

## ENGINEER AUTHENTICATION AT OIL AND GAS PRODUCTION FACILITIES

### PURPOSE

To provide an alternative solution to the requirement under section 3 of the Gas Code Regulation for gas-fired equipment used in process applications at oil and gas production facilities to be tested, certified or inspected and accepted by a certification body or inspection body accredited by the Standards Council of Canada. This variance will expire if the option for engineering field approval is adopted into the next update to the gas code regulation.

### DISCUSSION

Province-wide variances for non-certified gas-fired process equipment to be approved by registered engineering professionals have been issued by the Provincial Gas Administrator since 2004. While compliance to section 3 of the Gas Code Regulation is a minimum requirement, the *Safety Codes Act* supports objective or performance-based approaches to compliance through the application of a variance under section 38 of the *Safety Codes Act*. A variance provides approximately equivalent or greater safety performance for any thing, process or activity to which the *Safety Codes Act* applies. Regulations, codes and standards under the *Safety Codes Act* are not changed by the issuance of a province-wide or site-specific variance. The variance allows for an option or alternative solution to the prescriptive requirements of the *Safety Codes Act*, which include regulations, codes and standards.

A province-wide variance involving the practice of engineering is also a matter for the Association of Professional Engineers and Geoscientists of Alberta (APEGA) to take into consideration as the practice of engineering is a self-regulated profession governed by APEGA. The references to APEGA's authentication standard as a condition of this variance is a substantive basis for this variance providing approximately equivalent or greater safety performance.

### APPLICATION

This variance applies to all non-certified gas-fired equipment used in process applications at production facilities such as petroleum refineries, petrochemical plants and upstream oil and gas sites. This variance is not applicable to gas-fired appliances installed in control rooms, warehouses, corporate offices, gas stations and other non-process buildings. The installation of heating, ventilation and air-conditioning (HVAC) gas-fired appliances in any of these areas shall meet the requirements of the *Safety Codes Act*.

The use of this variance does not relieve a person from the regulatory duty under the *Safety Codes Act* to report an accident involving a fatality, injury or property damage involving gas installations or equipment.

A person who knows of a fatality or injury involving a gas installation or gas equipment; or property damage estimated to exceed \$250, if it is caused by fire or explosion; or an accident involving a gas installation or gas equipment where the accident results in injury to a person that

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Issuance of this STANDATA is authorized  
by the Provincial Gas Administrator



that requires professional medical attention, must notify a safety codes officer for the gas discipline of the circumstances and details of the accident. The safety codes officer is also required to notify the Provincial Administrator for the gas discipline of these incidents.

**Gas Code Regulation (AR 111/2010):**

**3(1)** No person shall manufacture, install, sell or offer for sale any equipment related to gas systems for use in Alberta unless the equipment has been

- (a) tested and certified by a certification body accredited by the Standards Council of Canada, or
- (b) inspected and accepted by a certification body or an inspection body accredited by the Standards Council of Canada, and the equipment bears evidence of having been accepted in the manner authorized by the certification body or inspection body.

**VARIANCE**

This variance provides approximately equivalent or greater safety performance with respect to persons and property as that provided for by the *Safety Codes Act* and section 3 of the Gas Code Regulation. This variance does not make or imply any assurance or guarantee with respect to life expectancy, durability or performance of any thing, process or activity to which this variance applies.

Where non-certified gas-fired equipment used in process applications at production facilities such as petroleum refineries, petrochemical plants and upstream oil and gas sites is authenticated by an APEGA licensed professional engineer or permit holder authorized to engage in the practice of engineering under the Alberta *Engineering and Geoscience Professions Act*, the authenticated thing, process or activity is considered to provide approximately equivalent or greater safety performance subject to the following conditions:

- 1) The thing, process or activity is authenticated in accordance with the Association of Professional Engineers and Geosciences of Alberta (APEGA) professional practice standard "Authenticating Professional Work Products"(current version), and any guidelines, bulletins or interpretations related to a dedicating professional work products.
- 2) The authenticating APEGA licensed professional engineer shall have a minimum of 5 years' experience and be familiar with CSA B149.3-20 Code for the field approval of fuel-burning appliances and equipment, including burner systems, control systems, hazard and risk assessments and risk mitigation.
- 3) The engineered designs are for new equipment and the alteration, repair, relocation or removal of existing equipment for all heat inputs and for which there is no certification.
- 4) The designs of the APEGA licensed professional engineer shall include a risk assessment of the appliance (and system) related to the objectives of the current CSA B149.3 code to provide approximately equivalent or greater safety with respect to process safety, persons, property and integrity of equipment;
  - a. The risk assessment process shall include participation of personnel with expertise in all aspects of the design, operation, and maintenance of the appliance type being installed, altered, or relocated.

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- b. The risk assessment process shall be facilitated by personnel with expertise in conducting risk assessments
    - c. The risk assessment documentation shall be provided to, maintained by the owner for the life of the appliance and made available upon request.
  - 5) All components are evaluated under the supervision of, through a process consistent with APEGA practice standards and guidelines or by the authenticating APEGA licensed professional engineer and include an assessment for conformance with codes adopted by the Alberta gas code regulation, industry-recognized published standards, process and safety performance requirements, and accepted test reports, if certified components are not available.
  - 6) Deviation from the codes adopted by the Alberta gas code regulation, only when necessary for technical reasons. A justifiable, valid technical reason (VTR) for such variation shall be documented and included in the project documentation so that it is available for review. Variations may include modifications to CSA B149.3 fuel train diagrams or use of non-certified components. A VTR, which can be justified may include for example, special process conditions, or special material requirements, but shall not be based on factors such as price, delivery, preferences of manufacturer or another non-adopted standard.
  - 7) The gas-fired process equipment displays a valid and permanent label (rating plate per the requirements of the referenced CSA B149.3 code at the time of installation) and the equipment is appropriately documented with an engineering report describing the design and the operational and safety characteristics of the equipment. The report shall include as a minimum the following:
    - a. Statement of equipment compliance to applicable codes with any exceptions noted as VTR's.
    - b. Written explanations of any VTR's for deviations from code.
    - c. Records pertaining to design specifications, installation, operation, and maintenance instructions provided to the owner of the equipment and available for Safety Codes Officers to review.
    - d. Description of any hazardous condition that may affect the appliance or its installation.
    - e. Specification of electrical area classification (in compliance with the Canadian Electrical code).
    - f. Process and Instrumentation Diagram(s) (P&ID).
    - g. Bill of Materials (BOM) or component data sheets showing the model number, manufacturer, construction, materials, ratings and certification of each relevant component and its tag number referenced on the drawings and on the physical component.
    - h. Wiring diagram(s).
    - i. Burner management system specifications.
    - j. Operating narrative, shutdown key / cause and effect diagram, ladder logic, installation and operation manual or other suitable description of appliance operation.
    - k. Commissioning / combustion report with equipment/permissive set points and stack readings at maximum fire.
    - l. Maintenance instructions.
    - m. Portable/movable appliances require a set-up/start-up procedure to be followed by the installer or operator upon arrival at each site, including a range of elevations where the appliance can be safely operated.
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- n. For an appliance approved for use with different fuels, a switchover procedure to be followed by the operator upon switching to another fuel without exceeding the maximum rating of the appliance.
- o. Records to support the application of this variance for any thing, process, or activity (i.e. equipment) shall be maintained by the owner for the life of the appliance and made available upon request.

This VARIANCE is applicable throughout the province of Alberta.