

VOC MANAGEMENT PLAN
Chapter 4 – Oil Transfer Procedure

4.1 General Characters of VOC

VOC is a pollutant to the air and act as a precursor to the formation of Troposphere Ozone - commonly termed Smog.

There are four criteria that impact on the extent and rate of evolution of gaseous VOC from crude oils and its subsequent release to atmosphere. These are:

- a) The volatility or vapour pressure of the crude oil;
- b) The temperature of the liquid and gas phases of the crude oil tank;
- c) The pressure setting or control of the vapour phase within the cargo tank; and
- d) The size or volume of the vapour phase within the cargo tank

4.2 USCG CFC Regulation of Transfer procedures and Vapour Emission Control

a) Oil Transfer Procedure (USCG 33 CFR 155.750(d))

Regulation text of oil transfer procedure is as follows:

- 1) If a vessel is fitted with a vapour control system, the transfer procedure must contain a description of the vapour collection system on the vessel which includes:
 - i) A line diagram of the vessels vapour control system piping, include the location of each valve, control device, pressure vacuum relief valve, pressure indicator flame arresters and detonation arresters, if fitted.
 - ii) The location of spill valves and runtime disks if fitted.
 - iii) The maximum allowable transfer rate determined in accordance with 46 CFR Part 39.30. 1(d)(1) through (d)(3).

b) Operational Requirement (46 CFR Part 39.30)

- 1) Vapour from a tank vessel may not be transferred to:
 - i) A facility in the United States which does not have its letter of adequacy endorsed as meeting the requirements of 33 CFR part 154, subpart E: or
 - ii) In the case of a lightering or topping off operation, a vessel that does not have its certificate of inspection or certificate of compliance endorsed as meeting the requirements of this part.

VOC MANAGEMENT PLAN
Chapter 4 – Oil Transfer Procedure

- 2) The pressure drop through the vapour collection system from the most remote cargo tank to the vessel vapour connection must be:
 - i) Determined for each cargo handled by the vapour collection system at the maximum transfer rate and at lesser transfer rates;
 - ii) Based on a 50 percent cargo vapour and air mixture, and a vapour growth rate appropriate for the cargo being loaded; and
 - iii) Included in the vessel's oil transfer procedures as a table or graph showing the liquid transfer rate versus the pressure drop.
- 3) If a vessel carries vapour hoses, the pressure drop through the hoses must be included in the pressure drop calculations required by paragraph (b) of this section.
- 4) The rate of cargo transfer must not exceed the maximum allowable transfer rate as determined by the lesser of the following:
 - i) Eighty (80) percent of the total venting capacity of the pressure relief valves in the cargo tank venting system when relieving at the set pressure required by §39.20-11(a) of this part;
 - ii) The total vacuum relieving capacity of the vacuum relief valves in the cargo tank venting system when relieving at the set pressure required by §39.20-11(a) of this part;
 - iii) The rate based on pressure drop calculations at which, for a given pressure at the facility vapour connection, or if lightering at the vapour connection of the vessel receiving cargo, the pressure in any cargo tank connected to the vapour collection system exceeds 80 percent of the setting of any pressure relief valve in the cargo tank venting system.
- 5) A cargo tank must not be filled higher than:
 - i) 98.5 percent of the cargo tank volume; or
 - ii) (2) The level at which an overfill alarm complying with §39.20-7 or §39.20-9(b)(2) of this part is set.
- 6) A cargo tank must not be opened to the atmosphere during cargo transfer operations except as provided in paragraph (g) of this section.
- 7) A cargo tank may be opened to the atmosphere for gauging or sampling while a tank vessel is connected to a vapour control system if the following conditions are met:
 - i) The cargo tank is not being filled;
 - ii) Except when the tank is inert, any pressure in the cargo tank vapour space is first reduced to atmospheric pressure by the vapour control system;
 - iii) The cargo is not required to be closed or restricted gauged by Table 151.05 of part 151 or Table 1 in part 153 of this chapter; and
 - iv) For static accumulating cargo, all metallic equipment used in sampling or gauging is electrically bonded to the vessel before it is put into the tank, and if the tank is not inerted, a period of 30 minutes has elapsed since loading of the tank was completed.

VOC MANAGEMENT PLAN
Chapter 4 – Oil Transfer Procedure

- 8) For static accumulating cargo the initial transfer rate must be controlled in accordance with Section 7.4 of the OCIMF, International Safety Guide for Oil Tankers and Terminals, in order to minimize the development of a static electrical charge.
- 9) If cargo vapour is collected by a facility that requires the vapour from the vessel to be inerted in accordance with 33 CFR 154.820(a) or (b), the oxygen content in the vapour space of each cargo tank connected to the vapour collection system must not exceed 8 percent by volume at the start of cargo transfer. The oxygen content of each tank must be measured at a point one meter (3.28 feet) below the tank top and at a point equal to one-half of the ullage. Where tanks have partial bulkheads, the oxygen content of each area of that tank formed by each partial bulkhead must be measured at a point one meter (3.28 feet) below the tank top and at a point equal to one-half of the ullage.
- 10) If the vessel is equipped with an inert gas system, the isolation valve required by §39.20-1(a)(6) of this part must remain closed during vapour transfer.
- 11) Unless equipped with an automatic self-test and circuit monitoring feature, each high level alarm and tank overfill alarm required by §39.20-7 or §39.20-9 of this part, on a cargo tank being loaded, must be tested at the tank for proper operation within 24 hours prior to the start of cargo transfer.

4.3 Oil Transfer Procedure

Oil transfer procedure (USCG 33 CFR 155.750(d))

The regulation require that the “oil transfer procedures” be posted where they can be easily seen or be readily available. These procedures must give the following information and retained on board under the title of CARGO OPERATION MANUAL (OIL TRANSFER PROCEDURE MANUAL).

- a) A list of each product transferred to or from the vessel. It must be completed at each different port and posted in cargo control room.

VOC MANAGEMENT PLAN
Chapter 4 – Oil Transfer Procedure

- b) A description of type of transfer system installed including:
 - i) A drawing of the piping, including the location of all valves, controls, pumps, vents and overflows.
 - ii) The location of the shutoff valve or other isolation device that separates any bilge or ballast system from the oil transfer system.

Vessels should have mounted on a bulkhead of the cargo control and pump the correct and updated piping diagram, including bunker system, as it is required in (2) a-b.

- c) A description of and procedures for emptying the discharge containment system.
- d) The number of persons required to be on duty during oil transfer operations. Under normal circumstances the following schedule represents the minimum requirements for licensed and unlicensed crew members during the following operations:
 - i) When loading cargo - One licensed officer, the pump man, two AB (Able-Body-seaman).
 - ii) When topping off - Two or more licensed officers, the pump man and two AB.
 - iii) When discharging - One or more licensed officers, the pump man and two AB.
 - iv) When COW or draining tanks - One or more licensed officers, the pump man and two AB.
 - v) When bunkering - Chief Engineer or one licensed Engine Officer, one unlicensed Engine department person. One AB should remain on deck watch for tending the vessel's moorings during the bunker operations.
- e) The duties by title of each officer, person in charge, pump man, able seamen and any other person required for each oil transfer operation.
- f) Procedures and duty assignments for tending the vessel's mooring and gangway during the transfer of oil.
- g) Procedures for operating the emergency shutdown and communications.
- h) Procedures for topping off tanks.
- i) Procedures for ensuring that all valves used during the oil transfer operations are closed upon completion of transfer.
- j) Procedures for reporting oil discharge into the water.
- k) Procedures for closing and opening the vessel openings.

Note: Enclosed to this section there is a copy of the “Tank vessel integrity” that should be posted together with the above oil transfer procedures.

OIL TRANSFER PROCEDURE MANUAL retained on board separately (Cargo Operation Manual) are amended incorporating above, as required by USCG 33 CFR Part 155.750(d).

VOC MANAGEMENT PLAN
Chapter 4 – Oil Transfer Procedure

OIL TRANSFER PROCEDURES (33 CFR 154.310-5)

Name of the Vessel: _____

Port: _____ Date: _____

a. The generic name of the cargo: _____

b. The name of the cargo as listed in Table 30.25.1 of 46 CFR: _____

c. Description of the appearance and odor of the cargo: _____

d. Hazards involved in handling this cargo: _____

e. Instructions for safe handling of the cargo: _____

f. The procedures to be followed if the cargo spills or leaks, or if a person is exposed to the cargo: _____

g. A list of fire fighting procedures and extinguishing agents effective with fires involving the cargo: _____

Signed by: _____

VOC MANAGEMENT PLAN
Chapter 4 – Oil Transfer Procedure

4.4 Tank Vessel Integrity

- (a) Except as provided in paragraph (b) when vessel is underway or at anchor must have all closure mechanism on the following properly closed:
 - I. Expansion trunk hatches
 - II. Ullage openings
 - III. Sounding ports
 - IV. Tank cleaning openings
 - V. Any other tank vessel opening that maintains the sea worthy condition of the tank vessel and prevents the inadvertent release of oil in the event of a tank vessel accident
- (b) No person may open any of the closure mechanism in paragraph (a) while the vessel is underway or at anchor except when authorized and supervised by a licensed officer.

In addition to above Rule/Regulation point of view, correct operation keeping the required position of valve to be carried out for which oil transfer procedure manual (cargo operation manual) retained separately to be referred.

VOC MANAGEMENT PLAN
Chapter 4 – Oil Transfer Procedure

4.5 Duty and responsibility

Description of duties by title

Person In Charge	Duties
A responsible officer for in cargo loading/unloading	<p>In cargo control room</p> <ol style="list-style-type: none">1. Order and supervise all Cargo loading/unloading operations.2. Operate and check the oil discharge monitoring and control system.3. Operate valves/pumps.
Crew/pump man	<p>On deck and in pump room</p> <ol style="list-style-type: none">1. Keep watch and ensure that the systems are in good order.2. Assist for valve operation and follow the command from the officer in cargo control room.3. Observe if cargo piping is leaked anywhere while cargo loading & unloading.4. Visual inspection of the surface of ballast water5. Observe cargo level on level gauging system.

A responsible officer must perform the duties to protect the environments in accordance with company policy of ENVIRONMENTAL PROTECTION & MARPOL 73/78.

VOC MANAGEMENT PLAN
Chapter 4 – Oil Transfer Procedure

4.6 Vessel Check List

First of all, a person in charge of a transfer operation utilizing vapour collection system must well notify this loading rate to all related person.

Before the transfer operation, all equipment should be function tested.

Check list here in this manual is a little different from those in cargo operation Manual (Oil Transfer Procedure Manual) since this manual mainly deals with operating and facilities for Vapour Emission Control only

PRE-ARRIVAL CHECKS AT TRANSFER OPERATION

<u>NO.</u>	<u>ITEM</u>
1.	Has terminal been notified?
2.	Are the H/V P/V valves checked that it will not remain open position?
3.	Are the isolating valves related to cargo loading positioned correctly?
4.	Is the inert gas isolating valve per each cargo tank in open condition?
5.	Is the common vent riser valve positioned in closed condition?
6.	Has high-high level alarm system been checked?
7.	Has the cargo monitoring system been checked?
8.	Has the pressure transmitter system been checked?
9.	Has the oxygen analyzing equipment been checked?
10.	Has the communicating system been checked and tested?
11.	In case where the terminal has a standard radio check, has this been completed and transmitted?

BEFORE CHECKS AT TRANSFER OPERATION

1.	Are all pre-arrival checks and condition in order?
2.	Has the transfer operation discussed with both ship and shore staff and is agreed plan readily available for easy reference?
3.	Has communication line between the deck, control station and control station/shore been set up and is it working properly?
4.	Has the transfer procedure been agreed by both ship and shore staff?
5.	Has the vapour main pressure equipment been checked?
6.	Has the high-high level alarm equipment been checked?
7.	Has the cargo monitoring equipment been checked?
8.	Has the oxygen equipment been checked?
9.	Has Inert Gas valve IG001 been checked closed - Before loading?
10.	Has Inert Gas valve IG001 been open - Before Discharging?

VOC MANAGEMENT PLAN
Chapter 4 – Oil Transfer Procedure

DURING THE TRANSFER OPERATION

1.	Is the cargo-loading rate maintained within maximum loading capacity?
2.	Is the pressure of vapour main line properly kept?
3.	Are all the relevant deck lines being frequently checked?
4.	Is a responsible person stationed in nominated position?

AFTER THE TRANSFER OPERATION

1.	Are relevant isolating valve positioned correctly? Open / Close position?
2.	Has Inert Gas valve IG001 been checked open - After loading? Has Inert Gas valve IG00I been checked kept open – After Discharging?

IMPORTANT!!

Before the VECS operation, IG001 valve to be closed for the separation / isolation of I.G plant / piping and VECS piping as required by USCG 46 CFR Part 39.20-1(a)(6).

---- This sentence have been described on the IGS manual retained on board separately, as required by USCG 46 CFR Part 32.53-85(b). ----

VOC MANAGEMENT PLAN
Chapter 4 – Oil Transfer Procedure

CARGO OIL TRANSFER PROCEDURES

M.T. _____ Call Sign: _____

Person in charge of oil transfer is: Position _____ Name: _____

1) This vessel transfer: crude oil _____ Product: _____

2) This vessel has fixed oil discharge containment around cargo manifold, which can be drained to no. 3 cargo oil tank (P&S).

3) Oil transfer operations require (Number): _____ crewmen.

4) Duties of personnel during cargo handling:

Position	Duties
Chief Officer	<ul style="list-style-type: none">- Conduct all cargo transfer operation in the CCR.- Ensure stress of the hull during all the time of cargo handling.
Second Officer "A"	<ul style="list-style-type: none">- Conduct chief officer's order.- Check 02 in the cargo tank.- Check any leakage and mooring on deck.
Second Officer "B"	<ul style="list-style-type: none">- Same as 2nd officer "A"
Pump man	<ul style="list-style-type: none">- Closely contact officers during cargo handling.- Visit and check any leakage in pump room.- Check cargo pump bearing temperature.
Bosun	<ul style="list-style-type: none">- Conduct Chief Officer's order.- Upon order, attend mooring emergency towing.
Crew on duty	<ul style="list-style-type: none">- Stand by around cargo manifold.- Observe deck/sea if leakage happened.- Check the visitors come to on board.

5) Person in charge of tending vessel's line during oil transfer is:

Position: _____ Name: _____

6) Procedures for emergency shut down / communications:

7) Procedures for topping off tanks or of normal filling:

8) After transfer, ensure that all valves used during transfer operation are closed and IG main isolation valve to be open.

9) If oil spill immediately stop the transfer and report to

VOC MANAGEMENT PLAN
Chapter 4 – Oil Transfer Procedure

a) Agent

b) U.S. Coast Guard
VHF Channel 16 or
Tel.: 1-180-424-8802

c) National Contact
(see SOPEP Manual,
Appendix 1)

Note: Line diagram of vessel's oil transfer piping is engraved on cargo console.

Master M.T. : _____