


Transportation of Dangerous Goods: *Theory*

The Safety Cat

Safety is a Marathon without an End... ...Let me help You Run!!!



Course Objectives

- ❖ **Review** TDG History
 - ❖ **Identify** Dangerous Goods Classes
 - ❖ **Use** Schedules 1, 2, 3 & Emergency Response Guide
 - ❖ **Outline** Duties, Responsibilities & Handling
 - ❖ **Understand** Means of Containment (*MoC*) & Packaging
 - ❖ **Review** Special Cases & Exemptions / Exceptions
 - ❖ **Learn** Safety Marks, Labelling & Placarding
 - ❖ **Complete** a Shipping Document
 - ❖ **Detail** Emergency Response Assistance Plans (*ERAP*) & Security Plans
 - ❖ **Define** Reporting requirements
 - ❖ **Understand** Practical Evaluation requirements
- 



What is TDG?

- ❖ The Transportation of Dangerous Goods Act is an “**Act to Promote Public Safety in the Transportation of Dangerous Goods**”
- ❖ TDG is a **Federal** requirement
- ❖ The United States (US) has a reasonable “*equivalent*” called “**49 Code of Federal Regulations**” (49CFR)
- ❖ TDG has **not** currently been affected by WMIS2015/GHS:
 - Workplace Hazardous Materials Information System 2015 / Globally Harmonized System





When does TDG not apply?

There are **several circumstances** when TDG requirements **do not apply**:

- ❑ For WHMIS Regulated Products
- ❑ When an Exemption is in-place
- ❑ For Consumer Commodities
- ❑ For small quantities of goods available to the Public
- ❑ Goods moved within an facility: not being transported, *etc...*



N/A



TDG Definitions

Consignor

- ❖ A person/organization in Canada who offers dangerous goods for transportation (*Shipper*)

Carrier

- ❖ A person who, whether or not for hire or reward, has possession of dangerous goods while in transport

Consignee

- ❖ A person/organization who receives & subsequently uses dangerous goods (*Receiver*)





TDG Definitions: Cont...

LC₅₀

- ❖ The concentration of a material **in air** which, on the basis of laboratory tests, is expected to kill 50% of a group of test animals when administered as a single exposure (*usually 1 or 4 hours*)

LD₅₀

- ❖ The amount of a material, **given orally**, all at once, which causes the death of 50% of a group of test animals





Class #2: Gases

Substances included if it is:

- ❖ Gas included in one of 3 divisions
- ❖ Mixture of gases
- ❖ Mixture of 1 or more gases with 1 or more vapours of substances included in other classes
- ❖ An article charged with a gas
- ❖ Tellurium Hexafluoride; **or**
- ❖ An Aerosol

Pictogram: changes in each Division



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Class #2: Gases, Examples...

- ❖ **2.1** = Propane, Acetylene, Butane
- ❖ **2.2** = Fire Extinguishers, Oxygen, Argon
- ❖ **2.3** = Chlorine, Ammonia, Carbon Monoxide

- ❖ **Class 2.2, Oxygen** has a special Label/Placard





Class #3: Flammable Liquids

Liquids, or liquids containing solids-in-solution/suspension **are included if they:**

- ❖ Flash-point $\leq 60^{\circ}\text{C}$, closed-cup test method
- ❖ Flash-point of 65.6°C , open-cup test method
- ❖ Intended or expected to be at temperature \geq flash point at any time while in *transport*

Flash-point $>35^{\circ}\text{C}$ are not included if they:

- ❖ **Do not** sustain combustion, as determined in accordance with the sustained combustibility test
- ❖ Fire-point **greater** than 100°C
- ❖ Water-miscible solutions with water content **greater** than 90%





Class #4: Flammable Solids

Substances included if it is:

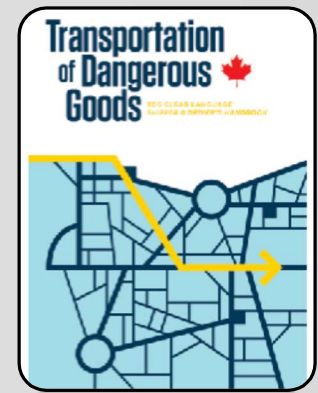
- ❖ Liable to **spontaneous combustion** or substances that on **contact with water** emit flammable gases (*water-reactive substances*)
- ❖ Meet criteria for inclusion in 1 of the divisions & packing groups of Class 4





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Schedules #1, #2 & #3



Schedule #1: Columns / Info

- ❖ **Column #1** = numerically by UN#
- ❖ **Column #2** = proper Shipping Name
- ❖ **Column #3** = Class / Secondary Class/es
- ❖ **Column #4** = PG / Category (*if applicable*)
- ❖ **Column #5** = Special Provisions (*if any*)

Col.1 UN Number	Col.2 Shipping Name and Description	Col.3 Class	Col.4 Packing Group / Category	Col.5 Special Provisions
UN2930	TOXIC SOLID, FLAMMABLE, ORGANIC, N.O.S.	6.1 (4.1)	I	16
			II	16
UN2991	CARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23°C	6.1 (3)	I	16
			II	16
			III	16
UN2992	CARBAMATE PESTICIDE, LIQUID, TOXIC	6.1	I	16
			II	16
			III	16
UN2993	ARSENICAL PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23°C	6.1 (3)	I	16
			II	16
			III	16
UN2994	ARSENICAL PESTICIDE, LIQUID, TOXIC	6.1	I	16
			II	16
			III	16





Exercise #3: Workplace Specific

Using Schedule #1:

- ❖ Using the 2 TDG products from Exercise #1

1. _____
2. _____

- ❖ Check Column #10 & reference ERG Guide #

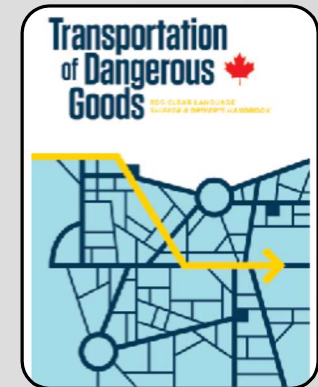
1. _____
2. _____

****Discuss** ability to comply with ERG requirements*



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TDG Duties, Responsibilities & Handling





Consignor (Shipper)

- ❖ Classify Goods
- ❖ Package Goods
- ❖ Display Safety Marks & Labels
- ❖ Complete and keep a shipping document (2yrs)
- ❖ Supply & Ensure Placards displayed
- ❖ Loads Goods safely
- ❖ Report spills under Shippers control
- ❖ Register for ERAP if required
- ❖ Ensure training is provided



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Carrier (*Driver*)

- ❖ Refuse non-compliant shipments
- ❖ Load/Off-load goods safely
- ❖ Keep shipping document accessible
- ❖ Supply placards if necessary
- ❖ Report spills under Carrier control
- ❖ Ensure shipping documents contain all required information: ISHP
- ❖ Verify quantity & description of goods on shipping documents
- ❖ Retain shipping document for (2yrs)
- ❖ Ensure they are adequately trained



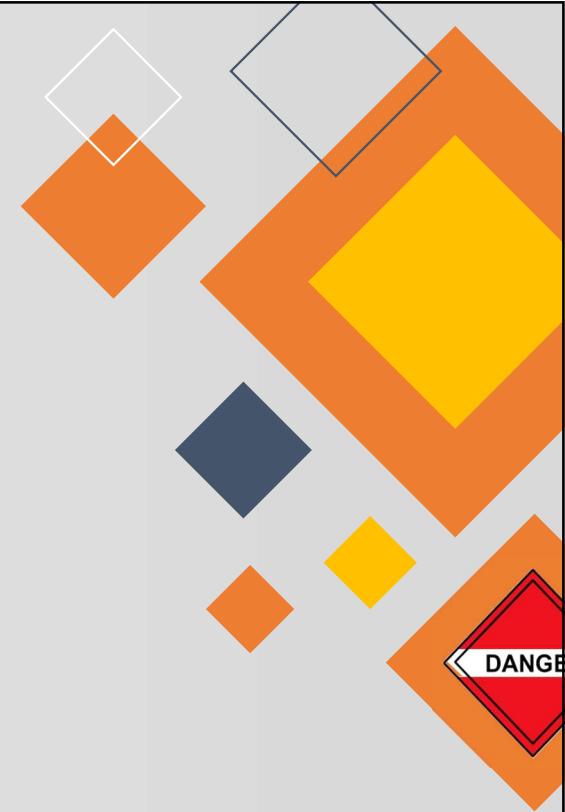
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Additional Exemptions

Numerous other Exemptions are in place:

- ❖ Medical Devices
- ❖ Samples
- ❖ National Defense
- ❖ Agricultural
- ❖ Pesticides
- ❖ Anhydrous Ammonia
- ❖ Ferries
- ❖ Passenger Carrying Vessels
- ❖ Refrigerating Machines
- ❖ Alcohol / Aqueous Solutions
- ❖ Biological Products
- ❖ Human / Animal Specimens
- ❖ Blood / Medical Waste
- ❖ Tissues / Organs for Transplant, **etc...**





TDG Exceptions Conditions

Schedule 1, Column 6(b)

The **outer** MoC:

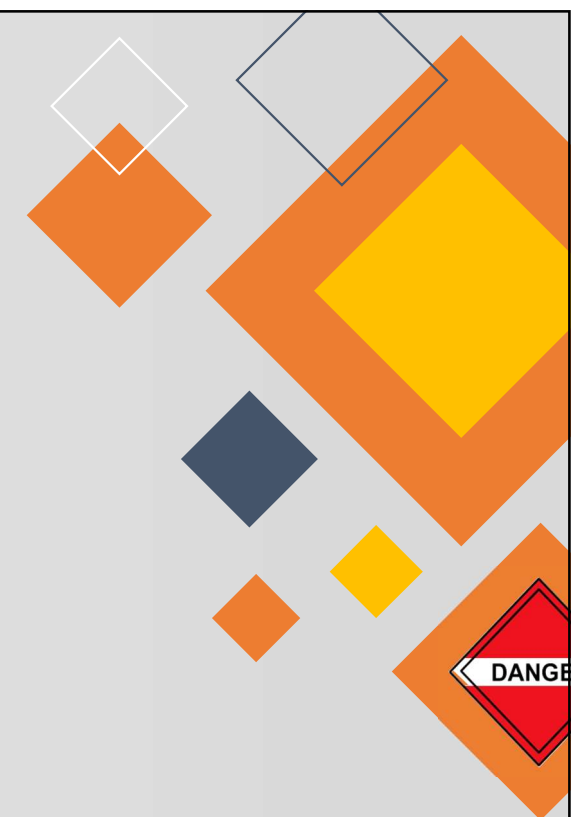
- ❖ Mass \leq number in Exceptions Table, *Column 2*

The **inner** MoC:

- ❖ Mass \leq number in Exceptions Table, *Column 1*

***Note:** *Measured in Grams or Millilitres*

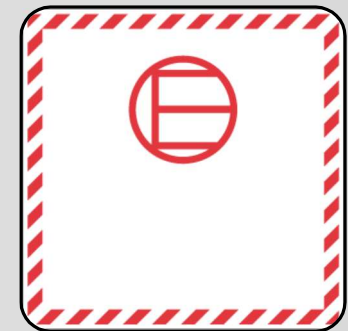
EXCEPTION





TDG Exceptions Conditions

- ❖ Quantity **must not exceed** 1,000 ml/gm
- ❖ Excepted quantities MoC inside overpack, following information **must be displayed on overpack**, unless information on MoC is visible through overpack:
 - Word “**Overpack**” (“*Suremballage*”)
 - The Excepted Quantities **mark**
- ❖ Shipping document must include words “**dangerous goods in excepted quantities**”
(“*marchandises dangereuses en quantités exceptées*”)



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Consignors Certification: Cont...

- ❖ Name of the organization is ***not* acceptable**
- ❖ The Consignor's certification ***must* appear** anywhere on the shipping document **after the information required** in Section 3.5 of the *TDG Regulations*
- ❖ **For example**, the Consignor can place it:
 - **Back** of the shipping document; or
 - On **last page** if there's multiple pages



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6 Different Reports

- ❖ Emergency Report
- ❖ Release / Anticipated Release Report
- ❖ 30-Day Follow-Up Report
- ❖ Loss or Theft Report
- ❖ Unlawful Interference Report
- ❖ ERAP Report

*...there are **other reports** for alternate modes of transport: Rail, Marine, Air*

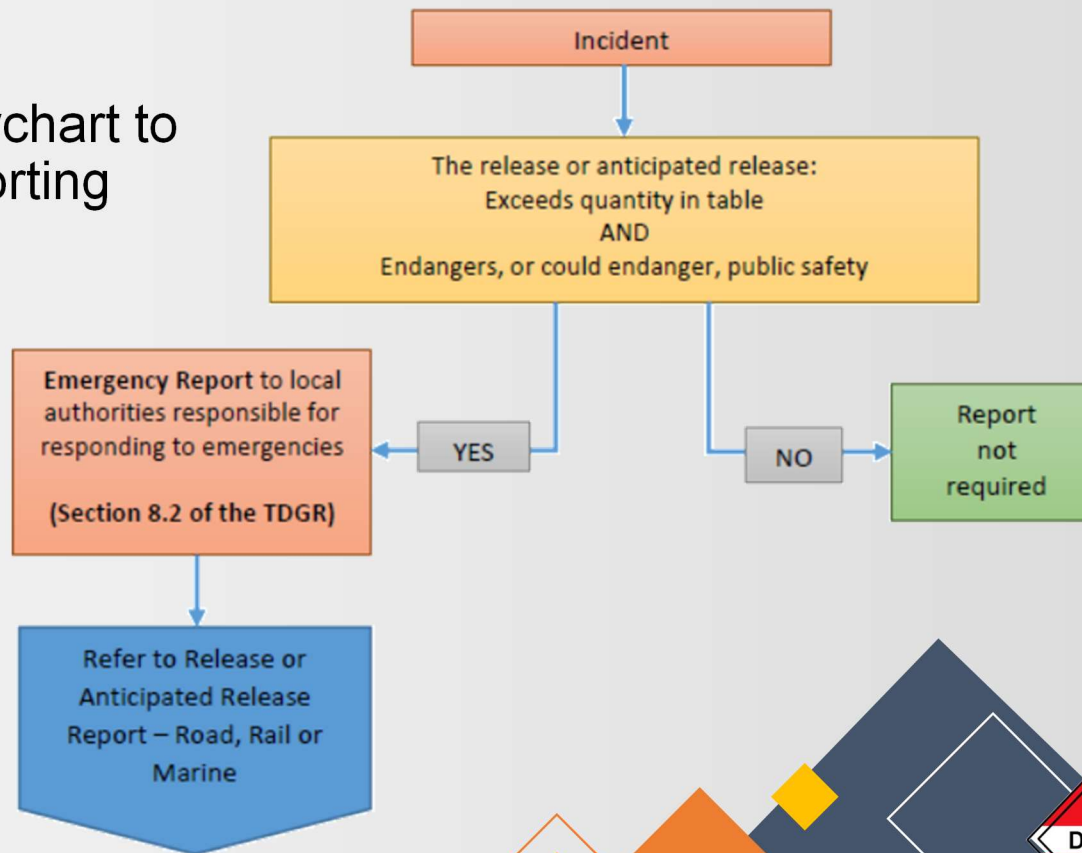


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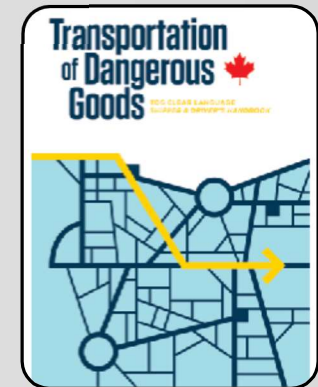
A red diamond-shaped sign with a white border and the word "DANGER" in white capital letters on a black background.

Emergency Report Flowchart

Follow the flowchart to determine reporting requirements



Practical Evaluation Requirements





CGSB Requirements: CAN/CGSB-192.3-2020



In 2020 the Canadian General Standards Board presented a plan to introduce/include a **practical component** in TDG training

This component is **in-keeping** with other countries

Each TDG trained person will be required to **complete a series of practical evaluations specific to all job duties/tasks related to TDG**

This component may be observed by their **Employer/Supervisor** or a **3rd Party/External provider**

Certification records must show that **both Theory & Practical components** were conducted and completed

[Link to CGSB Standard](#)



CGSB
ONGC



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