

XII. TUG ESCORT/ASSIST FOR TANK VESSELS

The state of California has developed regulations which specify escort requirements for tank vessels (self-propelled tankers or tank barges) operating in the Los Angeles/Long Beach Harbor Complex and its approaches. Jurisdiction for the enforcement of these regulations falls under the California Department of Fish and Game's Office of Spill Prevention and Response (OSPR). The Los Angeles/Long Beach Harbor Safety Committee is responsible to review these regulations annually and make recommendations to the Administrator of OSPR to provide for a process of continual improvement.

OVERVIEW OF LA/LB TUGBOAT EQUIPMENT: Five independent tug escort companies (AmNav, Crowley Marine Services, Foss Maritime, Millennium Maritime, and Sause Brothers) operate in LA/LB Harbors. These companies provide both dedicated ship and barge escort/assist services.

These five companies operate approximately 25 tugs in the LA/LB Harbors. The tugs' specific type of propulsion and individual horsepower varies from about 1600 HP to 5800 HP. These tugs have single screw, twin screw, Z-drive or Voith-Schneider propulsion. These tugs and their bollard pull ratings are listed in Appendix C, and an updated list is maintained by the Marine Exchange and available on their web site.

The Voith-Schneider and Z-drive tugs (with steerable nozzles aft) give the pilot unusual flexibility. The balance of the tugs use twin screws (some with flanking rudders and some with kort-type nozzles) and single screw propellers. Flanking rudders increase maneuverability when engines are going astern. Kort-type nozzles increase the force applied when the engines are going ahead and usually decrease the force when going astern.

Physical design can be a limiting factor. In very narrow channels, a long-hulled tug may be too long to effectively assist a wide-beam ship. Some ships have an extremely flared hull, making it difficult for some tugs to lie alongside, especially near the bow and stern. Because of the leverage, a tug is usually most effective when placed nearer the end of the vessel. Tractor tugs can effectively overcome some of these limitations.

HARBOR SAFETY COMMITTEE FINDINGS

1. The tugs available in LA/LB Harbors provide a sufficient selection of sizes, configurations and power to safely handle any tank vessel and comply with the state escort regulations. Competitive market forces result in a continual improvement in the capabilities of tugs available in the harbors.
2. All tugs presently escorting/assisting tank vessels within the LA/LB Harbors and the approaches thereto are designed to safely and effectively operate in the weather, current and tides described in Chapter II.

3. Current regulatory language allows for exemption from mandatory escorts for fully redundant tankers with double hulls. The definition of “fully redundant” has been amended to be consistent in both the LA/LB Harbors and San Francisco Bay Area Tug Escort regulations.
4. Bulk chemical tank vessels carrying particularly hazardous and/or toxic cargoes should follow the Plan’s tug escort standards and any additional Coast Guard or appropriate port requirements for tug escort/assist deemed necessary. Bulk chemical tank vessels are those which carry in bulk any of the commodities listed under 46 CFR, Part 150, Table 1. Bulk is defined as cargoes carried in tanks or pressure vessels which are constructed as part of the ship, the contents being loaded and discharged by the ship’s installed handling system. This definition includes large independent tanks within or atop vessels, but not “IMO tanks” designed for intermodal carriage. The Harbor Safety Committee will continue to monitor changing trends in vessels arriving in LA/LB Harbors to determine whether or not amendments to the tug escort regulations may be required.
5. As a result of the channel-deepening projects, larger tankers can now call at LA/LB Harbors. The Force Selection Matrix in 851.27 will be expanded to accommodate tankers in excess of 340,000 DWT.
6. As compliance with the bollard pull testing requirements of 851.23 paragraph (a) (7)(A) has become problematic, the Committee, in cooperation with other Harbor Safety Committees in the state, developed the optional Escort Tug Inspection Program, codified in the regulations in new paragraph (a) (7)(B), which can be used in lieu of periodic bollard pull testing.

OVERVIEW OF OPERATING PROCEDURES: The Plan covers tank vessels in the LA/LB Harbors carrying all types of petroleum cargoes. Most tank vessels carrying crude oil are loaded when inbound to either LA/LB terminals. Product- or chemical-carrying tank vessels may be either loaded or partially loaded both inbound and outbound. The Coast Guard may require additional tug escort/assist capabilities.

State regulations for inbound, laden (carrying as cargo a total volume of oil greater than or equal to 5,000 long tons) tank vessels require escort tug(s) to meet the tank vessel at the appropriate sea buoy. The tug(s) then accompany the tank vessel to the berth and assist in berthing. Outbound, laden tank vessels must use escort tugs from departing the berth until clearing the breakwater entrance. Tractor tugs must be tethered during arrival and departure. Conventional tugs may be tethered upon arrival but must be tethered upon departure.

Escort tugs are usually considered servants of the vessel and carry out the orders of the master or pilot to the best of their ability. Therefore, during emergency situations and where safety of the vessel (tug and/or tank vessel) is in question, the COTP or the master/pilot may waive operating procedures.

CURRENT TUG ESCORT REGULATIONS: The state tug escort regulations were developed from the Standards of Care originally written by the Los Angeles/Long Beach Harbor Safety Committee to institutionalize good marine practices and to guide those involved in the movement of tank vessels. The minimum requirements of the regulations herein reflect favorable circumstances and conditions. The Master/Pilot shall arrange for additional tug assistance if bad weather, unusual port congestion, vessel limitations, or other circumstances so require.

CALIFORNIA CODE OF REGULATIONS
TITLE 14, DIVISION 1
SUBDIVISION 4, OFFICE OF SPILL PREVENTION AND RESPONSE
CHAPTER 4. VESSEL REQUIREMENTS
SUBCHAPTER 2. TANK VESSEL ESCORT PROGRAM FOR
THE LOS ANGELES/LONG BEACH HARBOR
SECTIONS 851.20 - 851.32

Amended September 15, 2006
Effective October 15, 2006

851.20. Purpose and Scope.

This subchapter sets forth tank vessel escort requirements for tank vessels underway in the Los Angeles/Long Beach Harbor and their approaches. These requirements specify that tank vessels carrying 5,000 or more long tons of oil in bulk as cargo shall be escorted by a suitable escort tug or tugs. When required, the escort tug(s) shall take action under the direction of the tank vessel master or pilot, to influence the speed and direction of travel of the tank vessels in the event of a casualty, steering or propulsion failure, thereby reducing the possibility of groundings or collisions and the risk of an oil spill from these tank vessels.

This subchapter establishes the criteria for matching tugs to tankers and barges. Tankers will be matched according to a matrix that correlates a tanker's displacement with the braking force of a tug(s). Barges less than 20,000 displacement tons shall be matched based on the aggregate displacement tonnage of both the primary towing vessel and the tank barge. Barges with a displacement tonnage greater than 20,000 require a tethered escort and a one-to-one correlation between the sum of the total displacement tonnage of the primary towing vessel and its barge, and the escort tug(s).

The Administrator shall review the matching criteria, other program elements and enforcement mechanisms within three years of August 15, 2001. The program review will include a survey of the tank vessel-related incidents in U.S. waters to determine the type of failures that have occurred, an assessment of tug technology and any advances made in design and power, the tug escort-related rules and policies that are implemented by other coastal states and maritime organizations, and any changes to bathymetry in the Harbor. At the conclusion of the review, the Administrator will determine whether it is necessary to modify the tug/tank vessel matching criteria or any other provision of the program requirements.

Authority: Sections 8670.17.2, and 8670.23.1, Government Code.
Reference: Section 8670.17.2, Government Code

851.21. Definitions.

Definitions governing the construction of this subchapter can be found in Government Code Section 8670.3, and Chapter 1 of this subdivision.

Authority: Sections 8670.3, 8670.17.2 and 8670.23.1, Government Code.

Reference: Sections 8670.17.2, Government Code.

851.22. Applicability.

(a) This subchapter shall apply to all laden tank vessels when they are:

- (1) Inbound from the seaward limits of the pilot operating areas to anywhere inside the Federal Breakwater;
- (2) transiting anywhere inside the Federal Breakwater (from dock to anchor, anchor to dock and shifting between docks); and/or
- (3) outbound from dock or anchor to the Federal Breakwater.

(b) This subchapter shall apply to all escort tugs being used to escort tank vessels during transits described in subsection (a), above.

(c) This subchapter (except for this Subsection (c)) shall not apply to tankers with double hulls, as that term is defined in 33 CFR 157.03, when the tanker also has fully redundant steering and propulsion systems; as well as integrated navigation systems to minimally include:

- (1) Redundant propulsion and steering systems:
 - (A) two independent propellers each with a dedicated engine (or motor), propulsion system (electrical generation system) electrical system (including the switchboard), fuel system, lube oil system; and any other system required to provide the vessel with independent means of propulsion; and
 - (B) two independent rudders each with separate steering systems; and
 - (C) the propulsion and steering components, as described in subsections (A) and (B), above, shall be arranged in separate spaces, such that a fire or flood in one space will not affect the equivalent system in other space(s);
 - (D) a bow thruster with an assigned power source.
- (2) A navigation system in compliance with the federal navigational equipment requirements set forth in 33 CFR Sections 164.35, 164.37, 164.38(b), 164.40, 164.41, 164.42, and 164.43.

(3) No exemption to this subchapter shall be allowed for a tanker requesting a U.S. Coast Guard Captain of the Port letter of deviation, pursuant to 33 CFR Sections 164.51, 164.53, and 164.55.

(4) The Administrator may require tankers that are exempt from this subchapter under the conditions outlined in Subsection (c) above to periodically demonstrate the tanker and crew's ability to maneuver in response to a partial or total loss of propulsion and/or steering at a level of safety at least equal to that of an escorted tanker.

(d) This subchapter shall not apply to purely dedicated response vessels.

(e) Consistent with Section 851.26(e) of this subchapter, nothing in these regulations shall prohibit the master or pilot from taking any action necessary to avoid:

(1) a collision or grounding; and/or

(2) damage to the tank vessel or escort tug and/or its crew and/or cargo.

(f) The requirements outlined in this section are in addition to, and not a limitation of, any other responsibility created by custom, law, or regulation. The tank vessel master remains responsible for the safe navigation and maneuvering of the tank vessel in all circumstances.

Authority: Sections 8670.17.2 and 8670.23.1, Government Code.

Reference: Section 8670.17.2, Government Code; 33 USC 2002(b) and 2007; and 33 CFR 157.03.

851.23. Requirements for Escort Tugs; Bollard Pull Testing and Certification, Equipment Requirements, Crew and Training Standards.

(a) Bollard Pull Testing Requirements.

(1) All escort tugs in the Los Angeles/Long Beach Harbor used for escorting tank vessels, shall have their static bollard pull (ahead and astern) measured for determining their forces in kips.

(2) Static bollard pull measurements shall be verified by a member of IACS, and in accordance with the following standards:

(A) The measurement shall be taken with the escort tug's trim and/or displacement corresponding to applicable loadline requirements or letter of stability.

- (B) Auxiliary equipment (such as pumps and generators) which is driven from the main engine(s) or propeller shaft(s) in normal operation of the escort tug shall be connected during the measurement process.
- (C) All bollard pull measurements shall be derived solely on the basis of the escort tug's capabilities. No outside assistance shall be allowed.
- (D) The propeller(s) blades fitted during the measurement shall be the same as those used when the escort tug is in normal operation.
- (E) Water depth shall be a minimum of 45 feet (not underwater clearance).
- (F) Water current shall not exceed 1.0 knot.
- (G) Wind velocity shall not exceed 10 knots.
 - 1. Measurements of water current and wind velocity shall be provided to the classification society surveyor by the escort tug owner's representative.
- (H) Towline length shall be a minimum of 300 feet.
- (I) The strain cell used for the measurements shall have been calibrated within the past 12 months. The classification surveyor shall verify this fact. The accuracy of the strain cell shall be +/-2% within a temperature range of -40° and 104°F.
- (J) Instruments providing both a continuous read-out and the bollard pull graphically as a function of the time, shall be connected to the strain cell.
- (K) The surveyor for the classification society shall:
 - 1. be aboard the escort tug during the measurement process to verify that the bollard pull report is correct;
 - 2. determine the escort tug's static bollard pull capacity by averaging the forces recorded (without any significant tendency of decline) for a period of at least 15 minutes while maintaining a fixed reading with the engine(s) operating at the manufacturer's recommended continuous output;
 - 3. sign the completed BOLLARD PULL REPORT of the Los Angeles/Long Beach Harbor Safety Committee; and
 - 4. sign and issue a BOLLARD PULL CERTIFICATE.

(3) Escort tug companies shall provide the Los Angeles/ Long Beach Harbor Safety Committee with the results of the static bollard pull tests performed measurements taken pursuant to the provisions of this subchapter.

(4) Results of any and all static bollard pull measurements shall be inventoried and published by the Marine Exchange.

(5) Escort tugs which do not have current bollard pull certifications on file with the Marine Exchange and the Harbor Safety Committee or which do not meet the requirements for alternative compliance for bollard pull measurements, cannot be used for the escort of tank vessels in the Los Angeles/Long Beach Harbor.

(6) The braking force shall be re-measured after any modifications and/or repairs to the main engines, hull, shaft-drive line, or steering, that could affect bollard pull. The new measurements must be reported to the Los Angeles/Long Beach Harbor Safety Committee and on file with the Marine Exchange.

(7) Any escort tug used to comply with the requirements of this subchapter shall also meet one of the following:

(A) the escort tug shall have its braking force re-measured within 3 years of its last bollard pull test, or;

(B) the escort tug shall submit to an Escort Tug Inspection Program, as follows:

1. Escort tugs 150 gross tons or greater, and classed escort tugs shall be made available for inspection by the Administrator twice in five years during their dry dock examination. The period between inspections shall not exceed three years.
2. Escort tug maintenance records shall be made available for inspection by the Administrator.
3. If dry dock examination extensions are necessary, escort tugs shall comply with the direction of the cognizant Officer in Charge, Marine Inspection, or American Bureau of Shipping principal surveyors' direction.
4. For classed escort tugs, a copy of the Class Surveyor's report confirming that the condition of the drive train (shafts, propellers, nozzles or other type drive) and main engines are in the same state as when the builder's or last bollard pull certificate was issued, shall be forwarded to the Administrator.

5. Escort tug companies shall participate and have a certificate of compliance from one of the following Management Systems:
 - i. American Waterways Operators Responsible Carrier Program;
 - ii. International Safety Management;
 - iii. ISO 9000 (quality management).
 6. Escort tugs of less than 150 gross tons shall be made available for inspection by the Administrator once in five years during their dry dock examination. These escort tugs shall use a certified Marine Surveyor and shall comply with subsections 2, 3, and 4, above.
- (C) Escort tugs that submit to the Escort Tug Inspection Program, as described above, can perform escort duties in any port in the state, if the tugs meet the requirements of the appropriate subchapter (i.e., Subchapter 1, San Francisco Bay Region; Subchapter 2, Los Angeles/Long Beach Harbor; Subchapter 3, Port Hueneme Harbor; Subchapter 4, Humboldt Bay; Subchapter 5, San Diego Harbor), of this Chapter 4 of the California Code of Regulations.

(b) Equipment Requirements for Escort Tugs.

All escort tugs used to escort tank vessels shall be equipped with and shall maintain in good working order:

- (1) primary and secondary VHF radios; and
- (2) fendering appropriate to absorb the impact inherent in hull-to-hull operations; and
- (3) power line handling equipment fore and aft to mechanically assist in the deployment and/or retrieval of tow lines.

(A) Tow lines provided by tank vessels and/or escort tugs shall:

1. be maintained in sufficient number, length, condition and strength to assure effective control of the intended vessel maneuver, based on weather conditions, the tank vessel's size, and the escort tug's certified static bollard pull or alternative model forces;
2. have a certified strength of at least 1.5 times the escort tug's certified static bollard pull or the alternative model forces found in Section 851.29 of this subchapter.

c. Any escort tugs used to comply with the requirements of this subchapter shall meet crew standards as follows:

(1) Federal regulations regarding hours of work apply to licensed and unlicensed crew members. According to these regulations, working hours shall include any administrative duties associated with the tug whether underway or at the dock. Hours of rest shall be in accordance with Part A, Chapter 8, Section A-VIII/1, paragraphs 1-4, of the International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers, 1978, as amended in 95 (STCW) standard, which is incorporated by reference.

(2) An escort tug, during escort and assist operations required by this subchapter, shall have a minimum of three crewmembers on board ready to respond at the tug master's discretion during an escort transit. At least one crewmember shall be capable of resolving mechanical difficulties aboard an escort tug in the event of an emergency.

(3) The Administrator may review the equipment and crew on an escort tug to assure compliance with this subsection.

(d) Training requirements for the crew of any escort tug used to comply with the requirements of this subchapter shall include, but are not limited to:

(1) In addition to demonstrable skills that satisfy federal requirements (46 CFR, Section 10.464) for towing vessel licensure, the following training elements are required (with refresher training every 5 years):

(A) Masters/Mates:

- *1 Bridge management training;
- *2. Radar training;
- 3. Navigation/boat handling training or proficiency evaluation, including Rules of the Road refresher training;
- 4. Company policy and procedure orientation, including review of international, federal and state requirements;
- *5. Marine firefighting/fire prevention;
- *6. Personal safety, including:
 - i. First aid and CPR certification;
 - ii. Confined space hazard awareness;
 - iii. Injury prevention;

- iv. Cargo knowledge/hazard awareness.
- *7. Responsibility and authority of master including supervisory skills training;
- *8. Currency of knowledge, as required by federal law (46 CFR 15.812) to serve as pilot on non-self propelled tank vessels;
- *9. Knowledge of local geography:
 - i. Terminal location and approaches;
 - ii. Anchorages;
 - iii. Tanker routes.
- (B) Crew members, other than masters/mates:
 - 1. Deck equipment operations and safety training;
 - 2. Company policy and procedure orientation, which shall include a review of applicable international, federal and state requirements;
 - *3. Vessel firefighting/fire prevention;
 - *4. Personal safety, including:
 - i. First aid and CPR certification;
 - ii. Confined space hazard awareness;
 - iii. Injury prevention;
 - iv. Lock-out/tag-out procedure.
 - 5. Marine diesel operations training, including engine room equipment and alarms.

In addition to the subjects listed above within this Subsection (B) crew members, other than masters and mates, shall demonstrate their ability to operate the vessel in place of the master/mate in an emergency situation, when the master/mate is unable for any reason to operate in his/her capacity.

- (C) All crew members:
 - 1. Employee orientation, including:
 - i. Drug and alcohol policy;
 - ii. Safety as a condition of employment;
 - iii. Vessel layout/deck operations;

- iv. Required safety gear;
- v. Job responsibilities.

*2. Emergency procedures orientation:

- i. Fire;
- ii. Collision/allision;
- iii. Sinking;
- iv. Grounding;
- v. Man overboard;
- vi. Personal injury;
- vii. Oil spill reporting.

3. Knowledge and use of tug escorts:

- i. How to use an escort tug to reduce the risk of grounding or collision of an escorted vessel;
- ii. The roles of the tug (as servant of the vessel) and the pilot during escorts;
- iii. The primacy of safety of life and the escort tug;

4. Capabilities and performance limitations of the escort tug, including but not limited to:

- i. Handling and performance characteristics of escort tugs (e.g., stability, hydrodynamics, tripping, etc.);
- ii. Propulsion type;
- iii. Force capabilities;
- iv. Line and connection system integrity;
- v. Navigation systems.

(2) Training required as a condition of U. S. Coast Guard licensure (e.g., firefighting) may be used to satisfy the training specifications listed in Subsection (d)(1) above, as appropriate.

(3) Compliance with the crew training and qualification requirements listed in Subsection (d)(1) above shall be verified as follows:

- (A) Companies that comply with the International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers (STCW) certification and have a Safety Management System (SMS) in place shall provide internal audit reports and STCW training certificates to the Administrator upon request; or

- (B) Companies that are not STCW certified, but which have a SMS in place shall request approval from the Administrator by providing all of the following:
1. Details of their training program; and
 2. Certified audit reports; and
 3. Demonstration of proficiency of the crew in the training elements prior to approval when deemed necessary by the Administrator.

*Federal requirements

Authority: Sections 8670.17.2 and 8670.23.1, Government Code.

Reference: 8670.17.2 and 8670.23.1, Government Code.

851.24. Pre-Escort Conference.

(a) Prior to commencing an escorted transit, the tank vessel master/pilot shall:

- (1) contact the escort tug master, mate or officer in charge of the watch, to confirm the number and position of the escort tug(s); and
- (2) establish the radio frequency to be used for communications; and
- (3) establish the anticipated direction of movement and destination of the tank vessel; and
- (4) communicate any other pertinent information that the master/pilot and escort tug master, mate or officer in charge of the watch deem necessary to facilitate operations in the case of an unplanned event.

Authority: Sections 8670.17.2 and 8670.23.1, Government Code.

Reference: Section 8670.17.2, Government Code.

851.25. Speed Limits for Tankers.

(a) Tankers transiting between the seaward limits of the pilot operating areas and anywhere inside the Federal Breakwater shall restrict their speed as follows:

- (1) eight (8) knots for vessels 60,000 displacement tons and less;
- (2) six (6) knots for vessels exceeding 60,000 displacement tons.

(b) The maximum speed limits contained in subsections (a)(1) and (a)(2) reflect favorable circumstances and conditions and shall be adjusted for safety based on weather and tidal conditions and the proximity of other vessel traffic.

Authority: Sections 8670.17.2 and 8670.23.1, Government Code.

Reference: Sections 8670.17.2, Government Code.

851.26. General Escort Tug Requirements for Tankers.

(a) The force requirements contained in this subchapter reflect favorable circumstances and conditions. The tanker master/pilot shall arrange for additional escort tug(s) should adverse weather conditions, unusual port congestion, the contemplated movement of the vessel or other conditions or circumstances so require.

(b) The master/pilot of inbound tankers shall confirm by VHF contact with the required escort tugs(s), that the tug(s) is/are stationed at the appropriate seabouy prior to the tankers reaching the seaward limit of the pilot operating area.

(c) Tanker Crew Requirements.

(1) a tanker shall have:

- (A) sufficient and qualified line handling capable crew members standing by and available to immediately receive lines from each escort tug. The crew shall not be assigned duties that would interfere with their ability to immediately respond to an emergency situation;
- (B) its anchors ready for letting go prior to entering the pilot operating areas (inbound tankers only);
- (C) sufficient and qualified supervisors to provide direct supervision of line handling crew operations for tankers. Supervisors shall have direct radio communication capability with the bridge of the tanker.

(d) Tanker Equipment Requirements:

- (1) each tanker shall have appropriate and suitably maintained bitts and chocks that are of sufficient size, strength, and number to accommodate the anticipated forces of the escort tug(s);
- (2) the tanker owner/operator shall indicate the location of the appropriate bitts and chocks, as well as the safe working loads, on the ship=s general arrangement plan for each tanker. This information shall also be communicated to the pilot during the pre-escort conference required by Section 851.24 of this subchapter.

(e) Notwithstanding any other provision of this subchapter:

- (1) any additional requirements for tug escort as deemed necessary by the U.S. Coast Guard shall supersede the requirements of this subchapter;
- (2) During a non-emergency situation the master/pilot, may only adjust the minimum escort requirements contained in this subchapter with the concurrence of the Coast Guard Captain of the Port.

Authority: Sections 8670.17.2 and 8670.23.1, Government Code.

Reference: Section 8670.17.2, Government Code.

851.27. Tanker and Tug Matching Criteria.

(a) Force Selection Matrix. The tug(s) used for the escorted vessel movements described in Section 851.22, Subsections (a) and (b), shall provide forces equivalent to those delineated in the following Force Selection Matrix. Where multiple tugs are needed to meet these requirements, the total number of escort tugs for a single tank vessel movement or transit shall not exceed two.

(b) To meet the requirements of the Force Selection Matrix, tractor tugs shall be tethered, inbound and outbound. Conventional tugs may be tethered or untethered inbound, but shall be tethered outbound.

SECTION 851.27. FORCE SELECTION MATRIX								
TANKER DISPLACEMENT	TRACTOR TUGS			CONVENTIONAL TUGS				
	AHEAD FORCES FOR TUGS USING STERN LINE (VSP) ASTERN FORCES FOR TUGS USING HEADLINE (ASD)		2ND TUG RATIO	AHEAD FORCES		2ND TUG RATIO	ASTERN FORCES	
	LONG TONS	KIPS	SHORT TONS	R _{T2}	KIPS	SHORT TONS	R _{C2}	KIPS
0 TO < 60,000	20	10	2.7	50	25	1.2	30	15
60,000 TO <100,000	40	20	2.7	60	30	1.3	50	25
100,000 TO <140,000	50	25	2.7	80	40	1.4	80	40
140,000 TO <180,000	60	30	2.8	120	60	1.4	100	50
180,000 TO <212,000	90	45	3.8	220	110	1.6	120	60
212,000 TO <220,000	100	50	3.8	250	125	1.6	120	60
220,000 TO <260,000	120	60	5.3	410	205	1.6	140	70
260,000 TO <300,000	140	70	5.4	480	240	1.6	160	80
300,000 TO <340,000	170	85	5.6	590	295	1.6	190	95

(c) the above force requirements can be met by employing either:

- (1) a single tractor tug, in which case the required force is set forth in the tractor tug column in the matrix above; or

(2) a single conventional tug, in which case the tug must meet both the required forces set forth in the conventional tug ahead and astern columns in the matrix above.

(d) accurate tug-to-tanker matching calculations for two tugs to meet the force requirements set forth in the above matrix, may be derived by using either:

(1) two conventional tugs; or

(2) a combination of two tugs, which may be employed, as follows:

(A) When using one tractor and one conventional tug the combined tug forces shall be calculated by subtracting the tractor tug's force measurement from the required force amount set forth in the tractor tug column in the matrix above, and multiplying the balance by the ratio R_{T2} provided for the second tug in that tank vessel displacement category. The resulting force amount must be met by the conventional tug using its ahead force measurement.

E.g., force ahead of second tug \geq (force required from tractor tug column - force tractor) $\times R_{T2}$. I.e., force required from tractor tug column \leq force tractor + (force ahead of second tug) R_{T2} .

The conventional tug must also meet an astern force amount that shall be calculated by subtracting the tractor tug's force measurement from the required force amount set forth in the tractor tug column in the matrix above and multiplying the balance by 1.0.

E.g., force astern second tug \geq (force required from tractor tug column - force tractor) $\times 1$. I.e., force required from tractor tug column \leq force tractor + force astern conventional

(B) When using two tractor tugs, the second tractor tug's force requirement shall be determined in the same way as for a second conventional tug.

Example: A 180,000 displacement tanker requires a 90 kip tractor tug to meet the minimum escort standards of this subchapter. In a situation where a 70-kip tractor tug is available, one additional tug could be used to fulfill the remaining 20 kip requirement by multiplying this balance by the ratio (R_{T2}) for this category. Thus, the ahead force and the astern force of the second tug must be:

Ahead force for the second tug = $(90-70) = 20 \times 3.8 = 76$ (kips).

Astern force for the second tug = $(90-70) = 20 \times 1 = 20$ (kips).

- (C) When using two conventional tugs, the combined tug forces shall be calculated by subtracting the force measurement of the tug working at the transom from the required conventional tug ahead force amount set forth in the conventional tug ahead force column in the matrix above, and multiplying the balance by the ratio provided for the second tug, (R_{c2}) in that tank vessel displacement category. The resulting force amount must be met by the second conventional tug using its ahead force measurement.

E.g., force ahead of second tug \geq (ahead force required from conventional tug column - force ahead of first conventional tug) $\times R_{c2}$.

I.e., ahead force required from conventional tug column \leq force ahead of first conventional tug + (force ahead of second tug $\div R_{c2}$).

The second conventional tug must also meet an astern force amount that shall be calculated by subtracting the first tug's astern force measurement from the required force amount set forth in the conventional tug astern force column in the matrix above, and multiplying the balance by 1.0.

E.g., force astern of second tug \geq astern force required from conventional tug column - force astern of first conventional tug.

I.e., astern force required from conventional tug \leq column force astern of first conventional tug + force astern of second tug.

Example: a 180,000 displacement tanker requires a 220 kip ahead force and 120-kip astern force conventional tug to meet the minimum escort standards of this subchapter. In a situation where a 150-kip ahead force with 100-kip astern force conventional tug is available, one additional tug could be used to fulfill the remaining force requirements (second tug forces $\times R_{c2}$). Thus, the ahead force and the astern force of the second tug must be:

Ahead force for the second tug = $(220-150) \times 1.6$ 112 (kips)

Astern force for the second tug = $(120-100) \times 1$ 20 (kips)

851.27.1. Tank Barge and Tug Matching Criteria, Tethering, Stationing and Equipment Requirements

- (a) The tug(s) used to escort a tank barge must be able to provide sufficient braking force to stop the tank barge.

- (1) The braking force shall be measured either as:
 - (A) the escort tug's ahead static bollard for tractor tugs using stern lines (VSP); or
 - (B) astern static bollard pull for tractor tugs using headlines (ASD); or
 - (C) astern static bollard pull for conventional tugs;
- (2) At the appropriate seabouy:
 - (A) Tethered escort tug(s) are required for all tank barges and their primary towing vessels whose aggregate displacement tonnage exceeds 20,000;
 - (B) The escort tug(s) shall have the minimum individual or aggregate braking force, when tethered or untethered, as specified in Subsection (3) A. and B. below:
- (3)

Total Displacement Tonnage of the Tank Barge and the Primary Towing Tug	Minimum Required Escort Tug(s) Static Bollard Pull in Short Tons	
	<i>Tethered Escort Tug(s)</i>	<i>Untethered Escort Tug(s)</i>
(B) A. 0 to = 20,000 displacement tons	10 short tons	15 short tons
B. >20,000 displacement tons	<i>Tethered Escort Tug(s)</i>	
	A total astern static bollard pull (in pounds) equal to or greater than the sum of both the primary towing tug=s and barge=s total displacement tonnage. (E.g., where the total towing tug and tank barge displacement is 25,000 displacement tons, the escort tug(s)= astern static bollard pull shall be at least 25,000 pounds or 12.5 short tons.)	

- (4) A tank barge must be accompanied by a sufficient number, but no more than two tugs to provide the braking force specified in this section.
- (5) The towing tug which provides the power to push or tow a tank barge shall not become an escort tug during the course of a transit unless the towing tug has been

relieved of its duties as the primary towing vessel, and replaced with another tug that serves as the primary towing vessel.

Any towing tug that does become the escort tug after being relieved of all towing duties must meet all the requirements for escort tugs as specified in this subchapter.

(6) The primary towing vessels for tank barges transiting between the seaward limits of the pilot operating areas and anywhere inside the Federal Breakwater shall restrict their speed to four (4) knots.

(b) Stationing Requirements.

(1) The primary towing tug master or mate shall confirm by VHF contact with the required escort tugs(s), that the tug(s) is/are stationed at the appropriate seabouy prior to the tank barge reaching the seaward limit of the pilot operating area.

(c) Equipment Requirements.

(1) Each tank barge shall have deck chocks and bitts that are of sufficient size, strength and number to accommodate the anticipated forces of the escort tug(s) as stated in subsection (a)(3) above;

(2) The tank barge owner/operator shall illustrate the location of the bitts and chocks, and any other locations on the hull, which are capable of withstanding the forces exerted by the escort tug(s), within documentation kept on file with the Marine Exchange, and onboard the towing tug.

Note: Authority: Sections 8670.17.2(a) & 8670.23.1(d), Government Code.
Reference: Section 8670.17.2, Government Code.

851.28. General Requirements for Tank Vessels.

(a) All laden, inbound tank vessels engaged in movements described in Section 851.22, Subsections (a) and (b), shall:

(1) comply with the escort requirements specified in Section 851.27, or its alternatives found in Section 851.29; and

(2) report their displacement upon arrival and departure to the Vessel Traffic Information Service/Marine Exchange; and

(3) either through the tank vessel owner/operator or the agent acting on their behalf, provide the accurate displacement of the tank vessel when ordering tug escort services from the tug provider(s); and

(4) be met by the required escort tug at the seaward limit of the pilot operating areas; and

(5) not proceed closer than two nautical miles from the Federal Breakwater entrance unless the required escort tug is in position at the seaward limit of the pilot operating areas.

Authority: Sections 8670.17.2 and 8670.23.1, Government Code.

Reference: Section 8670.17.2, Government Code.

851.29. Alternative to Section 851.27 Requirements for Matching Escort Tugs to Tank Vessels.

(a) Measurement methodologies other than those used to establish the requirements in Section 851.27 may be used instead of, or in addition to, that section as follows:

(1) Escort tug operators may propose an alternate method for measuring the forces of any escort tug (in kips) than the static bollard pull measurement indicates. An alternate measurement may be submitted only once in any 12 month period and shall comply with the following:

(A) the owner/operator shall assure that the following are included when developing a methodology for calculating alternate forces for a given escort tug:

1. The alternate measurement is conducted from a starting speed of five (5) knots;
2. the escort tug is not required to exceed the limits of its ability to generate the forces, and in no instance submerges the deck edge to achieve the alternate measurement;
3. the escort tug operates all its equipment at or below the manufacturer's recommended guidelines for its safe working load;
4. unless demonstrated otherwise by full scale testing, all machinery shall be assumed to operate at or below performance levels published by the manufacturer;
5. any current bollard pull values registered with the Marine Exchange shall be utilized where appropriate in any formulas or models;
6. any known condition that would impair the escort tug's ability to perform shall be included in the calculation.

- (B) the measurement must be conducted by a naval architect or licensed marine engineer approved by the Administrator:
 - 1. the escort tug operator shall submit the name of the naval architect or licensed marine engineer to the Administrator for approval prior to having that individual or his/her company conduct an alternate measurement.
 - 2. the Administrator shall approve a naval architect or licensed marine engineer if that person has demonstrated the education, knowledge and experience necessary to conduct the testing and modeling of escort tug capabilities and forces.
- (C) The alternate model and the resultant measurements shall be approved by the Administrator before the alternate model may be used to match a tanker to an escort tug or tugs. The Administrator shall approve the alternate model if it provides both of the following:
 - 1. A higher force (in kips) than the static bollard pull measurement indicates; and
 - 2. at least the same level of protection as the forces required by Section 851.27.
- (D) After an alternate model is approved, the Administrator shall provide the Los Angeles/Long Beach Harbor Safety Committee with a list of the escort tug combinations which correspond to the tank vessel displacements and speeds under the approved alternate methodology.

(2) Tanker operators may develop a model for the vessels in their fleet relative to the steering and braking demands established by the alternate model may be used to match escort tugs to tankers in lieu of those specified in Section 851.27. An alternate compliance model may be submitted only once in any 12 month period and shall comply with the following:

- (A) The measurement must be conducted by a naval architect or licensed marine engineer approved by the Administrator.
 - 1. The tanker operator shall submit the name of the marine architect or licensed marine engineer to the Administrator for approval prior to having that individual or his/her company conduct an alternate model.
 - 2. the Administrator shall approve a naval architect or licensed marine engineer if that person has demonstrated the education, knowledge and experience necessary to conduct the testing and modeling of escort tug capabilities and forces.

- (B) The alternate model and the resultant measurements shall be approved by the Administrator before the alternate model may be used to match a tank vessel to an escort tug or tugs. The Administrator shall approve the alternate model if:
 - 1. It provides at least the same level of protection as the forces established in Section 851.27; and
 - 2. can be achieved using no more than two escort tugs as required by this subchapter.
- (C) After an alternate model is approved, the Administrator shall provide the Marine Exchange and the Los Angeles/Long Beach Harbor Safety Committee with the tank vessel demand in kips which corresponds to the tanker's displacement and speed under the approved alternate model.

Authority: Sections 8670.17.2 and 8670.23.1, Government Code.

Reference: Section 8670.17.2, Government Code

851.30. Reporting.

Anyone may report violations of the provisions of this subchapter to:

- (a) the Office of Spill Prevention and Response; or
- (b) The United States Coast Guard Captain of the Port.

Authority: Sections 8670.17.2 and 8670.23.1, Government Code.

Reference: Section 8670.17.2, Government Code.

851.31. Compliance Monitoring and Notification.

Compliance monitoring of these regulations shall be accomplished by the procedures specified in either subsection (a) or (b), below:

- (a) The development of a compliance monitoring program(s) or process(es) designed by the Port of Los Angeles and the Port of Long Beach (Ports), or their designees.
 - (1) The program(s) or process(es) shall specify how the Ports will provide the Administrator, or his designee, with notification of a violation(s) to the regulations; and
or
 - (2) that the vessel, under normal, not exigent circumstances, is to be detained until the requirements of this subchapter have been fully met.

- (A) The program and/or process shall be submitted to the Administrator for his/her review and approval no later than 120 days from the effective date of this regulation.
- (B) The Administrator shall have 60 days within which to review and either approve, conditionally approve or disapprove the Ports' submittal. Upon termination of this time line the Administrator shall:
 - 1. Fully approve the proposed program and/or process provided by the Ports and provide written confirmation of this approval.
 - 2. Conditionally approve the proposal(s). The Administrator shall provide a written explanation for the conditional approval and state the objectionable items contained in the proposal. The Ports shall be given 30 days from the date of their receipt of the Administrator's explanation, to resubmit a proposal which will either excise or mitigate, with an explanation, the Administrator's objections. The Administrator shall have 30 days from the date of receipt of the Ports' amended proposal, and shall either fully approve or fully disapprove this document.
 - 3. Disapprove the Ports' proposals.

(b) If either of the Ports' program(s) and/or process(es) is/are disapproved, or if either of the ports fail to submit a program, the Administrator shall implement the compliance monitoring provisions of this subchapter by the adoption of further regulations. These regulations may include the establishment of a Clearing House function within the Marine Exchange or through any other legal means deemed appropriate by the Administrator.

Authority: Sections 8670.17.2 and 8670.23.1, Government Code.

Reference: Sections 8670.17.2 and 8670.67(b), Government Code.

851.32. Remedies.

(a) Nothing herein shall limit or prevent any action by any party in a court of competent jurisdiction.

(b) Any person who knowingly, intentionally or negligently violates any provision of this subchapter shall be subject to criminal, civil, and/or an administrative civil penalty as prescribed in Article 9 of the Government Code beginning with Section 8670.57.

Authority: Sections 8670.17.2 and 8670.23.1, Government Code.

Reference: Sections 8670.17.2 and 8670.67(b), Government Code.