



**Canadian
Petroleum
Products
Institute**

**Institut
canadien
des produits
pétroliers**

Recommended Management Practices

Ultra Low Sulphur Diesel (ULSD) Distribution System

**Prepared by the Canadian Petroleum Products Institute
(CPPI)**

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Introduction

This Recommended Management Practices (RMP) document is intended to provide guidance regarding the handling of Ultra Low Sulphur Diesel (ULSD) in industry transportation operations, including the Canadian Petroleum Products Institute (CPPI) member companies and their bulk petroleum facilities (which include terminals and bulk plants). It is also a reference document for transportation operations personnel delivering road diesel to and from those bulk petroleum facilities.

Each company that handles ULSD should have a quality assurance control plan that both prevents and detects sulphur pick-up within the various distribution systems that could result in non-compliance at a point-of-sale.

Information from this RMP can be incorporated in whole or in part, at each company's sole discretion, in the development of their control plans.

Background

The Canadian government has passed regulations to limit the sulphur content of on-road diesel to maximum of 15 parts per million by mass (ppm) at point of sale in 2006. This extremely low sulphur-content diesel is commonly called Ultra Low Sulphur Diesel (ULSD). The government has also announced its intention to limit the sulphur in non-road diesel and furnace fuel in 2007 and 2010, respectively. These new regulations are part of an overall strategy to improve air quality and reduce related health impacts. The reduction of sulphur levels in diesel will enable the introduction of new diesel engine emission control technology that will significantly reduce the contribution of both on-road and non-road equipment to overall air pollution. CPPI member companies support these new initiatives and intend to fully comply with the new regulations.

The Canadian regulations are essentially aligned with those developed by the Environmental Protection Agency in the United States with respect to sulphur levels and timing. However, product testing & sulphur level reporting requirements differ significantly between the two countries.

Refer to the section entitled *Mandatory Requirements under Canadian Regulations* in this document for further details on regulatory requirements and timing of the introduction of ULSD.

The efficient delivery of bulk petroleum products is achieved as a result of moving fungible products through the same carrier systems. At various times, distillates and gasoline from different sources share:

- ships and barges (vessels);
- pipelines;
- tanks;
- pipeline manifolds;
- loading arms;
- rail and truck compartments;
- unloading hoses; and
- metering systems.

Some cross-contamination can occur when these products come in contact with one another but there are methods of dealing with these events for today's circumstances.

The arrival of ULSD (15 ppm maximum) necessitates new standards and procedures to prevent trace contamination. The challenge is very different from the low-sulphur gasoline standard because, while the latter standard requires a 30 ppm average value for sulphur, it does allow a peak value of 80 ppm. The 80 ppm value upper limit can be accommodated by today's distribution and delivery practices.

With the advent of Ultra Low Sulphur Diesel, a 0.3% volumetric contamination from a 2500 ppm regular sulphur diesel can make a 10 ppm ULSD material non-compliant. This contamination requires the material to be either downgraded, rebled or reprocessed at a distant refinery or on-site. In a situation where bulk storage is severely constrained – especially at the end of the distribution system in a remote bulk plant – inefficiencies exist, options are fewer and reliable supply will be a challenge.

Work completed so far in the USA (with their pipeline experience largely replicated in Canada) suggests that at each “hand-off” point to a new branch using today’s systems, which are designed for “normal” sulphur levels, ULSD shipments could pick up 1.5-2 ppm sulphur. Thus, after 4 “hand-offs”, by the time the product arrives in the customers’ tanks, excess contamination could occur. An example of 4 “hand-offs” might be: refinery to pipeline/terminal, terminal to bulk plant, bulk plant to tank truck, and tank truck to customer load point. Therefore, if the ULSD shipment leaves the refinery at the nominal target value of 8 ppm, and if each “hand-off” point includes today’s handling practices averaging a 2 ppm increase, then the product could be out-of-compliance, and unfit for sale as ULSD.

Only through a thorough understanding of the potential contamination points, followed by system and procedural modifications to lessen those exposures, can the delivery system be successful.

Mandatory Requirements under Canadian Regulations

This section outlines the regulatory requirements on the sulphur content of diesel and distillate fuels.

Sulphur in Diesel Fuel Regulations

The sulphur concentration units expressed in this regulation are mg/kg, rather than ppm. However, since they are equivalent and ppm is in more widespread use, ppm will be used here. This regulation sets the following sulphur limits for diesel fuels:

At Points of Production in Canada and at Points of Import into Canada:

Maximum Sulphur (ppm)	On-Road	Off-Road	Rail	Marine
2006 June 1	15	NYR	NYR	NYR
2007 June 1	15	500	500	500
2010 June 1	15	15	500	500
2012 June 1	15	15	15	15

At Points of Sale in Canada (excluding Northern Supply Area):

Maximum Sulphur (ppm)	On-Road	Off-Road	Rail	Marine
2006 September 1 *	15 *	NYR	NYR	NYR
2007 October 1	15	500	500	500
2010 October 1	15	15	500	500

At Points of Sale in Canada - Northern Supply Area:

Maximum Sulphur (ppm)	On-Road	Off-Road	Rail	Marine
2007 September 1	15	NYR	NYR	NYR
2008 December 1	15	500	500	500
2011 December 1	15	15	500	500

NYR = not yet regulated

* - application to extend point-of-sale compliance date by 45 days had not been accepted as of publication date

The "northern supply area" includes areas in the Yukon, Northwest Territories and Nunavut far from main highways and municipalities, the region within 50 km of Hudson Bay and James Bay, and parts of northern Quebec and Labrador.

Non-Regulated Distillate Fuels

Off-Road, Rail and Marine Diesel Fuels – The sulphur concentrations of these fuels are not federally regulated until the dates shown in the preceding section. Until those new limits apply, Off-Road and Rail Diesel Fuels may contain up to 5000 ppm sulphur and Marine Diesel Fuels may contain up to 10000 ppm sulphur (or more, depending on the grade).

Aviation Turbine (Jet) Fuels – The sulphur concentrations of Aviation Turbine Fuels are not federally regulated. These fuels may contain up to 3000 ppm sulphur.

Heating (Furnace) Fuel Oils – The sulphur concentrations of Heating Fuel Oils are not regulated. These fuels may contain up to 5000 ppm sulphur (or more, depending on the grade).

Product testing and reporting

Reporting the concentration of sulphur in diesel fuel is only required at the point of manufacture or import, on a quarterly basis until the end of 2014, and annually thereafter. There is no requirement in Canada to routinely report sulphur levels at any other point in the supply system.

Scope of the Document

This document will identify Recommended Management Practices for the successful distribution of ULSD. It includes Marine, Rail and Truck transportation as well as Bulk Plant and Terminal operations. It does not include operations within refineries or pipeline systems, but does indicate a brief recommendation for product sequencing.

RMPs that eliminate the potential for sulphur pick-up, while having the lowest risk, may not be practical or achievable. RMPs that rely on isolation to prevent sulphur pick-up typically carry a somewhat higher risk. Where neither of these approaches is feasible, the recommended practices may be a combination of facility modifications, controls and/or procedures which, if rigorously followed, will prevent or minimize sulphur pick-up.

Product testing at various points in the distribution system can be a useful means of verifying the effectiveness of these controls and procedures. However, due to the inherent variation associated with staff training, sampling procedures, test method variability and bias, and test repeatability, product testing should not be relied upon as the sole basis for ensuring compliance at point-of-sale.

This document describes flushing and change of service related to ULSD only. For change of service to products other than ULSD, previously established flushing procedures continue to be the standard.

The focus of this document is on maintaining the integrity of ULSD which, for the purposes of this document, means preventing or controlling sulphur contamination from other products.

1. Marine ULSD Loading and Unloading Recommended Management Practices

This section will address:

- Loading Recommended Management Practices
- Unloading Recommended Management Practices
- Vessel Design
- Quality Assurance Monitoring and Compliance Considerations

A. *Loading Recommended Management Practices*

Procedural

- Before loading, confirm last contents of the compartments, common piping and equipment aboard the vessel as well as the contents of the marine bulk petroleum storage facility product handling systems (loading lines, hoses) using shipping documentation or other means .
- review loading instructions with load port officials including product types, ; scope to include product types, qualities and quantities, and an assessment of potential sources of contamination, before, during or after loading.
- if change of service is required, follow "vessel change of service procedures" and confirm that loading lines, equipment and compartments have been drained, flushed or otherwise prepared
- where required, consider flushing the vessel product handling systems before departure from load port to minimize or eliminate flushing requirements at the point of discharge (unloading)
- Complete documentation confirming procedures followed

Verification options

- procedural compliance checks; e.g. volumetric reconciliation, meter/flush/displacement volume ticket verification, procedural documentation reviews
- Sample ULSD loading lines at load port; retain samples &/or test as appropriate

- Sample vessel compartments &/or lines to confirm last contents; retain samples or test as appropriate
- Sample “first ins” after loading a small amount into each compartment to ensure the valve and piping line-up is delivering the desired product; retain samples or test as appropriate
- Sample compartment(s) after loading; retain samples or test as appropriate.

B. Unloading Recommended Management Practices

Procedural

- sequence ULSD unloading to minimize the risk of sulphur contamination; e.g. loading ULSD last and unloading it first may minimize the potential for contamination and reducing flushing requirements
- review unloading instructions including confirmation of compartment contents, product handling systems, volumes, discharge sequence, drain and/or flush requirements as well as any vessel trim constraints with discharge bulk storage facility officials
- Complete documentation confirming procedures followed

Verification options

- procedural compliance checks; e.g. volumetric reconciliation, meter/flush/displacement volume ticket verification, procedural documentation reviews
- sample vessel compartments &/or piping prior to discharge; retain samples &/or test as required
- sample vessel and/or shore manifold during discharge; retain samples &/or test as required

C. Vessel Design

The use of double-hull construction marine vessels is the preferred method for transferring ULSD. The double-hull vessels generally have compartments with bottom discharge sump and piping, allowing the compartment to drain completely. If compartments can be drained completely and confirmed empty, compartment flushing is not required. Consider vessel trim during unloading operations to ensure the sump is at the low end of the compartment, allowing the compartment to be drained completely.

Single-hull vessels typically have flat-bottom compartments with suction-type discharge piping suspended above the bottom of the

compartment. This configuration will always leave product in the compartment with the potential of causing contamination. Flushing these compartments may be required before loading.

Given the variation of single-hull vessel design, flush volumes will vary (depending in part on the previous cargo as well as the specific vessel design), and should therefore be determined on a vessel-specific basis by testing. Again, consider vessel trim during unloading operations so the suction pipe is at the low end of the compartment, minimizing the amount of product retained in the compartment.

Dedicated Product Handling Systems

The use of dedicated product handling systems (pumps, risers and plumbing) is the preferred method for transferring ULSD because it removes the risk of sulphur contamination from other products. If product handling systems are dedicated to ULSD and permanently isolated from all other systems, flushing is not required.

Segregated Product Handling Systems

Where product handling systems are not dedicated and instead interconnected and isolated by valves, take special precautions to ensure that systems are properly drained (initially, and with each change of service) and isolated in the design of the plumbing system. Pressure relief plumbing, dead legs and valves need special attention to remove the risk of sulphur contamination from adjacent products. Refer to section 5D Dead Legs.

Multiple-Use Product Handling Systems

If product handling systems are used for multiple products a flush of a minimum of three times the collective internal volume of the system (pumps, meters and plumbing) is recommended for a change of service to ULSD. Note that flush volumes of three times are recommended where system design variation is typical, like on-board vessel product handling systems, otherwise flush volumes of two times should be sufficient.

Take special precautions to ensure that systems are properly designed to facilitate effective flushing. Pressure relief plumbing, dead legs and valves need special attention to remove the risk of sulphur contamination from adjacent products.

Given the complexity of vessel piping systems, effective flushing requirements should be determined on a vessel-specific basis.

2. Rail ULSD Loading and Unloading Recommended Management Practices

This section will address:

- Loading Recommended Management Practices
- Unloading Recommended Management Practices
- Tank Car Design
- Quality Assurance Monitoring and Compliance Considerations

A. Loading Recommended Management Practices

Procedural

- confirm loading line and load arm last contents; drain or flush if necessary
- confirm railcar last contents using visual check, shipping documentation and/or railcar valve seal; drain or flush if necessary
- drain compartment(s) dry and confirm with visual check (note: railcar should be on level ground)
- confirm railcar is empty using a pail check or other suitable means (if possible after first checking the manifold sight glass upstream of the faucet valve)
- Complete documentation confirming procedures followed

Verification options

- procedural compliance checks; e.g. volumetric reconciliation, meter/flush/displacement volume ticket verification, procedural documentation reviews
- Where circumstances warrant, after loading take a product sample and retain for future reference for an appropriate period.

B. Unloading Recommended Management Practices

Procedural

- confirm unloading line last contents; drain or flush if necessary
- Confirm tank car contents using shipping documentation and/or rail car valve seal system
- Complete documentation confirming procedures followed

Verification options

- procedural compliance checks; e.g. volumetric reconciliation, meter/flush/displacement volume ticket verification, procedural documentation reviews
- Draw samples from each compartment and test for sulphur levels before unloading, and retain for future reference for an appropriate period.

C. Tank Car Design

Use single compartment tank cars for ULSD deliveries. The use of double compartment cars delivering multiple products is not recommended.

Given the variation of rail car compartment design, some rail cars do not drain effectively and need to be routinely flushed. Use rail cars with positive slope bottoms for efficient draining instead of rail cars with flat bottoms, or confirm rail car compartment draining effectiveness on a tank car-specific basis, by testing.

3. Truck ULSD Loading and Unloading Recommended Management Practices

This section will address:

- Risk Management Options
- Loading Recommended Management Practices
- Unloading Recommended Management Practices
- Bulk Fuel Trailer Design

A. Risk Management Options

Dedicate Trucks for ULSD Deliveries

Dedicating trucks for ULSD deliveries will eliminate any change of service sulphur pick-up.

Segregate truck trailer application (use dual pump systems and dedicate one system for ULSD)

Unloading pumps

Installing pumps at delivery locations eliminates the need to use truck pump to pump off

B. Loading Recommended Management Practices

Procedural

- before loading, confirm last contents using shipping documentation and/or industry-standard product tags
- if change of service required, drain compartments dry (note: truck should be on level ground)
- confirm compartments are empty using a pail check or other suitable means after first checking the compartment retain sensor and the manifold sight glass upstream of the faucet valve
- if applicable, flush manifold, pump and other plumbing with minimum 3 times their combined capacity to eliminate any risk of contamination
- complete documentation confirming procedures followed

Verification options

- procedural compliance checks; e.g. volumetric reconciliation, meter/flush/displacement volume ticket verification, procedural documentation reviews

C. Unloading Recommended Management Practices

Some bulk fuel trailers are designed with a manifold intended to be connected to a tractor-mounted pump for unloading into aboveground tanks at delivery locations. These pumps and associated onboard plumbing can contain up to 100 litres of product that needs to be considered to avoid ULSD sulphur contamination.

The following are additional approaches to reduce the risk of sulphur contamination:

Procedural (non-dedicated, multiple product-use truck trailers)

- whenever possible, dispatch loads to permit pumping-off ULSD only, and gravity drop other products
- confirm contents of pump(s) and associated plumbing; flush if necessary with at least 3 times their combined volume
- unload ULSD first
- if delivery of higher sulphur product first is necessary, drain or flush manifolds, pumps or other plumbing prior to unloading ULSD
- complete documentation confirming procedures followed

Verification options

- procedural compliance checks; e.g. volumetric reconciliation, meter/flush/displacement volume ticket verification, procedural documentation reviews

D. Bulk Fuel Trailer Design

Although the following Bulk Fuel Trailer design features are not required, they are helpful in assisting operations personnel in following the above-mentioned recommended management practices. Therefore, it is recommended to specify the following design features when ordering new trailers:

- Sight glass at the manifold upstream of faucet valve
- Low point drain
- Retained product sensors
- Double bulkheads

4. Hose Reel Truck ULSD Loading and Unloading Recommended Management Practices

This section will address:

- Risk Management Options
- Loading Recommended Management Practices
- Unloading Recommended Management Practices
- Hose Reel Truck Design

A. Risk Management Options

Single Grade of Diesel (ULSD) at Storage Facility

Ideally, eliminate the risk of sulphur contamination by keeping only a single grade of diesel (ULSD) in inventory at a bulk petroleum facility, and re-brand it for use in other applications to non-road, locomotive, or marine diesel or heating fuel.

Dedicated Trucks for ULSD Deliveries

Dedicating trucks for ULSD deliveries exclusively will also eliminate any change of service sulphur contamination risk in hose reel delivery truck operations.

B. Loading Recommended Management Practices

Procedural (non-dedicated hose reel trucks)

For operations where the same hose reel truck is used for other products as well as ULSD:

- Confirm last-contained truck compartment contents using industry-standard tags and shipping documentation.
- For hose reel truck compartments that are to be loaded with ULSD, drain or pump dry with truck on level ground and confirm empty.
- Flush product handling systems, as required
- If product handling systems are used for multiple products a flush of a minimum of three times the collective internal volume of the system (manifold, pump, meter and hose reel plumbing) is required for a change of service to ULSD. Refer to manufacturers' instructions to quantify flushing quantities, drain at each change of service.

Note that flush volumes of three (3) times are recommended where system design variation is typical, like on-board vessel product handling systems, otherwise flush volumes of two times are sufficient.

Please note that for hose reel trucks without bottom loading fittings or low point drains, confirming empty with a pail check is not possible. Furthermore, a visual check to confirm empty may not be adequate given the plumbing variations of hose reel trucks, and therefore is not recommended.

- complete documentation confirming procedures followed

Verification options

- procedural compliance checks; e.g. volumetric reconciliation, meter/flush/displacement volume ticket verification, the "running volume on-board log", procedural documentation reviews

C. Unloading Recommended Management Practices

Procedural (Non-Dedicated Hose Reel Trucks)

- schedule and sequence deliveries to minimize flushing
- unload ULSD first
- if delivery of higher sulphur product first is necessary, drain or flush manifolds, pumps or other plumbing prior to unloading ULSD
- complete documentation confirming procedures followed

Verification options

- procedural compliance checks; e.g. volumetric reconciliation, meter/flush/displacement volume ticket verification, running volume log, procedural documentation reviews

D. Hose Reel Truck Design

Although the following Hose Reel Truck design features are not required, they are helpful in assisting operations personnel in following the above-mentioned recommended management practices.

Therefore, it is recommended to specify the following design features when ordering new hose reel trucks:

- Sloped bottom compartments designed to drain completely.
- Install low-point drains to confirm empty using a pail check.
- Dedicated, product-specific hose reels, pumps, meters and discharge plumbing (one set per compartment).
- Flushing manifold with sight glass.
- Flush tank.

5. Bulk Petroleum Facility Operations Recommended Management Practices

This section will address:

- Pipeline Sequencing
- Product Handling Systems
- Meter Calibration
- Dead Legs
- Drain-Dry Systems
- Bulk Petroleum Storage Tanks

A. Pipeline Sequencing

For pipeline operations, wherever possible, ULSD tenders should be sequenced to reduce the risk of sulphur contamination. Protecting the quality of flight fuels, minimizing product downgrading, and avoiding other forms of contamination need to be considered as well.

B. Product Handling Systems

Dedicated

In general, the use of dedicated product handling systems is the preferred method for all systems, pipeline receipts, loading and unloading, thermal relief systems and calibration, because it removes the risk of sulphur contamination from other products.

If the lines from the storage tank to the loading arms are dedicated to ULSD and permanently isolated from all other systems flushing is not required.

Where dedicated systems are not available, special procedures are generally required for segregated and multiple use systems for each change of service to ULSD to ensure target sulphur levels will be met, which may require draining or flushing. A detailed design review of each facility is required to develop proper change of service procedures for ULSD.

Segregated

Segregated loading product handling systems are where loading systems are interconnected and isolated by valves.

Special precautions need to be taken to ensure that systems are properly drained (initially, and with each change of service to ULSD)

and isolated in the design of the plumbing system. Pressure relief plumbing, dead legs and valves need special attention to remove the risk of sulphur contamination from adjacent products. Double block and bleed valves which properly isolate products with an internal air space (drainable) are recommended.

Multiple-Use

If the product handling systems are used for multiple products a flush of a minimum of two times the volume of the system is recommended for a change of service to ULSD.

Again, take special precautions to ensure that systems are properly designed to facilitate effective flushing. Pressure relief plumbing, dead legs and valves need special attention to remove the risk of sulphur contamination from adjacent products.

To ensure product handling systems are prepared to deliver ULSD, all product handling plumbing must be flushed, including fittings, meters and pumps.

Lastly, for pipeline receipts, special precautions need to be taken to ensure pipeline manifold flushing is effective, like the elimination of dead legs, special valves to ensure system isolation, etc. A detailed design review of each pipeline manifold is required to develop proper change of service procedures for ULSD.

C. Meter Calibration

Calibrating to a dedicated ULSD calibration line, mobile prover or directly into trucks is recommended.

Using the common calibration line available at some bulk petroleum facilities is not recommended because of the possibility of cross-contamination. The risk of contamination is high in calibration line plumbing systems because flushing is less effective, given the complex piping used in these systems. The exception to this would be if the calibration volumes are not retained for re-use, but slopped or downgraded instead.

D. Dead Legs

Dead legs are a terminating branch or idle section of piping that contains a volume of product that cannot be flushed, forming a source of contamination with a change of service to ULSD.

Remove dead legs permanently with physical piping changes, where possible.

Where not possible to eliminate permanently, remove potentially contaminating volumes within dead legs in the initial change of service process by draining with each change of service to ULSD.

E. Drain-Dry Systems

Drain-dry facilities are recommended at loading facilities for rail, truck and hose reel truck. These facilities facilitate change of service and eliminate any incentive to not follow recommended operating practices. These usually consist of an underground tank and appropriate fittings.

F. Bulk Petroleum Storage Tanks

Multiple tank systems are preferred since the receipt tank volumes can be isolated until the tender is received. ULSD is received into one tank while loading activities are conducted out of others.

Single tank systems require more diligence, given the potential for significant impact if tank sulphur levels are exceeded by an incoming contaminated product. Additional testing, monitoring of sulphur levels or compensating controls is required to manage this risk.

G. Receipt of Ultra Low Sulphur Diesel at Bulk Petroleum Facilities (by marine, pipeline, rail & truck)

Procedural

- prior to receipt, ensure the receipt system is readied; e.g. flush lines if necessary, open/close valves, and isolate the receipt tank if appropriate
- prior to receipt, verify incoming product using shipping documentation, product tags, seals, instrumentation, etc.
- at start of receipt, confirm delivery into correct receipt line and tank; for common receipt lines ensure line displacement and any flush volume delivered before opening valve to ULSD tank(s)

- after receipt, verify product delivered as intended; e.g. confirm level change in ULSD tank plus any other tanks receiving line displacement or flush volumes
- complete documentation confirming procedures followed

Verification options

- procedural compliance checks; e.g. volumetric reconciliation, meter/flush/displacement volume ticket verification, procedural documentation reviews
- draw samples at pre-determined points during the receipt and test to validate sulphur pick-up within tolerance

H. Shipping ULSD from a Bulk Petroleum Facility (by Marine, Rail, Truck and Hose Reel Truck)

Procedural

- prior to loading, ensure the vessel to be loaded is readied following established change of service requirements; e.g. drain-dry, flush
- during loading, confirm delivery into correct line and compartment
- complete documentation confirming procedures followed

Verification options:

- procedural compliance checks; e.g. volumetric reconciliation, meter/flush/displacement volume ticket verification, procedural documentation reviews
- draw samples at pre-determined points during loading and test to validate sulphur pick-up within tolerance

6. Inventory Conversion Recommended Management Practices

This section will address:

- Emptying Tanks
- Tank Turnover

Regardless of the strategy chosen to achieve compliance with sulphur in diesel legislation, it is essential that the effectiveness of a quality assurance control plan can be clearly demonstrated. Additional sampling and testing during the implementation phase should be done to document the effectiveness of facility changes, controls and procedures.

Planning is required to determine the steps required to turn over tanks with road diesel to ULSD. This applies to all types of tanks, above ground, underground, bulk petroleum storage and retail tanks.

A. Emptying Tanks

Replacing inventory of ULSD tanks is the most certain way to ensure sulphur levels are not affected by previous tank contents.

Empty tanks and replace contents. Confirm sulphur levels of ULSD in tank before returning to service. Please note that there are significant regulatory and safety issues with tank cleaning and therefore if this task is part of replacing contents it should only be undertaken by qualified individuals and organizations. Planning and notice is required for contractors if tank cleaning is to be part of replacing contents.

B. Tank Turnover

Inventory conversion by turnover is the simplest approach to inventory conversion.

For high volume bulk petroleum storage tanks, inventory turns of 7 to 8 times are sufficient to properly replace the tank contents with ULSD without emptying the tank, following the first receipt of ULSD and assuming only ULSD is added to the tank thereafter.

Please note that for this definition of an inventory turn to apply, in each instance the tank levels need to be lowered to below 30% of tank capacity before being replenished to 95% of tank capacity, repeating 7 to 8 times.

If inventory turns are not managed in this way, a greater number of inventory turns or pumping and flushing are still required.

7. CPPI Identification Tags

CPPI Identification Tags are more formally referred to as the CPPI Color-symbol System for Product identification. Product tags must be left on empty compartments / valves after offloading. This will identify products last-contained in the empty compartment prior to drivers commencing loading procedures.

The CPPI Colour-Symbol System currently includes a Low Sulphur Diesel (LSD) tag, and plans are to continue to use the same tag after the regulation comes into effect (2006). Therefore, there currently is no requirement to change CPPI tags.

However, the CPPI is reviewing the adequacy of continuing to use the same tag, partly in light of international examples, and the CPPI Colour-Symbol System would be revised accordingly.

8. Federal Regulatory Contacts

http://www.ec.gc.ca/CEPARegistry/documents/regs/offRoad_diesel/fuel.cfm

9. Glossary of Terms

Fungible Product – a product freely exchangeable for, interchangeable with or replaceable by another of like kind, in the satisfaction of a supply agreement or obligation