A Field Guide to Fuel Handling, Transportation & Storage

3rd Edition

DRAFT – (Nov_FC & MF)

ITISH
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linistry of Water, Land
nd Air Protection

FOREST SERVICE
BRITISH COLUMBIA

INTRODUCTION

ocument provides guidance on acceptable industry practice for managing fuel handling, transportation and
e in rural and remote areas of British Columbia. It summarizes requirements of applicable statutes of Canada
itish Columbia, industry codes of practice and recommendations relating to environmental protection, health
and fire protection.

ocument provides general guidance; however, it is not intended to address every type of *fuel facility*. It is the
sibility of each commercial or industrial operator to implement the statutory requirements for which they are
sible.

this document refers to legislation in effect on the date of publication and proposed legislation, users should
reference the current piece of legislation for accuracy of legal requirements.

ist the user:
ms or phrases that are defined in the section 11. Glossary are italicized in the text of this document; and,

gislated requirements and recommendations are separately highlighted throughout the document as follows:

- Denotes statutory requirements of legal documents, such as the BC *Fire Code* and the Transportation of Dangerous Goods Regulations, with text references.
- Denotes recommended practices.

g in this document should be construed as waiving compliance with any applicable statutory or other legal
ement.

ACKNOWLEDGMENTS

inistry of Water, Land and Air Protection and the Ministry of Forests acknowledge Ray Hollenberg, NorthW
nse Ltd., Smithers, B. C. and Canadian Forest Products Limited (CANFOR) for their contribution toward the
pment of this document.

TABLE OF CONTENTS

guide is meant to assist field operators in reducing the risk and environmental impact where flamm
mbustible liquids (See section 11. Glossary – this guide.) are handled, transported and stored. It
les statutory requirements and recommended practices for preventing fires and enhancing health,
nvironmental protection.

MALL CONTAINERS ≤ 230L – Canisters, Jerry Cans, Pails, Drums

Statutory Requirements & Recommended Practices

DESIGN

Containers ≤ 230L, used to store *flammable* or *combustible liquids* (e.g., gasoline & diesel fuel), must meet th
ppropriate design specification. (FC4.2.3.1.) (See definition of *small container* in section 11. Glossary – this
guide.)

Maintain containers in good condition – not damaged, rusting or leaking.

dequately seal containers with proper fitting lids, caps, bungs or valves to prevent spills and leaks.

OPERATIONS

control

Secondary containment is not required for individual *small containers*

pill control is required for small *containers* of flammable and *combustible liquids* that have the potential to s
FC 4.1.6.)

he degree of *spill control* should be based on the level of risk. (See Section 7. – Risk Assessment.)

ty Awareness

ll fuel containers must be labelled in accordance with the Workplace Hazardous Materials Information Syst
WHMIS), and according to the *Fire Code*. (FC 4.2.3.2.)

moking is not permitted where dispensing is being carried out. (FC 4.1.5.4.)

ne 20-B:C rated *fire extinguisher* or two 10-B:C rated *fire extinguisher*s are required where containers are st
ithin a building or structure. (FC 4.2.9.7. & FC 6.2.3.5.)

igns should be displayed where storage (e.g., *fuel cache*) or dispensing takes place.

ensing

Maintenance and operating procedures shall be established to prevent spills. (FC 4.1.6.3.)

Containers must not be filled beyond their safe filling level. (FC 4.5.2.7.)

Bullets: ■ Statutory Requirements • ❑ Recommended Practices ◦

Symbols: less than (**<**) greater than (**>**) equal to or less than (**≤**) equal to or greater than (**≥**)

Abbreviations: meter (**m**) litre (**L**) kilogram (**Kg**)

Statutory Requirements & Recommended Practices

Mark containers at a safe maximum fill level corresponding to approximately 90% capacity.

Use an electric fuel pump when dispensing from a *drum*. When an electric fuel pump is not available or not ractical, use a manual pump. Always store and secure the fuel hose above the *drum* to prevent siphoning.

Ensure that dispensing procedures are clearly outlined and posted where all operators can see them.

Keep the *drum* upright; avoid dispensing from a horizontal *drum*.

Ensure housekeeping is effective in maintaining a clean and tidy facility.

ergency Response

pills of TDG Class 3 – *flammable liquids* ≥ 100L must be reported to the Provincial Emergency Program (P elephone **1-800-663-3456**). (WMA, *Spill Reporting Regulation* – see definition of TDG Class 3 *flammable li* n section 11. Glossary – this guide.)

Ensure that spills are recovered and that all contaminated soil is removed or treated. (FC 4.1.6.3.)

ost initial spill response procedures with truck or *fuel cache*. (See Section 9. –Spill Response.)

Maintain a spill response plan and a kit capable of containing and absorbing fuel spills. (See Section 9.3. – Sp Response Equipment.)

ote Storage Locations

orestry landings must not be closer than 30 m to a stream to ensure that the landing provides sufficient buffe ediment, ash and fuel spill infiltration. (FPC – Community Watershed Guidebook 4, Section 6.4.1)

ssess and manage the risk potential at all remote *fuel cache* locations. (See Section 7. – Risk assessment.)

Ensure all empty containers are removed from remote locations and returned for refilling or recycling.

TRANSPORTATION

Note: TDG documentation is not required when the total fuel capacity of all the containers on the vehicle is ≤ 2000L. (TDG 2.31)

d Security

No person shall drive or operate on a highway a vehicle carrying a load unless the load is secured in a manne which ensures that:

- the load will not escape from the vehicle
- the load will not shift or sway in a manner that may affect the operation of the vehicle. (MVA Division 3

Bullets: ■ Statutory Requirements • ❑ Recommended Practices ◦

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Statutory Requirements & Recommended Practices

No person shall drive or operate a commercial vehicle on highway while the vehicle is carrying *drums* or barr
nd unless:

where metal *drums* or barrels are stacked on end, or on other metal *drums* or barrels, the stacks are separa
dunnage; and,

the vehicle has sides, sideboards or side stakes and the *drums* or barrels are blocked or tied down with
hardware adequate to prevent the load from shifting on the vehicle. (MVA 35.08)

Tie Downs must:

have a safe working load of not more than the weight of the load secured by the tie downs

be marked directly, or on a tag permanently attached, with:

(a) the safe working load as warranted by the manufacturer or by a registered professional engineer, or

(b) sufficient information so as to enable a peace officer to determine the manufacturer, grade and quality
the tied down. (MVA 35.08)

not to be used if worn:

(a) beyond a wear limitation specified by the manufacturer, or

(b) to the extent that they have become unsafe

when in use be protected as necessary against abrasion

when in use have any load binder handle that forms part of the tie down assembly locked in place and se
by rope, wire or chain or a locking mechanism that restricts any movement of the handle, and

be designed, constructed and maintained so that the driver of a vehicle can tighten them, unless the tied d
consists of steel, fibre or synthetic strapping, if the strapping is taut when in use.(MVA 35.12)

DOCUMENTATION & TRAINING

ection

All sites that require cleanup of contaminated soil must follow the WMA, *Contaminated Sites Regulation*.
Section 8. Treating Hydrocarbon Contaminated Soils – this guide.)

Inspect the storage and dispensing area and document the inspections to ensure the operations are in accordan
with this guide.

Develop an action plan to address potential liabilities and to upgrade facilities or practices that do not meet th
ndustrial standards identified in this guide.

Do not attempt a site cleanup unless you are familiar with the WMA, *Contaminated Sites Regulation*.
See Section 8. – Treating Hydrocarbon Contaminated Soils.)

Document any site clean-up with photos, written notes and samples.

ining

TDG training is not required when the total fuel capacity of all the containers on the vehicle is
00 L. (TDG 2.31)

TDG training and spill response training is recommended for anyone transporting *small containers.*

Bullets: ■ Statutory Requirements • ❑ Recommended Practices ◦

Symbols: less than (**<**) greater than (**>**) equal to or less than (**≤**) equal to or greater than (**≥**)

Abbreviations: meter (**m**) litre (**L**) kilogram (**Kg**)

Statutory Requirements & Recommended Practices

Ensure all operators have been given some awareness training in fuel handling, storage and dispensing proced
or *small containers.*

Review *risk assessment* and spill response procedures with employees.

Bullets:	■ Statutory Requirements	**Symbols:**	less than (**<**)	**Abbreviations:**	meter (**m**)
	•		greater than (**>**)		litre (**L**)
	❑ Recommended Practices		equal to or less than (**≤**)		kilogram (**Kg**)
	◦		equal to or greater than (**≥**)		

MALL TDG TANKS ≤ 454L – Truck-Box Fuel Tanks

Statutory Requirements & Recommended Practices

DESIGN

ll small tanks ≤ 454L must be designed, constructed, filled and closed so that, under normal conditions of andling and transport, there will be no discharge, emission or escape of the dangerous goods from the contai at could constitute a danger to public safety. (TDG 7.21.)

ll means of containment for small TDG tanks must meet the UN31 standard for *flammable or combustible* li n January 1, 2003.

s Used to Transport Diesel Fuel and other *Combustible liquids*

(Note**:** For FC and TDG definitions of flammable and combustible, see section 11. Glossary – this guide

mall TDG tanks (≤ 454L) used for *combustible liquids* that are constructed to a non-specified standard but m e intent of TDG Section 7.21 (See 2.1 Design above.) will be acceptable. (Note: This remains in the propos mendment to the TDG Regulation.)

s Used to Transport Gasoline and other *Flammable* Liquids

mall TDG tanks (≤ 454L) used for *flammable liquids* that are constructed to a non-specified standard but me ntent of TDG Section 7.21 (see Design above) may be used until January 1, 2003. Note:

- A non-*specified tank* manufactured before 1996 (with visible data plate or date stamp) with a capacity ≤ 4 that meets the criteria in TDG Section 7.21, is a permitted substitute for gasoline fuel until January 1, 20(
- A TC57 *portable tank* is a permitted substitute for gasoline fuel.
- A ULC/ORD 142.13 specified mobile refuelling tank manufactured before January 1, 2003, with a capaci ≤ 454L may be used as a permitted substitute for gasoline until January 1, 2010. (TDG)

OPERATIONS

Control & Secondary Containment

Secondary containment is not required for *truck-box fuel tanks* where the tank is mounted or built as an int f the vehicle.

econdary containment is required for any *truck-box fuel tank* that is > 230L and removed from the truck, trai obile unit and operated in a *fixed location* for any length of time. (FC 4.3.7.1.)

he degree of *spill control* should be based on the level of risk. (See section 7. Risk assessment – this guide.)

ty Awareness

truck-box fuel tank must be labelled with a *flammable/combustible* sticker or placard so that it is visible fro utside the truck. (FC 4.2.3.2 & TDG Part 5.1.2 & TDG Part 5.7)

ake appropriate measures against static charge build-up when transferring *flammable liquids* or *combustible quids* in trucks with plastic box liners or rubber mats.

Bullets: ■ Statutory Requirements • ❑ Recommended Practices ◦

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Abbreviations: meter (**m**) litre (**L**) kilogram (**Kg**)

Statutory Requirements & Recommended Practices

anks must not be filled beyond their safe filling level. (FC 4.5.2.7.)

ny vehicle fitted with a portable fuel tank is required to have at least one 20-B:C rated portable *fire extingui* r two 10-B:C rated portable *fire extinguisher*s are within 9m of the *truck-box fuel tank*. (FC 4.11.2.1.)

igns, indicating that the ignition must be turned off and smoking is not permitted while the vehicle is being efuelled must be visible to every driver approaching the dispenser.

o not fill beyond a safe-filling level corresponding to 90% capacity.

ensing

hen dispensing *flammable liquids*, ensure that static electrical charges are controlled by establishing an elec onnection between the tank or container and truck box fill stem, or by providing other appropriate measures pplicable. (FC 4.1.8.2. FC Appendix A-4.1.8.2.(1)(b))

ose nozzle valves must conform to CAN/ULC-S620-M, "Hose Nozzle Valves for Flammable and *Combusti quids*" (FC 4.5.5.2.)

n automatic shut-off nozzle must be used when using an integral hold-open device. (FC 4.5.5.2.)

hen a hose nozzle valve with a hold-open device is used, a break-away coupling conforming to AN/ULC-S644-M, "Emergency Break-away Fittings for Flammable and *Combustible liquids*" shall be prov C 4.5.5.2.)

o not use any object or device to maintain the flow of fuel that is not an integral part of the hose nozzle valv ssembly. (FC 4.5.8.6.)

se only manufacturer's specified pressure relief security caps. (FC 4.2.3.1.)

se fuel dispensing pumps conforming to good engineering practice, and designed for flammable or *combust quids* (Office of the Fire Commissioner, Interpretation Bulletin #_____, pending)

o not fuel or service equipment within a riparian management area of a stream or wetland, or within 30m of akeshore identified in an operational plan, unless (i) the equipment is hand held, or (ii) the fuelling or servici equired for carrying out fire fighting activities, required to move broken down equipment, or authorized by tl istrict manager. (FPC, *Timber Harvesting Practices Regulation* 24 (3); *Range Practices Regulation* 6 (3); *F oad Regulation* Part 3, 12 (1)(f) & (m))

perators should minimize the potential for overfilling a *truck-box fuel tank* by providing continuously super lling operations using suitably qualified personnel. (FC 4.3.1.8)

oses and nozzles used for dispensing fuel should be maintained in good repair.

se nozzles that must be kept open by continuous application of manual pressure.

ecure nozzles in the back of pickup trucks with some means of drip containment.

Statutory Requirements & Recommended Practices

)o not use hand pumps where power is available.

:nsure that all dispensing procedures are made available to operators.

:rgency Response

pills of TDG Class 3 – *flammable liquids* ≥ 100L must be reported to the Provincial Emergency Program (P elephone **1-800-663-3456**). (WMA, *Spill Reporting Regulation* – see definition of TDG Class 3 *flammable li* n section 11. Glossary – this guide.)

:nsure that spills are recovered and that all contaminated soil is removed or treated. (FC 4.1.6.3.)

ll vehicles transporting fuel must have a spill response kit capable of containing and absorbing fuel spills. FC 4.1.6.3.)

rovide spill response procedures and a current spill response plan with the vehicle.

Maintain a spill response kit, capable of containing and absorbing fuel spills, with the vehicle. See Section 9. 3. Spill Response Equipment – this guide.)

TRANSPORTATION

d Security

Jo person shall drive or operate on a highway a vehicle carrying a load unless the load is secured in a manne which ensures that:

the load will not escape from the vehicle

the load will not shift or sway in a manner that may affect the operation of the vehicle. (MVA Division 3

anks should be placed on plywood or equivalent material to prevent the tank from rubbing on the truck box latform.

OCUMENTATION & TRAINING

ection

ll sites that require cleanup of contaminated soil must follow the WMA, *Contaminated Sites Regulation*. Section 8. Treating Hydrocarbon Contaminated Soils – this guide.)

:nsure that drips and leaks are routinely cleaned so that the truck box remains clean.

ning

DG training and Spill Response training is recommended for anyone transporting fuel using a *truck-box fuel*

Bullets: ■ Statutory Requirements • ❑ Recommended Practices ◦

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Statutory Requirements & Recommended Practices

Review *risk assessment* and spill response procedures with employees. (See Sections 7. Risk assessment & 9 Response.)

ARGE TDG TANKS > 454L – Tank Vehicles

his section deals with *tank vehicles* used as temporary fuelling facilities that are intended to be mo

Statutory Requirements & Recommended Practices

DESIGN

k Trucks

he tank truck must be certified to the current CSA B620-1987/TC306 standard. If the proposed CSA B620-8/TC406 standard is adopted into the TDG Regulations, upgrades will not be required as long as it continues ass inspections. (TDG)

he current inspection requirements for tank trucks include:

- inspection by a facility that is registered by Transport Canada
- visual inspections every two 2 years and pressure testing is required every 5 years;
- under the proposed CSA B620-98 standard visual inspections and a leak test will be required every (1) ye and an internal inspection and pressure test will be required every five (5) years. (TDG)

a tank truck that does not meet the current CSA B620-1987/TC306 standard may be certified under a grandfather clause" or equivalence clause if it meets the intent of the CSA B620 standard. (TDG 7.33.1): Th ertification is valid only until January 1, 2005. After this date the tank must be disposed of or upgraded to m he CSA B620-98/TC406 standard. Only a Certified Transport Canada Inspector can certify the tank under th grandfather clause". (TDG)

nsure that all trucks used to transport fuel tanks meet commercial vehicle inspection requirements. Inspection may not be required in some remote locations where the trucks are not used on public roads; however, commitment to inspection is recommended to provide assurance that the trucks meet an industr standard for safety and performance.

ers & Semi-Trailers

On January 1, 2003 all large TDG tanks >454 L must meet UN31A or UN31B standard for *flammable* or *ombustible liquids*.

or specified manufactured fuel tanks:

a ULC/ORD standard 142.13 Mobile Refuelling Tank and a TC Standard 57 *Portable tank* are acceptable substitutes for transporting *flammable liquids* or *combustible liquids*;

- a ULC/ORD standard 142.13 Mobile Refuelling Tank may be used until January 1, 2010 only if it was manufactured before January 1, 2003. (ULC)

or non-specified manufactured fuel tanks, the following interim requirements must be met:

- non-specified fuel tanks (of any size) may be used to transport combustible liquid (e.g., diesel fuels) until December 31, 2002 if it is "designed, constructed, filled and closed so that under normal conditions there will be no leakage that could endanger public safety"
- a non-*specified tank* that is < 3000L, manufactured before July 1, 1996 and used for *flammable liquid* (e. gasoline) may be used if the tank is:

Statutory Requirements & Recommended Practices

(a) "designed, constructed, filled and closed so that under normal conditions there will be no leakage that could endanger public safety", and
(b) leak-tested, inspected and date stamped every 30 months by a facility registered by Transport Canada Note: If the fuel tank is used for *flammable liquids* (gasoline) and was manufactured on July 1, 1996 later, it must satisfy UN 31A or UN 31B (CGSB 43.146 standard). (TDG)

nsure that all tank trucks, trailers and semi-trailers used to transport fuel tanks meet commercial vehicle nspection requirements.
Note: Inspection may not be required in some remote locations where the trucks are not used on public roads owever, commitment to inspection is recommended to provide assurance that the trucks meet an industrial tandard for safety and performance.

OPERATIONS

Control & Secondary Containment

Note: *Spill control*, including *secondary containment*, is not required for *tank vehicles* where the tank is mounted o built as an integral part of the vehicle including tank trucks, trailers and semi-trailers.

fuel *storage tank* > 230L requires *spill control* (or *secondary containment*) when it is removed from a mob nit and installed in a *fixed location*. (FC 1.2.1.2.) (See section 6. Secondary containment & Collision Protect this guide.)

Consider additional *spill control* for all fuel storage and dispensing units (including secondary containment ystems) that operate in high-risk areas as determined by *risk assessment*. (See section 7. Risk assessment – th uide.)

ty Awareness

igns, indicating that the ignition must be turned off and smoking is not permitted while the vehicle is being efuelled must be visible to every driver approaching the dispenser. (FC 4.5.8.8.)

Maintain at least one 20-B:C portable *fire extinguisher* with the *tank vehicle* (FC 4.11.2.1.)

During loading and unloading bulk fuel from a *tank vehicle*, measures shall be taken against static electrical harges. (FC 4.11.3.2.)

nsure fuel storage is physically protected against collisions, including:
- moving the *tank vehicle* (or mobile skid) to a safe location or place a barrier (i.e. a log or equivalent protection) between the traffic area and the tank. (FC 4.5.2.1. & FC 4.11.2.4.) (See Section 6. 5. – Collisi Protection – this guide..)

anks must not be filled beyond their safe filling level. (FC 4.5.2.7.)

Bullets: ■ Statutory Requirements • ❑ Recommended Practices ◦ **Symbols:** less than (**<**) greater than (**>**) equal to or less than (**≤**) equal to or greater than (**≥**) **Abbreviations:** meter (**m**) litre (**L**) kilogram (**Kg**)

Statutory Requirements & Recommended Practices

When providing collision protection for fuel storage areas, consider selecting:
- a site that is easily visible
- a site that is way from traffic.

ensing

A *storage tank* shall be prevented from being overfilled by providing one or both of the following:
- continuous supervision of the filling operations by personnel qualified to supervise such operations (FC4.3.1.8.)
- an *overfill protection* device that meets the intent of ULC/ORD-C58.15, "*Overfill protection* Devices for Flammable Liquid *Storage Tanks*".

Refuelling equipment from a *tank vehicle* is permitted if the following conditions are met:
- only diesel fuel is dispensed into the fuel tanks (not gasoline)
- the fuelling is conducted in connection with commercial or industrial operations
- the fuelling is conducted outdoors on commercial or industrial establishments
- the fuelling is conducted using approved hose-reel and automatic closing nozzles
- appropriate training and equipment are supplied to deal with any incidental spillage. (FC 4.11.3.8.)

Do not fuel or service equipment within a riparian management area of a stream or wetland, or within 30m of lakeshore identified in an operational plan, unless (i) the equipment is hand held, or (ii) the fuelling or servici required for carrying out fire fighting activities, required to move broken down equipment, or authorized by tl district manager. (FPC, *Timber Harvesting Practices Regulation* 24 (3); *Range Practices Regulation* 6 (3); *Fo Road Regulation* Part 3, 12 (1)(f) & (m))

Do not use any object or device to maintain the flow of fuel, that is not an integral part of the hose nozzle valv assembly. (FC 4.5.8.6.)

When a hose nozzle valve with a hold-open device is used, a break-away coupling conforming to CAN/ULC-S644-M, "Emergency Break-away Fittings for Flammable and *Combustible liquids*" shall be provided. (FC 4.5.5.2.)

Fuel hose length must not exceed 4.5m, or 6m where a retracting system is used. (FC 4.5.5.1.(2)(3) & FC 4.11.3.8)

There should be no leaks from the valve or pipe system to the pump. Draw-off valves must be threaded at the discharge end or otherwise designed to provide a liquid-tight connection to the delivery hose.

Post all fuel handling procedures.

Operators should always stay with the nozzle while refuelling.

Any delivery hose that has the potential to cause a spill, if it were pulled from the delivery pump or valve, sho be fitted with a *breakaway valve*.

Statutory Requirements & Recommended Practices

Gravity-feed systems are considered high-risk facilities and should be phased out as soon as possible. Additio
ontrol measures are strongly recommended to ensure:

- the bottom-of-tank valve is protected
- the dispensing hose will not be pulled from the bottom of the tank without a break-away valve
- additional collision protection is installed to prevent the accidental contact with the tank
- the tank cannot be overfilled
- access to the top of the tank meets legal requirements
- the volumes of fuel are recorded through a meter system.

The use of automatic shut-off nozzles is recommended to discourage the use of devices to hold the nozzle val
ssembly open while refuelling.

Use fuel-dispensing pumps according to manufactures' specifications.

Close and lock valves as required.

ergency Response

pills of TDG Class 3 – *flammable liquids* ≥ 100L must be reported to the Provincial Emergency Program (P
elephone **1-800-663-3456**). (WMA, *Spill Reporting Regulation* – see definition of TDG Class 3 *flammable iquids* in section 11. Glossary – this guide.)

Ensure that spills are recovered and that contaminated soil is removed or treated. (FC 4.1.6.3.)
See section 8. Treating Hydrocarbon Contaminated Soils – this guide.)

All vehicles used to transport fuel must have a spill response plan and spill response kit, capable of containing
nd absorbing fuel spills, . (FC 4.1.6.3.) (See Section 9. 4. & 9.5. Spill Response Equipment – this guide.)

ost spill response procedures and maintain a spill response plan with the fuel system.

TRANSPORTATION

d Security

No person shall drive or operate on a highway a vehicle carrying a load unless the load is secured in a manner
which ensures that:

- the load will not escape from the vehicle
- the load will not shift or sway in a manner that may affect the operation of the vehicle.
- (MVA Division 35.03)

Appropriate placards must be visible on all four sides of any fuel truck or mobile refuelling trailer that is
2000 L whether filled or empty. (TDG Part V)

Bullets: ■ Statutory Requirements • ❑ Recommended Practices ◦

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Statutory Requirements & Recommended Practices

DOCUMENTATION & TRAINING

s Documentation

DG documentation (TDG 2.31 & TDG4.8) is required when transporting more than 2000L of TDG Class 3 lammable liquid. (See Section 11. – Glossary.) The shipping document must show:

- document number and date
- the name, address and signature of the shipper
- the consignee's name and address and the carrier's name
- fully trained-operator status
- full description and total volume of dangerous good(s);
- a 24 hour contact number
- the type and number of placards, if required. (TDG Part V)

hen transporting an empty tank, the shipping document must use the words: "Residue – Last Contained". Tanks that are cleaned and *purged* do not require any documentation. (TDG 4.19)

ection

ll sites that require cleanup of contaminated soil must follow the WMA, *Contaminated Sites Regulation*. Section 8. Treating Hydrocarbon Contaminated Soils – this guide.)

egular inspections must be conducted and documented to ensure that fuel trucks and mobile refuelling tanks eet all safety specifications. (TDG 7.33.1)

nspections should be documented and inspection reports kept on file.

ning and Signage

ost clearly legible operating instructions at card or key activated dispensers. (FC 4.5.8.4. & FC 4.5.8.8.)

mergency instructions must be conspicuously posted. (FC 4.1.6.3.)

pill response training needs should be assessed and implemented annually.

ll drivers who transport bulk fuel should be trained through the Canadian Petroleum Producers Institute (CP rivers Certification Training and Transportation of Dangerous Goods certification course or equivalent.

nly experienced drivers with a Transportation of Dangerous Goods (TDG) certificate and emergency respon aining (ERT) should transport bulk fuel.

Bullets: ■ Statutory Requirements • ❑ Recommended Practices ◦

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IXED LOCATION ABOVEGROUND STORAGE TANKS (AST) > 230L

Statutory Requirements & Recommended Practices

DESIGN

ll *storage tanks* for combustible and *flammable liquids* must be built and maintained in accordance with Underwriters Laboratories of Canada (ULC) tank specifications, and bear a current ULC certification plate or abel. (FC 4.3.1.2.)

Where a *storage tank* > 230L is removed or abandoned, it is permitted to be reused for the storage of *flammal iquids* and *combustible liquids* only after having been refurbished and found to conform to one of the accepta tandards. (FC4.3.1.2 & FC4.10.4.2.)

Materials, systems, equipment and procedures not specifically described in the *Fire Code*, or that vary from th pecific requirements of the *Fire Code,* or for which no recognized test procedure has been established, are ermitted to be used if it can be shown that these alternatives are equivalent on the basis of tests, evaluations ast performance. (FC 1.1.2.1.)

ll *aboveground storage tanks* must be installed on firm foundations designed to minimize uneven settling ar orrosion, and to prevent the design stress of the tank from being exceeded. (FC 4.3.3.1.)

Multiple tanks must have a minimum 1m separation between them. (FC 4.3.2.2.)

Hose Nozzle valves must conform to CAN/ULC-S620-M, "Hose Nozzle Valves for Flammable and *Combustible liquids*" (FC 4.5.5.2.)

When a hose nozzle valve with a hold-open device is used, a breakaway coupling conforming to CAN/ULC-644-M, "Emergency Break-away Fittings for Flammable and *Combustible liquids*" shall be provided. FC 4.5.5.2.)

Valves at the *storage tank* must be constructed of steel according to the *Fire Code*. (FC 4.3.6.2.(1))

To ensure a tank meets a specified engineering standard, check for a current certification plate or label.

nnual *risk assessments* should be conducted on all gravity-feed systems currently in operation and control neasures implemented to reduce and manage the risk(s).

Gravity-feed systems are considered high-risk facilities and should be phased out as soon as possible. dditional control measures are strongly recommended to ensure:

- the bottom-of-tank valve is protected
- the dispensing hose will not be pulled from the bottom of the tank without a break-away valve
- additional collision protection is installed to prevent the accidental contact with the tank,
- the tank cannot be overfilled
- access to the top of the tank meets legal safety requirements
- the volumes of fuel are recorded through a meter system
- a record of daily inspections and recorded volumes.

Statutory Requirements & Recommended Practices

porary-Out-Of-Service

boveground storage tanks, which will be out of service for a period not exceeding 180 days, must be isolate y closing and securely locking the necessary valves, or by capping the piping from the tank. (FC 4.10.2.2.)

f the tank contains flammable or *combustible liquids*, the liquid level in the tank must be measured and the eadings compared at intervals not greater than one month. (FC 4.10.2.2.)

When an *aboveground storage tank* will be out of service for a period exceeding 180 days:
- all liquid and vapour must be removed from the tank and its connected piping
- the tank markings must clearly indicate that the tank is empty. (FC 4.10.2.2.)

f the aboveground tank is on a cradle, so that the bottom of the tank is exposed, the bottom of the tank shoulc isually inspected and documented on a regular basis.

emote facilities, that are difficult or impossible to access on a monthly basis, should secured to prevent spill nd contamination. This may include leak detection monitoring equipment with wireless communication larms.

OPERATIONS

Control & Secondary Containment

pill control may include one or more of the following:
- double-walled tank
- tank-in-a-box system
- a graded or sloped site capable of diverting and containing a spill and preventing spills from entering natu waterways, storm drains and sanitary sewers
- a paved or concrete pad sloped so that water and spilled fuel is directed to an oil/water separator
- a non-combustible barrier of sufficient height to contain the spill. (FC 4.1.6 & FC 4.3.7.)

econdary containment areas must not be used for storage purposes. (FC 4.3.7.9.)

anks within the containment area must be on the ground, mounted on a skid or securely positioned on a crad he cradle or tank support shall have a fire-resistance rating of not less than 2 hours (i.e. steel). (FC 4.3.3.1.)

recipitation must not be allowed to accumulate within the containment area. (FC 4.3.7.8.)

ty Awareness

igns, indicating that the ignition must be turned off, smoking is not permitted while the vehicle is being efuelled, and any other fuelling procedure, must be visible to every driver approaching the dispenser. FC 4.5.8.8)

Bullets: ■ Statutory Requirements • ❑ Recommended Practices ◦

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Statutory Requirements & Recommended Practices

At least 2 portable 20-B:C rated *fire extinguisher*s must be available within 9m of the work area. (FC 4.6.5.1 & FC 6.2.3.5.)

Establish proper bonding, grounding and isolation components for protection against static charges during loading of *tank vehicles* when transferring *flammable liquids* or *combustible liquids*. (FC 4.6.4.5.)

Ensure fuel *storage tank* is physically protected against collisions. (FC 4.5.2.1.(3))

Tanks should be filled to an acceptable safe filling level corresponding to approximately 90% of capacity.

ensing

ixed dispensers must be protected against collision damage by either:
- a concrete island not less than 100mm high, or
- guard rails. (FC 4.5.3.3.)

uel dispensing hose length must not exceed 4.5m, or 6m where a retracting system is used. (FC 4.5.5.1.(2)(3

An automatic shut-off nozzle must be used when using an integral hold-open device. (FC 4.5.5.2.)

Do not use any object or device to maintain the flow of fuel that is not an integral part of the hose nozzle valv ssembly. (FC 4.5.8.6.)

There must be no leaks from the valve or pipe system to the pump. Draw-off valves must be threaded at the ischarge end or otherwise designed to provide a liquid-tight connection to the delivery hose. (FC 4.4.5.)

During loading and unloading bulk fuel from a *tank vehicle*, precautionary measures must be taken to prevent tatic electrical charges. (FC 4.11.3.2.)

Ensure that all operators stay with the fuel nozzle while refuelling.

Any delivery hose that has the potential to cause a spill, if it were pulled from the delivery pump or valve, hould be fitted with a *breakaway valve*.

The fuel dispensing hose should be stored inside the containment *berm* where applicable.

The use of automatic shut-off nozzles with an integrated hold-open device is recommended to discourage the f devices or objects to hold the nozzle valve assembly open while refuelling.

The fuel dispensing hose should be stored inside the containment *berm* where applicable.

Keep hoses off the ground and valves closed and locked when not in use.

Always stay with fuel dispensing system while refuelling.

Statutory Requirements & Recommended Practices

A hose retractor should be used to keep the hose off the ground when not in use.

All pumps used to transfer fuel should conform to manufactures' specification.

Use automatic shut-off nozzles.

Nozzles should be equipped with some means of drip containment.

ution Prevention

torage tanks must not be overfilled, and precautions must be taken to prevent overflow or spillage by provid ontinuous supervision of the filling operations by personnel qualified to supervise such operations (FC 4.5.8

o help minimize spills while filling the tank, an over-fill spill box should be located around the fill stem pipe

rgency Response

A spill response kit capable of containing and absorbing fuel spills must be made available and maintained FC 4.2.6.3) (See section 9.3 spill Response Equipment – this guide.)

Ensure that spills are recovered and that contaminated soil is removed or treated. (FC 4.1.6.3.)
See section 8. Treating Hydrocarbon Contaminated Soils – this guide.)

pills of TDG Class 3 – *flammable liquids* ≥ 100L must be reported to the Provincial Emergency Program (P elephone **1-800-663-3456**). (WMA, *Spill Reporting Regulation* – see definition of TDG Class 3 *flammable iquids* in section 11. Glossary – this guide.)

ost spill response procedures and maintain an emergency response manual with the *fuel facility*.

DOCUMENTATION & TRAINING

ection & Documentation

Visual inspections must be made daily and during each shift of the piping system, pumps and ancillary quipment for leaks spills and obvious abnormal conditions. Any leakage must be repaired immediately. FC 4.4.11.5.)

At *fuel dispensing stations* where the tank is resting on the ground (and visual inspection beneath the tank is n ossible) the measurement (by tank dip) and computation of any gain or loss of liquid shall be taken each day hat the station is in operation. (FC 4.3.16.1.)

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Statutory Requirements & Recommended Practices

ll sites that require cleanup of contaminated soil must follow the WMA, *Contaminated Sites Regulation*. Section 8. Treating Hydrocarbon Contaminated Soils – this guide.)

eep a record of all volumes before and after deliveries.

ning and Signage

nsure that the training of and fuel dispensing attendants includes procedures for:

- supervising the dispensing of flammable and *combustible liquids*
- taking appropriate measures to prevent sources of ignition from creating a hazard at the dispensers
- taking appropriate action in the event of a spill to reduce the risk of fire
- shutting off the power to all dispensers in the event of a spill or fire. (FC 4.5.8.5., FC 4.5.8.6. & FC 4.4.11.2)

pill and fire-training requirements should be assessed and implemented annually.

ll drivers who transport bulk fuel should be trained through the Canadian Petroleum Producers Institute (CP rivers Certification Training and Transportation of Dangerous Goods certification or equivalent.

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