the approval of type of gas metering devices–Revisions**

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**Category:** Gas

**Issue date:** 2023-02-14

**Effective date:** 2023-02-14

**Revision number:** 3

**Supersedes:** S-G-03 (rev. 2)

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## Revisions

The purpose of revision 3 was to:

- recognize the ISO 6976 standard and update the relevant sections (Introduction, section 4.0; Part 14, sections 4.3 and 4.4; Part 16, section 4.1).
- move the dry air density requirement (previously in Part 1, section 7.3.2) to Part 2, as a footnote in section 3.1.



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## Gas Process Advisory Committee (GPAC)

- In cooperation with representatives from the natural gas industry, Measurement Canada (MC) formed the Gas Process Advisory Committee (GPAC) in 2005, and jointly established a policy issue resolution process IRP for the GPAC to administer.
- This IRP is currently being used by the committee when reviewing proposed regulatory requirements or amendments (i.e. **new or revised specifications**, bulletins, and procedures), and when making decisions on the timing and manner in which these documents will be developed.
- When an issue gets rated from the IRP as a High Impact, a joint work group is formed to review the issue and provide recommendations

## Policy Issue Resolution Process

- GPAC identifies issues and completes an assessment of MC and industry impact level (high, medium and low), and determines need for JWG initiation (high impact items only) using the Impact Filter tool (places weights around different characteristics and parameters pertaining to economics and nature of compliance with E&G legislation)
- JWGs establish performance-based standards – Compliance principle: liability for measurement accuracy rests with meter owners (+ 3.0%)

## Policy Issue Resolution Process

- Since 2004, JWG's have successfully developed & implemented the following MC specifications:
  - Statistical sampling (acceptance and compliance);
  - Uncertainty determination;
  - Software security and event logging

## Prerequisite for devices incorporating new technology

- Prior to ELSD accepting an application for approval or approval modification of a metering device incorporating new technology, the **manufacturer shall provide written consent to give assistance to MC** in the development of any needed specifications and procedures for:
- approval, verification, reverification, sealing, installation and use of the device model(s) to be approved;
- identification of applicable measuring apparatus or of any needed modifications to existing measuring apparatus intended for use in verification of the device model(s).

### **Prerequisite for devices incorporating new technology**

Prior to ELSD issuing a NOA for a new metering device model;

- The following specifications shall be developed and authorized for use by MC:
  1. specifications for approval of the device;
  2. specifications for verification, reverification, installation and use of the device;
  3. specifications for the calibration, testing, and certification of the measuring apparatus/standards required for verification of the device.
- At least one recognized test facility or authorized service provider shall be identified by the approval applicant which has the capability, capacity and willingness to provide the needed verification/reverification inspection services
- At least one measuring apparatus or standard intended for use in verification of this device model shall be certified by either MC or the NRC
- All required training of MC inspectors or authorized service providers shall have been completed

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## International Harmonization

- S-EG-05 & S-EG-06, will be revised following revision of OIML D31
- Canadian workgroup to monitor OIML TC8/SC7 activities relating to proposed and/or ongoing projects for R137 (Gas Meters), R139 (Compressed gaseous fuel measuring systems for vehicles) and R140 (Measuring systems for gaseous fuel).
  - CIML approved new project (p6) for revision of R140 Measuring Systems for Gaseous Fuel (review parts 1&2, develop part 3, Canada is participant)
  - CIML approved new project (p7) for revision of R139 Compressed Gaseous Fuel Measuring Systems for Vehicles (revisions are specific to hydrogen dispensers, Canada is observer)

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## Provisional Specifications

In order to approve trade measurement devices that incorporate technologies or to address issues in the field with the installation requirements not covered by the existing specifications without incurring lengthy delays which can be associated with public consultation at the national level, trade measurement devices subject to the EGIA may be evaluated and inspected against provisional specifications that have been authorized by the President of MC

- When a new type of trade measurement device is submitted for approval, CoE may, in consultation with the ELSD, the approval applicant and other affected parties, develop provisional specifications applicable to the subject device in order to allow for its approval and inspection.
- Devices approved under a provisional specifications will be issued a Conditional Notice of Approval NOCA,
- NOCAs will remain in effect until the applicable provisional specification has been reviewed and revised by MC, undergone public consultation with industry participation, finalized and authorized by MC as a specification.

### **Application of new specifications for the purpose of approval and inspection**

Trade measurement devices approved on or after the effective date of new specifications

- Will be evaluated against those specifications in their entirety. If devices submitted for approval before the effective date, but evaluated and/or approved after that date, will also be evaluated against the new specifications in their entirety.

Trade measurement devices approved before the effective date of new specifications but initially inspected or verified after that date

- Are not required to meet the technical requirements (e.g., design, composition and construction) or the administrative requirements (e.g., marking) of the new specifications. In those cases, the devices will continue to be evaluated against the technical and administrative requirements that were in force when the devices were approved.
- However, the metrological performance (e.g., limits of error/tolerance) and the installation and use requirements prescribed by the new specifications are applicable.



### Application of new specifications for the purpose of approval and inspection

Trade measurement devices approved and initially inspected or verified prior to the effective date of new specifications

- Are not required to meet the technical requirements (e.g., design, composition and construction) or the administrative requirements (e.g., marking) of the new specifications.
- However, the metrological performance (e.g., limits of error/tolerance) and the installation and use requirements prescribed by the new specifications are applicable

Trade measurement devices modified and resubmitted to the Approval and Calibration Services Laboratory for evaluation after the effective date of new specifications

- Trade measurement devices that are modified in a manner that requires them to be resubmitted to the LMLS for a complete or partial evaluation (see GEN-26) will be evaluated against the metrological, technical and administrative requirements prescribed by the specifications before a new or revised Notice of Approval (NOA) can be issued.

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## Verification

The Act, section 9 (1) – Paraphrase : Where a meter is intended to be used as the basis of charge, it shall be

- Verified and
- Sealed

The verification process is specific to the device being examined. It typically assess the performance of the device by changing influence factors such as temperature, pressure and flow rates. It could also assess the calculation algorithms or accuracy. The result of successful verification is typically the sealing of the device and production of a record often termed an 'Inspection Certificate'. (Act 14)

## Specification Enforcement

- Specification development is typically a co-operative effort with key stakeholders including manufacturers and larger meter owners. As such, meter owners and contractors have a deep understanding of all specifications and the reasons and logic behind their design and deploy.

### Specification Enforcement

Historically and typically, when a violation of a specification is discovered, enforcement action proceeds in one of two manners:

1. If the meter owners, ASP or responsible party were oblivious to the breach, or unable to meet the requirements due to some outside circumstance (supply chain issues) and this offending party is communicating in an open and transparent manner with Measurement Canada. Then it is highly likely that a mutually agreed upon 'Corrective Action' or possibly a new policy (RMF 2.0) will be utilized to assist in the correction of the non-compliance.
2. Oppositely, in the case where communications between Measurement Canada and the party responsible for the violation of the specification indicate that the responsible party is not willing to move towards compliance voluntarily, then the Electricity and Gas Inspection Act includes Administrative Monetary Penalties. This portion of the Act was designed to ensure that compliance with the Act, Regs and Specifications is in fact, enforceable. Violations are associated with different weightings, a violation deemed to be more critical or impactful will have a greater monetary penalty associated with it.

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## Type Approval Requirements

Approval	Specs/Bulletins	Related documents
	S-EG-01 (Lengthened initial reverification period)	<ul style="list-style-type: none"><li>• S-S-05 (Sampling requirements)</li><li>• G-03 (Meters qualified)</li><li>• <b>Information bulletin — Measurement Canada publishes general requirements in support of lengthened initial reverification periods for natural gas and electricity meters</b></li></ul>
	S-EG-02 (Sealing provisions)	<ul style="list-style-type: none"><li>• <b>Moratorium on the application of sealing provision requirements in the type approval of gas analysis devices</b></li><li>• <b>Publication of specifications related to physical sealing of electricity and gas meters</b></li></ul>
	S-EG-05 (Software)	<ul style="list-style-type: none"><li>• GEN-40 (Application and implementation)</li><li>• <b>Moratorium on the application of sealing provision requirements in the type approval of gas analysis devices</b></li></ul>
	S-EG-06 (Event loggers)	
	PS-G-06 (Ultrasonic meters)	<ul style="list-style-type: none"><li>• G-16 (Third party test data)</li><li>• GEN-25 (LUM)</li><li>• GEN-36 (CSA Z234.1 Metric Practice Guide)</li></ul>
	S-G-03 (Meters)	<ul style="list-style-type: none"><li>• G-16 (Third party test data)</li><li>• G-22 (Telemetry devices)</li><li>• G-23 (Gas mixture test data from recognized organizations)</li><li>• GEN-25 (LUM)</li><li>• GEN-36 (CSA Z234.1 Metric Practice Guide)</li><li>• <b>Moratorium on the application of sealing provision requirements in the type approval of gas analysis devices</b></li><li>• <b>Publication of specifications related to physical sealing of electricity and gas meters</b></li></ul>
	S-G-07 (Mass to base volume - energy conversion functions)	
	GEN-06 (New specifications/technologies)	
	GEN-26 (Modifications to approved meters)	
	GEN-38 (Meters incorporating new technology)	
	GEN-44 (NOA's name modifications)	

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## Requirements related to Installation and use, verification and reverification

	Specs/Bulletins	Related documents
Verification Reverification	PS-EG-02 (Sealing)	Publication of specifications related to physical sealing of electricity and gas meters
	PS-G-03 (Mechanical conversion devices)	
	PS-G-04 (Turbine meters with high pressure test certificates)	
	PS-G-06 (Ultrasonic meters)	
	PS-G-07 (YEWFO vortex flow meters)	
	PS-G-14 (Correction devices and linearization functions)	
	PS-G-15 (Fluidic oscillation meters)	
	PS-G-16 (Conditioning orifice plates)	
	PS-G-17 (PFM installations)	
	PS-G-18 (Gas chromatographs)	
	S-G-02 (diaphragm meters)	
	S-G-04 (flow conditioners)	
	S-G-05 (Flow computers and transmitters)	
	S-G-06 (Cone-shaped differential pressure meters)	
	S-G-07 (Mass to base volume - energy conversion functions)	
	S-EG-04 (Resealing new meters and newly re-verified meters)	
	G-02 (Temporary permission; no sealing)	
	G-14 (Low intervention)	
	G-16 (Third party test data)	
	G-18 (Reverification periods)	
	G-19 (In situ retrofitting of diaphragm meters with AMRs)	
	G-23 (Gas mixture test data from recognized organizations)	
	GEN-06 (New specifications/New technologies)	
	GEN-16 (Industry safety and security)	
	GEN-23 (Conditional permission - gas metering installations)	
	GEN-24 (Gas metering installations)	
	GEN-25 (LUM)	
	GEN-27 (Inspection certificates, test results & reverification periods)	
	GEN-33 (Conditional permission - telemetering devices)	
	GEN-34 (The reporting of meter defects and nonconformities)	

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# Thank You

