4. Reading and interpreting the code

Overview

Purpose

Researching a specific issue in the Codes can be a time-consuming and frustrating experience. Although many gas technicians are experienced with code use, some simple tricks or tips can make the exercise easier and more reliable for those less familiar with the Codes. This Chapter focuses on using various navigational techniques to access information contained in the Codes.

Objectives

At the end of this Chapter, you will be able to:

- describe the purpose of the CSA B149.1 Scope and identify where you can find it;
- describe the meanings of the terms "and", "or", and "shall" as used in CSA B149.1;
- describe the organizational structure of CSA B149.1;
- identify available aids to assist in locating requirements; and
- identify the process used to interpret the CSA B149 Codes and the Ontario requirements.

Terminology

Term	Abbreviation (symbol)	Definition
And		In the CSA B149 Code, indicates that you must meet all the requirements that a word links
May		In the CSA B149 Code, indicates an advisory or optional statement
Or		In the CSA B149 Code, indicates that you must meet only one of the requirements that a word links
Shall		In the CSA B149 Code, indicates a mandatory requirement
Should		In the CSA B149 Code, indicates a recommendation or that which is advised but not mandatory

Scope, definitions, abbreviations, and reference publications

Scope

The first task is to determine which of the three CSA B149 Codes that cover gas technician work are applicable to the issue at hand. The first section of each Code outlines the scope of the Code —i.e., what it covers and does not cover. For example, it would be useless to apply the CSA B149.1 requirements to a propane installation on a recreational vehicle since only the CSA B149.2 applies to those installations.

In some cases, more than one of the Codes may apply. For example, if the installation involves industrial propane-fired process ovens, compliance with all three Codes (CSA B149.1, CSA B149.2, and CSA B149.3) may be a requirement. In most cases, however, technicians use only one or two of the Codes. Residential propane or natural gas installations normally require reference to only the CSA B149.1 Code.

Definitions, abbreviations, and the use of specific terms

Words or terms appear in the definition pages of Section 3 of that Code. Both common and unusual terms have a specific meaning that is necessary for interpreting the Code Section and applying it as intended.

The word "***shall***" is a key word that CSA B149.1 uses, and its importance is highlighted in the following Clause:

> 1.6 In this Code, unless approved otherwise by the authority having jurisdiction, "shall" indicates a mandatory requirement; "should" indicates a recommendation or that which is advised but not mandatory; "may" indicates an advisory or optional statement. Notes to the text do not include mandatory or alternative requirements. The purpose of a note is to separate from the text explanatory or informative material that is not properly a part of this Code. Notes to figures and tables, however, are considered part of the figure or table and are written as mandatory requirements. Legends to figures are also written as mandatory requirements.

As indicated above, use of the words "***may***" or "***such as***" or non-use of the word "***shall***" means the text gives the direction an option, recommendation, or suggestion.

Where the Code provides a list of requirements, pay careful attention to the words "***and***" and "***or***". The use of "***and***" indicates that you must meet all the requirements that a word links, while the use of "***or***" indicates that you must meet only one of the requirements that the word links. Clauses 6.4.1 and 6.4.2 of CSA B149.1 help illustrate this point.

You must comply with both (a) and (b) of Clause 6.4.1. Clause 6.4.2 gives you an option to use either (a) or (b) of Clause 6.4.2, but you shall use one of the two methods.

The Codes use abbreviated names of organizations. Annex I of CSA B149.1 identifies each company or organization mentioned within the pages of the Code.

Reference publications

The Code mentions numerous reference publications, standards, and other codes. Section 2 lists all the reference material the Code uses. A complete listing of standards adopted in Ontario is available from TSSA in a document called "*Titles of Standards and Laboratory Test Reports Authorized in the Province of Ontario*".

It is sometimes necessary to refer to a standard or code referenced in CSA B149 to fully understand and comply with a requirement.

CSA B149.1 content

Index and table of contents

Once you have chosen the correct Code, the best way to find specific information is to start with the index located at the back of the Code. It lists subject areas alphabetically and gives the section or clause number, table, or annex that addresses that subject.

If you are unable to find the item in the index, try the table of contents pages at the front of the book. It lists the topics in the order in which they appear in the text under broad section headings such as "Pressure controls" or "Piping and tubing systems, hose, and fittings". The more specific subsection titles listed below these headings should assist you in narrowing your search.

You must take care when using the table of contents to check other sections that may apply to the issue at hand. For example, three sections of CSA B149.1 contains code requirements related to pressure testing.

Hierarchy of clauses

Use a hierarchical method of clause numbering to identify sections and subsections within the Code. Although the Code does not give each separate level a title (i.e., all levels are referred to as clauses), for explanatory purposes, this text uses terms for each level as shown in the following example:

Section 4. General
→ *Subsection* 4.3 Responsibilities of the installer
→ *Clause* 4.3.5
→ *Subclause* 4.3.5 a)

Read a clause in context with the subject covered in the higher-level subsection and section.

Changes and highlighting

Changes from a previous edition of the Code are not identified, and you may only find a change through careful comparison with the previous edition of the same Code. The 2015 edition of the CSA B149 series codes included a delta (Δ) in the margin to highlight a change which the 2020 editions do not.

It is worthwhile spending some time reading through the Codes that apply to your work situation. A good practice is to mark the sections that you commonly reference with tabs and highlight the clauses that are important to your work. For example, it is recommended that you identify the piping and tubing sizing tables clearly so natural gas systems are not mistakenly sized using the propane tables.

The current applicable Code should be readily available to every technician. A gas technician is expected to comply with the requirements that the Code provides.

Annexes

At the back of the Code, you will find a section entitled "Annexes". This section is made up of engineering tables, procedures, and information developed to assist you with sizing piping/tubing systems or vents, as well as procedures for purging; protection of piping, meters, or tanks, and a wealth of other information.

Usually, a clause within the Code refers you to these tables or pages. How the clause makes the reference determines whether the annex information is a requirement or a guideline providing a recommended means of complying with the Code.

For example, Clause 6.3.2 of CSA B149.1 requires sizing of the piping/tubing system so that the pressure drop never exceeds 1 in w.c., when the supply pressure is between 7-14 in w.c. The Clause references the tables in the annexes only as one means of achieving this core requirement. On the other hand, Clause 6.23.7 specifically requires compliance with Annex H, which makes Annex H a requirement.

Applying and interpreting the Code and the Ontario requirements

Ontario requirements

Remember that the Ontario amendments in the *Code Adoption Document* (available on coloured pages) has amended the national Code. It is essential to check these amendments. A good practice would be to cross out any amended sections in the Code and note the applicable page or change in the amendment section.

As discussed earlier in this text, it is important to consider how all the legal requirements are interrelated. You should not view or apply the Code in isolation from the Act, regulations, standards, and manufacturer's instructions. They are all legal requirements that may pertain to the situation at hand.

Application of current Code to existing installations

Code requirements change in response to problems identified in the field or new technology and information. In some cases, these changes mean that existing installations no longer comply with the current Code.

For example, the CSA B149 Codes allowed the venting of an appliance into an unlined chimney until the Code changed in 1978, requiring a clay-tile liner or metal liner in a chimney.

Appliances installed before that code change could remain in operation since they were "in accordance with the Code at the time of installation", but any installations after the code change had to comply with the new requirement for liners.

Unless the regulation or code specifically states that you must take action to bring existing installations into compliance with new requirements, consider existing installations to be in compliance.

If the installation has a significant change or addition, the entire installation must be brought into compliance with current requirements.

Using the chimney liner example, if the pre-1978 appliance was replaced or moved or if another appliance were added to the chimney after 1978, the entire installation would have to be brought into compliance with the requirements at the time of installation.

Due diligence must be applied to any situation where it is found that the installation does not meet current requirements but is proven to have been installed in compliance with the requirements at the time of installation. The reason or intent of the change must be considered and the appropriate action taken to ensure that the installation is *safe*.

Conflicting legal requirements

When applying the Codes, you should remember to also consider the other legal requirements, such as those found in the Electrical Code, Building Code, municipal by-laws, and certified manufacturer's instructions, in order to ensure that your installation meets all legal requirements.

Codes that other Acts—whether federal or provincial—accepted into law always specify the scope of application and often specifically delineate how they apply in relation to other laws covering the same topics. The Code or the Act or regulation accepting the Code may specify this.

For example, CSA B149.1 requires the following in relation to electrical connections and components:

> 4.7.1 Electrical connections between an appliance and building wiring shall comply with the local electrical code or, in the absence of such, with the *Canadian Electrical Code, Part I*.

As previously discussed, the scope of certificate in the *Fuel Industry Certificate Regulation* specifies the aspects of electrical work that require fuel technician certification and the limits beyond which the technician must have a valid certificate of qualification as an electrician issued under the *Trades Qualification and Apprenticeship Act*.

Areas of conflict between other Acts, regulations, and accepted codes and standards are rare. You should direct interpretations to the two authorities having jurisdiction over any conflicting legal documents.

In the event of a conflict between the *Technical Standards and Safety Act, 2000* (including the regulations, codes, and standards) and a municipal by-law, the Act prevails.

In the event of a conflict between the Act, regulations, or codes and a manufacturer's certified instructions, the Act, regulations, or codes prevail.

Nevertheless, due diligence indicates that if municipal by-laws or manufacturer's instructions are *more* stringent than the code requirement, the *most* stringent clause must take effect. In no case must the end result be *less* than the code requires.

Interpreting the Code

Certainly, there are always going to be disputes and grey areas in interpreting the Codes. This is a positive thing since it indicates that the Code is flexible and requires your input for proper application. It also leads to code development and the evolution of safety requirements.

If you would like to have input into the development, improvement, or change regarding a code issue, you should contact the appropriate code committee via the information outlined in the ***Notes*** of the Preface of the Code:

> **(4)** To submit a request for interpretation of this Code, please send the following information to **inquiries@csagroup.org** and include "Request for interpretation" in the subject line:
>
> a) define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;
>
> b) provide an explanation of circumstances surrounding the actual field condition; and
>
> c) where possible, phrase the request in such a way that a specific "yes" or "no" answer will address the issue.

Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization and are published in CSA's periodical Info Update, which is available on the CSA web site, www.csagroup.org.

A legal interpretation for Ontario requires a written request made to Fuels Safety, TSSA.

Assignment Questions – Chapter 4

1) Are the provisions outlined in a CSA B149 Annex mandatory?
   a) Yes
   b) No
   c) Sometimes