Propane Plant Operator 1
Record of Training Curriculum Document

Introduction:

This TSSA document defines the required training curriculum content for PPO-1 Record of Training programs under Ontario Regulation 215/01(Fuel Industry Certificates). Ontario Training Providers who wish to have their PPO-1 training programs accredited by TSSA must submit training programs that meet with the requirements of this curriculum.

There is no requirement to follow the order of this curriculum unless otherwise noted, provided all of the content and objectives are met.

Ontario Regulation 215/01

PPO-1 certificate

34. A person may perform the following functions if the person is the holder of a PPO-1 certificate or is the holder of a record of training issued by an accredited training provider approved by the director that indicates that the person has taken training acceptable to the director:

1. Transfer propane to and from tank cars, cargo liners, tank trucks, filling plants and container refill centres.
2. Fill containers and operate propane transfer equipment in a filling plant or container refill centre.

Theory testing may be done by module or at the completion of the course.

Estimated minimum total number of hours for program delivery: 12 to 15 hours.

MODULE 1
Estimated hours: .5
Module Title: Propane; Properties of the Fuel and Related Hazards

MODULE – 01	ENABLING OBJECTIVES *The student will be able to:*	THEORY | CONTENT
01.01	Identify the properties of propane as a vapour and as a liquid as well as the hazards associated with the fuel.	Identify the properties of propane as a liquid and as a vapour in terms of: · chemical composition (MSDS Information) · calorific value · boiling and freezing points · relative density · physical and identifiable characteristics of both liquid and vapour propane · uses in industry, home heating and transportation for both liquid and vapour propane · expansion between the liquid and vapour states · working pressures for appliances Identify the hazardous potential of propane as a liquid and as a vapour · frostbite and blinding potential · required Personal Protective Equipment for working with propane · first aid measures · sources of ignition and extinguishing fires · carbon monoxide · range of flammability · explosive potential · provide examples of propane related incidents or accidents
01.02	**THEORY TESTING**	**Candidates shall perform a written theory test with core elements of each learning objective represented in the test.** **The testing may be separated into modules**

MODULE 2

Estimated hours: 1
Module Title: Legislation and Codes

MODULE – 02	ENABLING OBJECTIVES *The student will be able to:*	THEORY | CONTENT
02.01	Identify the applicable sections of the TSS Act.	The TSS Act · Identify the role of TSSA in the Fuels Industry and its jurisdictional authority as per the Act
02.02	Identify the applicable requirements of Ontario Regulation 215/01.	Identify the scope of the PP0-1 Certificate as per Ontario Regulation 215/01.
02.03	Identify the applicable requirements of Ontario Regulation 211/01.	· identify requirement for approval · identify the requirements for regulated activities involving propane · identify the duties of an employer · identify the requirements placed upon an ROT holder in the case of an accident or occurrence · identify the requirements placed upon an ROT holder for immediate and non-immediate hazards · identify requirements for propane vehicle operation · identify requirements for propane filling plants and refill centres · identify requirements for propane tank trucks · identify requirements for propane tank truck and facility inspection
02.04	Identify the applicable requirements of the CSA B149.2.	· identify the applicable requirements of the B149.2 Code for Container Storage and Container Filling including all aspects of Container Filling from Bulk Trucks · identify the applicable requirements of the B149.2 Code for Filling Plants and Refill Centres with regard to: “Tank Systems, filling plants and refill centres” · identify the applicable requirements of the B149.2 Code for Filling Plants and Refill Centres with regard to: Tank trucks, tank trailers and cargo liners · identify the applicable requirements of the B149.2 Code for Filling Plants and Refill Centres with regard to Operation, Maintenance and Personnel Training; Operating Procedures, Maintenance Procedures and Documentation procedures · identify the applicable requirements of the B149.2 Code for tank trucks · identify the applicable requirements of the

MODULE – 02	ENABLING OBJECTIVES *The student will be able to:*	THEORY | CONTENT
		B149.2 Code for equipment and container clearances as well as protection for equipment and containers · identify signage requirements for Auto Dispensers, Filling Plants and Refill centres
02.05	Identify the applicable requirements of WHMIS and TDG with regard to propane. Identify the safety and first aid requirements related to working with propane.	· identify WHMIS and MSDS information regarding propane gas · identify the TDG requirements for the transportation of propane cylinders and propane tank trucks · identify preventative safety measures including Personal Protective Equipment; accident prevention, sources of ignition, leak detection and emergency procedures · identify first aid procedures for propane related injuries, freeze burns, inhalation exposure...etc.
02.06	**THEORY TESTING**	**Candidates shall perform a written theory test with core elements of each learning objective represented in the test.** **The testing may be separated into modules**

MODULE 3

Estimated hours: 2
Module Title: Propane Bulk Plants and Propane Tanks

MODULE – 03	ENABLING OBJECTIVES *The student will be able to:*	THEORY | CONTENT
03.01	Identify the common types, sizes and components of propane storage tanks. Identify the NBIC Supplement 7 requirements for tank inspections.	· identify commonly used tank types and their sizes · identify and describe the construction and component parts of consumer tanks and bulk storage tanks including relief valves, pressure relief valve manifold, rotary liquid level gauge, fixed liquid level gauge, tank pressure gauge, storage tank thermometer and dip tube · identify and describe the valving of consumer and bulk storage tanks including back check and double back check valves, excess flow valves, globe/ball and angle valves · identify and describe Emergency Shut Off Valves, Internal Flow Valves, Internal Safety Control valves with air, nitrogen and fusible link safety systems · identify the required CRN identification number and markings on tanks · identify TDG Regulations for specification tanks vs consumer tanks · identify TDG requirements for the transportation of consumer tanks (under 5% of total volume) Review the NBIC Supplement 7 criterion for tank inspection · identify the requirements for tank pressure relief valve inspection and replacement intervals
03.02	Identify the typical components of a propane bulk plant.	Using pictures, diagrams, video and/or onsite visits identify the typical components and structures within a propane bulk plant, including: · fencing and protection · bulk plant supply tanks · liquid propane piping; vapour propane piping, pumps and compressors · rail car unloading platform and manifold and cargo liner unloading platform and manifold · bulk truck loading platform and manifold (bulkheads) · cylinder docks and filling stations · safety systems and fire extinguishing equipment · alarm systems · required clearances for bulk and filling plant components and operations from the CSA B149.2 Code

MODULE – 03	ENABLING OBJECTIVES *The student will be able to:*	THEORY | CONTENT
03.03	Identify emergency and safety procedures for filling plants and bulk plants.	Identify and describe typical emergency procedures for filling plants and bulk plants including: - review of RSMP requirements - manual activation of ESV - automatic nitrogen/air and fusible link safety systems - activation of alarms and shut down systems - evacuation procedures - required emergency contacts - required reporting - fire extinguishing procedures Identify common maintenance and operating procedures for bulk plants and filling plants.
03.04	Identify the requirements of filling tanks by volume.	· identify and describe the purpose and operation of the fixed liquid level gauge ('spit valve') · identify and review the procedure for filling tanks by volume · identify the hazards and the causes of tank overfilling (this would include the hazards associated with filling by the tank gauge as opposed to the spit valve) · identify the requirements for tank evacuation when overfilling occurs
03.05	**THEORY TESTING**	**Candidates shall perform a written theory test with core elements of each learning objective represented in the test.** **The testing may be separated into modules**
	PRACTICAL	
03.06	Identify what would constitute an unacceptable condition for a tank.	Candidates shall be tested on the proper inspection of tanks and must be able to identify unacceptable conditions
03.07	Demonstrate the process and procedures for tank filling by volume.	Candidates shall be tested on the demonstration of proper process and procedures for tank filling by volume Candidates shall be tested on emergency shut down procedures during filling operations

MODULE 4

Estimated hours: 2-3
Module Title: Propane Cylinder Filling

MODULE – 04	ENABLING OBJECTIVES *The student will be able to:*	THEORY | CONTENT
04.01	Identify various types of cylinders, their components, markings etc.	· identify commonly used cylinder types and sizes · identify and describe the construction and component parts of cylinders including valve types, relief valves, fixed liquid level gauge, dip tube · identify the required Transport Canada date code and markings on cylinders and the requirement for 10 year recertification · identify the requirements for cylinder and inspection
04.02	Identify cylinder filling equipment used at refill centres.	Using pictures, diagrams, video and/or onsite visits identify the typical components and structures within a propane bulk plant, including: - ISC valve(with door interlock) · ISC valve(with door interlock) · fusible link · pump switch · explosion proof light · scale; scale beam, scale platform, weight · purge cylinder, purge gauge · gas hoses · fire extinguisher · required signage
04.03	Demonstrate an understanding of cylinder filling by weight.	Identify and explain the requirements from CSA B149.2; Section 6; Table 'Maximum Permitted Filling Density of a Cylinder by Weight' · perform theory exercises to support this learning objective · identify the hazards and the causes of cylinder overfilling · identify the requirements for cylinder evacuation when overfilling occurs
PRACTICAL		
04.04	Identify what would constitute an unacceptable condition of a cylinder.	Candidates shall be tested on the proper inspection of cylinders and must be able to identify unacceptable conditions.
04.05	Demonstrate the process and procedures for cylinder filling by weight.	Demonstrate the proper process and procedures for cylinder filling by weight . Candidates shall be tested on the demonstration of proper process and procedures for cylinder filling by weight Candidates shall be tested on emergency shut down procedures during filling operations
04.06	**THEORY TESTING**	**Candidates shall perform a written theory test with core elements of each learning objective represented in the test.** **The testing may be separated into modules**

MODULE 5

Estimated hours: 1
Module Title: Propane Bulk Truck Loading Platforms (Bulkheads)

MODULE – 05	ENABLING OBJECTIVES *The student will be able to:*	THEORY | CONTENT
05.01	Identify the components and purpose of a bulk plant pumping system.	**Identify the operational characteristics of the pump.** Using pictures, diagrams and demonstration, identify the following components of a pumping system and explain their purpose: · the pumping system; belt drive pumps vs. direct drive pumps · liquid and vapour piping (include colour coding) · the strainer · the bypass valve · the bypass line Identify common pump malfunctions and remedies. Identify unacceptable conditions for pumps and pump operation.
05.02	Identify the components and purpose of a bulk plant compressor system.	**Identify the operational characteristics of a compressor system.** Using pictures, diagrams and demonstration, identify the following components of a propane compressor system and explain their purpose: · strainer · inlet pressure gauge and outlet pressure gauge · hydrostatic relief valve · oil pressure gauge/oil dipstick/oil pressure adjustment · liquid trap · four-way directional valve · explosion proof motor Identify common compressor malfunctions and remedies. Identify unacceptable conditions for compressors and compressor operation.
05.03	Identify the components of a bulk truck loading platform.	Using pictures, diagrams and demonstration, identify the following components of a propane compressor system and explain their purpose: · ISC valves · liquid line · vapour equalization line · bulkheads · hose end shut off valves · ESV's · remote shut off · ground cable · back check valve

MODULE – 05	ENABLING OBJECTIVES *The student will be able to:*	THEORY | CONTENT
		Identify the requirements for inspection of loading platforms and unacceptable conditions for components.
05.04	**THEORY TESTING**	**Candidates shall perform a written theory test with core elements of each learning objective represented in the test.** **The testing may be separated into modules**
NB: Bulk Truck Loading Procedures to follow module on Bulk Trucks		

MODULE 6

Estimated hours: .5
Module Title: Propane Bulk Trucks and Cargo Liners

MODULE – 06	ENABLING OBJECTIVES *The student will be able to:*	THEORY | CONTENT
06.01	Identify the design and components of typical propane bulk trucks and cargo liners as well as the inspection requirements for bulk trucks and cargo liners.	Using pictures, diagrams and demonstration, identify the following components of propane bulk trucks and cargo liners, and explain their purpose, maintenance and inspection requirements: · the truck tank (typical sizes, construction, mounting, relief valves, compliance with CSA B620 standards; ASME data plate) · rotary gauge, pressure gauge, fixed liquid level gauge, float gauge, tank thermometer · liquid withdrawal connection and required valving · vapour equalizing connection and required valving · PTO System · hydraulic pump drive system · delivery hoses · liquid metering equipment · Chock Blocks · TDG signage · emergency shutdown systems · vehicle circle check requirements

MODULE 7

Estimated hours: 2-3
Module Title: Propane Bulk Truck and Cargo Liner Loading at Bulk Plants

MODULE – 07	ENABLING OBJECTIVES *The student will be able to:*	THEORY | CONTENT
07.01	Identify bulk plant vehicle safety rules.	· identify and describe bulk plant hazards · identify vehicular sources of ignition and required clearances · identify bulk truck parking procedures (chock blocks, parking brake) · identify bulk plant PPE requirements
07.02	Identify bulk truck and cargo liner loading procedures.	**Using written instructions, pictures, diagrams and demonstration, and/or video, identify the step by step procedures for bulk truck and cargo liner filling at a loading platform. The procedural instruction should include the following items:** · loading rack, ESV, tank connection and hose inspection, bulk tank temperature and volume checks volume and temperature measuring calculations for cargo liner deliveries to bulk plants · attaching and inspecting the ground cable · leak checking connections · setting the rotary gauge · opening the bleed valve · pump and compressor checks and operation · proper connection of hoses · constant monitoring requirement · tightening of connections in the event of a leak · how to determine when the tank is full · stop fill and closing procedures · TDG signage · documentation · identification of emergency procedures during filing operations
07.03	**THEORY TESTING**	**Candidates shall perform a written theory test with core elements of each learning objective represented in the test.** **The testing may be separated into modules**
PRACTICAL		
07.04	Demonstrate the proper procedures for bulk truck loading.	Demonstrate the procedure for loading platform inspection. Demonstrate the procedure for bulk truck and cargo liner vehicle operation and inspection. Demonstrate bulk truck and cargo liner loading procedure.
07.05	Practical testing	Students shall be tested on the demonstration of procedures for loading platform inspections, bulk truck/cargo liner operation and inspection. Students shall be tested on the demonstration of bulk truck/cargo liner loading procedures.

MODULE 8

Estimated hours: 0.25
Module Title: Propane Rail Car Unloading Tower

MODULE – 08	ENABLING OBJECTIVES *The student will be able to:*	THEORY | CONTENT
08.01	Identify components of typical rail car unloading towers.	Using pictorial diagrams, pictures, text and/or video, identify and describe the following components of unloading towers: - ladders and ramps - fire suppression equipment - liquid and vapour lines - shut off valves

MODULE 9

Estimated hours: 0.5
Module Title: Propane Rail Cars

MODULE – 09	ENABLING OBJECTIVES *The student will be able to:*	THEORY | CONTENT
09.01	Identify components of a typical propane rail car.	Using pictorial diagrams, pictures, text and/or video, identify and describe the following components of a propane rail car: · typical rail car design and construction · pressure relief valve · placarding · the rail car dome · valving; hand wheels, excess flow, ball valves · liquid and vapour lines · slip tube guage · thermometer well · sampling valve · care and attention should be paid to the description of these components, their operation and associated hazards

MODULE 10

Estimated hours: 2-3
Module Title: Propane Rail Car Unloading

MODULE – 10	ENABLING OBJECTIVES *The student will be able to:*	THEORY | CONTENT
10.01	Identify the procedures for completing outage tables.	Identify the requirements for calculating the outage and completing the table for a rail car delivery.
10.02	Identify safety precautions for rail car unloading.	**Using sing pictorial diagrams, pictures, text and/or video, identify and describe the following safety precautions:** · PPE; Neoprene gloves, fire retardant, long sleeve clothing · fire suppression equipment · controlling sources of ignition · chocking of wheels · inspection of rail cars · constant attendance during transfer operations · proper carrying of valves · emergency/leak procedures; ESV operation
10.03	Identify requirements for testing of propane in rail cars	**Using sing pictorial diagrams, pictures, text and/or video, identify and describe the following required tests using typical industry testing methods for propane delivered by rail car:** · mercaptan odorant testing · hydrogen sulphide testing · dew point testing · weathering test · anhydrous ammonia testing
10.04	Identify requirements for unloading of propane from rail car to bulk storage.	**Using pictorial diagrams, pictures, text and/or video, identify and describe the following steps for unloading propane rail cars:** · calculating the maximum amount of fuel that can be transferred into the available bulk storage tanks · rail car inspection points · securing the rail car · inspection for leaks · testing of rail car contents and gauging of propane in the rail car · proper attachment and inspection of liquid and vapour lines · operating valves, compressors and monitoring of tank pressure using standards set by Transportation of Dangerous Goods Regulation · check of sampling valve to insure all liquid has been removed · disconnection and bleeding of hoses · closing of all valves and openings and final inspection · changing placards · closing and latching of rail car dome. · noting deficiencies in the bill of lading
10.05	**THEORY TESTING**	**Candidates shall perform a written theory test with core elements of each learning objective represented in the test.**

MODULE – 10	ENABLING OBJECTIVES *The student will be able to:*	THEORY | CONTENT
		The testing may be separated into modules
PRACTICAL **NOTE: If practical demonstration and testing of rail car unloading is not possible within the training course, all candidates must be instructed to work under the supervision of experienced PP0-1 certificate holders when performing rail car unloading operations until such a time as it can be determined by the supervising certificate holder that the candidate is qualified to do so independently.** **Theoretical training on this topic is insufficient to qualify an individual to perform this task.**		
10.06	Practical training on propane rail C car unloading	Demonstrate all aspects (as noted above) of the following: · rail car tower inspection · rail car inspection · rail car unloading procedures
10.07	Practical testing	Candidates shall be tested on all aspects (as noted above) of the following: · rail car tower inspection · rail car inspection · rail car unloading procedures