



Fuels Safety Program	Ref. No.: FS – 155-09	Rev. No.:
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Subject: Guidelines for the Implementation of O. Reg. 440/08 – Amendment to O. Reg. 211/01, Propane Storage and Handling

Sent to: Posted on Web-Site and Distributed Propane Filling Plant and Container Refill Centre License Holders, Propane Regulation RRG, Propane Advisory Council

Ontario Regulation 440/08 which amends Ontario’s Propane Storage and Handling Regulation was filed on December 11, 2008. The new requirements come into effect at different timelines depending on the specific amendment. This document is a guideline for the implementation of the new requirements.

This document is ordered in terms of implementation timing. Section references are made to O. Reg. 211/01. Note: The excerpts from the Regulation are bolded for ease of identification.

ROT’s referred to in this document are only the ROT’s listed in Ontario Regulation 215/01, and referred in Ontario Regulations 211/01 and 440/08.

1) Effective January 1, 2009, the requirement for persons to produce a certificate or ROT:
6(2)

“Any person who is required to hold a certificate or ROT under this Regulation shall produce it on demand of the director, an inspector, or any other person”

This will be checked during TSSA’s annual inspections of facilities with transfer operations and may be checked during any other type of inspection.

2) Effective January 1, 2009, the requirement for submitted application drawings to identify tanker truck parking:
27(3)(d)(i)

“... submit a legible plan in triplicate that shows ... the location of parking spaces designated by the applicant for tanker truck parking.”

This will be checked during TSSA’s engineering review of the application and during TSSA’s annual inspections.

3) Effective February 9, 2009, the requirements for training:
5(3)

“Every person who is licensed to operate a facility under this Regulation shall ensure that their employees or agents are trained in the facility’s emergency management procedures and shall ensure that they are trained at least annually in emergency management procedures.”

5(4)

“Every person who is licensed to operate a facility under this Regulation shall ensure that new employees or agents receive the training required by subsection (3) as soon as is practical after they commence their responsibilities”

This will be checked during TSSA’s annual inspections of facilities with transfer operations and may be checked during any other type of inspection. Typical inspection requirements would be to check procedures, records and verbally question persons in attendance during the inspection.

Notes:

- Until the risk and safety management plans are in place, certificate holders and ROT's shall be aware of current emergency shut down devices/procedures and other employees shall be aware of evacuation procedures. When risk and safety management plans are in place, all employees shall to adhere to the plan's requirements
- Employees are those that are employed at the facility
- As soon as practical shall be evaluated to the company's procedures for training and shall not exceed 3 months

4) Effective December 31, 2009, the requirement for site specific training and service and maintenance of fire protection devices:

5(5)

“Every person who is licensed to operate a facility under this Regulation shall ensure that certificate holders or persons with a ROT, who perform functions at the facility, are provided with site-specific training and shall keep a record of the persons who were trained and the dates on which they were trained and the name of the trainer on each date.”

This will be checked during TSSA's annual inspections of facilities with transfer operations and may be checked during any other type of inspection. Typical inspection requirement would be to check procedures, records and verbally question persons in attendance during the inspection.

Notes:

- For LPG endorsements holders and infrequent drivers, a sign off by the certificate/ROT holder indicating that he/she has read and understood the site specific training shall be considered sufficient
- The employer is the person who would be delivering the training. Thus the qualification of the trainer is left to the employer
- For cylinder exchanges or handling facilities, there is no site specific training required as no ROT/certificate holder functions are being performed at those facilities.

5(6)

***“Every person who is licensed to operate a facility under this Regulation shall keep,
(a) records of the dates on which the fire protection devices, equipment or systems were serviced, maintained, repaired or tested, and
(b) the results of those tests”***

This will be checked during TSSA's annual inspections of facilities with transfer operations and may be checked during any other type of inspection. Typical inspection requirement would be to check procedures and records.

Notes:

- Fire protection equipment shall include emergency shut down equipment as well as reactive equipment (i.e. fire extinguishers). As this requirement comes into place prior to the Risk and Safety Management Plan, the facility license holder shall determine the frequency of service, etc..
- This requirement only applies to the facility's equipment and does not include equipment outside the control of the licensed holder
- TSSA requires current records on site for inspection purposes

5) Effective December 31, 2009, the requirement for officers, directors, etc to hold a certificate or ROT.

27.1(3)

“On application for a licence for a retail outlet, filling plant, cardlock/keylock, private outlet or container refill centre or on application for its renewal, the applicant shall ensure that at least one person referenced in

subsection (4) holds a certificate or a ROT that is at least at the highest level of certificate or certificates or ROT required for the operation of the referenced facility.”

27.1(4)

“For the purposes of the subsection the person who must hold the certificate or ROT is,

- (a) an officer or director, in the case of a corporation;**
- (b) a partner, in the case of a partnership; or**
- (c) the proprietor, in the case of a sole proprietorship.”**

This will be checked by TSSA’s licensing department during application and renewals. Typically, a letter providing confirmation that the company has complied, naming the officer, director, etc. with a photocopy of their wallet card.

Notes:

- For your typical BBQ fill, the ROT would be a PPO-3 and for a bulk plant, it would be a PTO or PPO-1 as applicable.
- The person in this case would apply to the license holder

6) For new or modified facilities with transfer operations, effective December 31, 2009, the requirement for increased municipal interaction:

27.1(5)

“On application for a licence for a retail outlet, filling plant, cardlock/keylock, private outlet or container refill centre or on application for a modification, the applicant shall provide a letter from the municipality or, in the case of land within a planning area consisting of territory without municipal organization, the planning board where the referenced facility is located,

- (a) indicating that the referenced facility’s use, or its intended purpose does not contravene the zoning by-laws of the municipality or of the planning board, as the case may be;**
- (b) confirming that the municipality or the planning board has been provided details of the proposal and has had the opportunity to comment to the applicant on the land use planning aspects of the proposal; and**
- (c) setting out any comments referred to in clause (b) and how the applicant intends to address those applicable to the applicant’s risk and safety management plan”**

This will be checked during TSSA’s engineering review of the application. Typically, a letter from the municipality would satisfy (a) and (b) and a letter from the applicant would satisfy (c)

Notes:

- The applicant’s letter to municipality should include (a) and (b), if the municipality only responds to (a) then it will be deemed to have satisfied (a) and (b).
- In the absence of a definition of “proposal”, a proposal shall be considered to be the complete application submitted to TSSA for a new license or modification.

7) For new or modified facilities with transfer operations, effective December 31, 2009, the requirement for increased fire service awareness:

13(3)

“No person shall operate a new or modified facility unless they have first contacted the fire service where the facility is located to provide the fire service with an opportunity to attend at the site and to become familiar with the facility”

This will be checked during TSSA’s engineering review of the application. Typically, a copy of the letter from the applicant to the fire service would satisfy this requirement.

8) For new or modified facilities with transfer operations, effective January 1, 2010 and for existing facilities, effective upon the renewal of facility’s license in 2011, the requirement for fire service approval.

27.1(1)

“The director shall not consider an application for a licence for a retail outlet, filling plant, cardlock/keylock, private outlet or container refill centre or an application for an expansion of one, unless it is accompanied by an approval from the fire service responsible for the area where the referenced facility is located.”

27.1(2)

“The approval of the fire service shall indicate that the fire service has approved all components of the risk and safety management plan that address fire safety, fire protection and emergency preparedness”

This will be checked during TSSA’s engineering review of the application. Typically, an approval letter from fire services would satisfy this requirement.

Note: The fire service approval process is under review

9) For new or modified facilities with transfer operations, effective force January 1, 2010 and for existing facilities, effective upon the renewal of facility’s license in 2011, the requirement for a risk and safety management plan.

3.1(1)

“A person who holds a licence to operate a retail outlet, filling plant, cardlock/keylock, private outlet or container refill centre shall prepare a risk and safety management plan, which shall, at a minimum, address the following matters:”

Engineering will check that risk and safety management plan has been prepared and stamped/sealed by a professional engineer.

3.1.(1)1.

“A hazard analysis that identifies possible hazardous scenarios, the frequency of those scenarios and their consequences, and that takes into account,

Engineering will check for hazard analysis was done, the type used and for the appropriate standard used. The following will be specifically checked for inclusion: Identification of hazard scenarios with their associated frequencies and consequences.

Note: Vandalism may be considered as a possible scenario in the hazard analysis with controls identified. However, vandalism may not be included in the risk assessment unless it is expected that the frequency of this scenario could adversely impact the level of risk such that the assessed risk becomes unacceptable. In such situations, the frequency for vandalism could be obtained from sources such as the police or similar enforcement agencies.

3.1(1)1.i.

“the most severe incident or situation that could occur at the referenced facility based on the total capacity of propane at the referenced facility, and”

Engineering will confirm that the most severe incident is identified, that the largest vessel is correct and that the total capacity is correct with regards to the site plan. Note Engineering will need to confirm that site plan submitted with RSMP matches facility’s license.

“total capacity” means the total volume of fixed, portable, mobile and all other transient storage at a retail outlet, filling plant, cardlock/keylock, private outlet or container refill centre, including the total volume of all cylinders or tanks in which propane is stored and any tanker trucks or rail cars that stay at the retail outlet, filling plant, cardlock/keylock, private outlet or container refill centre for longer than it takes for the propane to be transferred;

Unless tanks, cylinders, vessels, etc are purged and free of propane liquid and vapour, the maximum allowable propane capacity of the vessel, tank, cylinder, etc. will be used to calculate total capacity.

3.1(1)1.ii.

“any less severe incident or situation that could occur at the referenced facility.”

Engineering will check that less severe situations are included.

3.1(1)2.

“A risk assessment that is based on the single largest transient, mobile, portable, or fixed propane storage vessel, as the case may be, at the referenced facility and that,

i. estimates the injury or death that would likely be caused to people at or in the vicinity of the referenced facility as a result of an incident or situation described in paragraph 1,”

Engineering will check that there is an estimate of death or injury included for the situations outlined in the hazard analysis. The single largest Propane storage vessel is defined as per section 3.1(1)2.ii

3.1(1)2.ii.

“reasonably estimates the hazard distance applicable to the referenced facility, or”

Hazard Distance is defined using the United States Environmental Protection Agency’s Risk Management Program Guidance for Propane Storage Facilities (40 CFR PART 68)”.

Hazard distance is the distance at which 1 pound per square inch (psi) overpressure is felt resulting from a vapor cloud explosion (worst case scenario) involving the contents of a single largest vessel on a site. The Worst Case Release Scenario is defined by the release of the contents of the total capacity at the facility or the single largest vessel (or piping) containing Propane which will result in a vapor cloud explosion (VCE). The endpoint of 1 psi overpressure was chosen as the threshold for potential serious injuries to people as a result of property damage cause by an explosion (e.g. injuries from flying glass from shattered windows or falling debris from damages houses).

Public receptors are also defined by EPA “as offsite residences, institutions (e.g. schools and hospitals), industrial, commercial, and office buildings, parks, or recreational areas inhabited or occupied by the public at any time without restriction by the stationary source where members of the public could be exposed to radiant heat, overpressure, as a result of an accidental release”

O.Reg 440/08 requires that every risk and safety management plan submitted for licensing include an estimation of the hazard distance. TSSA requires that this hazard distance be calculated using the definition provided above and guidance provided in the implementation guidelines. The purpose of estimating “hazard distance” is necessary to estimate the vulnerability of potential damage on the public receptors by taking into account the location of the propane facility in relation to the proximity of the population that could be affected as a result of the worst-case scenario.

Engineering will check that the hazard distance is estimated based on the largest vessel, in accordance with:

$$D = 17 \times \left(0.1 \times W_f \times \frac{HC_f}{HC_{TNT}} \right)^{1/3}$$

where: **D** = Distance to overpressure of 1 psi (meters)

W_f = Weight of flammable substance (kilograms or pounds/2.2) f

HC_f = Heat of combustion of flammable substance (kilojoules per kilogram) (Propane: 46,333 kjoule/kg)

HC_{TNT} = Heat of explosion of trinitrotoluene (TNT) (4,680 kilojoules per kilogram)

Nominal Water Capacity (USWG)	Distance to Endpoint (m)
500	168
1,000	211
2,000	267
5,000	363
10,000	456
30,000	658
90,000	949

Note: For single largest storage vessel

In general, if two or more vessels that contain a regulated substance and are permanently connected through piping or hoses for transfer of the regulated substance, the applicant must consider the total quantity of the regulated substance in all the connected vessels and piping when determining the threshold quantity in a process. The applicant cannot consider the presence of automatic shutoff valves or other devices that can limit flow, because these are assumed to fail for the purpose of determining the total quantity in a process.

3.1(1)2.iii.

“concludes that the assessed risk is acceptable based on the measures described in paragraphs 3 and 4.”

Option 1:

The professional engineer submitting the risk and safety management plan concludes that there are no public receptors within the hazard distance. This indicates that the consequence resulting from the worst case hazard scenario will likely not cause injury or death at or in the vicinity of the referenced facility as there are no public receptors within the hazard distance. It is assumed that estimated hazard distance is the radius of influence and includes the “vicinity of the referenced facility”

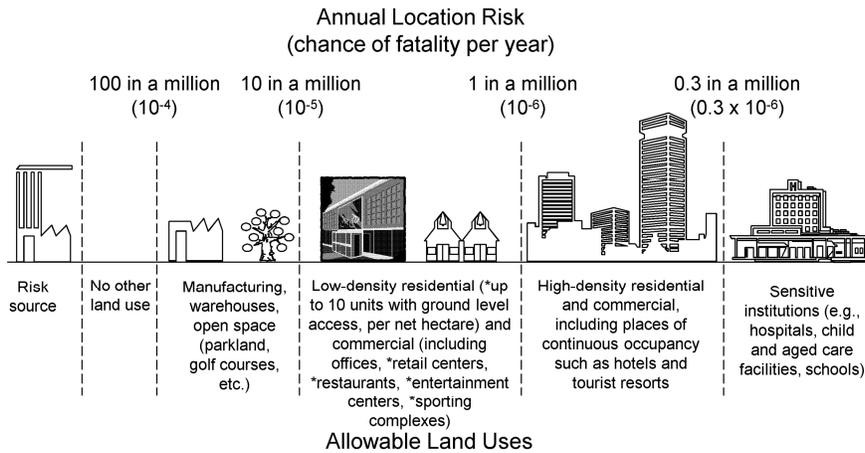
Option 2:

If it is determined that there are public receptors within the “hazard distance”, the professional engineer submitting the risk and safety management plan shall assess the risk by estimating the probability of death to an individual (individual risk) resulting from the identified hazard scenarios at or in the vicinity of the referenced facility using the methodology provided in the implementation guidelines.

Individual risk can be expressed as the annual chance that a person living at a given location near the propane facility might die as a result of an incident or situation. TSSA requires that the professional engineer conclude that the individual risk is equal to or lower than the acceptable levels as defined in the figure shown below.

Annual location risk is a function of the estimated individual risk and involves the estimation of distances (location risk distances) from the propane facility at which four predefined values of location risk (100 in a million, 10 in a million, 1 in a million, and 0.3 in a million) are established.

Acceptable Levels of Public Location Risk for Land Use Around Hazardous Facilities (Current)



Proposed in 2007 by the CSChE PSM Division,
modified from the 1994 MIACC (Major Industrial Accidents Council of Canada) Guidelines
*further discussion required

*Note: On consultation with CSChE PSM division, no further modifications are currently being considered. In reviewing the UK Planning Advice for Developments near Hazardous Installations (PA/DHI) guidelines, the land use identified on as retail, restaurants, etc. will continue to reside in the 10 in a million - 1million risk classification.

The above chart can be best described by the following five criteria:

No public receptors are allowed at or within a location risk distance at which the individual risk is 100 fatalities in a million individuals per year or more;
Public receptors representing manufacturing, warehouses, open space (parkland, golf courses etc.) are allowed at or beyond a location risk distance at which the individual risk is 10 fatalities in a million individuals per year;
Public receptors including those identified in criteria (2) above, low-density residential and commercial offices (including offices, retail centers, restaurants, entertainment centers, sporting complexes) are allowed at or beyond a location risk distance at which the individual risk is 1 fatality in a million individuals per year;
Public receptors including those identified in criteria (2) and criteria (3) above, high-density residential and commercial places of continuous occupancy such as hotels and tourist resorts are allowed at or beyond a location risk distance at which the individual risk is 0.3 fatalities in a million individuals per year, and
All public receptors including sensitive institutions are allowed at or beyond a location risk distance at which the individual risk is less than 0.3 fatalities in a million individuals per year.

In the absence of Ontario specific risk acceptance criteria, the modified MIACC criteria for land use planning was established to be the criteria for acceptable risk. The regulation does not differentiate between new, modified, and existing facilities with respect to the requirements of the risk and safety management plan. As a result, TSSA will use the modified MIACC criteria for “acceptable level of risk” for new, existing, and modified facilities.

3.1(1)3.

“A risk mitigation and control plan that is based on the reasonable measures taken to limit the risks assessed in subparagraphs 2 i and ii. Where total capacity at the referenced facility exceeds 5,000 USWG, the risk mitigation and control plan, in addition to accounting for the matters in subparagraph 2 i, shall also consider nearby land use.”

Engineering will confirm that a risk mitigation and control plan is included; that it is declared by a P.Eng as reasonable to limit the risks assessed; that it clearly itemizes the controls and mitigation preferably in a chart form

that can be utilized by TSSA inspectors; and references land use within the hazard distance. The control and mitigation items should be in a format that can be readily be used by TSSA for inspection purposes.

3.1(1)4.

“An emergency response and preparedness plan that provides for onsite and offsite procedures, including evacuation procedures, to be followed in the event of an incident or situation described in paragraph 1.”

Engineering will confirm that an emergency response and preparedness plan is included.

3.1(2)

***“The risk and safety management plan shall be prepared,
(a) by a professional engineer, where the total capacity of propane at the retail outlet, filling plant, cardlock/keylock, private outlet or container refill centre is 120,000 litres or more (30,000 USWG); or
(b) by a person who has specialized knowledge in the field of risk management, where the total capacity of the retail outlet, filling plant, cardlock/keylock, private outlet or container refill centre is less than 120,000 litres (30,000 USWG).”***

This requirement will be checked during TSSA’s engineering review of the application

Notes:

- Because there is no consensus or professional designation on who is qualified to prepare a Risk and Safety Management Plan (RSMP), TSSA will require that the plan be prepared by (sealed/stamped) a professional engineer regardless of the facility’s capacity
- This policy decision will be re-visited by the TSSA, the propane industry and impacted stakeholders when we have more experience with RSMP’s.

3.1(3)

“On receipt of the risk and safety management plan, the director shall confirm that the plan meets the requirements of this section.”

This requirement will be checked during TSSA’s engineering review, as outlined previously in 3.1(1).

3.1(4)

“The director shall make available to the public, in print or electronic form, the evacuation procedures set out in the risk and safety management plan.”

The applicant shall submit evacuation procedures in the risk and safety management plan and TSSA shall make that available upon request.

Note: Engineering will confirm that an evacuation plan is included. Internal evacuation will be the responsibility of the applicant and the external evacuation will be the responsibility of emergency responders

3.1(5)

“No person shall operate a retail outlet, filling plant, cardlock/keylock, private outlet or container refill centre unless the person has submitted a risk and safety management plan to the director that meets the requirements of this section and the risk and safety management plan is kept current in accordance with this section.”

3.1(6)

***“No person shall operate a retail outlet, filling plant, cardlock/keylock, private outlet or container refill centre,
(a) except in accordance with the risk and safety management plan; and
(b) unless the person has implemented,
(i) the measures set out in the risk mitigation and control plan required under paragraph 3 of subsection (1), and***

(ii) the emergency response and preparedness plan required under paragraph 4 of subsection (1).”

This will be checked during TSSA’s annual inspections of facilities with transfer operations (specifically that the controls and mitigation identified in RSMP have been implemented).

3.1(7)

“No person shall operate a retail outlet, filling plant, cardlock/keylock, private outlet or container refill centre with fixed, portable, mobile or transient storage, or any combination of them, in excess of that provided for under the risk and safety management plan.”

This will be checked during TSSA’s annual inspections of facilities with transfer operations.

3.1(8)

“A person who operates a retail outlet, filling plant, cardlock/keylock, private outlet or container refill centre shall maintain an up-to-date account of any changes to identified hazards, assessed risks and the emergency response and preparedness plan and shall conduct a full review of the risk and safety management plan at least annually.”

This will be checked during TSSA’s annual inspections of facilities with transfer operations. The review shall be prepared by a professional engineer. Typically, a letter from the engineer confirming that the risk and safety management plan continues to be acceptable would satisfy this requirement. TSSA will expect re-submission of their plan if the facility has been modified or if the facility’s assessed risk increases beyond the acceptable risk level.

Note: Fire service will likely only re-review when there is a re-submission

3.1(9)

*“A person who operates a retail outlet, filling plant, cardlock/keylock, private outlet or container refill centre,
(a) shall give written notice to the director within 15 days of a change to any of the information contained in the risk and safety management plan;
(b) shall update the risk and safety management plan to reflect the change; and
(c) shall implement any risk mitigation and control measures and emergency response and preparedness measures identified as part of the update.”*

Note: This requirement is for major elements.