

Operating Procedures

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2.1 Definitions

- a. Allowable Draft Limit (ADL):** A vessel shall be considered to be within its ADL if it transits the Panamax locks, its mean draft does not exceed 39.5 feet (12.04 m), and its deepest point of immersion does not exceed 39.75 feet (12.12 m); or, if it transits the Neopanamax locks, and its deepest point of immersion does not exceed 50.0 feet (15.24 m.)
- b. Barge:** A flat-bottomed vessel of full body and heavy construction without installed means of propulsion.
- c. Canal Operation Compatibility Area:** A continuous area generally following the course of the Panama Canal, and generally contiguous to it, running from the Atlantic to the Pacific. It includes the Atlantic entrance and its anchorage areas, the port of Cristobal, Gatun Locks, Gatun Dam, Gatun Spillway, Gatun Power Station, portions of Gatun Lake, Culebra (Gaillard) Cut, Pedro Miguel Locks, Miraflores Lake, Miraflores Locks, Miraflores Spillway, Miraflores Filtration Plant, Miraflores Power Station, the Port of Balboa, the Pacific Entrance and its anchorage areas, as well as the land and water areas encompassing them.
- d. Carousel Lockage:** In the Panamax locks, the use of three locomotive crews on the center wall and two on the side wall for consecutive lockages, where the first crew on both sides takes the first vessel through the whole lockage, and the second crew on each side do the same for the second vessel, using the return track to go back to the next vessel when the lockage is completed.
- e. Center-Chamber Handline Lockage:** A lockage of a vessel without locomotive assistance with the vessel secured by mooring lines to both center and side walls during filling and emptying.

- f. Chamber:** That portion of a lock structure within which a vessel remains while being raised or lowered in each step or lift.
- g. Clear Channel:** A channel where certain vessels may not meet another. This requirement may be waived by mutual consent and at the discretion of the pilots involved, except if clear channel is due to dangerous cargo.
- h. Clear Cut Transit:** A transit in which a vessel because of size, maneuverability, cargo, visibility, or structural peculiarity shall not meet another vessel in Gaillard Cut.
- i. Commercial Vessel:** A self-propelled vessel, other than a naval, military or other privately owned vessel.
- j. Complete (Full) Daylight Transit:** A transit that is restricted entirely to daylight hours.
- k. Complete Lockage:** The complete passage through a lock of a vessel or group of vessels that are raised or lowered in the same chamber at the same time. In order to be considered as a complete lockage, a vessel, or group of vessels, must cross the end of the approach wall, be locked up or down and pass the knuckle in departing from the opposite end of the lock.
- l. Cut-style Tug:** A tug made fast to the stern of a vessel to exert directional control over the vessel.
- m. Dangerous Cargo:** Any substance, whether packaged or in bulk, intended for carriage or storage, and having properties coming within the classes listed in the International Maritime Dangerous Cargo Code (IMDG). And any substance shipped in bulk, not coming within the IMDG Code classes, but which is subject to the requirements of the Bulk Chemical Code, the Gas Carrier Code, the International Gas Carrier Code, or Appendix B of the Solid Bulk Code.
- n. Double Culvert Operation:** In the Panamax locks, the simultaneous use of side wall culvert and center wall culvert for filling or emptying lock chambers.
- o. Daylight:** The period between 20 minutes before sunrise and sunset.
- p. Daylight Lockage:** A lockage in which transit of the locks is restricted to daylight hours.
- q. Daylight in the Cut:** A transit in which passage through Gaillard Cut is restricted to daylight hours.
- r. Daylight Transit:** A transit in which passage through all locks, Miraflores Lake, Gaillard Cut and Gatun Lake is restricted to daylight hours.
- s. Dead Tow:** A non-self-propelled vessel.
- t. Follow-through Lockage:** A lockage of the last ship in one direction during relay operations, for which only one set of locomotives is used from knuckle to knuckle. This

type of lockage is performed only before relaying in the opposite direction or resuming regular lockages.

u. Handline Vessel: Small craft of up to 125.0 feet, or tugboats up to 150 feet in length that normally do not use locomotives at the locks

v. High Mast Lighting (HML): High intensity lights installed at all locks for the purpose of improving visibility at night for transiting vessels.

w. HML Transit: A transit of a vessel that due to size, maneuverability, visibility, cargo, and structural characteristics, as determined by the Executive Manager for Transit Operations, may begin or be completed, at either end of the Canal, including Miraflores Lake, during the hours of darkness.

x. Hydraulic Assist: A method used at Pedro Miguel Locks and Gatun Locks lower level to assist the departure of a ship by spilling water behind it.

y. Integrated Tug-Barge Combination: A barge that is specifically configured to receive a tugboat, and with the tug, becomes, for navigational purposes, a single self-propelled unit with normal ship characteristics that meets all ACP regulations for transit and can operate under all conditions in which a ship of equivalent size can operate.

z. LLNGC (Large Liquefied Natural Gas Carrier): Neopanamax vessels that transport or have transported liquefied natural gas.

aa. Locks: A structure designed to raise and lower vessels from one body of water to another in a continuous process that may consist of a series of steps or lifts.

bb. Long Chamber (or Extra Long Chamber) Lockage: A lockage in the Panamax locks of a vessel utilizing the full chamber length by leaving the inner gates immediately behind a lockage open and by-passed.

cc. Maximum Allowable Draft (MAD): a vessel shall be considered to be within the MAD if it does not exceed the maximum TFW draft allowed by her Loadline Certificate; and its deepest point of immersion does not exceed thirty-nine (39) feet nine (9) inches if it transits the Panamax locks; or it does not exceed 50 feet if transits the Neopanamax locks.

dd. Maximum Authorized Draft: Lesser of the maximum authorized transit draft or the maximum tropical freshwater draft by Load Line Certificate.

ee. Maximum Authorized Transit Draft: Deepest point of immersion in Tropical Fresh Water (TFW) of a particular vessel, as authorized by its Classification Society, Gatun Lake level, and Canal restrictions permitting. Notwithstanding the above, the maximum authorized transit draft is 39.5 feet (12.04 meters) TFW, with Gatun Lake level at 81.5 feet (24.84 meters) or more. The maximum authorized transit draft for vessels transiting the Neopanamax locks is 50.0 feet (15.24 m) TFW, with Gatun Lake level at 81.5 feet (24.84 meters) or more.

ff. *Neopanamax vessel:* Vessel with a beam in excess of 106.20 feet, with an overall length equal or less than 1205 feet, and with a maximum TFW draft of 50.0 feet (15.24 m.)

gg. *Neopanamax Locks:* The locks of Cocoli and Agua Clara.

hh. *Nesting:* A procedure of tying one or more handlines abreast each other.

ii. *Non-Self-Propelled Vessel:* A vessel that either does not have an installed means of propulsion or has an installed means of propulsion which is not functioning during transit. It is also referred to as dead tow.

jj. *Panamax vessel:* A vessel 100.0 feet (30.48 meters) or more in beam but equal or less to 106.20 feet, and with a maximum TFW draft of 39'-09".

kk. *Panamax Locks:* The locks of Gatun, Miraflores and Pedro Miguel.

ll. *Panamax Plus vessel:* Vessel with beam equal or less than 106.2 feet, with an overall length equal or less than 966.99 feet and with a maximum TFW transit drafts of 39'-09".

mm. *Precaution Designator (PD):* The code assigned to each vessel due to cargo that sets forth the ACP precautionary measures that shall be taken for that vessel while in Canal waters.

nn. *Precise Level Datum (PLD):* The level surface to which all heights or elevations are referred. For the Panama Canal, the 0.00 PLD adopted was mean sea level as determined at pre-construction time. Atlantic Mean Low Water (MLW) equals -0.4 feet (-0.1 m) PLD; Pacific Mean Low Water Springs (MLWS) equals -7.6 feet (-2.3 m) PLD; Gatun Mean Lake Level (MLL) equals 85 feet (25.9 m) PLD; and Miraflores Mean Lake Level (MLL) equals 54 feet (16.5 m) PLD.

oo. *Protrusion:* Anything that extends beyond any portion of the hull of a vessel, whether it is permanent or temporary.

pp. *Published TFW Maximum Draft:* Deepest point of immersion in Canal waters, authorized by the Canal Authority, taking into account the water level of Gatun Lake and other limitations deemed necessary because of restrictions in the Canal.

qq. *Regular:* A vessel less than 91.0 feet (27.74 meters) in beam.

rr. *Relay Lockage:* A lockage where vessels going in the same direction, in the same lane, use two separate sets of locks locomotives from knuckle to knuckle. A set of locks locomotives assists the vessel from its locks arrival to the first or second chamber and then returns for the following lockage. The other set of locks locomotives completes the lockage.

ss. *Short Chamber Lockage:* A lockage of a vessel in either the 650-foot (198-meter) short chamber or the 350-foot (107-meter) short-short chamber section of the chamber formed by using the intermediate gates.

- tt.** *Side Wall Handline Lockage:* A lockage of a vessel without locomotive assistance with the vessel secured by mooring lines to either chamber wall, or moored alongside another vessel that is secured to either chamber wall, during filling and emptying.
- uu.** *Single Culvert Operation:* The use of only one of the culverts (the side wall culvert unless otherwise stated) for filling or emptying chambers in the Panamax locks.
- vv.** *Super:* A vessel 91.0 feet (27.74 meters) or more in beam.
- ww.** *Tandem Lockage:* The simultaneous lockage of two vessels in the same chamber. Handlines, unless of excessive length, are not considered as part of a tandem.
- xx.** *Through Lockage:* A lockage of the first ship in one direction during relay operations, for which only one set of locomotives is used from knuckle to knuckle.
- yy.** *Transit:* A complete passage of a single vessel through the Canal.
- zz.** *Tropical Fresh Water Draft (TFW):* Tropical Fresh Water draft of Gatun Lake, density 0.9954 gm/cc at 85° F (29.4° C). [Transition to fresh water frequently alters the trim of large vessels 3 to 4 inches (8 to 10 cm) by the head.]
- aaa.** *Wing Fling:* A side wall procedure for placing messengers and cables aboard qualifying vessels without the use of a rowboat.

2.2 Special Requirements and Restrictions

- a.** *General:* The requirements for number of pilots, transit restrictions and tug assistance is based on pilot observation, handling characteristics, visibility and propulsion, after evaluation by a Canal port captain for loaded and ballast conditions. Tables I, II and III on the following pages outline normal requirements and restrictions for various categories of vessels as set forth in this section.
- b.** *Authority to Override:* Due to special circumstances, such as, but not limited to, schedule deterioration, the Executive Vice President for Operations (OP), the Transit Operations Division Executive Manager (OPT), or their designee, may authorize deviations from the rules in order to avoid Canal operational disruptions.
- c.** *Dead Tows:* Dead tows require extraordinary preparation and coordination. The Transit Operations Division will identify those tows that require a tow sheet and will prepare one as soon as possible in accordance with the established policy. Tow sheets will be distributed to MTC, towboat operations, line handling operations and transit pilots. Any tow that is determined to be essentially the same as a power driven vessel, for the purpose of determining transit requirements, will not require the issuance of a tow sheet. The Transit Operations Division will ensure that MTC is informed, that the necessary data for transit is entered in the Ship Data Bank, and that the Transit Sheet is properly annotated.

d. Vessels of Unusual Configuration: Vessels with protrusions or unusual construction features restricting visibility may be assigned DAYLIGHT LOCKAGE, providing the vessel has good maneuvering characteristics and is not overly large. If the Transit Operations Division Executive Manager determines that the vessel has poor maneuvering capabilities and is excessively large, additional restrictions may be assigned, ranging up to COMPLETE DAYLIGHT TRANSIT.

e. Minimum Full Ahead Speed: The ACP has determined that the minimum full ahead speed required for vessels in order to complete transit in standard times is 8 knots.

CHARACTERISTICS		RESTRICTIONS						TUG REQUIREMENTS		
LENGTH	BEAM	CLEAR CHANNEL	DAYLIGHT TRANSIT	DAYLIGHT IN CUT	CLEAR CUT	825' TANDEM LIMIT	825' HAND LINE LIMIT ⁽⁸⁾	LOCKS		CUT
								IN	OUT	
900' & OVER	ANY	NO ⁽⁹⁾	NO ^(5/7/11)	NO ^(5/6/7)	YES	---	---	2	1	1
800' – 899.99'	91.0' & OVER	NO	NO ^(5/11)	NO ^(5/6/7)	NO ^(12/13)	YES	YES	2	0 ⁽¹⁾	1
	UNDER 91.0'		NO	NO	NO				0	0 ⁽³⁾
700' – 799.99'	91.0' & OVER	NO	NO ⁽⁵⁾	NO ^(5/6)	NO ⁽¹³⁾	YES	YES	2	0 ⁽¹⁾	1
	UNDER 91.0'		NO	NO	NO				0	0 ⁽³⁾
650' – 699.99'	100' & OVER	NO	NO ^(5/7)	NO ^(5/6)	NO ⁽¹³⁾	YES	YES	2	0 ⁽¹⁾	1
ANY	100' & OVER	NO	NO ^(5/6/7/11)	NO ^(5/6/10)	NO ⁽¹³⁾	YES	YES	2	0 ⁽¹⁾	1
	95.0' – 99.99'	NO	NO ^(5/6/7)	NO ^(5/6)	NO ⁽¹³⁾	YES	YES	2	0	1
	91.0' – 94.99'	NO	NO ^(5/6/7)	NO ^(5/6)	NO ⁽¹³⁾	YES	YES	2	0	1
	85.0' – 90.99'	NO	NO	NO	NO	YES	YES	1 ⁽²⁾	0	0 ⁽³⁾
	80.0' – 84.99'	NO	NO	NO	NO	YES	YES	1	0	0 ⁽³⁾
570' & OVER	75.0' – 79.99'	NO	NO	NO	NO	YES	YES	1	0	0 ⁽¹³⁾
	UNDER 75.0'	NO	NO	NO	NO	YES	YES	1	0	0 ⁽¹³⁾
UNDER 570'	75.0' – 79.99'	NO	NO	NO	NO	YES	YES	0 ⁽⁴⁾	0	0 ⁽¹³⁾
	UNDER 75.0'	NO	NO	NO	NO	YES	YES	0 ⁽⁴⁾	0	0 ⁽¹³⁾
DANGEROUS CARGO RESTRICTIONS, TABLES II AND III ALSO APPLY										

TABLE I – Ship Requirements and Restrictions (Up to Panamax dimensions)

NOTES

- (1) Tug out on pilot request for vessels 100 feet and over in beam.
- (2) Two tugs into Pedro Miguel southbound if beam is 87 feet or over.
- (3) Tug in Cut if mean draft is 34 feet TFW or more.
- (4) No tugs unless maximum authorized displacement is 20,000 tons or more or when authorized by the Canal Operations Captain for specific ships.
- (5) Daylight Transit if forward visibility obscured more than 2 S/L or 500m, whichever is less, or more than 15° horizontally.

- (6) Daylight in the Cut if drafts exceed the allowable draft limit (ADL)
- (7) Except when not complying with the established criteria.
- (8) Handlines can lock with a single vessel with an aggregate overall length (vessel + handline) of not more than 725 feet for up lockages and 800 feet for down lockages; and with tandems with an aggregate overall length of all vessels in the lockage (tandem + handline) that does not exceed 675 feet for up lockages and 750 feet for down lockages. When handlines are nested during a lockage, the length of the largest piece will be used in calculating the aggregate overall length.
 ACP equipment can lock with single vessels limited to 850 feet aggregate overall length, and tandem limited to 825 feet aggregate overall length.
 ACP equipment with handlines alongside can lock with an aggregate overall length limited to 800 feet with single vessels, and to 750 feet with tandems. When not tied alongside, the aggregate overall length is limited to 750 feet with single vessels, and to 725 feet with tandems.
- (9) Clear Channel during the hours of darkness from Gatun Locks to Atlantic Channel Buoy No. 11.
- (10) Daylight in the Locks and Cut if PD-1 or 2.
- (11) Daylight transit of Gatun Lake if vessel is passenger, vehicle carrier, roll-on roll-off, and tanker or bulkers with PD-1 or 2.
- (12) Clear Cut at night only.
- (13) Refer to Table VIII covering Meetings in the Cut.

CHARACTERISTICS		RESTRICTIONS							
Length (feet)	Beam (feet)	Clear Pacific Channel	Basin to Bridge	Clear Agua Clara Reach	Junction to Mole buoy	Daylight at the Locks	Daylight in Cut	Clear Cut	Daylight at Gatun Lake
ANY	OVER 160'	YES	YES	YES	NO ⁽³⁾				
ANY	OVER 143'	YES	YES	NO ⁽²⁾	NO ⁽³⁾				
ANY	106.2-143'	NO ⁽¹⁾	YES	NO ⁽²⁾	NO ⁽³⁾				
ANY	UNDER 106.2	NO ⁽⁴⁾	NO ⁽⁴⁾	NO ⁽²⁾	NO				
ANY	OVER 160'	YES	YES	YES	NO ⁽³⁾				
LNG	ANY	YES	YES	YES	YES	YES	YES	YES	YES
Over 1000 ⁽¹⁾	OVER 106.2'					NO ⁽⁵⁾	YES	YES	YES
Over 1000 ⁽⁶⁾	OVER 135'					NO ⁽⁵⁾	YES	YES	YES
Upto 1000 ⁽⁶⁾	OVER 135'					NO ⁽⁵⁾	YES	YES	YES
Upto 1000 ⁽⁶⁾	120.01' – 135'					NO ⁽⁵⁾	NO ^(5/7/8)	YES	NO ^(7/9/10/11)
Upto 1000 ⁽⁶⁾	106.2 – 120'					NO ⁽⁵⁾	NO ^(5/7/8)	YES	NO ^(7/9/10/11/13/14)
Over 1000 ⁽⁶⁾	ANY					NO ⁽⁵⁾	YES	YES	YES
Over 850'	ANY						YES	YES	NO ⁽⁹⁾

TABLE II – Vessel Restrictions (Vessels exceeding Panamax dimensions)

NOTES

- (1) 232 feet combined beam restriction
- (2) 214 feet combined beam restriction
- (3) 265 feet combined beam restriction
- (4) Unless a Panamax Plus vessel, then (1) applies

- (5) Except when not complying with the established criteria
- (6) 1050' if container vessel
- (7) Except when PD1 or PD2
- (8) TFW not to exceed 45 feet
- (9) Except passenger vessels, vehicle carriers and Ro-Ro vessels.
- (10) Does not apply to container vessels
- (11) Except when not qualified for the Cut at night
- (12) No meetings at Gatun Lake at Night
- (13) 220 feet combined beam restriction at Gatun Lake at Night
- (14) Max TFW Draft of 42 feet

CHARACTERISTICS			TUG REQUIREMENTS AT NEOPANAMAX LOCKS and TUG REQUIREMENTS FOR TRANSIT for NEOPANAMAX AND PANAMAX PLUS VESSELS							
Length (LOA) (feet)	Beam (feet)	TFW Draft (feet)	Coochi northbound Assist (thru lcks)	Coochi southbound Assist (thru lcks)	Agua Clara northbound Assist (thru lcks)	Agua Clara southbound Assist (thru lcks)	Tug Out	Cut Tug	Deckhand Leaders	Deckhands
REGULARS			2 ⁽¹⁾ (2)	2 ⁽¹⁾ (2)	2 ⁽¹⁾ (2)	2 ⁽¹⁾ (2)	0	0 ⁽²⁾	2	8
SUPERS Y PANAMAX			2 ⁽⁵⁾ (2 ⁽³⁾ (4))	2 ⁽⁵⁾ (2 ⁽³⁾ (4))	2 ⁽⁵⁾ (2 ⁽³⁾ (4))	2 ⁽⁵⁾ (2 ⁽³⁾ (4))	1 ⁽⁸⁾	1 ⁽³⁾	2	8
PANAMAX PLUS	≤106.2'	≤ 45.0'	2 ⁽⁹⁾ (2 ⁽³⁾)	2 ⁽⁹⁾ (2 ⁽³⁾)	3 ⁽⁹⁾ (2 ⁽³⁾)	2 ⁽⁹⁾ (2 ⁽³⁾)	1 ⁽⁹⁾	1 ⁽³⁾	2	8
< 1,100'	≤120'	≤ 45.0'	2 ⁽⁹⁾ (2 ⁽³⁾)	2 ⁽⁹⁾ (2 ⁽³⁾)	3 ⁽⁹⁾ (2 ⁽³⁾)	2 ⁽⁹⁾ (2 ⁽³⁾)	1 ⁽⁹⁾	1 ⁽³⁾	2	8
< 1,100'	>120'and<150'	≤ 45.0'	2 ⁽³⁾ (2 ⁽³⁾ (11))	2 ⁽³⁾ (2 ⁽³⁾ (11))	3 ⁽³⁾ (2 ⁽³⁾ (11))	2 ⁽³⁾ (2 ⁽³⁾ (11))	1 ⁽³⁾	1 ⁽³⁾	2	8
PANAMAX PLUS	≤106.2'	> 45.0'	2 ⁽³⁾ (2 ⁽³⁾ (14))	2 ⁽³⁾ (2 ⁽³⁾ (14))	3 ⁽³⁾ (2 ⁽³⁾ (14))	2 ⁽³⁾ (2 ⁽³⁾ (14))	1 ⁽¹³⁾	1 ⁽¹⁴⁾	2	8
≥ 1,100'	≥ 150	> 45.0'	2 ⁽³⁾ (2 ⁽³⁾ (14))	2 ⁽³⁾ (2 ⁽³⁾ (14))	3 ⁽³⁾ (2 ⁽³⁾ (14))	2 ⁽³⁾ (2 ⁽³⁾ (14))	1 ⁽¹³⁾	1 ⁽¹⁴⁾	2	8
LNG PMX PLUS & NEO < 1,100'		≤ 45.0'	2 ⁽⁹⁾ (2 ⁽³⁾ (15))	2 ⁽⁹⁾ (2 ⁽³⁾ (15))	3 ⁽⁹⁾ (2 ⁽³⁾ (15))	2 ⁽⁹⁾ (2 ⁽³⁾ (15))	1 ⁽⁹⁾	1 ⁽¹⁴⁾ (15)	2	8
LNG NEO < 1,100'	>120'and<150'	≤ 45.0'	2 ⁽³⁾ (2 ⁽³⁾ (11)(15))	2 ⁽³⁾ (2 ⁽³⁾ (11)(15))	4 ⁽³⁾ (12)(2 ⁽³⁾ (11)(15))	2 ⁽³⁾ (2 ⁽³⁾ (11)(15))	1 ⁽³⁾	1 ⁽¹⁴⁾ (15)	2	8
ADDITIONAL TUGS			(16)(17)(18)(19)(20)							

TABLE III – Tug Requirements Neopanamax Locks (Vessels exceeding Panamax dimensions)

NOTES

- (1) Min 30 preferably less than 48 TONS Bollard Pull
- (2) CUT TUG if > 80' beam and Deepest point of Immersion over 34' TFW
- (3) 60 TONS Bollard Pull
- (4) 60 TONS Bollard Pull (30 if equipped with a bow thruster in good working conditions)
- (5) 30 TONS Bollard Pull
- (6) 30 TONS Bollard Pull (if Panamax)
- (7) 30 TONS Bollard Pull if Panamax > 850 feet LOA
- (8) 30 (if not equipped with a bow thruster in good working conditions)
- (9) 50 TONS Bollard Pull
- (10) 50 TONS Bollard Pull (if not equipped with a bow thruster in good working conditions)
- (11) 60 TONS Bollard Pull (75 for bulkers and tankers with displacement ≥ 120,000)
- (12) 60 TONS Bollard Pull (Applies to vessels without working bow thruster and beams ≥ 140')
- (13) 60 TONS Bollard Pull (if not equipped with a bow thruster in good working conditions)
- (14) 75 TONS Bollard Pull
- (15) F1F1 TUG

- (16) LNG Vessels Escort from Pacific Sea buoy to Mole Buoys (75 tons and F1F1)
- (17) LNG Vessels Escort from buoy 10 Pacific Channel to buoy 7 Atlantic Channel (60 tons and F1F1)
- (18) Super and Panamax LOA \geq 850 feet and all Panamax Plus and Neopanamax 1 tug through the Cut
- (19) Neopanamax bulkers and tankers with displacement over 120,000 MT:1 escort between Agua Clara and Cocoli Locks
- (20) Neopanamax container vessels with displacement over 130,000 MT:1 escort between Agua Clara and Cocoli Locks

2.3 Meeting, Clear Channel and Overtaking Restrictions

The following meeting, clear channel, and overtaking restrictions shall apply to vessels in the Atlantic Channel, Gatun Approach, Agua Clara Reach, Victoria Reach, Balboa Reach, Miraflores Approach, and the Pacific Channel:

- a.** Vessels 900 feet (274.3 m) and over shall not meet any vessel between Gatun Locks and Atlantic Channel Buoys 11 during the hours of darkness.
- b.** Vessels designated PD1 or PD2 will not overtake another vessel or be overtaken between
- c.** Vessels designated as PD 1 or PD 2 will not overtake or be overtaken in the Pacific between buoys 1 and 2 in the Pacific Channel and Miraflores and Cocoli locks nor between the Atlantic Breakwater and the locks of Gatun and Agua Clara on the Atlantic side.
- d.** If for any reason the available width of the channel at Gatun Approach, Agua Clara Locks, Balboa Reach, Victoria Reach is less than 630 feet the following additional restriction will apply:
 - (1) Vessels with a LOA of 700' or over, not in compliance with the published visibility requirements will have a clear channel basin-to bridge restriction, and clear channel restriction between buoy 13, and Agua Clara or Gatun Locks.
 - (2) The restrictions in Table IV on the next page will apply.

VESSEL		RESTRICTIONS WHEN CHANNEL IS LESS THAN 630'			
LENGTH OVERALL (LOA)(feet)	BEAM (feet)	CLEAR CHANNEL	DAYLIGHT TRANSIT	DAYLIGHT IN THE CUT	CLEAR CUT
1,205	Over 106.2	YES	YES ⁽⁸⁾	YES	YES
	100 – 106.2	YES ⁽¹²⁾	YES ⁽⁸⁾	YES ⁽⁵⁾	YES
	95.0 – 99.99	YES ⁽¹²⁾	YES ⁽⁸⁾	YES ⁽⁵⁾	YES
	91.0 – 94.99	YES ⁽¹²⁾	YES ⁽⁸⁾	YES ⁽⁵⁾	YES ⁽⁷⁾
	85.0 – 90.99	NO	NO	NO	NO ⁽⁶⁾
	80.0 – 84.99	NO	NO	NO	NO ⁽⁶⁾
570 or over	75.0 – 79.9	NO	NO	NO	NO
	Less than 75.0	NO	NO	NO	NO
Less than 570	75.0 – 79.99	NO	NO	NO	NO
	Less than 75.0	NO	NO	NO	NO

TABLE IV – Restrictions when channel is less than 630'

NOTES

(5) Unless qualified for transiting the Cut at Night.

(6) Clear Cut at night if draft exceeds 38 feet and have no other restrictions.

(7) Clear Cut at night but it may meet other vessels during daytime with a combined beam limitation of 170 feet.

(8) Except when qualified for HML transit of the locks.

(12) Vessels with a LOA of 900 feet or over, will be clear channel at night between Gatun Locks and buoy 11 of the Atlantic Entrance.

2.4 Overtaking and Speed Limitations

a. Except when authorized by the Canal Operations Captain (Transit Operations Division Executive Manager), a power-driven vessel shall not overtake and pass another power-driven vessel in Gaillard Cut, Mamei Curve, Bohio Bend between Buoys 38 and 40A, or in any channel under 700 feet (213.4 m) in width, such as the Pacific entrance channel between Buoys 15 and 16 and Miraflores Locks, and the Atlantic channel from Gatun Locks to Buoy 15. This paragraph does not apply where either the overtaking or the overtaken vessel is less than 150 feet (45.7 m) in length or is an ACP power-driven vessel, with or without a tow. In no case will one vessel overtake another without permission being given to do so by the overtaken vessel.

b. In addition to the safe speed requirements contained in *ACP Navigation Regulations, Annex, article 108 (Rule 5)*, all pilots, towboat masters, launch operators and vessel operators are expected to proceed with due regard for the wave-making characteristics of the vessel and for the safety of personnel and equipment. Even with no obvious work in progress and no signals displayed, the amount of wake generated when passing the Transit Resources Division dock at Diablo, the Gamboa Dredging Division area, and other docks and launch landings along the waterway should be limited.

2.5 Dangerous Cargo

a. *Precautionary Measures*

The precautionary measures assigned by the Authority to vessels with dangerous cargo vary depending on the inherent properties of the cargo and whether it is transported in bulk or packaged. Following is background information on this subject:

(1) Regulations require vessels to submit detailed information to MTC concerning all dangerous onboard. This information must be declared via the Maritime Portal no less than 96 hours in advance of arrival.

(2) Based on this information a single Precaution Designator (PD) is assigned to each vessel by the Transit Operations Division.

(3) The ship will be assigned the PD corresponding to the most restrictive packaged cargo, bulk cargo, empty tank, or slop tank onboard.

(4) The PD assigned to each vessel sets forth restrictions and other measures to be taken for that vessel while in Canal Waters.

(5) When a vessel does not provide the necessary information as required by the regulation, an "**H**" or "**HOLD**" is assigned. This means that the vessel will not be allowed to transit, dock or enter the Inner Anchorage of Cristobal until the cargo information is made available.

(6) All vessels (public, commercial, private, ACP, etc.) shall have a PD assigned for *transiting* the locks. MTC shall be notified when ACP vessels will have dangerous cargo on board in order to assign the appropriate PD. A PD-N will also be assigned to private yachts, commercial towboats, and fishing vessels under 125 feet (38 m).

(7) Any vessel which has been assigned a PD from 1 to 6 shall display an identifying flag by day and a red light by night. Flag "B" (BRAVO) indicates flammables or explosives aboard (PDs 1, 3, 4 & 5). Flag "T" (TANGO) indicates toxic or radioactive materials (PDs 2 & 6). Only the general nature of dangerous cargo aboard is thus identified. To determine the specific precautionary measures to be taken for a given vessel due to dangerous cargo refer to the PD, not the flag.

(8) Unless notified by the appropriate operator, PDs will be assigned to ACP barges according to Table V.

(9) No exception to this section shall be made without the approval of the Executive Vice President for Operations or the Transit Operations Division Executive Manager. If approval is obtained, OPTS, OPTN, OPTS-CP1, OPTN-CP1, OPTC, OPTC-T, OPTC-TST, and OPTC-TPT must be notified immediately by *E-mail* of the "approved exception." However, the general policy is not to make exceptions to these standards.

ACP Barge Name	Operator	Normal Cargo	PD
102	OPD	Diesel Oil	4
103	OPD	Diesel Oil	4
104	OPD	Diesel Oil	4
105	OPD	Diesel Oil	4
Navigation Barge No. 2	OPR	Diesel Oil	4
Explosive Float 1	OPD	Explosives [NMT 2,268 Kg (5000 pounds)]	5
Explosive Float 2	OPD	Explosives [NMT 2,268 Kg (5000 pounds)]	5
Explosive Float 3	OPD	Explosives [NMT 2,268 Kg (5000 pounds)]	5
Explosive Float 4	OPD	Explosives [NMT 25 Kg (55 pounds)]	5
Explosive Float 5	OPD	Explosives [NMT 25 Kg (55 pounds)]	5

TABLE V - PDs Assigned to ACP Barges

b. Responsibility

(1) Executive Vice Presidency for Operations managers shall ensure compliance with the dangerous cargo requirements of this section which are within their area of responsibility.

(2) The Transit Operations Division Executive Manager is responsible for maintaining the safe, efficient operation of the Canal and coordinating overall response to emergencies. Special circumstances may arise during which more or less restrictive procedures may be applied. Each such instance must be well-reasoned, appropriate to existing circumstances and shall not result in significant unnecessary risk. The Transit Operations Division shall be advised of each such incident as soon as possible, and when practicable, beforehand.

c. Procedures

(1) Table VI sets forth the precautionary measures to be taken for each vessel due to its cargo, according to its assigned PD.

PRECAUTIONARY MEASURES DUE TO CARGO ¹															
PD	Flag ²	Hot Work	Tandem Lock	ACP Craft	Hand Line	Explo. Anchor _{8/9}	Atlantic Inner Anchor	Balboa Basin/ Cartagena/ Cucaracha	Clear Cut	Chann. Rest.	HML Qual	NIC Qual	Gatun Lake (night)	Pilot Cristo. Harbor	Locks Fire Truck
H			DANGEROUS CARGO HOLD, AVOID CANAL WATERS, OUTER EXPLOSIVE ANCHORAGE ONLY												
1	B	NO ³	YES ¹⁰	NO	NO	YES	NO ⁴	NO	YES ¹⁵	YES ⁵	YES ⁶	YES ¹³	YES ¹⁴	YES	YES
2	T	YES	YES ¹⁰	NO	NO	YES	NO ⁴	NO	YES ¹⁵	YES ⁵	YES ⁶	YES ¹³	YES ¹⁴	YES	NO
3	B	NO ³	YES ¹⁰	YES ¹¹	YES ¹²	YES	NO ⁴	YES	NO	NO	YES	YES	YES	YES	YES
4	B	NO ³	YES	YES ¹¹	YES ¹²	YES	NO ⁴	YES	NO	NO	YES	YES	YES	YES	NO
5	B	NO ³	YES	YES	YES	YES	NO ⁴	YES	NO	NO	YES	YES	YES	YES	NO
6	T	YES	YES	YES	YES	NO	YES	YES	NO	NO	YES	YES	YES	NO	NO
7	NO PRECAUTIONARY MEASURES DUE TO DANGEROUS CARGO														
N	NO DANGEROUS CARGO														

TABLE VI - Precautionary Measures Due to Cargo

NOTES:

1. Precautionary measures in this section are due to dangerous cargo. Normal operating restrictions also apply.
2. Vessel shall fly BRAVO or TANGO flag as indicated by day and display a red light at night.
3. No hot work, smoking, open flame or other possible sources of ignition within a perimeter of 50 ft (15.2 m) of the occupied lock chamber. This applies to both that portion of the locks and any vessels within a perimeter of 50 ft (15.2 m).
4. Unless specifically authorized by the Canal Port Captain (CPC), Cristobal, or in his absence, the duty Canal Port Captain, and then only in the explosive anchorage.
5. In addition to normal operating restrictions, vessels designated as PD-1 or PD-2 will not overtake or be overtaken in the Pacific or Atlantic approach channels. Furthermore, where those channels are less than 630 feet (192.07 m) in width, the following restrictions will apply:
 - a. Vessels with PD-1 or PD-2 and a beam of 100 ft (30.49 m) or over will be clear channel.
 - b. Vessels with PD-1 or PD-2 and a beam of less than 100 ft (30.49 m) shall not meet other vessels that would result in a combined beam of 180 ft (54.86 m) or more.
6. Not High Mast Lighting qualified if beam is over 100 ft (30.48 m)
7. Reserved.
8. PD-1 and PD-3 vessels left at Gatun Anchorage without a pilot go to the explosive anchorage. Any overflow of vessels on the same category, and all other PD vessels without a pilot shall anchor at the eastern side of the Gatun Anchorage Basin, filling in to the east of a line connecting Buoy Nos. "A" and "7".
9. Exceptions could be approved on a case-by-case basis by the Canal Operations Captain upon advice from the Transit Operations Division Chemist Section.
10. When a PD-1, 2 and 3 is involved in a tandem, the aggregate overall length of the two vessels will not be in excess of 800 feet (243.9 m).

11. ACP hand line craft and single vessels limited to 850 feet (259.08 m), providing no commercial hand line in the lockage; ACP hand line craft and tandem limited to 800 feet (243.9 m) aggregate overall length providing no commercial hand line in the lockage.
12. Commercial hand line craft and single vessels limited to 725 feet (221. m) in up lockages, and 800 feet (243.9 m) in down lockages. Commercial hand line craft and tandem limited to 675 feet (205.8 m) aggregate overall length in up lockages, and 750 feet (228.6 m) in down lockages.
13. A vessel of 100 feet or more in beam, or of 800 feet or more in length overall, with precautionary designator PD-1 or PD-2 shall not qualify for Transiting the Cut at Night. However, this restriction shall not apply to full container vessels.
14. Tankers and bulk-carriers 100 feet or more in beam with a precautionary designator PD-1 or PD-2 shall not be scheduled (as updated at the time the vessels is underway in Gatun Lake or the Gaillard Cut) to transit any portion of Gatun Lake between Gamboa Signal Station and Buoy 16 during the hours of darkness
15. Except for full container vessels, vessels involved in meetings in Gaillard Cut shall not have a precautionary designator PD-1 or PD-2.

(2) Table VII sets forth the PD and Flag for each IMO class and division of hazardous bulk and packaged cargoes.

(3) PD for liquid and gas tankers not gas-free shall be assigned as if they carry their last cargo. (Inert tanks are not considered gas-free).

(4) For PD 1 or 2, a minimum CP-4/2 pilot is required. For PD 3, 4 and 5, a minimum CP-4/1 pilot is required.

d. Tankers Claiming Cargo Tanks as "Gas Free" or "Inert"

In order to standardize the term "gas free" for applicability of the ACP Navigation Regulations, Chapter IX, Dangerous Cargo, and its interpretation when used by tankers in the pre-arrival radio message to the Marine Traffic Control required by the *ACP Navigation Regulations*, the following policy is established:

(1) The term "gas free" is widely used within the shipping industry and the level of being gas free has several values depending on the application. For the ACP, a vessel's cargo or slop tanks are considered to be GAS FREE if they meet the following criteria:

(a) They have been stripped of flammable liquid residues

(b) Their oxygen content is at least 19.5% but not greater than 22% by volume, and

(c) Their concentration of flammable vapors or gases in their atmospheres is less than 10 percent of the Lower Explosive Limit (LEL).

The goal is to have a vessel which, while in transit or at dock, is safe enough to endure a collision and not risk an explosion.

(2) To bring this definition to a working application for transiting or docking vessels, empty tanks shall be tested by the crew and verified safe for entry and hot work. When

applicable, masters will report in their pre-arrival radio message the following: "**All cargo tanks and cargo slop tanks are gas free and considered safe for entry and safe for hot work.**" Vessels with inert gas systems on board shall provide the following information in their pre-arrival radio message:

- (a) If cargo tanks have been stripped of cargo and are inert.
- (b) If the inert gas system is operational.
- (c) The last cargo carried.

PRECAUTION DESIGNATORS (PD) AND FLAGS FOR IMO CLASSIFICATIONS					
IMO CLASS AND DIVISION	DESCRIPTION	BULK CARGOES		PACKAGED CARGOES	
		PD	FLAG	PD	FLAG
1.1	Explosives, mass explosion hazard (2 tons or more)	----	----	3	B
1.1	Explosives, mass explosion hazard (less than 2 tons)	----	----	5	B
1.2	Explosives, projection hazard (5 tons or more)	----	----	5	B
1.3	Explosives, fire hazard (5 tons or more)	----	----	5	B
1.4	Explosives, no significant hazard (5 tons or more)	----	----	5	B
1.5	Explosives, very insensitive substances with mass explosion hazard (5 tons or more)	----	----	5	B
1.6	Explosives, extremely insensitive articles without mass explosion hazard	----	----	7	----
2.1	Flammable gases	1	B	7	----
2.2	Non-flammable, non-toxic gases	7	----	7	----
2.3	Toxic liquefied anhydrous ammonia only	2	T	6	T
2.3	All other toxic gases	6	T	6	T
3	Extremely flammable liquids, flash point: below -27°C (*)	1	B	7	----
3	Very flammable liquids, flash point: -27°C to below +18°C	3	B	7	----
3	Flammable liquids, flash point: +18°C to +60°C	4	B	7	----
	Combustible liquids, flash point: above +60°C	7	----	7	----
4.1	Flammable solids	7	----	7	----
	Coal in bulk, mhb per the bc code	5	B	----	----
4.2	Spontaneous combustible solids	7	----	7	----
4.3	Dangerous when wet solids	7	----	7	----
	Direct reduced iron (dri) in bulk, mhb per the bc code	5	B	----	----
5.1	Oxidizing substances	7	----	7	----
5.2	Organic peroxide	7	----	7	----
6.1	Toxic substances	6	T	6	T
6.2	Infectious substances	6	T	6	T
7	Radioactive material	----	----	6	T
8	Corrosive substances	6	T	7	----
9	Miscellaneous dangerous substances and articles	7	----	7	----
	Hazardous solid materials transported in bulk listed in group b, bc code (except coal and dri)	7	----	----	----
	Substances listed in appendix i, annex i MARPOL not classified as dangerous cargo	7	----	7	----

TABLE VII - Precaution Designators & IMO Classifications

NOTES: - Less than 5 tons of IMO 1.2, 1.3, 1.4 and 1.5 are PD: 7
 - BC CODE: Code of Safe Practice for Solid Bulk Cargoes
 - MHB: Material Hazardous Only in Bulk

(*) Exception for double-hull vessels: tankers transporting residues and slops with a flash point below -27°C in slop, residual or retention tanks will be assigned PD-3.

e. Reporting Shipments of Hazardous Wastes

(1) Vessels transporting hazardous wastes that are subject to the control of the Basel Convention on their trans-boundary movements and disposal are required to report their shipment to the Panama Canal authorities in the vessel's advance radio messages. The wastes are to be identified by correct technical name, United Nations Number and International Maritime Organization (IMO) Class and Division if applicable.

(2) Additionally the following advance information should be provided to the Chemists, Senior Canal port captain's Office, Pacific:

(a) Copy of a movement document, indicating the point at which the trans-boundary movement commences and the point of disposal, name of competent authorities, responsible parties and any other requirements as required by Articles 6, 11 and any other article of the Basel Convention.

(b) Copy of Certification from shipper that the hazardous wastes are packaged and labeled in conformity with applicable IMDG (International Maritime Dangerous Goods Code) requirements.

f. Reporting Dangerous Cargoes in Bulk

(1) Complete information pertaining to dangerous cargo transported in bulk aboard vessels must be provided to the Panama Canal Authority prior to entering Canal waters. It is an ACP requirement that all cargo in bulk, either liquefied-gas, liquid or solid be reported in detail via Maritime Portal no later than 96 hours before ETA. . In order to ensure efficient vessel scheduling for our customers, timely and complete information regarding dangerous cargo is of paramount importance.

(2) Tankers shall report the cargo loading condition of each tank separately, including slop tanks. Specific information required includes the following:

(a) For tanks with cargo (includes slop tanks): Proper shipping name, IMO class, and UN Number of cargo; amount of cargo in metric tons; flashpoint in °C, if applicable; and the condition of the vapor space (inerted or not inerted)

(b) For empty tanks or tanks containing slops (or residues): Proper shipping name, IMO class, and UN Number of last cargo or residue; amount of residue or slops; flashpoint in °C of last cargo or residue, if applicable; and atmospheric condition of tanks (inerted and not gas free; inerted and gas free; not inerted and not gas free; not inerted and gas free).

(c) Current cargo and last cargo information must be reported even if either of the aforementioned is not listed as dangerous cargo. In such case, the information on proper shipping name, IMO Class, and UN number may be replaced by the corresponding description and harmonized code as set forth by the World Customs Organization (WCO).

(3) All solid bulk cargo carried aboard dry-bulk carriers or general cargo carriers shall be reported via Maritime Portal. The report shall provide the technical names of the cargo in accordance with the International Maritime Solid Bulk Cargoes Code (IMSBC Code).

g. Reporting Shipments of Direct Reduced Iron

(1) Vessels transporting Direct Reduced Iron (DRI) in any of its forms, hot or cold molded briquettes, lumps, pellets or by-product fines, are required to report the shipment by its correct Bulk Cargo Shipping Name (BCSN) to the Traffic Management Unit in the vessels' advance radio messages.

(2) DRI has been classified by IMO as belonging to the "Materials Hazardous only in Bulk, MHB" class and is listed in the IMO's International Maritime Solid Bulk Cargo Code (IMSBC), Appendix 4." The IMO number for cold molded briquettes, lumps or pellets is "BC No. 15" and for hot molded briquettes is "BC No. 16."

(3) Additionally, the following advance information should be provided to the Marine Chemists at Transit Operations Division:

(a) Copy of certification that DRI is suitable for loading.

(b) Copy of certification that DRI conforms to IMO requirements.

(c) Statement from master or shipper that IMO precautions as listed in the "Code of Safety Practices for Solid Bulk Cargoes" for cold or hot molded briquettes have been followed.

(d) Copy of procedures to be followed by the ship to ensure safety of ship and cargo in the event the cargo gets wet.

(e) Statements from Master that the hazardous wastes packages are stowed in accordance with applicable IMDG requirements and on his planned response procedures to be followed by the ship to ensure safety of ship and crew in the event the hazardous waste is spilled or leaked.

(f) Proof of financial responsibility and adequate provision for indemnity covering public liability and loss to the Panama Canal Authority consistent with international practice and standards as set forth by the Treaty Concerning the Permanent Neutrality and Operation of the Panama Canal.

h. Reporting Radioactive Cargoes

(1) The International Atomic Energy Agency (IAEA) is the United Nations Agency authorized by statute to develop and promulgate regulations for the safe transport of radioactive materials. The IAEA publishes its **Regulations for the Safe Transport of Radioactive Material** which provide the international basis for the development of requirements for the different modes of transport. The International Maritime Dangerous Goods (IMDG) Code is the binding document making these regulations compulsory to all Member States of the International Maritime Organization.

(2) Consequently, as the Regulations for the Navigation in Panama Canal Waters include the IMDG Code by design, ships transporting radioactive material must comply with the Regulations for the Safe Transport of Radioactive Materials.

(3) For additional or specific requirements of any radioactive material shipment, please contact the Dangerous Goods Transport Specialist at the Canal port captain's (Pacific) Office at:

Phone: (507) 272-4112

Fax: (507) 272-3015

E-Mail: cargoinfo@pancanal.com

i. Coverage requirements for transiting vessels carrying radioactive cargoes

(1) Transiting vessels carrying radioactive material as cargo shall provide the Panama Canal Authority with current proof of financial responsibility and adequate provision for indemnity to third parties as a guarantee against any possible damage and/or loss to the Republic of Panama, the Panama Canal Authority, and/or any other agency, including coverage to persons, lives and property.

(2) The aforementioned insurance policies must include the Panama Canal Authority (ACP) as an *Additional Named Assured*. Considering that these insurance policies are for liability coverage, ACP may be regarded as a third party with a right to claim under that policy. As a result, the terms and conditions of the policy must clearly establish that including ACP as an *Additional Named Assured* does not preclude the ACP from presenting a claim under such policy, and does not curtail, in any way, the right of the ACP to be indemnified for any damages that may be suffered.

(3) The following requirements of coverage from transiting vessels carrying specific radioactive cargoes will apply:

(a) For all IMO Class 7 material in excepted packages and non-fissile material in industrial packages, transiting vessels must provide either/or:

- A "coverage in full" certificate issued by any P&I Club part of the International Group, including:

- Four-fourths (4/4) of the assured (s) liability arising out of collision with another ship, and
- Liability for loss or damage to any fixed or floating object (FFO).

If the "Hull & Machinery" Policy covers the above, the same must be provided, or

- A minimum amount of US\$20,000,000.00 (twenty million dollars) of liability insurance per TEU container. The Panama Canal Authority may request an increase in the amount of insurance as a result of risk evaluation made by ACP officials.

(b) For fissile radioactive material in industrial packages, and for all fissile and non-fissile radioactive material in Type A, Type B(U), and Type B(M) packages, transiting vessels must provide either/or:

- A “coverage in full” certificate issued by any P&I Club part of the International Group, including:
 - Four-fourths (4/4) of the assured (s) liability arising out of collision with another ship, and
 - Liability for loss or damage to any fixed or floating object (FFO).

If the “Hull & Machinery” Policy covers the above, the same must be provided, or

- A minimum amount of US\$30,000,000.00 (thirty million dollars) of liability insurance per TEU container. The Panama Canal Authority may request an increase in the amount of insurance as a result of risk evaluation made by ACP officials.

(c) For radioactive cargoes under special arrangement or not consolidated in freight containers or any other radioactive cargo not specifically identified in this Notice, please contact our Dangerous Goods Transport Specialist at the Canal port captain’s (Pacific) Office (507) 272-4112, or fax (507) 272-3015.

j. *Advance Notification of Shipments of Fissile Materials*

(1) The Panama Canal Authority (ACP) requires a 30-day advance notification for vessels that will be transiting the Panama Canal carrying radioactive cargo containing fissile materials.

(2) Therefore, vessels in this category must provide, in addition to the 30-day advance notification, full documentation of applicable certificates and technical details of the cargo in order to allow the Panama Canal Authority the opportunity to verify the compliance of the cargo with the current amendment of the IMDG Code. Those vessels that do not comply with the advance submittal of the documentation will not be approved transit through the Panama Canal or may be subject to delays until such time that the documentation review is completed.

(3) For additional details on the required documentation mentioned above, please contact the ACP Dangerous Goods Transport Specialist at the Canal port captain’s (Pacific) Office at telephone number (507) 272-4112 or fax (507) 272-3015.

2.6 Loading and Unloading Explosives

a. *General:* Explosive cargoes will not normally be loaded/unloaded at Authority facilities. The exception is consignment to the Authority, which may be handled at the Reserve Landing in Gamboa. Explosives handled as cargo at a waterfront facility and at an inland facility and explosives handled as part of Canal operations (e.g., dredging), shall be under the safety cognizance of the Safety Division.

The purpose of this section is to describe the procedures and amplifications found necessary to implement *ACP Navigation Regulations, articles 132 to 134*, and regulate the use of Authority facilities for loading and discharging explosives. Deviation from this Section may be directed by the Authority if special circumstances so warrant.

b. Procedures

(1) The Transit Operations Division Executive Manager provides safety oversight for all operations involving the transfer of explosives to or from vessels within Canal operating waters and at ACP waterfront facilities. To conduct the oversight program, a marine safety specialist monitors the explosive handling operation to ensure safety guidelines are met, conducts on-site and vessel inspections to ensure applicable standards are being applied, and will participate in any pre-operation planning.

(2) As required by the *ACP Navigation Regulations, Annex, article 134*, the application shall be submitted to the marine safety advisor for review and authorization. The application with attachments shall be submitted at least ten working days prior to the requested explosive handling operation. Form 4606, Application and Permit to Load/Offload Explosives, is available at the Safety Division.

(3) In general, the U.S. Coast Guard Explosive Loading Guidance is utilized to establish our policy with regard to explosive Quantity/Distance (Q/D) restrictions and their policy takes into consideration the Net Explosive Weight limitations under certain conditions and within certain time restraints.

(4) The following guidelines will be applied to break-bulk, roll-on/roll-off and containerized explosive shipments:

(a) The Quantity/Distance tables are applicable to any IMO explosive cargo.

(b) Operations shall cease during storms. When securing from an operation, the hatch shall be closed with the permanent hatch, and not merely covered.

(c) Operations shall not begin until 30 minutes after local sunrise and shall be secured by 30 minutes prior to local sunset. Beginning and securing mean the actual movement of cargo. Preparation to begin or operations to secure may occur outside the sunrise/sunset limits. The Safety Division may grant exceptions to this and will be contingent on adequate lighting being provided.

(d) For the purpose of determining the Net Explosive Weight to use in entering Paragraph 6.b (2), the entire hazardous material content of the vessel plus the content on the pier shall be used.

(e) Explosive cargoes may not be stored on ACP pier facilities or staging areas at any time.

(f) Scheduling of explosive handling operations is subject to Canal traffic conditions. Once in progress, they may be suspended due to Canal operational requirements at the request of the Transit Operations Division Executive Manager or his representative. It may also be suspended at any time if, in the opinion of the Safety Division on-site inspector, conditions have changed in such a way that the safety of the operation is jeopardized.

(5) The guidelines listed above will be used by the Safety Division in conjunction with other factors (i.e., population density, topography, property use, Q/D tables, alternative sites, etc.) in making a final decision to authorize or not authorize the requested operation; therefore, the necessity to notify the Safety Division ten working days in advance of the requested operation.

2.7 Tandem Lockages

a. At Miraflores, Pedro Miguel and Gatún locks, two vessels not more than 825 feet (251.5 m) in aggregate overall length may normally make tandem lockages whenever directed. When the combined length exceeds that limit, special authorization is required from the Transit Operations Division Executive Manager, *which may be granted for emergencies*. When a vessel (excepting container vessels) designated as PD-1, 2 or 3 is involved in a tandem, the aggregate overall length of the two vessels may not be in excess of 800 feet (243.9 m). In all cases, the lead ship shall be placed as far forward in the chamber as is safely possible.

b. At Miraflores, Pedro Miguel and Gatún locks, ACP equipment can make the lockage with a tandem when the combined length of all three vessels does not exceed 800 feet (243.9 m.)

c. At Miraflores, Pedro Miguel and Gatún locks, commercial handlines can make the lockage with a tandem when the combined length of all three vessels does not exceed 675 feet (205.74 m) on an up-lockage and 750 feet (228.60 m) on a down lockage.

d. At Miraflores, Pedro Miguel and Gatún locks, commercial handlines and ACP equipment can make the lockage with a tandem when the combined length of both tandem vessels and the longest of the nested handlines does not exceed 750 feet (228.60 m). If the handlines are not nested together, the maximum aggregate length will be restricted to 725 feet (221 m).

e. At Miraflores, Pedro Miguel and Gatún locks, for tandems in excess of 725 feet (221 m) and for any lockage when the lockmaster considers it expedient, the pair of gates immediately behind the second vessel shall be left in the open position. Both pairs of gates ahead of the lead vessel shall be closed whenever possible. [This operation is possible in Pedro Miguel and in the upper chamber of Gatun or Miraflores Locks.]

f. When moving from chamber to chamber and when leaving the last chamber, the bow locomotive of the second vessel shall maintain a distance of at least 200 feet (61 m) from

the stern locomotive of the first vessel. When leaving, the locomotives' cables shall not be cast off the second vessel until the first vessel is clear of the lock chamber. Normally, when the green lights on the locomotives on both vessels are displayed, a constant interval between vessels will be maintained.

2.8 Handline Lockages

Except with vessels assigned PD 1 and 2, handlines can be locked at Miraflores, Pedro Miguel and Gatun locks as follows:

- a.** A commercial handline may lock with a single vessel as long as the aggregate overall length (vessel and handline) does not exceed 725 feet (221 m) for up lockages and 800 feet (243.84 m) for down lockages. When more than one handline will lock nested with a vessel, the length of the largest piece will be used in calculating the aggregate overall length. However, handlines normally will not be locked both ahead and astern of the vessel(s) in a lockage.
- b.** ACP equipment may be locked with any vessel provided the aggregate overall length does not exceed 850 feet (259.08 m) and that the ACP equipment are the only handlines in the lockage.
- c.** ACP equipment with commercial handlines alongside can lock with an aggregate overall length limited to 800 feet (243.90 m) with single vessels, and to 750 feet (228.66 m) with tandems. When not tied alongside, the aggregate overall length of the vessel and the small crafts is limited to 750 feet (228.66 m) with single vessels, and to 725 feet (221.04 m) with tandems. Vessels with PD-1, PD-2, PD-3 or PD-4 will not be able to participate in these lockages.
- d.** A commercial handline vessel locking with a larger vessel should normally be placed astern of the larger vessel on “up” lockages and ahead on “down” lockages. ACP tugs may be placed at either end of the chamber when approved by the Canal port captain on duty to meet operational requirements, when previous arrangements have been made with the locks or in case of emergency. Exceptions are also made at Pedro Miguel when vessels are tied up because of fog. . When the combined length exceeds the limits set forth on paragraphs a. b. and c. above, special authorization is required from the Transit Operations Division Executive Manager or his designee.

2.9 Short Chamber Lockages

(NOTE: This procedure is not available in the lower chambers at Miraflores Locks.)

Under normal operating conditions the full chamber length will be used for lockages. When special instructions are issued for saving water, or when desirable for other

reasons, short chamber lockage procedure, using the intermediate gates and the short-chamber section, may be used. An extra short section; however, it is used only at Pedro Miguel Locks for the rapid movement of handline vessels.

(1) Whenever a lockage is to be handled in a short chamber, the lockmaster shall inform the pilot by radio. Vessels of 500 feet (152.4 m) or less may be placed in short chambers when it is necessary. During efforts to conserve water, the maximum length may be increased to 525 feet (160.02 meters). Vessels of 400 feet (121.9 m) or more, dispatched as PD 1 through 6, shall be given full chamber. Vessels of 350 feet (106.7 m) or less, dispatched as PD-4 through 6, that are accompanied by handlines shall be given a full chamber. All ships operating on nuclear power shall be given full chamber.

(2) When the chamber sections are equalized the intermediate gates will be opened. Pilots should not proceed until the far gates are opening. Should the pilot choose to move up in the chamber, he should notify the lockmaster and proceed at reduced speed after the intermediate gates are fully open.

2.10 Length, Beam and Draft

- Vessels transiting the Panamax Locks.
 - a.** The maximum length overall, including bulbous bow and protrusions, for a commercial vessel acceptable for regular transit is 950 feet (289.56 m), except passenger and container ships may be 965 feet (294.13 m) overall.
 - b.** The maximum beam between the outside surfaces of the shell plating for a commercial vessel, or an integrated tug-barge combination acceptable for regular transit, is 106 feet (32.31 m).
 - c.** A vessel's initial transit draft may not exceed 35.5 feet (10.82 m) TFW (deepest point of immersion) unless a deeper transit draft for the vessel is authorized by a Panama Canal port captain.
- Vessels transiting the Neopanamax Locks.
 - d.** The maximum length overall including bulbous bow for commercial or non-commercial vessels acceptable for regular transit of the Neopanamax locks is 366.0 m (1200.8 ft.).
 - e.** The maximum beam for commercial or non-commercial vessels and the integrated tug-barge combination acceptable for regular transit of the Neopanamax locks measured at the outer surface of the shell plate and all protruding structures below the lock walls is 49.00 m (160.76 feet).

f. All vessels transiting the Canal should have sufficient ballast to permit safe handling during transit. Drag must not adversely affect maneuverability and/or visibility. The minimum saltwater transit drafts are shown in Table VIII.

LENGTH	MINIMUM DRAFT TSW
Up to 425' (129.5 m)	Trimmed so pilot can see the ranges over the forecastle from center of navigation bridge
Over 425' (129.54 m)	8' (2.44 m) forward, 14' (4.27 m) aft
Over 475' (144.78 m)	18' (5.49 m) forward, 20' (6.10 m) aft
Over 525' (160.02 m)	20' (6.10 m) forward, 22' (6.71 m) aft
Over 580' (176.78 m)	22' (6.71 m) forward, 24' (7.32 m) aft
Over 625' (190.50 m)	24' (7.32 m) forward, 26' (7.92 m) aft
Over 1,000' (304.80 m)	26' (7.92 m) forward, 28' (8.53 m) aft
Over 1,100' (335.28 m)	28' (8.53 m) forward, 30' (9.14 m) aft

TABLE VIII - Minimum Saltwater Draft

g. Masters of vessels that are unable to ballast to the above drafts will be required to take their maximum ballast. After maximum ballast condition has been reached, if the required drafts have not been attained, the vessel will be evaluated by a Canal port captain to determine under what conditions it may transit. Additional constraints may be imposed, which may include the assignment of extraordinary tug assistance (tug on pilot's request) and channel or daylight restrictions. In all such cases, the master must execute Form 4322 releasing the Authority from liability.

h. Vessels may be denied transit when the vessel's maximum point of immersion exceeds its maximum authorized transit draft, or when the vessel's maximum point of immersion exceeds the published TFW maximum draft then in effect.

i. Vessels whose list, trim or handling characteristics are such as to endanger themselves, Canal appurtenances and/or a third party, may have further limitations placed on them to insure safe transit.

j. The draft of non-self-propelled barges 550 feet (167.64 m) or more in length may be limited when, in the opinion of Canal authorities, such limit is necessary to insure safe transit.

k. Whenever the pilot in charge of a vessel making a transit discerns or is informed that the draft is more than 3 inches (8 cm) in excess of the allowed loadline limit, he shall report the fact to the Transit Operations Division Executive Manager and request a tug or tugs for the balance of the transit. Whenever a vessel develops an excessive draft condition or an undesirable list or trim, the vessel shall be anchored or tied up at the earliest opportunity as authorized by *ACP Navigation Regulations, article 3*. The use of a tug or tugs shall be mandatory for the transit or partial transit of a vessel loaded beyond her marks, as above, with excessive list or trim.

l. When the point of maximum immersion of a vessel is known or suspected to exceed the published TFW maximum draft it shall be reported immediately to the Canal Port Captain on duty and the ship shall not be moved until instructions for its disposition are received. If the ship is found exceeding the published TFW maximum draft, it will be stopped in the next available area where it does not obstruct traffic, until the drafts are corrected. In cases where the vessel is unable to adjust its drafts to the published TFW maximum draft, the completion of the transit may be approved under certain circumstances, with additional resources and/or restrictions at the vessel's expense.

2.11 Release Requirements

a. *Release Form 4322, Undertaking to Release and Indemnify:* Vessels not in compliance with transit requirements may be required to execute an Undertaking to Release and Indemnify in order to continue the transit. If excessive draft or excessive trim or list is observed, the pilot of a vessel in Canal waters shall notify the Canal port captain, requesting assistance as required before proceeding. In all cases, unless the offending conditions are satisfactorily corrected, the master or commanding officer of the vessel must execute a Form 4322 to release the Canal from liability before the movement is resumed. (See copy of this form on page 30.)

b. *Release Form 4323, Undertaking to Release and Indemnify (ship dry-docked, docked or berthed by ACP pilot):* Masters of vessels will be required to execute this form undertaking to release the Authority from liability in case of accident for the identified problem when a vessel is to be docked, dry-docked, or berthed by a Canal pilot. Pilots or boarding officers are requested to have the master of the vessel sign the form prior to docking vessels in Balboa, Cristobal and Rodman harbors exceeding the drafts that are shown in Tables VI, VII and VIII of this section, or when a vessel is to be berthed on a pier that has inadequate or absent fendering and/or lighting. (See copy of this form on page 31.)

c. *Form 4327, Notice of Effect of Departing Without Investigation:* It is the pilot's duty to inform the Canal port captain immediately in the case of a vessel involved in an accident. In the case of grounded vessels, vessels that have struck the bank, and vessels that strike the locks, to the extent possible, the vessel should not be moved until contact is established with the Canal port captain. In no case should a vessel with the watertight

integrity of the hull in question be moved into the navigation channel or into the lock chamber. After consultation between the pilot, the Canal port captain, and the Canal Operations Captain, if the decision that is safe to proceed has been reached, the movement may continue. In the case of minor damage to the vessel, the Pilot shall inform the master of his right to have an investigation, and his duty to so request, if desired, as outlined in OP Notice to Shipping about "Marine Accident Investigations." Should the master decline to make such a request, the pilot shall fill in Form 4327 and have the master sign it. The pilot should not sign any documents provided by the vessel unless authorized to do so by the appropriate Canal authority. (See copy on page 32.)

d. *Form 3821 (OPTS), Mooring of a bunker vessel under compulsory pilotage by the ACP alongside a docked vessel:* Bunkering/fueling a vessel at any dock from a tank vessel moored alongside the offshore side of that ship is not considered by ACP to be a recommended practice in waters under Canal operation control. The Transit Operations Division Executive Manager may allow exceptions on a case-by-case basis; however, if this is done, ACP will require both vessels to sign Form 3821 (OPTS), "*Mooring of a bunker vessel under compulsory pilotage by the ACP alongside a docked vessel,*" before proceeding with mooring that requires an ACP pilot. (See copy on page 33.)



AUTORIDAD DEL CANAL DE PANAMÁ

Ship Identification No.

To: CANAL OPERATIONS CAPTAIN
UNDERTAKING TO RELEASE AND INDEMNIFY

I, _____ Master of the _____ for and in consideration of the _____ being permitted to
 (Name of vessel)

transit the Panama Canal under the following circumstances: (Check the applicable item(s) and delete others.)

- _____ (a) Transit at a draft greater than her allowable Panama Canal fresh water draft.
- _____ (b) The possibility exists that the vessel's draft may exceed her allowable Panama Canal draft. The vessel's draft will be read on arrival in fresh water and, if it is proven to be equal to or less than her allowable Panama Canal draft, this Undertaking to Release and Indemnify is null and void.
- _____ (c) Transit at less than minimum draft specified in article 52 of the ACP Navigation Regulation.
- _____ (d) Other deficiency(ies) or condition(s). (Specify).

do hereby undertake, for the said vessel, her owners, operators, charterers, crew, or any other persons having any interest in her, and for myself, to release the Panama Canal Authority and the Republic of Panama from, and to indemnify them against, any loss or damage, or any liability incurred by the Panama Canal Authority or the Republic of Panama under, or in respect to:

- (a) Articles 63 to 74 of the Panama Canal Authority Organic Law (Law No. 19 of June 11, 1997),
- (b) Property of the Panama Canal Authority, or the Republic of Panama; and
- (c) Panama Canal Authority employees to the extent and in the proportion that the above-described circumstances may proximately cause or contribute to a casualty and resulting damages.

By accepting the vessel in the above-described circumstances for transit, the Panama Canal Authority does not, and shall not be deemed to, waive any rights against the vessel, her owners and operators as stated in article 4 of the ACP Navigation Regulation.

(The following paragraph is not applicable for draft deficiencies.)

It is understood that the obligations assumed by the undersigned, on behalf of himself, the _____ her owners, operators, charterers, crew, or any other persons having an
 (Name of the vessel)

interest in the said vessel, as stated in this Undertaking to Release and Indemnify, shall continue in effect for all transits of the Panama Canal by the _____

(Name of the vessel)
 on and after _____ until such time as the Authority is satisfied that condition(s) noted
 (Date)

above has (have) been rectified. It is further understood that this document does not, of itself, grant continuing permission for the _____ to transit the Panama Canal in the above-stated
 (Name of the vessel)

condition. Such permission must be obtained from the Canal Operations Captain for each intended transit until such time as the condition(s) noted above has (have) been rectified.

WITNESSED:

 (Authorized ACP Official)

 (Owner/Master/Agent)

 (Title)

 (Vessel)

 (date)



AUTORIDAD DEL CANAL DE PANAMÁ

Ship Identification No.

TO: EXECUTIVE VICE PRESIDENT FOR OPERATIONS

**UNDERTAKING TO RELEASE AND INDEMNIFY
(Ship dry-docked, docked, or berthed by Canal pilot)**

I, _____ Master of the _____

for and in consideration of the _____ being dry-docked,
(Name of vessel)

docked or berthed by a pilot employed by the Panama Canal Authority under the following circumstances: (Check the applicable item(s) and delete others.)

- _____ (a) Main engine is not fully operational.
- _____ (b) Deck machinery is not functioning properly.
- _____ (c) Vessel subject to damage if operation requires landing alongside dock with inadequate fendering.
- _____ (d) Vessel is not fully manned for maneuver.
- _____ (e) No visibility forward due to vessel's excessive drag.
- _____ (f) The vessel's draft may exceed available depth of water at the assigned dock.
- _____ (g) Other deficiency(ies) or condition(s). (Specify).

do hereby undertake, for the said vessel, her owners, operators, charterers, crew, or any other persons having any interest in her, and for myself, to release the Panama Canal Authority and the Republic of Panama from, and to indemnify it against, any loss or damage, or any liability incurred by the Panama Canal Authority or the Republic of Panama under, or in respect to:

- (a) Articles 63 to 74 of the Panama Canal Authority Organic Law (Law No. 19 of June 11, 1997),
- (b) Property of the Panama Canal Authority, or the Republic of Panama; and
- (c) Panama Canal Authority employees to the extent and in the proportion that the above-described circumstances may proximately cause or contribute to a casualty and resulting damages.

By accepting the vessel in the above-described circumstances for dry-docking, docking or berthing, the Panama Canal Authority does not, and shall not be deemed to, waive any rights against the vessel, her owner, operators, charterers, or any other persons having interest in her.

It is understood that the obligations assumed by the undersigned, on behalf of himself, the _____

_____, (herein after referred to as "the vessel"), her owners, operators, charterers, crew, or any
(Name of the vessel)

other persons having an interest in the said vessel, as stated in this undertaking to release and indemnify, shall continue in effect for all dry-docking, docking or berthing with the assistance of a Canal pilot by the vessel on and after _____
(Date)

until such time as the Authority is satisfied that condition(s) noted above has (have) been rectified. It is further understood that this document does not, of itself, grant continuing permission for the vessel to dry-dock, dock or berth with the services of a pilot in the above-stated condition. Such permission must be obtained from the Executive Vice President for Operations or his designee for each intended dry-docking, docking or berthing until such time as the condition(s) noted above has (have) been rectified.

WITNESSED:

(Authorized ACP Official)

(Title)

(Date)

(Owner/Master/Agent)

(Vessel)

PANAMA CANAL AUTHORITY

4327 (OPT)
Rev. 10-2007

NOTICE OF EFFECT OF DEPARTING WITHOUT INVESTIGATION

On _____ the vessel _____
(SIN _____) or its cargo, crew or passengers, met with an accident or sustained an injury within the Panama Canal water
or water adjacent thereto, as follows: _____

(Brief description of accident, including place, circumstances, probable injuries, etc.)

As Master of the vessel involved, you have the right to have this incident investigated by the Board of Inspectors of the Panama Canal Authority. A request that such an investigation be conducted must be made in writing and addressed to the Chairman of the Board.

If you do not wish the incident investigated by the Board, you should be aware that, pursuant to article 74 of the Panama Canal Authority Organic Law (Law No. 19 of June 11, 1997), a claim for injuries to persons or property, including vessel damage, may not be considered by the Panama Canal Authority, or an action for damages lie thereon, unless prior to the departure from the Panama Canal of the vessel involved:

- (1) That an investigation of the accident and the injury caused has been completed according to a procedure that shall include a hearing by the Board of Inspectors of the Authority, as provided in the cited Law.
- (2) That the basis for the claim has been laid before the Authority.

In determining when a vessel has departed from Canal waters within the meaning of the statute requiring investigations of marine accidents prior to departure, the definition of the term "Canal Waters" contained in the ACP Navigation Regulation, article 8, is applicable. (Copy of the maps showing the two boundary lines is enclosed.)

Should you elect to sail without an investigation, it is requested that you acknowledge receipt of this notice by signing the enclosed copy thereof and return it to a Canal official.

Your cooperation will be appreciated.

Master, _____
(Name of vessel)



AUTORIDAD DEL CANAL DE PANAMÁ

Ship Identification No.

TO: CANAL OPERATIONS CAPTAIN

UNDERTAKING TO RELEASE AND INDEMNIFY
(Mooring of a bunker vessel under compulsory pilotage by the ACP alongside a docked vessel)

I, _____, Master of the _____ (hereinafter referred to as "the vessel"), for and in consideration of the vessel (please check applicable condition):

- having a bunker vessel under compulsory pilotage by the ACP thereto attached while docked
- being moored to a docked vessel while under compulsory pilotage by the ACP

do hereby undertake for the vessel, her owners, operators, charterers, crew, or any other persons having any interest in her, and for myself to release the Panama Canal Authority and the Republic of Panama from, and to indemnify it against, any loss or damage, or any liability incurred by the Panama Canal Authority or the Republic of Panama under, or in respect to:

- a. Damages resulting from navigation, as set forth in Articles 63-74, Chapter IV, Section Two of the Panama Canal Authority Organic Law.
- b. Property of the Panama Canal Authority, or the Republic of Panama; and
- c. Panama Canal Authority employees to the extent and in the proportion that the requested maneuver may proximately cause or contribute to a casualty and resulting damages.

By accepting the vessel for the maneuver described above, the Panama Canal Authority does not, and shall not be deemed to waive any rights against the vessel, her owner, operators, charterers, or any other persons having interest in her.

It is understood that the obligations assumed by the undersigned, on behalf of himself, the vessel, her owners, operators, charterers, crew, or any other person having an interest in the vessel, include the commitment by the vessel to follow good industry practices for bunkering operations and taking all measures to avoid pollution of Canal waters and surrounding environment. A safety checklist based on an agreed bunkering plan between both vessels shall be employed. As a minimum, the plan and ensuing checklist shall account for grades and total quantities to be transferred, transfer rates and times, pre-transfer checks, communication procedures, responsible parties aboard each vessel, equipment checks during transfer, tank soundings, normal finalization procedures, and emergency operations (including notification of incidents/accidents).

It is further understood that this document does not, of itself, grant future permission for similar activities. For each intended mooring by a Canal pilot of a bunker vessel to the offshore side of a vessel for bunkering, permission must be obtained from the Canal Operations Captain or his designee.

MASTER OF THE VESSEL

NAME: _____
 SIGNATURE: _____
 DATE: _____

AUTHORIZED ACP OFFICIAL

NAME: _____
 TITLE: _____

2.12 Assignment of Locomotives, Wires and Deckhands at the Panama Locks

The number of locomotives, wires, deckhand leaders and deckhands that are normally assigned to a transiting vessel scheduled to transit the Panamax locks, depending on size and displacement, are established in Table IX. These guidelines can be modified by the Transit Operations Division Executive Manager, or his designee, to satisfy specific requirements of the ship, such as the case of large, deep-draft vessels.

VESSEL SIZE		VESSEL TYPE	DRAFT	MAXIMUM DISPLACEMENT (Long Tons)		LOCOS	WIRES	DECKHAND LEADERS	DECKHANDS
FROM	TO			FROM	TO				
900' (274.32 m) and over		All	All	Any Tonnage		8	16	2	22
850' (259.08 m)	Under 900' (274.32 m)	Tankers and Bulk Carriers	Over 38' (11.58 m)			8 ⁽¹⁾	16 ⁽¹⁾	2	22
		Tankers and Bulk Carriers	Over 38' (11.58 m)			6	12	2	17
		All Others	All			6	12	2	17
600' (182.88 m)	Under 850' (259.08 m)	All	All			6	12	2	17
Over 570' (173.74 m)	Under 600' (182.88 m)	All	All	30,000 and over	6	12	2	17	
				Under 30,000	4	8	2	12	
Over 500' (152.40 m)	570' (173.74 m)	All	All	30,000 and over	6	12	2	17	
				22,000 Under 30,000	4	8	2	12	
				Under 22,000	4	6	2	10	
Over 125' (38.10 m)	500' (152.40 m)	All	All	30,000 and over	6	12	2	17	
				22,000 Under 30,000	4	8	2	12	
				12,000 Under 22,000	4	6	2	10	
				Under 12,000	4	4	2	9	

TABLE IX – Assignment of Locomotives, Wires & Deckhands

⁽¹⁾ Requires approval of the Canal Port Captain on duty.

VESSEL SIZE AND TONNAGE	CRITERIA	ADDITIONAL PERSONNEL
<p>1. Vessels more than 125' and up to 500' LOA.</p> <p>2. Less than 12,000 tons of displacement and up to 600' LOA.</p> <p>3. More than 22,000 tons but less than 30,000 tons of displacements, 4/4, 4/6 or 4/8.</p>	Without winches or slow winches on the bow and the stern.	1,2 or 3 extra deckhands. (CHARGEABLE)
	Vessels transiting northbound or southbound, relaying at the locks.	1, 2 or 3 extra deckhands. (CANALCONVENIENCE)
<p>Barges</p> <p>(2 bosuns on the barge and 1 bosun on the commercial towing tug if using locomotives.)</p>	Barges 4/4	1, 2 or 3 extra deckhands if there is difficulty in sharing the resources due to obstructions or due to a communication barrier. 3 if barge is over 80' in beam
	Barges 4/6	2 extra deckhands if there is difficulty in sharing the resources due to obstructions on the stern or due to a communication barrier on the stern.
	Barges 4/8	0 extra deckhands.
Caisson	Caisson	Personnel will be required according to established procedures.
<p>1. Vessels over 125' but less than 600' LOA, with 30,000 tons or more of displacement (6/12).</p> <p>2. Tankers and bulk carriers of 600' but less than 850' LOA (6/12).</p> <p>3. Vessels, other than tankers and bulk carriers, 600' but less than 900' LOA (6/12).</p>	Vessels without winches, with slow winches or Barber Roll-on Roll-off not performing relay operations (on stern).	Two (2) Due to difficulty in sharing the resources on the stern due to obstructions or due to a communication barrier. (CHARGEABLE)
	Without bow winches on any other type of 6/12 vessel that is performing relay operations or not.	Two (2) (CHARGEABLE)
	Without stern winches on any other type of 6/12 vessel that is performing relay operations or not	One (1) (CHARGEABLE)
<p>All vessels 900' LOA and over (8/16).</p>	Without winches or with slow winches at the second station.	One (1) (CHARGEABLE)
	Without winches or with slow winches at the third station, or deck winches are distant.	One (1) (CHARGEABLE)
	Vessels with winches performing relay operations.	Two (2) (CANALCONVENIENCE)

TABLE X – Criteria for Additional ACP Deckhands

NOTES:

- For 4/4, 4/6, 4/8, 6/12, 8/16 vessels, additional deckhands can be required in special cases such as but not limited to vessel's configuration.

2.13 Pilot Requirements

a. Table XI shows the minimum pilot requirements for transiting vessels.

Length (LOA)	Beam	Draft	Tonnage	Control Pilots	Minimum Qualification
From 65 up to 225 feet	Up to 79.9 feet	Deepest point of immersion in TFW 39 feet and 9 inches	Up to 12,000 tons	1	CP-02
Up to 526 feet	Up to 79.9 feet		Up to 20,000 tons	1	CP-03
Up to 600 feet	Up to 79.9 feet		Up to 25,000 tons.	1	CP-04-01
Up to 600 feet	Up to 79.9 feet		Up to 30,000 tons	1	CP-04-02
Up to 899.9 feet	From 80 up to 85.9 feet		Unlimited	2	CP-04-03
Up to 899.9 feet	From 86 up to 91.9 feet		Unlimited	2	CP-04-04
Up to 899.9 feet	92 up to 96.9 feet		Unlimited	2	CP-04-05
Up to 900 feet	97 up to 99.9 feet		Unlimited	2	CP-04-06
Up to 900 feet	Less than 106.2 feet		Unlimited	2	CP-04-07
Up to 966.99 feet	Less than 106.2 feet		Unlimited	2	CP-04-08
Up to 966.99 feet	Less than 106.2 feet	Deepest point of immersion in TFW of 50 feet	Unlimited	2	CP-04-09
Up to 1,205 feet	Less than 135.0 feet		Unlimited	2	CP-04-10
Up to 1,205 feet	Unlimited		Unlimited	2	CP-04-11

TABLE XI – Minimum Pilot Requirements

- b.** Passenger vessels with passenger capacity of 50 passengers or over will be assigned a CP-04-03 pilot when carrying at least one passenger aboard.
- c.** Vessels carrying nuclear materials as sole cargo will be assigned pilots with a minimum qualification of CP-04-08. Nuclear submarines will be assigned pilots qualified for nuclear submarines with a minimum qualification of CP-04-08. Trident class submarines will be assigned pilots qualified for Trident class submarines with a minimum qualification of CP-04-08.
- d.** Every Neopanamax vessel will have two pilots on board at all time while in Agua Clara or Cocoli Locks, or while transiting between Cocoli Locks and the Gamboa Signal Station.
- e.** Dead Tows will require the following pilot qualifications:
1. Pilots will be assigned to the commercial tug and the dead tow according to Table XI, except that:
 - i. Pilots assigned to a commercial tug will have a minimum qualification of CP-04-02. ACP Tugs normally do not require a pilot.
 - ii. Pilots assigned to a dead tow will require a minimum qualification of CP-04-03.
 2. When a commercial tug is towing alongside, the pilots will be assigned according to the combined beam of the tug and the dead tow, up to 85 feet for vessel transiting the Panamax locks and up to 140 feet at the Neopanamax locks.
 3. When an ACP tug is towing alongside, the pilots will be assigned according to the beam of the dead tow, based on Table XI.
- f.** Pilots assigned to Harbor and Extra Harbor Pilot duties shall have a minimum qualification of CP-04-09, with the exception of Extra Harbor Pilots assigned to stand watches in dredging equipment, auxiliaries, and other similar equipment.
- g.** Pilots assigned to Harbor and Extra Harbor pilot duties can be assigned to other duties as follows:
- i. Northbound vessels from the Pacific Anchorage to the basin of the Port of Balboa.
 - ii. Southbound vessels from the breakwater to Buoy No. 4 on the Atlantic Channel;
 - iii. Southbound Neopanamax vessels from exiting Cocoli Locks, to any of the Pacific Ports, and
 - iv. Northbound Neopanamax vessels from exiting Agua Clara Locks, to any of the Atlantic Ports

2.14 Up Lockage of Vessels With Wide Flared Bows

The procedures outlined below are recommended for up lockages of vessels with wide flared bows. They should help to prevent accidents that cause delays, affect the customer, and put out of service for extended periods equipment that is essential for Canal operations.

- a.** Prior to arriving at the locks, pilot should confirm with the Transit Resources' deckhand leader the planned location for placement of the locomotive wires. This is especially important on the stern of wide beam vessels with ramps or other structural restrictions.
- b.** It is strongly recommended that the pilot brings the vessel to a complete stop and secure the center wall locomotives prior to entering the jaws of the locks.
- c.** It is imperative that these vessels remain parallel to the approach wall and not allow the flare of the bow to overhang the lock wall once the vessel begins to enter the jaws. To accomplish this it is recommended that the stern (Cut-style) tug be shifted to the quarter prior to the vessel's bow entering the jaws of the lock. The pilot must exercise sound judgment in making the determination as to when to shift a tug, and consideration should be taken to the capability of the tug involved and the configuration of the vessel at the stern. At least one of the assisting tugs should be used to push on the parallel mid-body of Panamax vessels until all center wall locomotives are made fast. The stern tug should be kept in position until all center wall locomotives are made fast.
- d.** On all vessels with wide flared bows, the No.2 center wall locomotive will stop before proceeding into the "S" turn at the bottom of the incline, pay out wire until the flare of the bow has cleared the locomotive, and then proceed with the ship. When the locomotive has reached the top to the incline, it should resume normal position.

2.15 Standard Procedures for Relay Lockages

- a.** Relay lockages are performed at the Panamax locks using two locomotive teams in the same lane in order to increase lockage output and overall Canal capacity. The first team picks up the vessel at the approach wall and takes it to the level where the relay occurs. At Gatun Locks, the first team picks up the vessel at the approach wall and takes it to the middle level where the vessel is moored and the locomotives are exchanged. At Miraflores Locks, the lockages locomotives are exchanged in the upper level. The second team then picks up the vessel and completes the lockage.
 1. On vessels 900 feet in length overall, the pilot in control of the vessel will notify the lockmaster once the vessel is in position. The lockmaster will inform the pilot when the relay operation has concluded, who will continue with the lockage.
 2. Vessels that rate 4 locomotives may be relayed with the chamber in stage of filling, however, there must not be any water movement.

3. When relaying northbound 6-locomotives vessels at Miraflores Locks, and southbound 6-locomotives vessels at Gatun Locks the relay operation may begin once the gates behind the vessel have closed, however, the mooring lines will not be coiled in, or the locomotive's wires let go until the first 15 feet of the chamber have been filled. The gates ahead of the vessel shall remain closed until the relay operation has been concluded.
 4. When relaying southbound 6-locomotives vessels at Miraflores Locks, and northbound 6-locomotives vessels at Gatun Locks, the relay operation can begin once the gates behind the vessel are closed. The gates ahead of the vessel shall remain closed until the relay operation has been concluded.
- b.** Subject to the availability of locomotives, tugs and operating personnel, all vessels scheduled for lockage in the relay lane will be relayed excepting vessels of unusual configuration, such as submarines and vessels with protrusions, which would unduly delay the lockage. These unusual vessels shall use the regular lockage procedures or an alternate approved method.
- c.** Under normal conditions, relay operations at Gatun and Miraflores Locks are carried out during complete eight-hour shifts. The number of shifts and hours vary according to traffic levels, which also determine whether relay operations are conducted in a single lockage lane or simultaneously in both lockage lanes.
- d.** Boarding officers must ascertain that the vessels have adequate and sufficient mooring lines (wire ropes not acceptable), sufficient chocks and bits, and are suitable for relay operations. Should deficiencies in this regard are discovered, the boarding officer shall inform the Canal Port Captain on duty.
- e.** In an emergency or under special circumstances, relay procedures are modified to meet the needs of the situation. To the extent possible, proposed modifications should be coordinated among the lockmaster, control pilot, Canal port captain on duty and the Traffic Management Unit, subject to final approval by the Canal port captain on duty.
- f. *Tie-up Locomotives***
- (1) Tie-up locomotives are stationed on the center wall approach and are used to assist vessels to moor on the approach walls to wait for the lockage locomotives in the relay lane. Two tie-up locomotives are used to support relay operations at Gatun Locks; one locomotive is assigned to the bow of a vessel and the other to the stern.
 - (2) Tie-up locomotives at Miraflores Locks, will be offered when available, however, at this time they are not a requirement to support relay operations.
- g. *Tug Service***
- (1) The standard procedure is to assign a tug or tugs and tie-up locomotives to assist vessels in tying up to the Gatun Locks approach wall. At Miraflores Locks, in addition to the tug assistance, tie-up locomotives will be assigned when available.

(2) Normally, at least two tugs will be made available at the locks approach to support relay operations. Tug service to assist vessels in mooring to either the north or south approach walls will be provided without charge to vessels that would not otherwise require tugs. Vessels in the category of "Tug on pilot's request" will be considered vessels ordinarily requiring tugs. Tug service will be provided as follows:

(a) Vessels that do not ordinarily receive tug assistance will be scheduled for one tug and the tie-up locomotive.

(b) Vessels that normally use one tug will be scheduled for one tug plus the tie-up locomotives. When tie-up locomotives cannot be provided, a second tug will be assigned at no additional charge.

(c) Vessels that normally use two tugs will be scheduled for two tugs in addition to the tie-up locomotives.

h. Radio Communications

(1) At Miraflores, the normal radio channel (5 in the east lane and 6 in the west, both on Zone 1) is used up to the point of locomotive exchange.

(a) The relay channel (channel 9 – Zone 1) is used after the exchange.

(b) Lockmasters must make adjustments during double relays or if relays and tandems are scheduled simultaneously.

(2) At Gatun, separate frequencies are used for the upper and lower levels, with the lower frequency assigned to the upper level.

(a) In the east lane, channel 4 is used in the lower level and channel 3 in the upper level, (both channels are on Zone 1).

(b) In the west lane, channel 6 is used in the lower level and channel 5 in the upper level (both channels are on Zone 1).

(3) Locks personnel will maintain close communications with the control pilot during tie-up operations.

(4) The control pilot will notify MTC whenever the schedule cannot be accomplished as planned or a delay occurs.

i. Relay Procedures

(1) *Preparations for approach and arrival of the vessel at the locks for the relay lockage*

(a) Transits through the Panama Canal transit, especially those involving relay lockages, are a team-work effort, and good communications among pilots, canal deckhand leader, lockmasters, locomotive operators and Marine Traffic Control (MTC) are of vital importance on this endeavor. Every member of the team must promptly inform the rest of team of any problems or unexpected changes that involve the vessel, especially changes from regular lockage to relay lockage and thus, allow the personnel to prepare for the lockage.

(b) For relay lockages, canal deckhand leader must verify that:

- Upon receipt of the cross bridge radios, be certain that the radios are properly charged and that they function properly.
- That the cross bridge radios are delivered to the pilot in control, and that the frequency to be used during the lockage is established and informed to all parties using these radios.
- All equipment necessary for the relay lockage is available and ready for use.

(c) For any lockage, whether regular or relays, vessel must provide on each, the bow and on the stern, an officer and two seamen to assist handle the lines and operate the winches simultaneously. Should the vessel fail to provide the required personnel, the canal deckhand leader on the bow/stern must immediately report this discrepancy to the pilot of the vessel, who will instruct the master to comply with this requirement before the vessel arrives at the locks. Additionally, the vessel must provide a lookout on both stations.

(d) Every effort should be made to meet the tie-up schedule. Vessels must be dispatched and the pilots must board and get underway in time to arrive on schedule for tying up. Deckhands should be dispatched to allow them to board on time to be ready for the tie-up. All other relay personnel and resources must, likewise, be in position and ready for the lockage.

(e) Before relay operations begin, the deckhand crew prepares the stations by setting the mooring lines that will be used during the relay. The deckhand leader should check mooring lines for flaws before a vessel arrives at the locks for relay operations. If mooring lines are found to be inadequate, the pilot must be notified.

(f) During relays at Gatun Locks and other lockages when time is important, arriving vessels should come in along the approach wall to tie up as soon as the preceding ship has moved into the chamber.

(g) To allow the messenger line for the side wall bow locomotive cables to be taken aboard, vessels should tie up with the bows as close as possible to the lock entrance. Ships should be ready to move forward as soon as locomotives are alongside and cables aboard.

(h) Spill or fill will not be held during relays for any vessel approaching the locks except in an emergency. The notification is made by an amber spill light at the end of the center wall. Double culvert preference will be assigned to the relaying lane unless MTC, in coordination with pilots and lockmasters, has requested preference for the non-relay lane.

(2) *Tie-up (Mooring to the Approach wall)*

(a) When tie-up procedures are followed, tie-up locomotive cables are secured aboard the arriving vessel and the vessel is moored to the lock walls.

(b) The use of the vessel side chocks should be avoided when mooring vessels to the lock walls. Deckhands should make every effort to run all aft mooring lines out from the

chocks nearest the stern of the vessel and to run all forward mooring lines out from the chocks nearest to the bow.)

(c) At the sea entrances, vessels over 91 feet (27.74 m) in beam will tie up with the bow angled toward the center wall and as close as possible to the last bitt on the water side of the center wall track. Also, the stern may be allowed to extend beyond the soft nose, providing there is no contact between the vessel's bow and the wall and sufficient maneuvering room is left for the bow tug to avoid making contact with the wing wall. (CAUTION: The vessel's mooring lines must not be placed across the locomotive tracks.)

(3) *Receiving first set of locomotives of the relay team*

(a) After instruction from the pilot, the tie-up locomotive cables must be cast off and the locomotives must be moved clear before the first set of relay locomotives arrive.

(b) Locomotive wires will be placed on board the vessel as soon as the locomotives are alongside the vessel. Gatun and Miraflores locks procedures differ as follows:

- *Gatun Locks:* At the sea entrance, after the water in the chamber has been lowered and the center wall locomotive wires are made fast, the vessel will move forward far enough into the entrance of the locks so that the bow side wall locomotive wires can be made fast. The sea gates will be kept closed until the control pilot indicates that they should be opened. After the ship has passed the knuckle, however, the lockmaster may order them opened as necessary. The vessel will proceed into the chamber as soon as the gates are fully recessed. The vehicular bridge must be completely open.

- *Miraflores Locks:* Normally, the sea gates will be opened only by a direct order of the lockmaster at request of the pilot, however, if the next scheduled northbound ship with a beam of 95 feet (28.96 meters) or more is not in sight, the control-house operator can open the gates without a direct order from the lockmaster. For those vessels whose draft and beam would prevent the center wall locomotives from maintaining control over the vessel as it approaches the lock entrance, the pilot, should wait along the approach wall until some of the current dissipates. Experience has proven that the majority of the relaying vessels can safely move up to the lock entrance before the current fully dissipates. Should the control pilot conclude that the vessel's size and draft necessitate waiting until some of the current dissipates, he will immediately notify Marine Traffic Control (MTC) and report the reasons for this conclusion to the Canal Port Captain on duty. MTC will notify the next vessel in the relay process if it is determined that a delay will occur.

(c) When a vessel has been tied up or is waiting in a position that is close enough to the wing-wall knuckle, and once the tug on the bow has been released and is clear and no spilling is in progress, the side wall rowboat may be used to make the locomotive wire messenger fast to the heaving lines from the vessel.

(d) On down lockages, as soon as the center and side wall's bow locomotive wires have been made fast to the vessel, the pilot will move the vessel slowly toward the gates so that the vessel will be in position to enter the chamber as soon as the gates are fully recessed.

(4) *Entering the chamber*

(a) On down lockages, as soon as the center and side wall bow locomotive wires are made fast to the ship, the pilot will move the vessel slowly toward the gates so that it will be in position to enter the chamber as soon as the gates are fully recessed.

(b) At the Gatun Locks sea entrance, after the chamber has been lowered and the center wall locomotive cables are made fast to the ship, the vessel should move toward the entrance enough to allow the bow side wall locomotive cables to be made fast. The sea gates will be kept closed until the pilot requests that they be opened. The vessel will start entering the chamber as soon as the gates are fully open and recessed into the lock walls.

(c) At the Miraflores Locks sea entrance, the sea gates will open as soon as the water in the chamber is lowered. The gates will be kept shut only in an emergency or when an exception has been approved in advance by the Transit Operations Division Executive Manager.

(d) When a vessel exceeding 91 feet (27.7 m) in beam is tied up at the Gatun sea entrance, care must be taken not to position the vessel at an angle that could cause the bow tug to be trapped against the wall. Adequate maneuvering room must be provided to ensure that the tug does not make contact with the wing wall and that there is no contact between the bow of the vessel and the wall.

(5) *Mooring at the Relay exchange point in the relay chamber:*

(a) The locks locomotives accompany the vessel into the chamber where the relay will take place.

(b) At Miraflores Locks, relays are carried out in the upper level.

(c) At Gatun Locks, the relays are carried out in the middle chamber.

(d) The locks locomotive and the vessel are stopped at the chamber at the relay exchange point with the locomotives holding the vessel in position.

(e) Several factors influence positioning the vessel for relay operations. The vessel shall, in most cases, be positioned as far back as possible in the chamber to facilitate the exchange of locomotives. The vessel can normally be stopped as soon as its stern is entirely clear of the path for the rear miter gates, as indicated by the recesses in the lock walls. Efforts should be made to stay away from inclines to the extent feasible. On up lockages, it is advisable to keep the No. 1 locomotives below the incline. Exceptions are made when available space is an issue, as with transits by vessels of considerable length or lockages in which a handline vessel is positioned astern of a transiting ship.

(f) At Miraflores Locks, relays are carried out in the upper level.

(g) At Gatun Locks, the relays are carried out in the middle chamber.

(6) *Jackknifing*

(a) The term jackknifing refers to a common practice when mooring a vessel in the chamber during relays in which “inward” configuration of vessel mooring lines is used. When the lines of the vessel are jackknifed, its bow mooring lines are extended backward to bitts on the locks wall that are located behind the bow. The stern lines are extended forward to bitts that are located ahead of the stern. In other cases, an “outward” configuration is used, with the bow lines extending ahead of the vessel and the stern lines behind it.

(b) Jackknifing is recommended during all “up” lockages by car carriers.

(c) Jackknifing is useful when there is concern over the possibility that a vessel moored in the locks chamber could come into contact with the gates. For this reason, jackknifing is often used with tandem transits.

(d) In certain situations, jackknifing is not advisable. For example, judgment must be exercised prior to jackknifing a small vessel because the bow and stern lines should not be moored to the same bitt.

(e) The decision to jackknife a vessel can be made either by the pilot or by the lockmaster, but the one who elects the procedure needs to inform the other. The lockmaster is also responsible for notifying the line handling boatswain, who will notify the line handlers. The pilot should also notify the deckhand leader, who will relay the information to the deckhands.

(f) When feeding out mooring lines, deckhands should make the following adjustments if the vessel will be jackknifed:

- Allow for more slack.
- Direct the lines in the appropriate direction.

(g) If a vessel's bow mooring lines are jackknifed, the stern lines must be jackknifed as well – and vice versa.

(7) *Exchanging the relay locomotives on vessels 900' or less in LOA*

(a) The deckhands position the mooring lines and messenger lines that will be sent out from the port and starboard sides at the bow and stern of the vessel.

(b) Heaving lines are used to transfer the mooring and messenger lines to the lock walls. This can be accomplished in two ways:

- Ordinarily the line handlers on the wall will throw heaving lines to the deckhands aboard the vessel and the deckhands then tie the heaving lines and messenger lines to the eyes of the mooring lines.

- For certain lockages, specially those involving high ships, it may be safer or more practical for the deckhands to throw heaving lines to the lock wall. The deckhands prepare for this procedure by securing the heaving line to the messenger and mooring lines.

(c) As soon as the pilot has stopped the vessel in position for the relay, the canal deckhands, under supervision of the canal deckhand leader and in coordination with the locks personnel of the locks, ease the lines down on the bow and on the stern as the line handlers pull the lines onto the lock wall.

(d) The line handlers untie the messenger and heaving lines from the mooring lines.

(e) The heaving lines are retrieved.

(f) The line handlers secure the messenger lines to temporary posts or to the hooks that were installed on the lock walls for this purpose. Line handlers secure the mooring lines to bitts on the lock walls.

(g) When the lockmaster signals the deckhand leader that the mooring lines are in position, the deckhand leader instructs the deckhands to tighten the lines with the vessel's winches with the assistance of the crew the vessel, to keep the vessel secured in the chamber.

(h) The deckhand leader notifies the pilot that the mooring lines are secured and tight, and the pilot gives the order to cast off the wires of the locomotives either by radio or hand signal. The pilot may elect either to have the cables cast off individually or all at the same time.

(i) The locomotive operator slackens the cables and gives the cast off signal to the deckhands.

(j) The deckhands release the cables from the vessel bitts and the cables are allowed to fall into the water.

(k) The locomotive should move away from mooring lines while the cable is being recovered and placed on the locomotive hook.

(l) The first set of locomotives returns to the approach wall to pick up the next vessel.

(m) The second team of locomotives moves into position alongside the vessel.

(n) The deckhands create slack in the messenger lines secured to the lock walls. The line handlers from the second team of locomotives tie the cables to the messenger lines. On six- and eight-car lockages, the deckhands on the vessel will throw additional messenger lines to the line handlers on the lock walls who will secure the lines to the cables for the locomotives on stations 2 or 3.

(o) The deckhands take the messenger lines to the winch and, with the assistance of the crew of the vessel, bring the locomotive cables aboard the vessel.

(p) Once the deckhands have secured the cables to the vessel bitts, the canal deckhand leader notifies the pilot and signals the locomotive operator.

(q) The operator tightens the cables to secure the vessel in the chamber and turns off the amber light for the locomotive.

(r) The deckhand leader instructs the deckhands to create slack in the mooring lines after receiving the cast off order from the pilot.

(s) Once the lines are slackened, the deckhand leader gives the signal to the line handlers to remove the mooring lines from the bitts on the lock walls.

(t) The deckhand leader supervises as the deckhands pull the mooring lines aboard the vessel.

(u) The lockmaster starts filling/emptying the chamber.

(v) The lockage continues under normal procedures.

(8) *Exchanging the relay locomotives on vessels of 900' or over in LOA*

The procedure for exchanging locomotives on vessels of 900' or more in length will be the same as the procedure for vessels of less than 900' in length explained in (7) above with the following exceptions:

(a) The process of securing the vessel's lines to the chamber walls, and the exchange of the locomotives are under the direct responsibility of the lockmaster.

(b) During relay lockages on vessel of this size, filling/emptying the chamber can be performed during the exchange of the locomotive, at discretion of the lockmaster.

(9) *Filling/spilling relay chambers*

(a) When relaying vessels with LOA of less than 900' (274.32 m) the filling or spilling of the chamber will not be carried away until the exchange of locomotives has been completed.

(b) When relaying vessels assisted by 4 locomotives, the relay can be completed with the chamber empty, or partially filled, but without movement of water.

(10) *Tandem relays*

(a) Conducting relay operations in connection with tandem lockages represents a special challenge due to the decreased amount of available space in the chamber. If one of the vessels is positioned near an incline, mooring will be more difficult because there are no bitts on the wall until the next level.

(b) If an unsecured tug follows a relaying vessel into the chamber, the mooring lines for the relaying vessel are attended to first.

(11) *Relay Lockages of Non-Relay Vessels:*

Vessels of less than 900 feet (274.32 m) LOA, which are classified as Non-Relay vessels, may be considered for relays on a case by case basis, after inspection and approval by proper Canal authorities .

2.16 Carrousel Operations

Carrousel Lockage is the use of three locomotive crews on the center wall and two on the side wall for consecutive lockages.

The first crew on both sides takes the first vessel through the whole lockage, and the second crew on each side does the same for the second vessel, using the return track to go back to the next vessel when the lockage is completed.

Since there are three crews on the center wall and two crews on the sidewall, the first crew from the side wall will return and work with the third crew from the center wall to assist the third ship, the second crew from the side wall returns to assist a fourth vessel with the first from the center wall that has returned and the cycle continues.

2.17 Hydraulic Assist Procedures

The *Hydraulic Assist Procedure* is a special lockage procedure utilized only at Gatun and Pedro Miguel locks. It is a means for assisting a large vessel to leave the lock chamber when completing a "down" lockage, by admitting water into the chamber behind the vessel as it moves out. This procedure is available, upon pilot request, for vessels having a beam over 99 feet (30.2 m) and draft over 37 feet (11.3 m) TFW, unless restricted by water conservation directives.

(1) The following general locks operating procedures shall be used when applying the hydraulic assist:

- (a) Lockmaster may advise pilot that hydraulic assist is available.
- (b) Move vessel well into the lock chamber with the bow about 100 feet (30.48 m) from the exit gates and ship centered in the chamber.
- (c) Spill chamber to equalize with Miraflores Lake when used at Pedro Miguel and with sea level when used at Gatun Locks.
- (d) Open exit gates fully.
- (e) Start the vessel from the chamber with locomotives and ship's engines.
- (f) Upon notification by the pilot that he desires a hydraulic assist and is prepared to receive the water, the lockmaster will have water admitted into the upper portion of the chamber (aft of the vessel's stern) to assist departure of the ship. Water may be introduced from either side- or center wall culvert. Moderate use may be made of the ship's engine during the entire departure. During relays only "through" lockages can utilize a hydraulic assist.

(2) At Gatun Locks, the following procedures will be used to admit water through the side wall:

(a) Upon notification that the pilot is ready to receive water, the lockmaster will order one side wall rising stem valve (RSV) to be opened half-way to admit water to the lower chamber through the upper seven side wall culvert laterals. When the vessel's stern reaches a point approximately 120 feet (35 m) from the lower intermediate gates, the half-open RSV will be **CLOSED** and the opposite RSV will be **OPENED**, fully.

(b) The rate of flow will be sufficient to attain a vessel speed of 1 mph (1.6 kph) and 2 mph (3.2 kph) during departure.

(c) Experience will determine the amount of water that is deemed necessary. The flow will be stopped when the stern is between the lower main gates and vehicular crossing or when the pilot requests it.

(3) At Pedro Miguel Locks, the following procedure will be used to admit water through the side wall:

(a) As soon as the vessel starts moving from the chamber, one side wall north RSV will be opened. Intermediate valves will be closed so that water enters the chamber only through the upper four side wall culvert laterals, (east lane north valve fully open and west lane north valve approximately 3/4 open).

(b) Continue to admit water behind the ship through the one fully opened side wall culvert RSV until the vessel's stern is at the lower gates (vehicular crossing), at which time the flow will be stopped.

(c) Maintenance personnel should be prepared for emergency closure if the need arises. Also, it may be necessary to operate Miraflores Spillway gates to control Miraflores Lake elevation.

(4) In order to exert maximum lateral control during departure of the vessel, it shall be routine procedure for operators of stern locomotives to move their locomotives until fairleads are opposite the chocks. They shall take the initiative to shift their locomotives to this position as soon as gates are open and vessel begins to depart the chamber.

(5) The following procedures are used at both locks to admit water through the center walls:

(a) When the pilot orders the locomotives to tow or as soon as the vessel starts moving from the chamber, the first three upstream cylindrical valves will be opened.

(b) When the vessel's stern reaches a point approximately 120 feet (36.58 meters) from the intermediate gates, the next four upstream cylindrical valves are opened.

(c) The flow will be stopped when the stern is between the lower main gates and vehicular crossing or when the pilot requests it. At this time or whenever the flow is stopped for any other reason, all valves on the high-water side must be closed.

(6) Locomotives cannot effectively check a vessel's forward motion when in this position. Therefore, if called upon to slow or stop the ship, stern locomotive operators must first move back behind the chocks before applying the brakes. The angle between cable and locks wall should be between about 30° and 45° for this purpose.

(7) Locomotive operators shall be alert and take the initiative to shift to a higher speed [from 1.6 KPH (1 MPH) to 3.2 KPH (2 MPH) to 4.8 KPH (3 MPH)] as the vessel speed increases. **This is the only way to take full advantage of the procedure.** Otherwise, the locomotive would brake the ship.

2.18 Standard Lockage Procedures for the Neopanamax Locks

a. Boarding officers must ascertain that the vessels have adequate and sufficient mooring lines (wire ropes or combination are not acceptable), also sufficient chocks and bits, that are suitable for up and down lockage operations, tie up operations when required to do so, and for the use of the assisting tugboats. Neopanamax vessels winches operational conditions must be inspected. If any deficiency is found Canal Port Captain and Marine Traffic Control (MTC) must be notified.

b. Before the vessel's arrival to the approach wall, the ACP deckhand crew prepares the stations by setting the mooring lines that will be used during the stay at the approach wall and/or lockage. The ACP deckhand leader should check mooring lines for flaws before a vessel arrives at the locks. If mooring lines are found to be inadequate, the pilot, MTC and Canal Port Captain office must be notified.

c. Communications between pilots and the ACP deckhand leader will be by radio (cross bridge).

d. Two tugboats shall normally be assigned to a vessel when approaching, entering, moving through and exiting the locks; one will be working on the bow with a hawser and one on the stern cut style.

e. Two additional tugboats shall normally be assigned to a vessel when arriving at the approach wall, either to enter directly to the chamber or to secure at the approach wall; one tugboat will be working at the vessel's bow and one at the vessel's quarter.

f. Radio communication between pilots and tugboat masters will be on the channel designated for, at their meeting points.

g. Pilots will establish a radio communication with the lockmaster prior to the vessel's arrival to the approach wall.

h. Radio communications on the approach wall, between pilots and lockmasters, will be on the channel designated for the approach wall.

i. Lockmasters will maintain close communications with the control pilot during their arrival at the approach wall.

j. Vessels arrive at the approach wall either to enter the Neopanamax locks or to position to tie up at the approach wall using their engines, rudder, bow and stern thrusters if they are so equipped, and with the assistance of a bow and stern tugboats.

k. Pilots shall maneuver their vessels to make a soft parallel landing so that only the flat part of the vessel's hull makes contact with the approach wall.

l. During tie up operations the lockmaster shall communicate with the pilot to provide guidance in tie up positions.

m. If the vessel will tie up at the approach wall, the ACP deckhands aboard the vessel throw heaving lines to the approach wall linehandlers on the wall, these heaving lines are tie at the other end to the eyes of the mooring lines.

n. Neopanamax vessels will be required to tie up at the approach wall a total of twelve (12) mooring lines, six (6) forward and six (6) aft, distributed as two (2) headlines, two (2) stern lines, two (2) forward and two (2) aft spring lines and two (2) forward and two (aft) breast lines.

o. The ACP deckhands ease the lines out as the approach wall linehandlers pull the lines onto the approach wall.

p. Approach wall linehandlers secure the mooring lines to their respective bits on the approach wall.

q. The approach wall linehandlers untie the messenger and heaving lines from the mooring lines

r. The approach wall linehandlers signal the ACP deckhand leader that the mooring lines are in position and the ACP deckhand leader instructs the vessel's crew to tighten the lines with the vessel winches to keep the vessel secured next to the approach wall.

s. As soon as, the vessel is secured, the ACP deckhand leader shall notify the pilot of this. The lockmaster will inform the pilot when the spill/filling operation begins.

t. During the spill/filling operation, the ACP deckhands crew in coordination with the vessel's crew will keep an eye on the vessel's lines to keep them tight, and with the

assistance of the tugboats it will be ensured that the vessel's hull remains flat alongside the approach wall.

u. When the spill/filling operation is completed, the pilot will be notified by the lockmaster. The pilot will instruct by radio to the ACP deckhand leader to cast off the lines.

v. The ACP deckhand leader instructs the ACP deckhands to create slack in the mooring lines after receiving the cast off order from the pilot.

w. After the lines are slack, the ACP deckhand leader gives the signal to the locks linehandlers to remove the mooring lines from the bitts on the approach wall.

x. The ACP deckhand leader supervises as the ACP deckhands pull the mooring lines aboard the vessel.

y. Once the lines are secured onboard the vessel's deck, and the gates are open, the pilot will wait for the signal to proceed into the chamber from the lockmaster, then the vessel will proceed to enter the lock chamber.

z. Pilots shall again maneuver their vessels to make a soft parallel landing so that only the flat part of the vessel's hull makes contact with the chamber wall.

There must always double gates ahead of the vessel during the lockage, unless a gate is out of service, or specific instructions have been given on this regard.

Vessels arrive in position to tie up at the locks center wall using their engines, rudder, bow and stern thrusters if they are so equipped, and with the assistance of a bow and stern tugs.

Radio communications between pilots, lockmasters and tugboat masters will be on the channel designated for their lockage.

Once the vessel is in position alongside the center wall, the locks linehandlers pick up the vessel's lines.

The ACP deckhands aboard the vessel throw heaving lines to the locks linehandlers on the wall, these heaving lines are tie at the other end to the eyes of the mooring lines.

Neopanamax vessels will be required to tie up at the chambers walls a total of four (4) mooring lines, two (2) forward and two (2) aft, distributed as one (1) headline forward, one (1) forward spring line, one (1) stern line, and one (1) aft spring line.

ACP deckhands should make every effort to run all forward mooring lines from the chocks nearest to the bow and to run all aft mooring lines from the chocks nearest the stern of the vessel.

The ACP deckhands ease the lines out as the locks linehandlers pull the lines onto the lock wall.

Locks linehandlers secure the mooring lines to their respective bitts on the lock wall.

The locks linehandlers untie the messenger and heaving lines from the mooring lines.

The locks linehandlers signal the ACP deckhand leader that the mooring lines are in position and the ACP deckhand leader instructs the vessel's crew to tighten the lines with the vessel winches to keep the vessel secured in the chamber.

As soon as, the vessel is secured, the chamber will be emptied or filled whichever is the case.

During the emptying or filling operation, the vessel's crew in coordination with the ACP deckhand's crew will pick up with the assistance of the vessel's winches the slack on the lines secured at the lock wall.

When the chamber emptying or filling operation is completed, the pilot will be notified by the Lockmaster.

nn. The ACP deckhand leader instructs the vessel's crew to create slack in the mooring lines after receiving the cast off order from the pilot.

oo. After the lines are slackened, the ACP deckhand leader gives the signal to the locks linehandlers to remove the mooring lines from the bitts on the lock wall.

pp. The ACP deckhand leader supervises as the vessel's crew in coordination with the ACP deckhand's crew pulls the mooring lines aboard the vessel.

qq. Once the lines are secured onboard the vessel's deck and the gates are open, the vessel will proceed to move between the lock's chambers or exiting the locks.

rr. This procedure will be followed on each chamber while emptying or filling operations, and while moving between or exiting the lock's chambers.

ss. In an emergency or under special circumstances, lockage operations or tie up procedures could be modified to meet the needs of the situation. To the extent possible, proposed modifications should be coordinated among the lockmaster, control pilot, Canal Port Captain on duty and Marine Traffic Control (MTC), subject to final approval by the Canal Port Captain on duty.

2.19 Standard Procedures for Lockage Operations for Personnel at the Neopanamax Locks

a. A lockage crew typically consist of 23 members: two lockage and control center operation foremen (one will function as lockmaster and the other as locks operator), a clerk, and four line-handling gangs (two in the upper level and two in the lower level). The line-handling gang normally includes one tie-up foreman and four line handlers. At all times, a line handler gang shall be on the bow and one on the stern of each ship.

b. For tie-up issues in the chamber, the upper level chamber is attended by upper level crew. For intermediate level chamber, the line handling gang consist of one tie-up foreman and four line handlers from the upper level crew and one tie-up foreman and four line handlers from the lower level crew, those closer to the intermediate chamber.

c. Radio communications between pilots and lockage and control center operation foreman will be on the designated channel which must be maintained throughout the lockage. Alternate channels are used for subsequent vessels. Pilot will established a radio communication with the lockage and control center operation foreman prior to the vessel's arrival to the approach wall. They must maintain close communications during the lockage operation.

d. Before lockage operations begin, the lockage and control center operation foreman makes sure that the lower or upper level line-handling crew is ready to receive the vessel depending of the direction of the vessel.

e. There must always double gates ahead of the vessel during the lockage, unless a gate is out of service, or different instructions have been given on this regard.

f. The lockage and control center operation foreman must prepare the lower or upper level chamber to receive the vessel. After vessel verification, one of the lockage and control center operation foreman will order the other lockage and control center operation foreman to open the gates. Normally, the lockage and control center operation foreman only waits for the pilot to arrive at the sea-side approach wall before opening the sea gates.

g. The gates are opened, and the vessel moves into the chamber

h. Once the vessel is in position alongside the continental side wall within the chamber, deckhands aboard the vessel throw heaving lines to the line handlers on the lock wall. These heaving lines are tied at the other end to the eyes of the

mooring lines. In the meantime, the locks operator starts to close the gates as soon as the stern of the vessel is completely clear of the gates.

i. The deckhands ease the lines down as the line handlers pull the lines onto the lock wall. The line handlers untie the heaving lines from the mooring lines.

j. The line handlers secure the mooring lines to the respective bitts on the lock wall. The vessels requires to tie up at the wall of the chambers with a total of four mooring lines, two forward and two aft, distributed as one headline forward, one forward spring line, one stern line, and one aft spring line. The tie-up foreman must ensure that all lines are placed correctly and safely on the lock wall and send the signal to the deckhand leader that the mooring lines are in position.

k. After the vessel mooring lines have been secured and taut, the tie-up foreman informs the lockage and control center operation foreman that the mooring lines are secured and taut, and then the lockage and control center operation foreman issues the order to the other lockage and control center operation foreman, to start the filling/emptying of the chamber.

l. When the filling/emptying chamber operation is completed, the locks operator informs the lockage foreman, then the lockage foreman will order the lock's operator to start opening the gates in front of the vessel, and informs the pilot.

m. The pilot must issue the order to cast off the mooring lines to the deckhand leaders.

n. After the deckhand create slack in the mooring lines and the deckhand leader give the cast-off signal to the line handlers; the line handlers remove the mooring lines from the bitts and the deckhands pull the mooring lines aboard the vessel.

o. Once the lines are secured onboard the vessel and the gates are completely opened, the vessel will proceed to move to the next chamber, or to exit the locks.

p. In an emergency or under special circumstances, deviations from this standard procedure are acceptable. To the extent possible, these deviations should be coordinated among the lockage and control center operation foreman, control pilot, CPC on duty and MTC. In cases of disagreement on the application of the deviations from the procedure, final approval is given by the CPC on duty.

2.20 Standard Orders Tug Orders at Neopanamax Locks

Table XII contains the standard tug positions and orders given to tugs assisting vessels at the Neopanamax locks.

COMMUNICATIONS - STANDARD ORDERS TO TUG MASTERS – NEOPANAMAX LOCKS			
TUGS ID WHILE ASSISTING VESSELS AT NEOPANAMAX LOCKS			
Tug location	Alternative 1	Alternative 2	Alternative 3
"On the Hawser"	Alpha Tug	Tug's name	Hawser Tug
Vessel's Port or Starboard bow	Bravo Tug	Tug's name	Port / Starboard Bow Tug
Vessel's Port or Starboard Quarter	Charlie Tug	Tug's name	Port / Starboard Quarter Tug
Vessel's Stern "Cut-Style" or two lines through the same chock	Delta Tug	Tug's name	Cut Style Tug
Depending on the pilot's need	Echo Tug	Tug's name	According to location requested by the pilot
ORDERS TO TUG ALPHA			
Order	Directions	Alternative directions	Forces
Tow / Pull	9 O'CLOCK	Bow to port	Full / Half / Slow / Stop
	10 O'CLOCK		
	11 O'CLOCK		
	12 O'CLOCK	Straight ahead	Just stay ahead
	1 O'CLOCK	Bow to starboard	Full / Half / Slow / Stop
	2 O'CLOCK		
3 O'CLOCK			
ORDERS TO TUGS BRAVO & CHARLIE			
Order	Expanded orders	Forces	
Push	One whistle, push	Full / Half / Slow / Stop	
Back (at 45° / 90° / Alongside)	Two whistles, back		
ORDERS TO TUG DELTA			
Order	Expanded orders	Forces	
Push Stern to Port / Starboard	Push, two whistles / one whistle	Full / Half / Slow / Stop	
Back Stern to Port / Starboard	Back, two whistles / one whistle		
Straight back	Three whistles straight back		
Push straight ahead in line with the keel			
ORDERS TO TUG ECHO			
Order / Directions / Alternative directions / Expanded orders	Forces		
According to location requested by the pilot	Full / Half / Slow / Stop		

TABLE XII – Standard orders to Tug Masters at Neopanamax Locks

2.21 Excessive Smoking

A ship shall be considered to be emitting excessive smoke whenever, in the opinion of the lockmaster or pilot, such smoke would be hazardous to people if they were in its path or would interfere seriously with the lockage. In such a case, the pilot shall report the situation to the office of the Canal Operations Captain or his designee, who may direct the master to secure the boilers or engines.

(1) If a vessel is unable to stop excessive smoking prior to a lockage, the vessel shall be anchored or moored until the smoking is controlled. The vessel may then later continue its transit, subject to transit schedules.

(2) If excessive smoking develops during lockage, the lockmaster may notify the pilot to have the master stop the smoking. If the smoking continues unabated, the lockage shall be stopped at once and the pilot will immediately inform the Canal Operations Captain, who will determine further procedures and actions to be taken. After all possible measures have been taken by the crew to control the excessive smoking, the lockage may be

continued under the vessel's own power, or in extreme cases with the vessel securing the engines and being towed out of the locks by tugs, if available, or locomotives. The vessel shall then be moored at an isolated location until the problem can be resolved, the engines safely restarted, and the transit continued, subject to transit schedules.

(3) In the event the condition cannot be remedied, the transit may be completed under tow as a dead vessel with the engines secured, subject to transit schedules. Arrangements should be made to ensure that witnesses, such as the pilot and lockmaster, are available, as needed.

2.22 Spilling

a. General: All elevations and sill heights in the following paragraphs refer to Precise Level Datum (PLD).

b. *Miraflores Lake Level and Operation of Miraflores Spillway*

(1) The level of Miraflores Lake is a controlling factor in the permissible draft of transiting ships. (All lake elevations given in this section are to be considered as mean readings, without the momentary surges up or down.)

(a) Miraflores Lake is to be controlled so that its elevation never falls below 53.3 feet (16.31 m). The elevation is normally maintained between this level and 54 feet (16.46 m). When necessary for the transit of deep draft ships or other unusual events, the elevation can be temporarily raised to 54.5 feet (16.61 m).

(b) For ships with a draft between 38 feet (11.58 m) and 39.5 feet (12.04 m) TFW, Miraflores Lake shall be raised to elevation 54 feet (16.46); for ships 39.5 feet (12.04) TFW or greater, and for all aircraft carriers, Miraflores Lake shall be raised to as close to 54.5 feet (16.61 m) as is practical. This elevation provides a clearance of two feet (61 centimeters) between the keel of the ship and the 13 foot (3.96m) south sill elevation at Pedro Miguel.

(c) Control house operators are responsible maintaining the desired level of Miraflores Lake and ensuring the minimum keel clearance.

(2) The level of Miraflores Lake is to be controlled with as little interference to shipping as possible, and in the dry season, with a minimum waste of water.

(a) Before starting a spill of more than 3,750 cfs (106 cu m) [a 1-foot (0.30 meter) opening of six gates or a 5.2-foot (1.6-meter) opening of one gate], the control house operator shall notify MTC so that pilots will be informed and act accordingly. In order to minimize delay to spill while waiting for ships to be secured, this notice to MTC should be given as soon as it appears that a heavy spill must be made. If traffic has been suspended because of heavy spilling, the spilling should be rapid and continuous for controlling the lake as quickly as possible and with minimum delay to traffic.

(b) Whenever the lake is rising above the required operating range, spilling should be accomplished by opening the number of gates necessary to bring the water down to a safe range.

c. *Miraflores Spillway Signals*

It is the responsibility of control house operators to operate signal lights to indicate spilling operations to pilots approaching Miraflores Spillway. Two amber indicating lights are installed on top of the spillway at the west end. The lights are spaced about 10 feet (3 m) apart on a horizontal line. These lights will indicate spilling as follows:

- (1) One amber light to indicate that spilling is under way with a total combined opening of not more than 5 gate-feet (1.50 gate-m).
- (2) Two amber lights to indicate that spilling is under way with a total combined opening of more than 5 gate-feet (1.50 gate-m). (**NOTE:** 5 gate-feet (1.50 gate-m) is equal to five gates opened 1 foot (0.30 m), one gate opened 5 feet (1.50 m), or other equivalent combinations.)

d. *Gatun Spillway Signals*

It is the responsibility of control house operators to operate a signal light to indicate to the pilots that spilling operations are under way at Gatun Spillway. Whenever one or more spillway gates are open, a red indicating light shall be displayed at the south end of Gatun Locks center wall. The control house operator shall be notified in advance by the operator at the Gatun Hydro Station. Lockmasters will advise pilots of transiting ships of the number of spillway gates open.

2.23 Power Failure at the Locks

Power loss, either locally or in one or more feeders from the substation, is apt to cause confusion especially if a lockage or water spilling or filling is in progress. Use of good judgment and compliance with the following general rules will help to reduce such confusion:

- (1) Whenever any power failure occurs, the senior control house operator shall determine as quickly as possible whether the failure is local or at the generating plant or substation. If the failure is local and other feeders are still energized, locks maintenance personnel will proceed to perform the repairs required to restore power to the machinery needed. In case of total loss of power, the Senior Control House Operator should find out how long the power will be off by calling the senior operator at Gatun hydro from Gatun Locks, or the power dispatcher at Balboa from Pedro Miguel or Miraflores locks.

If power failure occurs in the Neopanamax locks, the foreman and control operator shall determine as quickly as possible whether the failure is local or not, and will ensure that the

emergency generator started to synchronize it with the machinery needed to continue with the lockage until the problem is solved.

(2) Normally, at Gatun Locks enough power is initially restored by the Gatun hydro to provide basic requirements, such as high mast lighting and operation of locks machinery. However, this does not allow normal lockage operations to proceed and locks locomotives must not be operated until the senior operator at Gatun hydro advises the senior control house operator that full power has been restored. He will, in turn, notify the lockmaster that normal operation of locks locomotives can proceed.

(3) If a lockage or other operation is in progress and power cannot be quickly restored, maintenance personnel may have to operate machinery with pneumatic pumps or close valves with the force of gravity.

2.24 Yacht and Handline Scheduling Procedures

a. Purpose

Scheduling procedures for yacht and handline vessels have been developed to promote the safety of vessels and vessel personnel, to make more efficient use of ACP resources, and to minimize delays to regularly scheduled transiting vessels. Safety is enhanced by special lockages for handlines rather than locking them with large vessels and by scheduling the transit of yachts during daylight hours, to the extent practicable (see Section 2.8 of this Directive).

b. Procedures

(1) Yacht and handline vessels will be inspected prior to transit by the Transit Operations Division Executive Manager or his designee.

(2) They must have sufficient deckhands aboard, adequate mooring lines, adequate fendering, good on-board illumination and proper navigation lights.

(3) If sufficient deckhands are not on board, the Authority may provide deckhands at the prevailing tariff rates.

(4) All vessels transiting the Canal are under the direction of a Canal pilot or licensed ACP employee. Except in unusual circumstances and as determined by the Transit Operations Division Executive Manager or his designee, yacht and handline vessels under 65 feet (20 m) in length will be assigned a Transit Advisor, who will provide comprehensive local knowledge of the Canal operating area and procedures for an efficient and safe transit.

(5) Yachts and other handlines under 65 feet (20 m) in length will normally be scheduled in lockages with vessels using locomotives.

- (6) Generally, up to six handlines in each direction may be locked through. The hand line shall be scheduled so that all or most of the transit between Gatun and Gamboa can be accomplished during daylight hours.
- (7) Handlines may go alongside a tugboat in the chamber, at the discretion of the tug master, if approved by the Canal port captain.
- (8) Unless the handline vessel is in tow, the hand line vessel is not allowed to remain lashed to any tugboat while moving.
- (9) To prevent potential damages by the propeller wash of a tug, handline vessels shall not go alongside or be near an omni-directional tug, unless the tug is tied to the locks wall with mooring lines and its propulsion units are secured.

2.25 Bow and Stern Thrusters, Variable Pitch Propellers and Cut-style Tugs

While entering the Locks and in order to avoid the possibility of a serious accident, pilots on vessels equipped with bow/stern thrusters, continuously running variable-pitch propellers, or assisted by a tug Cut-style, shall take the following precautionary measures:

- a.** When the pilot makes first radio contact with lockmaster while approaching the locks, he shall advise the lockmaster that his vessel is equipped with bow/stern thrusters and whether he intends to use them.
- b.** Similarly, the pilot shall advise the lockmaster when the vessel is equipped with variable-pitch propeller so that caution may be exercised to avoid fouling lines on propellers.
- c.** Lockmasters will relay this information to boatmen and bosuns. Boatmen will use extra caution when approaching the vessel.
- d.** If boatmen are forced to abandon the attempt, bosuns shall be alert to instruct line handlers to place messengers aboard as rapidly as possible, using heaving lines thrown from the vessel or the wall. In this case, the stern locomotive shall alert the pilot that his locomotive cables are not coming on board in a normal manner by blowing his air horn five times.
- e.** Pilots should avoid the use of bow/stern thrusters while in that vicinity or at the locks gates.

NOTE: *The pilot advise the deckhand leader on board that his vessel is equipped with bow/stern thruster or/and variable pitch propellers, so that caution may be exercised to avoid fouling lines on propellers.*

2.26 Tie-up Procedures at Pedro Miguel North Approach Wall

a. Tie-up Area: Vessels required to tie-up at the end of the north approach wall of Pedro Miguel Locks due to fog or other emergency will use the 1,200 feet (365.76 m) of approach wall plus the 470 feet (143.26 m) of the center wall between the jaws of the lock chamber and the north miter gates.

b. Maximum Combined Vessel Length: The maximum combined lengths of vessels permitted to tie-up along the designated area are:

Ships	Northbound	Southbound
2	1,420 feet (432 m)	1,370 feet (418 m)
3	1,370 feet (418 m)	1,320 feet (402 m)

NOTE: A mooring distance of at least 50 ft (15 m) must be maintained between ships at all times.

c. Mooring Line Arrangements: The following are recommended:

(1) The vessel or vessels closest to the north softnose should make fast with:

- (a) Two head lines and two stern lines;
- (b) One spring line forward;
- (c) One spring line aft;
- (d) One forward breast line; and
- (e) One after breast line.

(2) The vessel closest to the miter gates should make fast with:

- (a) Three head lines and three stern lines;
- (b) Two spring lines forward;
- (c) Two spring lines aft;
- (d) One forward breast line; and
- (e) One after breast line.

d. Vessel Responsibility: Once the vessel is made fast, the ship's crew is responsible for rigging a pilot ladder on the outboard side of the vessel for the disembarking of Canal deckhands. The ship's crew is also responsible for tending the mooring lines while the

vessel is alongside the approach wall, and taking in the lines when the vessel leaves the approach wall. Vessel shall take the standard precautions for quarantine, such as rat guards, and are forbidden the use of ladders or gangways without the permission of the Transit Operations Division Executive Manager.

e. Pilot and Locks Responsibilities:

(1) Pilots will check the mooring lines to insure that they are properly positioned to minimize the fore and aft surge from the drawing of water into the lock chamber.

(2) When the stern or bow of the vessel is inside the jaws of the lock chamber, and drawing of water into the locks chamber is to be performed:

(a) The lockmaster will call the pilot on the assigned chamber frequency prior to starting.

(b) The control pilot will remain on the bridge monitoring the operation until the drawing of water into the lock chamber is completed.

(c) Locks operating personnel will perform slow draw by opening only one rising stem valve (1/2 of single culvert) in the culvert of the corresponding side wall through the filling procedure.

(d) Sounding of the emergency or danger signal (five or more short blasts on the ship's whistle) will alert locks operation personnel to stop the drawing of water into the chamber.

f. Casting Off Procedure: One long blast on the ship's whistle is the signal to cast off all mooring lines. Northbound vessels will not slack their lines and cast off until the vessel ahead has cleared the softnose.

2.27 Procedures for Mooring and Unmooring at Cucaracha Tie-up Station

a. Description:

Cucaracha Tie-up Station is a 1,125-foot-long dock, with a total usable area of 1,373 feet in length, which is located on the east bank of Cucaracha Reach at the southernmost end of Culebra Cut. There are eleven mooring bitts along the face of the dock. The bitts are of rigid construction and capable of accepting any vessel that transits the Canal.

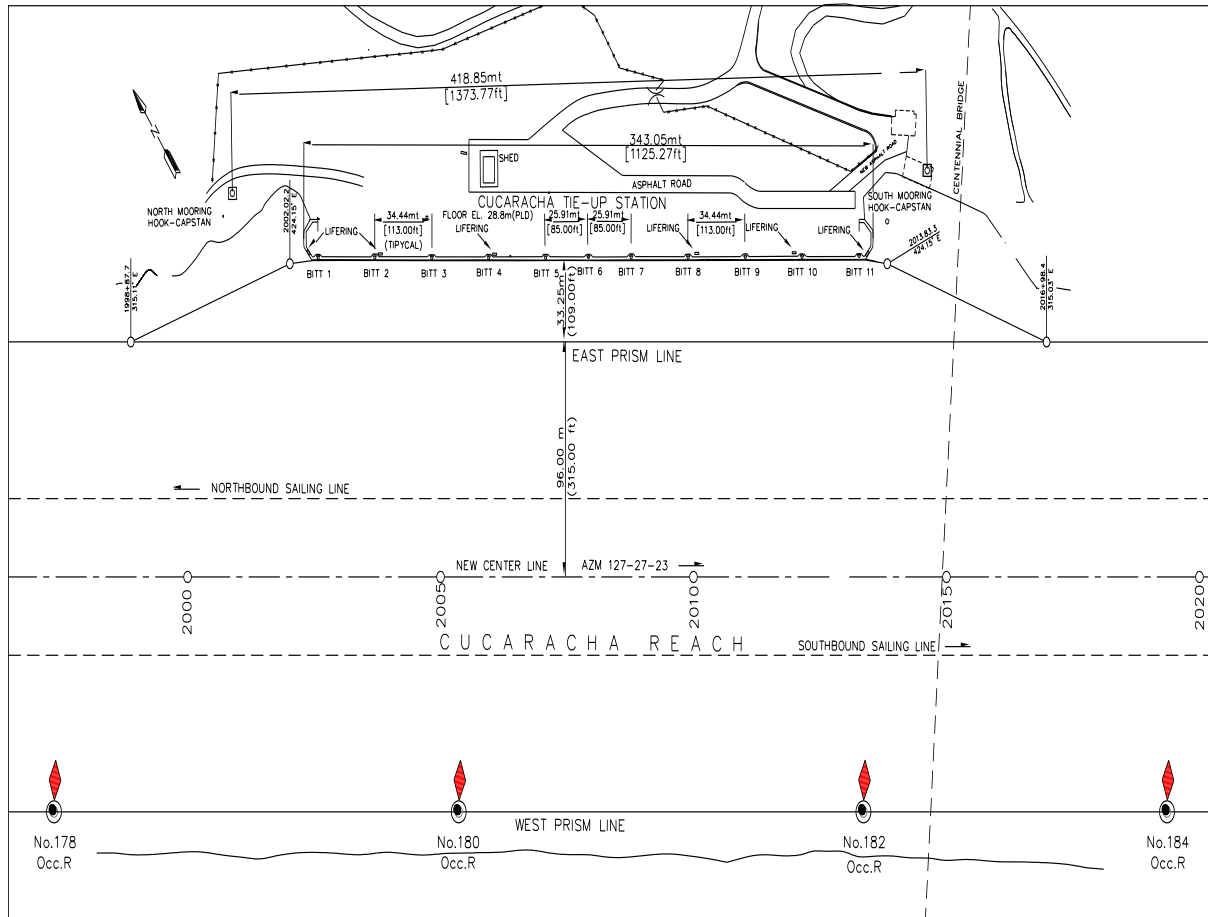


FIGURE 1 – Cucaracha Tie-up Station

In addition, two mooring stations are located on the shore side of the tie-up dock: One at the northernmost part of the dock and one at the southernmost part of the dock. Each station is equipped with a single hook. The mooring hooks are rated at 100 tons each and are the quick-release type, capable of swinging through an arc of 180 degrees. Each station is also equipped with a single speed electric capstan.

b. Tie-up Procedure:

(1) Approach: The pilot shall maneuver his vessel with the aid of tugboats, as required, to make a soft parallel landing so that only the flat part of the vessel’s hull makes contact with the dock.

(2) Communications: Good radio communications shall exist between the pilot, tie-up station foreman and tug(s) during the mooring or unmooring operation. The working radio channel for the operation is the frequency specially dedicated to this Tie-Up Station and

found in **channel 11 of Zone 2** of the portable radios. The tie-up foreman shall communicate with the pilot to provide guidance in tie-up position, which is set by markers.

(3) Tug requirements: Two tugboats shall normally be assigned to a vessel when mooring and unmooring.

(4) Mooring line arrangements: The vessel shall provide lines and shall operate winches as directed by the pilot or deckhand leaders.

- For vessels over 300 feet in length the following lines are utilized:
 - Two headlines
 - Two stern lines
 - Two forward spring lines
 - Two after spring lines
 - Two forward breast lines
 - Two after breast lines
- For vessels 300 feet in length or less the following lines are utilized:
 - Two headlines
 - Two stern lines
 - Two forward spring lines
 - Two stern spring lines
 - One forward breast line
 - One after breast line

If, because of the vessel's size, a breast line forward or aft cannot be lead out of a chock that is located on the forecastle or stern of the vessel, every effort should be made to lead a breast line out from a chock that is located on the main deck. The chock located nearest to the bow or stern should be used when this occurs.

(5) Shore side line handling requirements: One ACP deckhand leader and eight deckhands for one vessel or twelve deckhands for two vessels arriving at the same time are required. Deckhands shall be positioned to receive and shift lines as soon as the ship is within heaving line range of the dock.

(6) On board line handling requirements: For northbound vessels, the ACP deckhands shall send heaving lines ashore. For southbound vessels, the vessel's crew shall handle the lines under the pilot's guidance.

- Mooring line sequence:
 - Forward and after spring lines out first
 - Head and stern lines out next
 - Forward and aft breast lines out last

- Once the vessel is made fast, the ACP deckhands shall disembark and it shall be the responsibility of the vessel's crew to let go and retrieve the mooring lines when departing the tie-up station.

(7) Use of the vessel's anchor: Once the vessel is moored, the pilot shall order the offshore anchor to be walked out with enough chain so that it lays flat on the bottom. Note that the anchor must not be dropped, but must be walked out.

(8) Proper watch standing: The master shall have his crew tend the mooring lines and keep the lines tight. Keeping the mooring lines tight will prevent a surge of the vessel by transiting vessels navigating in the channel close to the tie-up station. Note that the master shall be advised regarding the time the next pilot will board and shall stand watch on VHF Channel 12 for any updates (via the Flamenco Signal Station).

c. Minimum Acceptable Clearance Between Vessels: The minimum acceptable clearance between vessels moored at the tie-up station shall be 50 feet forward and 50 feet aft.

d. Minimum Safe Speed: Pilots are instructed to proceed with caution and at safe minimum speed when passing by the Cucaracha Tie-up Station while a vessel is moored.

e. Mooring Restrictions: Vessels classified as Precaution Designator 1 (PD-1) or 2 (PD-2) and vessels without holding tanks will not be allowed to moor at Cucaracha unless an emergency occurs.

f. Vessel LOA Limitations:

- One vessel: Any length.
- Two vessels: The combined length of the two vessels shall not exceed 1,220 feet.

g. Beam Limitations: *The distance of the face of the dock to the east prism line is 33.25 m (109 feet)*

- Panamax vessels: Any beam.
- Neopanamax vessels: Any beam with tug assistance standing by and meeting restrictions implemented.

2.28 Procedures for Mooring and Unmooring at Cartagena Tie-up Station (Southern)

a. Description:

Cartagena Tie-up Station (Southern) consists of five mooring islands or breasting dolphins (See Figure 1). The breasting dolphins are of rigid construction, capable of accommodating vessels that transit the Canal provided that certain procedures are strictly adhered to. Vessels must land perfectly parallel to the structure so that the weight of the

vessel is equally distributed on each breasting dolphin. The vessel should have little or no headway at this time. The fendering system in these breasting dolphins is spring-mounted and designed to withstand compression forces, but cannot accommodate shears or twists. Upon initial contact, the resultant forces may spring a vessel away from the structures.

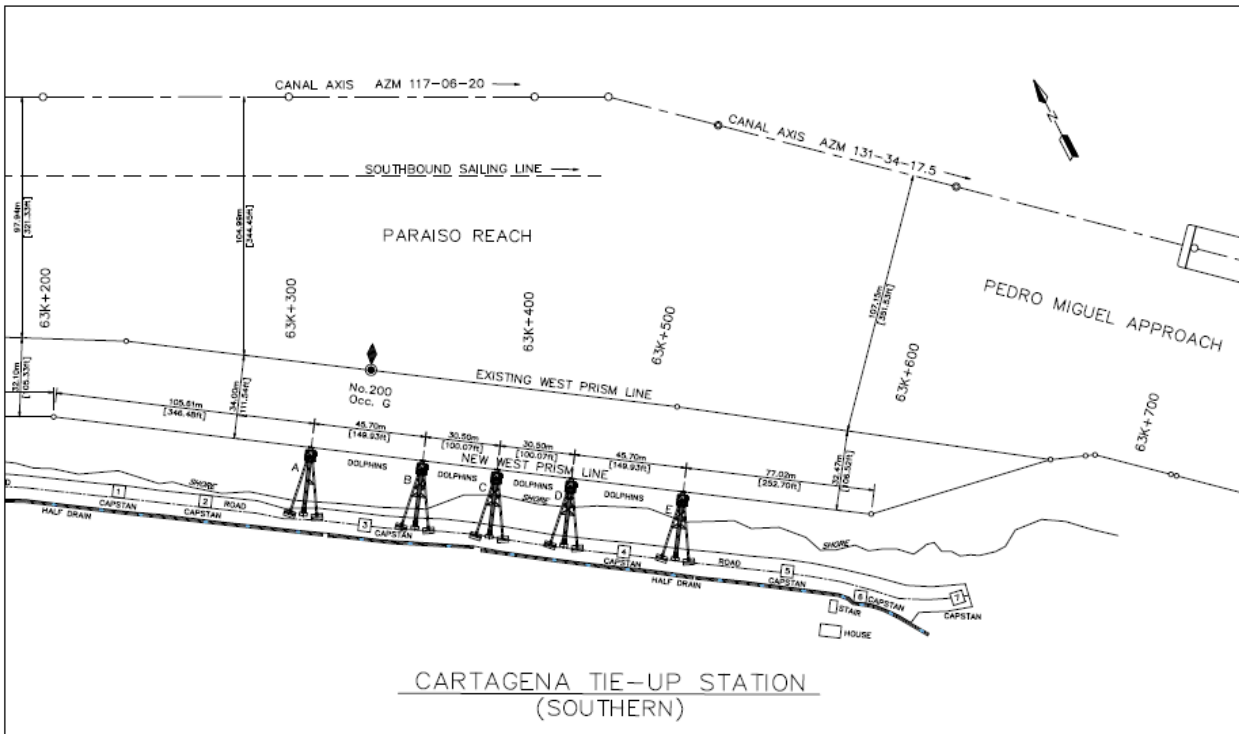


FIGURE 2 – Cartagena Tie-up Station (Southern)

For the purpose of identification, the breasting dolphins are lettered A through E, starting with the northernmost breasting dolphin. The distances between the breasting dolphins are as follows:

- Between A and B: 150 feet (45.7 meters)
- Between B and C: 100 feet (30.5 meters)
- Between C and D: 100 feet (30.5 meters)
- Between D and E: 150 feet (45.7 meters)

Total distance between dolphins A to E: 500 feet (152.4 meters)

(1) Each breasting dolphin is equipped with a single-speed electric capstan and one 100-ton quick-release hook. The hook can swing through an arc of 180 degrees. The design of the breasting dolphin's face piece requires that the flat part of the vessel's hull rest on the face piece. The face piece will not adjust to any curvature in the hull plating. Vessels that do not have a sufficient flat hull surface to rest against at least two face pieces will not normally be moored at the tie-up station.

(2) In addition, seven mooring stations are located on the landside of the breasting dolphins with two hooks each. They are numbered from 1 through 7, starting with the northernmost station.

Total distance between mooring stations 1 to 7: 1145 feet (349.1 meters).

(3) Each station is also equipped with a single-speed electric capstan. All mooring hooks are rated at 100 tons and are of the quick-release type, capable of swinging through an arc of 135 degrees.

(4) The system is provided with a remote release control. From a control panel, the hooks might be released individually or all together simultaneously.

b. Vessel Suitability:

The Transit Operations Division Executive Manager or his designee will determine a vessel's suitability for use of the Cartagena Tie-up Station (Southern) based upon its ability to rest securely on the breasting dolphins, its mooring arrangements, its protrusions, dangerous cargo restrictions, availability of holding tanks or other approved means to prevent discharge, of other unsanitary liquids, etc. Once the vessel's suitability has been established, MTC may schedule use of Cartagena Tie-up Station (Southern) using the following guidelines:

(1) Cartagena Tie-up Station (Southern) has no limitation due to the vessel's size.

(2) Vessels less than 300 feet should tie-up using breasting dolphins B-C or C-D.

(3) Vessels over 300 feet should tie-up with her midship section as close as possible to mooring dolphin C (the middle one).

(4) The minimum acceptable clearance between vessels moored at the tie-up southern and northern stations shall be 150 feet (45.7 meters).

(5) Deviations from these procedures must be approved in advance by the Transit Operations Division Executive Manager or his designee.

c. Tie-up Procedure:

(1) *Approach:* The pilot shall maneuver his vessel with the aid of tugboats, as required, to make a soft parallel landing so that only the flat part of the vessel's hull makes contact with the face pieces.

(2) *Communications:* Good radio communications shall exist between the pilot, tie-up station foreman and tug(s) during the mooring or unmooring operation. The working radio channel for the operation is the frequency specially dedicated to this Tie-Up Station and found in **Channel 10 - Zone 2** of the portable radios. The tie-up foreman shall

communicate with the pilot to provide guidance regarding tie-up position, which is set by a marker.

(3) *Tug requirements:* Two tugboats shall normally be assigned to a vessel when mooring and unmooring.

(4) *Mooring line arrangements:* The vessel shall provide lines and shall operate winches as directed by the pilot or deckhand leaders.

- For vessels over 300 feet in length the following lines are utilized:
 - Two headlines
 - Two stern lines
 - Two forward spring lines
 - Two after spring lines
 - Two forward breast lines
 - Two after breast lines
- For vessels 300 feet in length or less the following lines are utilized:
 - Two headlines
 - Two stern lines
 - Two forward spring lines
 - Two stern spring lines
 - One forward breast line
 - One after breast line

If due to the vessel's size, a breast line forward or aft cannot be led out of a chock that is located on the forecastle or stern of the vessel, every effort should be made to lead a breast line out from a chock that is located on the main deck. The chock located nearest to the bow or stern should be used when this occurs.

(5) *Shore side line handling requirements:* One ACP deckhand leader with transit radio on channel 3B (Maneuver) and twelve deckhands per station (southern and northern) are required. Deckhands shall be positioned to receive and shift lines as soon as the ship is within heaving line range of the dock.

Prior to the vessel's arrival, the line handlers will have messengers leading from the breasting dolphin to the appropriate mooring hook for each mooring line that they expect to receive. When the first heaving line is sent from the vessel, they are to tie all the messengers to the heaving line from the vessel at the same time.

(6) *On board line handling requirements:* For northbound vessels, the ACP deckhands shall send heaving lines ashore. For southbound vessels, the vessel's crew shall handle the lines under the pilot's guidance.

- Mooring line sequence:

- Forward and after spring lines out first
- Head and stern lines out next
- Forward and aft breast lines out last

- Once the vessel is made fast, the ACP deckhands shall disembark and it shall be the responsibility of the vessel's crew to let go and retrieve the mooring lines when departing the tie-up station.

(7) Use of the vessel's anchor: Once the vessel is moored, the pilot shall order the offshore anchor to be walked out with enough chain so that it lays flat on the bottom. Note that the anchor must not be dropped, but must be walked out.

(8) Proper watch standing: The master shall have his crew tend the mooring lines and keep the lines tight. Keeping the mooring lines tight will prevent a surge of the vessel by transiting vessels navigating in the channel close to the tie-up station. Note that the master shall be advised regarding the time the next pilot will board and shall stand watch on VHF Channel 12 for any updates (via the Flamenco Signal Station).

d. *Minimum Acceptable Clearance Between Vessels:* The minimum acceptable clearance between vessels moored at the tie-up southern and northern stations shall be 150 feet (45.7 meters).

e. *Minimum Safe Speed:* Pilots are instructed to proceed with caution and at safe minimum speed when passing by the Cartagena Tie-up Station while a vessel is moored.

f. *Mooring Restrictions:* Vessels classified as Precaution Designator 1 (PD-1) or 2 (PD-2) and vessels without holding tanks will not be allowed to moor at Cartagena unless an emergency occurs.

g. *Vessel Size Limitations:* There are no size limitations at Cartagena Tie-up Station (Southern).

2.29 Procedures for Mooring and Unmooring at Cartagena Tie-up Station (Northern)

a. *Description:*

Cartagena Tie-up Station (Northern) consists of four mooring islands or breasting dolphins (See Figure 3). The breasting dolphins are of rigid construction, capable of accommodating vessels that transit the Canal provided that certain procedures are strictly adhered to. Vessels must land perfectly parallel to the structure so that the weight of the vessel is equally distributed on each breasting dolphin. The vessel should have little or no headway at this time. The fendering system in these breasting dolphins is spring-mounted and designed to withstand compression forces, but cannot accommodate shears or twists. Upon initial contact, the resultant forces may spring a vessel away from the structures.

Care should be exercised so that the assisting tugs are not utilizing full power or are not flush alongside, as the combined forces of the vessel springing away and the tug pushing could cause considerable damage to the vessel.

(1) For the purpose of identification, the breasting dolphins are lettered A through D, starting with the northernmost breasting dolphin. The distances between the breasting dolphins are as follows:

- Between A and B: 150 feet (45.7 meters)
- Between B and C: 100 feet (30.5 meters)
- Between C and D: 100 feet (30.5 meters)

Total distance between dolphins A to D: 350 feet (106.7 meters)

(2) Each breasting dolphin is equipped with a single-speed electric capstan and one 100-ton quick-release hook. The hook can swing through an arc of 180 degrees. The design of the breasting dolphin's face piece requires that the flat part of the vessel's hull rest on the face piece. The face piece will not adjust to any curvature in the hull plating. Vessels that do not have a sufficient flat hull surface to rest against ~~to~~ at least ~~to~~ two face pieces will not normally be moored at the tie-up station.

(3) In addition, five mooring stations are located on the landside of the breasting dolphins with two hooks each. They are numbered from 1 through 5, starting with the northernmost station.

Total distance between mooring stations 1 to 5: 915 feet (278.96 meters).

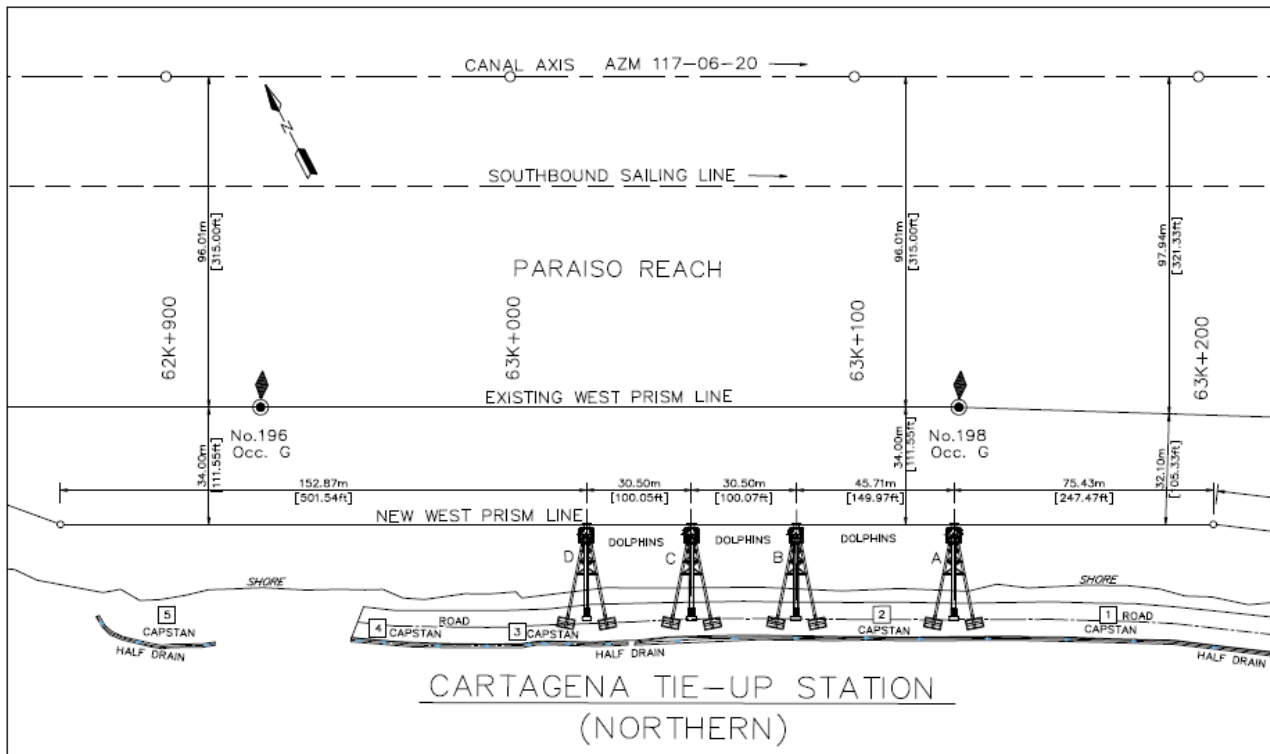


FIGURE 3 – Cartagena Tie-up Station (Northern)

(4) Each station is also equipped with a single-speed electric capstan. All mooring hooks are rated at 100 tons and are of the quick-release type, capable of swinging through an arc of 135 degrees.

(5) The system is provided with a remote release control. From a control panel, the hooks might be released individually or all together simultaneously.

b. Vessel Suitability:

The Transit Operations Division Executive Manager or his designee will determine a vessel's suitability for use of the Cartagena Tie-up Station (Northern) based upon its ability to rest securely on the breasting dolphins, its mooring arrangements, its protrusions, dangerous cargo restrictions, availability of holding tanks or other approved means to prevent discharge, of other unsanitary liquids, etc. Once the vessel's suitability has been established, MTC may schedule use of Cartagena Tie-up Station (Northern) using the following guidelines:

- (1) Cartagena Tie-up Station (Northern) has an 815 feet vessel's size limitation.
- (2) Vessels less than 300 feet should tie-up using breasting dolphins B-C or C-D.

(3) Vessels over 300 feet should tie-up with her midship section as close as possible to mooring dolphin B.

(4) The minimum acceptable clearance between vessels moored at the tie-up southern and northern stations shall be 150 feet (45.7 meters).

(5) Deviations from these procedures must be approved in advance by the Transit Operations Division Executive Manager or his designee.

c. Tie-up Procedure:

(1) *Approach:* The pilot shall maneuver his vessel with the aid of tugboats, as required, to make a soft parallel landing so that only the flat part of the vessel's hull makes contact with the face pieces.

(2) *Communications:* Good radio communications shall exist between the pilot, tie-up station foreman and tug(s) during the mooring or unmooring operation. The working radio channel for the operation is the frequency specially dedicated to this Tie-Up Station and found in **channel 10 of Zone 2** of the portable radios. The tie-up foreman shall communicate with the pilot to provide guidance regarding tie-up position, which is set by a marker.

(3) *Tug requirements:* One or two tugboats shall normally be assigned to a vessel when mooring and unmooring. Tug(s) shall be assigned at the pilot's request.

(4) *Mooring line arrangements:* The vessel shall provide lines and shall operate winches as directed by the pilot or deckhand leaders.

- For vessels over 300 feet in length the following lines are utilized:
 - Two headlines
 - Two stern lines
 - Two forward spring lines
 - Two after spring lines
 - Two forward breast lines
 - Two after breast lines
- For vessels 300 feet in length or less the following lines are utilized:
 - Two headlines
 - Two stern lines
 - Two forward spring lines
 - Two stern spring lines
 - One forward breast line
 - One after breast line

If due to the vessel's size, a breast line forward or aft cannot be led out of a chock that is located on the forecastle or stern of the vessel, every effort should be made to lead a

breast line out from a chock that is located on the main deck. The chock located nearest to the bow or stern should be used when this occurs.

(5) Shore side line handling requirements: One ACP deckhand leader with transit radio on channel 3B (Maneuver) and twelve deckhands per station (southern and northern) are required. Deckhands shall be positioned to receive and shift lines as soon as the ship is within heaving line range of the dock.

Prior to the vessel's arrival, the line handlers will have messengers leading from the breasting dolphin to the appropriate mooring hook for each mooring line that they expect to receive. When the first heaving line is sent from the vessel, they are to tie all the messengers to the heaving line from the vessel at the same time.

(6) On board line handling requirements: For northbound vessels, the ACP deckhands shall send heaving lines ashore. For southbound vessels, the vessel's crew shall handle the lines under the pilot's guidance.

- Mooring line sequence:

- Forward and after spring lines out first
- Head and stern lines out next
- Forward and aft breast lines out last

- Once the vessel is made fast, the ACP deckhands shall disembark and it shall be the responsibility of the vessel's crew to let go and retrieve the mooring lines when departing the tie-up station.

(7) Use of the vessel's anchor: Once the vessel is moored, the pilot shall order the offshore anchor to be walked out with enough chain so that it lays flat on the bottom. Note that the anchor must not be dropped, but must be walked out.

(8) Proper watch standing: The master shall have his crew tend the mooring lines and keep the lines tight. Keeping the mooring lines tight will prevent a surge of the vessel by transiting vessels navigating in the channel close to the tie-up station. Note that the master shall be advised regarding the time the next pilot will board and shall stand watch on VHF Channel 12 for any updates (via the Flamenco Signal Station).

d. *Minimum Acceptable Clearance Between Vessels:* The minimum acceptable clearance between vessels moored at the tie-up southern and northern stations shall be 150 feet (45.7 meters).

e. *Minimum Safe Speed:* Pilots are instructed to proceed with caution and at safe minimum speed when passing by the Cartagena Tie-up Station while a vessel is moored.

- f. Mooring Restrictions:** Vessels classified as Precaution Designator 1 (PD-1) or 2 (PD-2) and vessels without holding tanks will not be allowed to moor at Cartagena unless an emergency occurs.
- g. Vessel Size Limitations:** There is an 815 feet vessel's size limitation at Cartagena Tie-up Station (Northern).

2.30 Procedures for Mooring at Miraflores Lake

a. The primary use of this mooring area (Figure 4) is for ships with mechanical difficulties discovered during transit and for northbound ships that are determined to be over-draft at Miraflores Locks. Consequently, vessels should not be scheduled for these moorings until the large, northbound supers have cleared Miraflores in the morning.

- (1) Vessels up to 700 feet in length may be moored to the north mooring area. All vessels scheduled for the north mooring area should be 500 feet in length or more.
- (2) Larger vessels will be moored to the south mooring area. All vessels scheduled for the south mooring area should be 600 feet in length or more.
- (3) Vessels PD-1, PD-2 should not be scheduled to tie up at the moorings for more than 12 hours.

b. When proceeding to the Miraflores Lake Moorings, the following guidelines should be taken into account:

- (1) Pilots and masters of vessels scheduled to tie up at the moorings should be advised with ample time for them to verify and rig lines of proper length and strength.
- (2) All vessels should run four lines from both the bow and stern when tying up at the moorings. Normally, headlines will be run first, but the decision as to the order in which these lines are run will be left to the discretion of the pilot.
- (3) Two lines will be placed to each buoy. Lines that are run to the buoys in the center of the mooring area will be placed on adjacent buoys, not alternating buoys, i.e., place lines on the two buoys on the left (west) or the two buoys on the right (east). The lines should not be placed under tension until all lines intended for the buoy are on the hook and personnel attaching the lines are clear of the buoy.

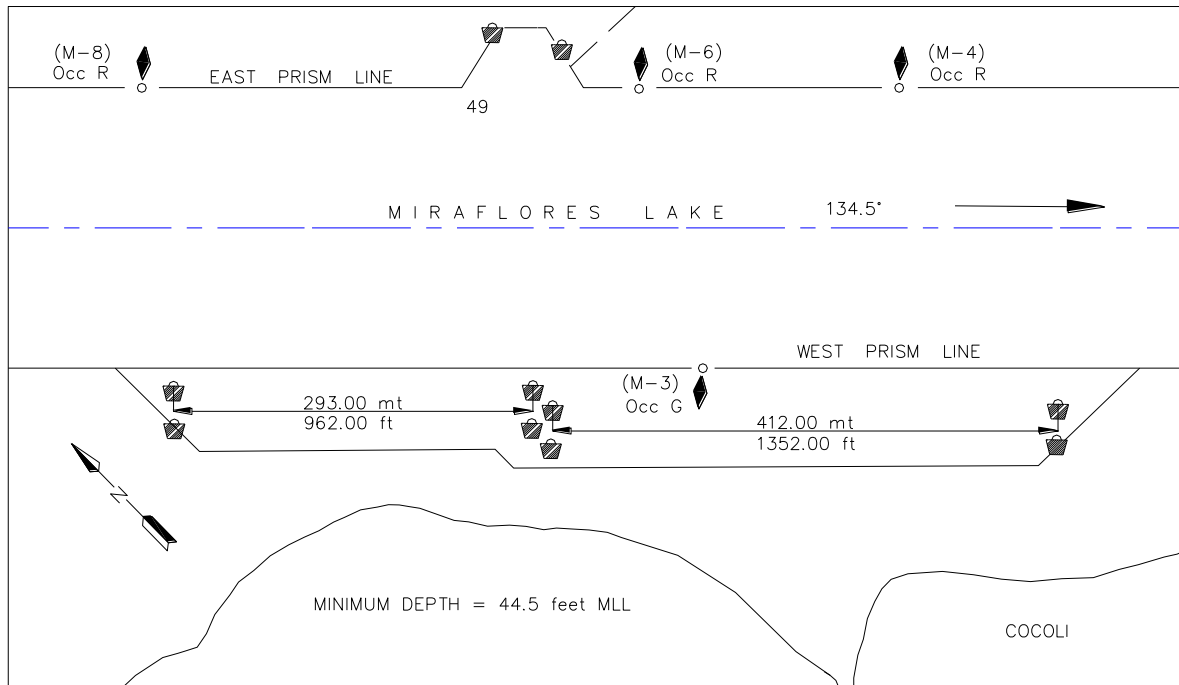


FIGURE 4 - Miraflores Mooring Area

(4) Vessel lines are lowered to the water's edge and launches take the lines and make them fast to the mooring buoys as ordered. Each assisting launch will handle only one line at a time.

(5) The tugs and launches will be equipped with the Moorings Maneuvering frequency on Zone 2 - channel 9 and will have a crew of at least two seamen and one launch operator.

2.31 Procedures for Mooring at Cocoli

When proceeding to the Cocoli moorings, the following guidelines should be taken into account:

- (1) Cocoli Moorings will be used by vessels 900 up to 1200 feet in length over all.
- (2) The master of the vessel should be advised with ample time the number of lines, tugs, or if the anchor is going to be used, and when to have the crew on stand-by for tying up at the moorings. Usually two tugs will be available for the operation. The working radio channel for tugs and for launches is the Moorings Maneuvering frequency on Zone 2 - channel 9.
- (3) If the anchor is used, no more than two shackles of chain are recommended.
- (4) A minimum of two and up to 4 headlines and stern lines are recommended; the headlines should be sent first. The launch assisting will handle only one line at a time.

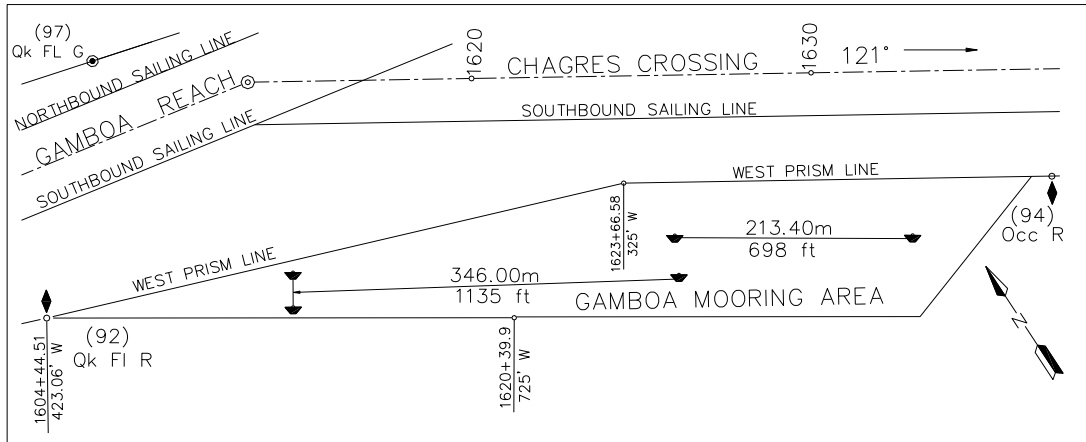


FIGURE 6 - Gamboa Mooring Area

2.33 Handling of Submarines

a. The Transit Operations Division Executive Manager or Canal port captain on duty will confirm 24 hours prior to arrival with the appropriate office, that the commanding officer of the submarine has acknowledged instructions to surface at least 16 Km (10 miles) off the Cristobal Breakwater or Balboa Anchorage sea buoy, and that once they have surfaced that they are monitoring Channels 12 and 16 in order to receive the time they are to pass through the breakwater entrance or arrive at the sea buoy.

b. Handling of submarines in the Canal requires special care due to their peculiarities and design. The following general considerations are pertinent to ensure a safe transit.

(1) In conventional twin screw submarines, the screws are close together and close to the surface. When maneuvering, there is not much twisting force with one engine ahead and one astern.

(2) In nuclear submarines, the pilots should be specially assigned. These vessels are given priority transits, clear-Cut, with full chamber lockages. Nothing that could hinder or jeopardize its safe transit should occur.

(3) A pilot should, whenever possible, ride as an observer before taking control of nuclear submarines.

(4) Transits should be full daylight due to hazardous boarding conditions and limited surface area.

(5) Canal deckhands are not necessary, but one or more Canal deckhand leaders may be assigned to instruct submarine crews on handling of wires, heaving lines, etc.

(6) Tugs should not be used, as ACP tugs do not have underwater fendering. Should tugs be necessary, they can be employed on a hawser.

- (7) All tugs, launches and other craft should be instructed to avoid the area near the diving planes and propellers.
- (8) Nuclear submarine rudders are forward of the propeller, with the propeller at the very stern. The propeller slip stream has no effect on the rudder when going ahead.
- (9) Submarines should not be relayed or tied-up to locks approach walls.
- (10) Nuclear submarines are not to be locked in tandem with other vessels. The lockmaster will, if time allows, hold a pre-lockage conference to remind all crew members of special lockage requirements for nuclear subs.
- (11) Time for dissipation of spill and mixing current at both Atlantic and Pacific sea entrances must be considered.
- (12) Submarine turning circles are naturally large. Locks approaches should be made as straight as possible to avoid large changes in heading.
- (13) No trainees will be used for the lockage of these vessels; only qualified operators will operate locomotives during the course of the lockage. Should the car have a student in the control cab, the instructor is to take over until the submarine completes the lockage.
- (14) Enter locks slow allowing extra time for the submarine crew to make locomotive wires fast. Extra heaving lines should be kept at each station in case one misses the line boat.
- (15) During the lockage, the lockmaster will station in the vicinity of No.1 center wall locomotive to monitor the operation until the lockage is completed. Should any problem arise, he must inform the pilot immediately.
- (16) Locks line handling crews should be on the alert with two extra heaving lines ready at each locomotive in case a messenger line is lost or in case there is a failure to make the messenger fast via the rowboat method. Getting cables on board as soon as possible is very critical with submarines.
- (17) Engines should be used to stop the vessel in the chamber and to start vessel ahead. This reduces the possibility of damage to the chocks and cleats.
- (18) Double culvert fill should be used and locomotive operators instructed to use great care to keep the vessel in the middle of the chamber.
- (19) Stop the vessel a little further back in the chamber. This will allow you more room to get the headway up for steering prior to letting go the stern wires. This is especially true leaving the sea ends at Gatun and Miraflores.
- (20) Submarines generally have good steerage at about two knots towing speed. The stern wires can be cast off with the engine stopped so they will not foul the propeller or diving planes. The bow wires are cast off last.

2.34 OHIO Class Submarines

The following special measures will be taken to ensure the safe transit of OHIO submarines:

- (1) There is no change in the status of the transit pilot as provided by *ACP Navigation Regulations, Article 92*.
- (2) A copy of this section and a sketch of hull outline (Figure 6) will be provided in the envelope given to the control pilot upon reporting to his duty station.
- (3) Prior to the start of the transit, it will be the responsibility of the Transit Operations Division Executive Manager to ensure that all requirements of this directive have been met and so advise the pilot when he reaches his duty station.
- (4) The MTC watch supervisor will advise the operations supervisor, or in his absence the senior lockmaster on duty at all locks, of the proposed transit and preliminary schedule 24 hours prior to the transit of this class of vessel.
- (5) For OHIO submarines transiting southbound the MTC watch supervisor will advise the Cristobal Port Entry Coordinator of the vessel's lockage time and have the Port Entry Coordinator inform the commanding officer at what time to pass through the breakwater entrance. Passage through Cristobal Breakwater should be planned 1-1/2 hours before the vessel is scheduled to arrive at Gatun Locks. For northbound transits, the MTC watch supervisor will advise the Port Entry Coordinator at Flamenco to inform the commanding officer what time to arrive at the sea buoy.
- (6) The MTC watch supervisor will advise the Launch and Linehandling Operations Unit general foreman, the foreman on duty, or his designee, for both Northern and Southern Districts 24 hours prior to the transit, to have three English-speaking deckhand leaders assigned to the vessel. This will permit the stationing of a deckhand leader at each locomotive station.

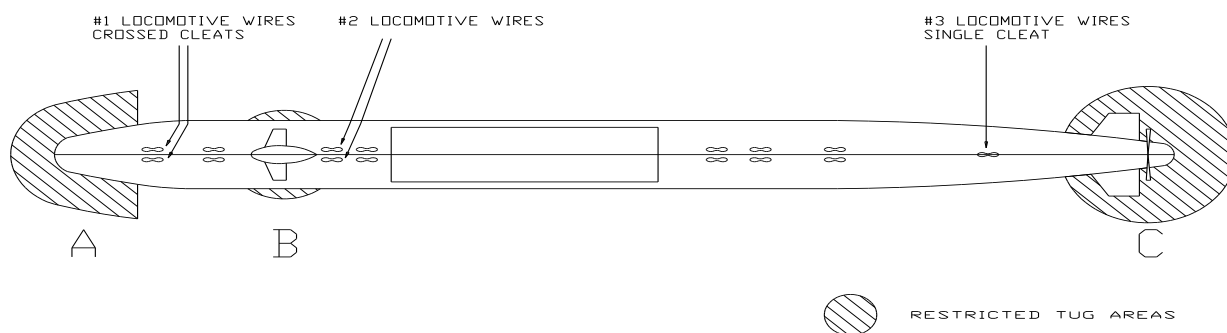


FIGURE 7 - Ohio Class Submarines

- (7) The MTC scheduler, when preparing the transit schedule, will plan on two omni-directional tugs assisting into each lock. Should he be advised that two

omni-directional tugs will not be available for the transit, the Transit Operations Division Executive Manager is to be contacted at once for solving this problem.

(8) The MTC Scheduler will alert the Towboat Vessel Manager, Northern and Southern Districts, 24 hours prior to the vessel's arrival, about the assignment of the omni-directional tugboats.

(9) Transit Operations officers will notify the pilot when the early calls are made the day before the transit, that the assignment is a OHIO class submarine.

(10) The Launch and Linehandling Operations Unit foreman on duty will confer with the MTC transit scheduler so that he can know when it is necessary to have the three deckhand leaders report for duty.

(11) The Launch and Linehandling Operations Unit foreman, Northern and Southern districts, will be responsible for ensuring that the Canal bosuns take eight heaving lines out to the vessel.

(12) The lockmaster will station in the area adjacent to where the No. 1 center wall locomotive is parked as it awaits the vessel. Should anything unexpected occur anytime during the lockage, he will immediately alert the pilot.

(13) During the lockage, the lockmaster will continue to station in the vicinity of the No. 1 center wall machine until the lockage is completed.

(14) No special crews are required for lockage of these vessels. However, only qualified locomotive operators will operate the locomotives during the course of the lockage. Should the car have a student in the control cab, the instructor is to take over until the submarine completes the lockage.

(15) Locks line handling crews should be on the alert with two extra heaving lines ready at each locomotive in case a messenger line is lost or in case there is a failure to make the messenger fast via the rowboat method. Getting cables on board as quickly as possible is very critical with submarines.

(16) All personnel are to be made aware that at no time can the hull make contact with the lock walls or tugboat.

(17) The Towboat Manager is to provide each tug captain a copy of the hull sketch and instruct them that at no time will the tugboat be allowed to come to a distance that is less than 35 feet (11 m) away from the submarine's hull.

(18) Each tugboat captain and launch operator shall study **Figure 6** with special emphasis to be paid to the shaded areas A, B and C that are shown in the sketch. These areas are particularly vulnerable to any outside contact and contact must be avoided at all costs.

(19) Ship shall provide a minimum of five men to be stationed at each of the cleats (minimum total 15 men) where the locomotive wires are to be made fast. These men will work under the direction of the Canal deckhand leaders and it will be their duty to bring the locomotive wires on board the vessel.

2.35 Embarking or Disembarking During Transit

a. The Panama Canal Authority (ACP) does not provide commercial launch services on a regular basis at this time. However, when operational needs allow it, embarking and disembarking may be accommodated. The operation will take place only after approval by the Canal port captain on duty on the side of the Isthmus under his supervision. These services will entail a charge, unless otherwise authorized as official or courtesy.

b. Normally, passengers and crew members aboard vessels, agents, agents' representatives, vessels' contractors or ACP employees or others on *Official* or *Courtesy* transits, utilizing Authority launch service **without** a service charge, will only be permitted to embark or disembark from transiting vessels in the Canal at the Balboa Basin at the Pacific terminal (Diablo Landing), Gamboa at Chagres Crossing (Gamboa Landing), and Gatun Lake Landing at the Atlantic terminal. The number of personnel should be limited and large groups avoided.

c. The designation of these sites by the Executive Vice President for Operations is based on safety and operational considerations. Every effort will be made to limit the use of the Gamboa Landing for official Canal business due to facilities and resource limitations. Pilots, towboat personnel, deckhands, and other Authority employees on duty will be governed by operational requirements when performing their official duties.

d. Subject to operational and safety considerations, the following are exceptions to the above rules:

(1) Personnel utilizing Authority launch service **with** a service charge may also embark or disembark a transiting vessel at the Balboa or Cristobal anchorages and the Mine Dock.

(2) In cases of dire need or an emergency, personnel may also embark or disembark at the locks. This will require previous approval of the Transit Operations Division Executive Manager who will provide authorization on a case-by-case basis.

(3) Prevailing tariff rates will apply to ACP launch service and for gangway handling when embarking or disembarking at the locks. *Shipping Agents will be charged based on CPC approval.*

e. *When embarking or disembarking at the locks is authorized:*

(1) Permission will be communicated by MTC to the appropriate control house operator, Canal Protection Supervisor on duty and the Admeasurement Unit Manager.

(2) Each occasion that a gangplank is secured to a vessel, the operations supervisor will notify the Admeasurement Unit and district Canal port captain.

(3) The message must name the person or persons and baggage or packages involved and the steamship agency requesting the service.

(4) Only those person(s) and material identified and approved will be permitted to be embarked or disembarked.

f. Steamship agents will make arrangements with the government customs and immigration offices whenever required.

g. *Use of Davis and Paraiso landings*

(1) These facilities are not suitable for use by the general public. They were constructed only as work areas with no controlled access or contraband control measures.

(2) Due to the movement of tugs and the maneuvering of ships in these areas, boarding is more complex than normal. The close proximity to the locks normally makes it impractical to use the accommodation ladder, leaving only the pilot ladder.

(3) With the exception of pilots assigned to transiting vessels or going to or from the tie-up station, admeasurers, deckhands, and other ACP personnel on duty, boarding vessels in these areas requires specific approval by the Transit Operations Division Executive Manager.

(4) These facilities are not normally used by non-Authority personnel for embarking/disembarking vessels in transit, except when absolutely necessary due to an emergency, or specifically approved by the Transit Operations Division Executive Manager or his designee.

h. *Weapons in Authority buildings and facilities*

The carrying of weapons within Authority buildings and facilities is prohibited, except in the case of law enforcement officials or employees of the Authority who are authorized to carry weapons in the performance of their official duties. Exceptions to this regulation must be approved by the Protection and Emergency Response Division Executive Manager.

2.36 Diving in Canal Operating Waters

a. *Responsibility and Organization:* The Industrial and Locks divisions are the two Authority units with the responsibility for performing diving operations. The Industrial

Division, through the salvage and diving general foreman, is responsible for all industrial, marine and salvage dive operations in the waterway. The Locks and Installation Maintenance Division, through the equipment maintenance supervisor (mechanical supervisor) at each locks, is responsible for performing diving operations within the locks facilities and approaches, mainly to correct deficiencies, perform inspections and repairs to underwater equipment to ensure continuous operations of the locks. Diving operations shall be performed following guidance provided in the Safe Diving Practices Manual.

b. *Planning:* Careful and through planning is key to ensure a safe and successful diving. The on site responsibility of the diving job is delegated by the general foreman to the official in charge, who is responsible for compliance with the diving plan and details of the dive operation. He is also responsible for notifying all concerned. Diving operations in the Canal channel, the anchorages or near/within the locks, or which could affect/be affected by transiting vessels, shall be coordinated with sufficient time with MTC. Advance notification of extended diving jobs is desired for publication in the Daily Information Sheet.

c. *Notification and Signaling by Divers:* The official in charge of diving operations at the locks, Canal channel or anchorages, shall notify the MTC watch supervisor by radio or phone (272-4201) before positioning, at the time the diver, or divers, get in the water, and when the job is completed. He shall provide MTC with an estimate time for completion and shall follow any instruction given by MTC at the time contact is made. He shall also ensure that the supporting ship, boat of diving craft displays the proper signal, flags, day shapes or lights to indicate diving operations are in progress. While in the job site, he shall monitor the radio to receive any further instructions.

d. *Notification by Watch Supervisors:* The MTC watch supervisor is responsible for notifying the Canal port captain on duty, ACP floating equipment operators and pilots concerned of any diving activity in progress near the locks, in the Canal channel or the anchorages. Vessels maneuvering near the diving area shall take adequate precautionary measures.

e. *Commercial Diving Operations*

Commercial diving operations may be permitted in Canal waters prior approval by the Port Captains office.

Personnel engaged in diving operations shall display the proper signal, flags, day shapes or lights to indicate diving operations are in progress, and shall notify Flamenco/Cristobal Signal stations the beginning and the completion of the operations.

These operations may be performed at any time of the day as long as it has received the prior approval of the Port Captain's office.

2.37 Canal Flight Restrictions

a. General

Current policy and procedures in effect establish that the Dirección de Aeronáutica Civil (National Aeronautics Directorate) is responsible for flight regulations in the Republic of Panama. However, after obtaining approval from the above-mentioned agency, all observation flights above Canal waters or areas must be coordinated and approved by the Panama Canal Authority Transit Operations Division.

b. Purpose

To control air space above Canal operating waters and areas in an effort to ensure the safe and efficient transit of vessels, non hindrance to ongoing operations, and Canal security.

c. Procedures

Overfly restrictions at the Canal require that all aircraft:

(1) Not overfly the Canal locks (Miraflores, Pedro Miguel and Gatun), dams, dry docks, spillways, the island of Barro Colorado, or any other sites that may be designated lower than 2,500 feet (750 m) Mean Sea Level (MSL). Only emergency missions are permitted to operate over these areas when absolutely necessary.

(2) For flights over populated areas, the minimum altitude is 1,000 feet (300 m) above the highest obstacle within a 2,000-foot (600-meter) radius, except for landings or takeoffs.

(3) If flying a mission specifically for photo coverage of a vessel in transit or Canal operations, the pilot must obtain prior approval for 1,000 feet (300 m) MSL from the Transit Operations Division. However, additional restrictions are as follows:

(a) Any vessel in Gaillard Cut may not be approached any closer than within a radius of 500 feet (150 m) while maintaining the altitude of 1,000 feet (300 m) MSL.

(b) At all locks (Miraflores, Pedro Miguel and Gatun) the pilot must remain outside the east and west fence line or if filming north or south, maintain 3,000 feet (900 m) horizontally.

(4) Occasionally foreign naval vessels while in transit request to conduct help operations. Approval must be obtained from the Dirección de Aeronáutica Civil and coordinated with the Transit Operations Division. These operations will be conducted as follows:

(a) Although the general rule states such operations will not be conducted closer than 1,000 feet (300 m) from the nearest waterfront installation, for Authority purposes such activities are limited to Cristobal Anchorage, Gatun Lake and Balboa Anchorage.

(b) General flight restrictions are in effect.

(c) These operations will be considered if scheduled to be conducted Monday through Friday 0800 to 1600 hours, except holidays.

d. Notification

Incidents of flights within Canal operating waters and areas in violation of established regulations shall be reported immediately to the office of the Transit Operations Division for handling.

2.38 Work Performed in Canal Operating Waters

a. Coordination: Any work to be performed by either ACP units or private contractors for ACP within Canal operating waters shall be coordinated with the Transit Operations Division Executive Manager.

(1) Prior to any work affecting waterside operations being contracted out or performed by Authority units, the Office of Canal Operations will be notified so that piloting, the method of work performance and transit scheduling requirements, as well as acceptable locations to moor the vessel when not occupied at the work site, can be addressed.

(2) In the event that heavy weights are to be moved, stability calculations will be furnished as part of the statement of work.

(3) Prior to commencement, the ACP unit having the action to oversee the execution of the project shall call for a meeting to coordinate operational requirements, with participation of representatives from the Transit Operations Division, Traffic Management Unit and any other unit affected.

b. Charges for Marine Services: Charges for marine services such as pilotage or line handling provided to the contractors, which as a condition of contract will be either charged or waived, shall be previously coordinated with the Admeasurement Unit.

(1) All such contracts shall be submitted to, reviewed and commented upon by the Admeasurement Unit and Transit Operations Division prior to solicitation.

(2) In order to insure the correct processing of charges for marine services, the Admeasurement Unit must be furnished a copy of each contract that involves the movement of vessels in Canal waters or requires that marine services be rendered.

(3) The cooperation of all units providing any kind of marine services in connection with a contract is required for proper accountability.

c. Non-ACP Vessels: Contractors performing work for the Authority in Canal operating waters shall have the floating equipment scheduled to be used in such work inspected and

approved for operation in accordance with requirements specified in the Maritime Regulations for the Operation of the Panama Canal, and other applicable regulations.

(1) Normally, vessels working or maneuvering in the navigable channels of the Canal will require, depending on their size, either a pilot or a transit advisor assigned to supervise their movement. Appropriate arrangements must be made regarding the subsistence of these personnel as well as their protection from the elements.

(2) When the vessel is idle, a qualified representative of the contractor will be required to remain aboard for the security of the vessel unless prior arrangements have been made and approved by the Transit Operations Division Executive Manager.

(3) Operators of floating equipment will require appropriate documentation, issued by the Panama Maritime Authority's Merchant Marine Directorate (Dirección General de Marina Mercante) certifying that they are qualified to operate such equipment.

(4) Requests for inspection/authorization to operate within Canal operating waters shall be made in advance, allowing sufficient time to have all identified deficiencies corrected prior to transiting or commencing any phase of the work.

(5) Vessels are subject to boarding and inspection by personnel from the Safety Division, Transit Operations Division, or Admeasurement Unit at any time for compliance with these requirements. Vessels found not in compliance will have the authorization to operate revoked.

d. Notification and Responsibility: When a contractor is involved, ACP units such as the Engineering Division, Contracting Division and/or Purchasing and Contract Branch coordinating the project are responsible for ensuring compliance with proper billing and accounting procedures.

The Transit Operations Division is responsible for notifying Marine Traffic Control Unit and contractors of restrictions that might be necessary to perform the job. Traffic Management Unit is responsible for notifying transiting vessels of those restrictions.

e. Contacts: Primary contacts within the Executive Vice Presidency for Operations will be as follows:

(1) Transit Operations Division: for the method and means of operations, operator's qualifications, pilotage, communications, lights and day-shape requirements.

(2) Board of Inspectors (OPXI): for floating equipment certification.

(3) Admeasurement and Billing Unit (OPTC-A): for admeasurement of vessels, tolls, and other marine services information related to billing.

(4) Marine Traffic Control Unit (OPTC-T): for transiting schedule, coordination of movement and communication while at work site.

2.39 Blasting in Canal Operating Waters

- a.** All blasting operations, to be performed by either ACP units or private contractors for ACP in Canal channels, anchorages or near/within the locks, shall be previously coordinated with the Transit Operations Division Executive Manager. Advance notification of extended blasting jobs is desired for publication in the Daily Information Sheet.
- b.** Prior to commencement, a meeting shall be called to coordinate operational requirements and restrictions, with participation of representatives from the Transit Operations Division and the Traffic Management Unit. The Locks and/or Transit Resources Divisions may participate if blasting will take place within three kilometers (2 miles) of any Locks or tug/launch landing.
- c.** Arrangements shall be made to ensure that the MTC watch supervisor is notified by radio or by phone (272-4201) at least 30 minutes prior to any blast and as soon as completed.
- d.** The watch supervisor is responsible for immediately notifying transiting vessels and ACP floating equipment that a blasting is imminent. The locks control houses and tug/launch landings that might be affected as per Paragraph 2.30(b) of this section will also be notified to insure that no diving operations are in progress at the time of the blast.
- e.** If required, additional coordination will be established, on a case-by-case basis, with the Transit Operations Division.

2.40 Regulations Regarding ACP's Minimum Visibility

1. Vessels transiting the Panama Canal must comply with the following minimum visibility requirements for the navigation bridge:
 - a.** For all conditions of draft and trim, the view of the water surface from conning positions 1, 2 and 3 in the navigation bridge shall not be obscured by more than two (2) ship lengths, or 500 meters forward of the bow, whichever is less, straight ahead to 10 degrees to either side from each of the conning positions.
 - b.** If the visibility from normal conning positions is obscured by cargo gear or other permanent obstructions forward of the beam, the total arc of obstructed visibility from shall not exceed 10 degrees.
 - c.** The side hull plating at the vessel's waterline, fore and aft, shall be visible from bridge wing conning positions.
 - d.** Vessels shall be required to execute an Undertaking and Release if visibility from the bridge is considered by the Canal Authority to present a hazard.

e. Vessels that do not to comply with these visibility requirements due to cargo, cargo gear, structures, or any other reason, shall correct the deficiency in order to transit. If the deficiency cannot be corrected, the vessel shall inform the ACP at least 48 hours prior to arrival in order to take the necessary actions and minimize the possibility of transit delays. This notification shall be made through the ACP's Maritime Service Portal or any other means acceptable by the ACP. If information regarding deficiencies is not received prior to arrival, the vessel will be considered in compliance; however, if deficiencies are detected upon arrival, the vessel may experience transiting or docking delays, and may also be subject to additional charges.

f. Vessels failing to meet ACP visibility requirements, for which notification was not received as required in Paragraph (e) above, may be subject to delays and charges above the regular service charge.

g. The ACP will determine the conditions under which non-compliant vessels may be allowed to transit or dock. Vessels that require additional resources due to their visibility condition, will be assessed the corresponding charges.

2. Notwithstanding the visibility requirements established herein, full container vessels of 700 feet or over in length overall and 100 feet or over in beam transiting in laden condition with a blind distance that exceeds 1 ship length will be assessed fees based on vessel dimensions, in accordance with official ACP tariff items #1065.0001 or #1065.0002.

Upon arrival at Canal waters, the "Blind Distance Declaration," Form 1746 (OPTC-A), available at <http://www.pancanal.com/common/maritime/forms/1746.doc> shall be completed by the master and presented to the ACP Boarding Officer. Please be advised that the "Pre-Arrival Vessel Information," Form 1743 (OPT), and the detailed Visibility Declaration required in the Maritime Service Portal are no longer required.

3. All vessels that arrive for transit not in compliance with the Panama Canal visibility requirements as outlined above are subject to the conditions and service charges. Any denial of transit or transit delays experienced due to non-compliance of the above or any other non-compliance will not be considered as an acceptable justification for claims from vessels for delays in navigation, in accordance with Article 6 of the "Maritime Regulations for the Operations of the Panama Canal."

4. Regulation on Pre-Arrival Information Required for Transit

(a) Article 30 of the Regulation on Navigation in Panama Canal waters establish that all vessels arriving for transit or port calls at the terminal ports of Balboa and Cristobal shall provide the required information not less than 96 hours in advance of arrival. Timely submittal of this information is essential for appropriate assignment of resources and applicable restrictions, if necessary.

(b) Additionally, vessels over 45.72 meters (150 feet) LOA are required to submit Form 1743, Pre- arrival Vessel Information, no later than 48 hours prior to arrival. The

visibility from conning positions 1, 2, and 3 reported in this document shall be expressed in ship lengths calculated for tropical salt water.

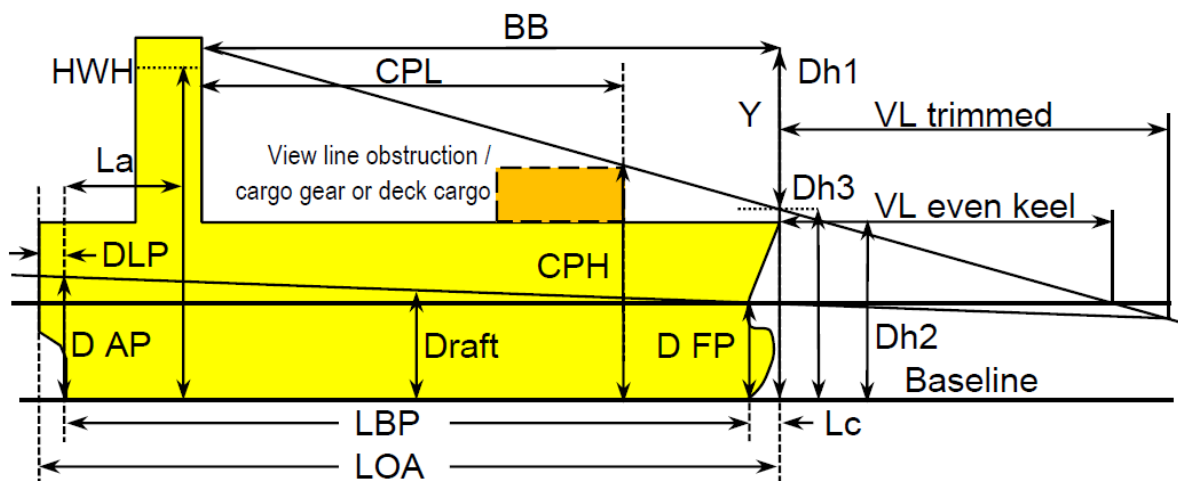
(c) Revisions to arrival information previously submitted are permitted no later than 36 hours without affecting the vessel’s transit schedule, but such notification must be sent to Arqueadores@pancanal.com. Failure to do so may result in the assignment of resources and the application of charges based on previously submitted information.

(d) Non-compliance with these requirements, or providing incorrect or incomplete information, may delay the transit or docking of the vessel.

(e) The following formulas shall be used to calculate the blind distance and visibility length:

$$BD = \left(\frac{Dh + Lc \left(\frac{Dh1 - Dh}{LBP + Lc - La} \right) - Draft - \left(\frac{Trim}{2} \right)}{\left(\frac{Trim}{LBP} \right) + \left(\frac{Dh1 - Dh}{LBP + Lc - La} \right)} \right) - Lc$$

$$VL = BD / LOA$$



Where:

- VL** = Visibility in ship Length
- BD** = Blind Distance
- LOA** = Length Over All
- LBP** = Length Between Perpendiculars
- BB** = Longitudinal distance from wheelhouse front Bulkhead to Bow

- La** = Longitudinal distance from the After Perpendicular (AP) to pilot position
= $LOA - BB - DLP - 0.75$
- Lc** = Longitudinal distance from the Forward Perpendicular (FP) to the Bow
= $LOA - LBP - DLP$
- Dh1** = Height from baseline to wheelhouse deck plus 1.8m = $HWH + 1.8$
- HWH** = Height from baseline to Wheelhouse deck
- Dh** = Highest value between the heights resulting from Dh2 and Dh3
- Dh2** = Height from Baseline to top of Bow
- Dh3** = Height at bow from baseline to intercept of obstructed view line = $Dh1 - Y$
- Y** = Height from view line obstruction/cargo gear or deck cargo to pilot's height of eye projected to the bow of the vessel
= $(Dh1 - CPH)(BB + 0.75) / (CPL + 0.75)$
- CPH** = Critical Point Height from baseline to top of deck cargo obstructing the view line
- CPL** = Critical Point Length from the wheelhouse front bulkhead to the view line obstruction/cargo gear or deck cargo
- DLP** = Distance Longitudinal from transom to the after Perpendicular (AP)
- Draft** = Mean of drafts at the perpendiculars = $(D AP + D FP) \div 2$
- Trim** = Trim of the vessel (negative by the stern, positive by the head) = $D FP - D AP$
- D AP** = Draft at the After Perpendicular (AP)
- D FP** = Draft at the Forward Perpendicular (FP)

Note: The longitudinal pilot position and pilot's height of eye used in the above calculations conform to Regulation 22.1.8 of SOLAS 2009 Chapter V, which states "*The upper edge of the navigation bridge front windows shall allow a forward of the horizon, for a person with a height of eye of 1,800mm above the bridge deck at the conning position*". The longitudinal distance of the pilot position for use in the above is clarified as 0.75m aft from the wheelhouse front bulkhead. Metric units shall be used in the above formulas.

To facilitate the pre-arrival process and provide for expeditious scheduling of vessels, a copy of the General Arrangement Plan must be sent to Arqueadores@pancanal.com or ACP-Shipplans@pancanal.com, in PDF or AutoCAD format, at least 96 hours prior to the vessel's ETA.

2.41 Transit of Supers, Panamax, Panamax Plus and Neopanamax in Gaillard Cut during Hours of Darkness (NIC)

- a. *Supers, Panamax, Panamax Plus and Neopanamax* may transit the Gaillard Cut during the *hours of darkness* provided that they comply with ACP requirements established in the *Evaluation Criteria for Transiting the Cut during the Hours of Darkness*.

- b.** Neopanamax container vessels with beams up to 135 feet, LOA not exceeding 1050 feet, and a a deepest point of immersion not exceeding 45.0 feet will be permitted to transit Culebra Cut at night if the comply with criteria established for transiting the Cut at night, unless restricted for other reasons.
- c.** Neopanamax vessels, other than container vessels, with beams up to 135 feet, LOA not exceeding 1000 feet, and a a deepest point of immersion not exceeding 45.0 feet will be permitted to transit Culebra Cut at night if the comply with criteria established for transiting the Cut at night, unless restricted for other reasons.
- d.** Vessels PD-1 or PD-2 with beams over 120 feet will not be allowed to transit the Cut during the Hours of Darkness.
- e.** Submarines, dead tows with hazardous deck conditions or inadequate deck lighting, and all dead tows on the hawser or on the hip, shall have a *Daylight Transit* restriction. However, dead Tows arranged as an Integrated Tug and Barge (ITB); or dead tows arranged pusher style or in the notch which are properly secured, and which have good handling characteristics, may be allowed to transit the *Culebra Cut* during the *hours of darkness*
- f.** When a transiting vessel develops a deficiency that results in the vessel not complying with the provisions of this section, the vessel shall proceed to the nearest anchorage, unoccupied tie-up station or unoccupied mooring station, to correct the deficiency prior to proceeding with the transit.

2.42 Transiting of Supers, Panamax, Panamax Plus and Neopanamax Vessels in Gatun Lake at Night

- a.** With the exception of those vessels prescribed in paragraph (b) of this section, Supers, Panamax, Panamax Plus y Neopanamax vessels may be allowed to transit Gatun Lake between Gamboa Signal Station and Gatun or Agua Clara Locks, during the hours of darkness.
- b.** The following vessels shall not be scheduled to transit any portion of Gatun Lake between Gamboa Signal Station and Buoy 16 during the hours of darkness:
 - (1) Vessels of 800 feet or more in length overall that are either Passenger vessels, Vehicle Carriers, or Roll-On / Roll-Off vessels;
 - (2) Vessels, with the exception of container vessels, over 120 feet in beam or exceeding 850 feet in LOA with a precautionary designator PD-1 or PD-2;
 - (3) Supers, Panamax, Panamax Plus and Neopanamax vessels that are not allowed to transit the Gaillard Cut during the hours of darkness as prescribed in section 2.37;

(4) Submarines, dead tows with hazardous deck conditions or inadequate deck lighting, and all dead tows on the hawser or on the hip.

(5) Vessels with Complete Daylight or Daylight Transit restrictions which may not transit during the hours of darkness.

c. Neopanamax and Panamax Plus vessels up to 120 feet in beam, or up to 1,050 feet in length, or deepest point of immersion in TFW of 42 feet, unless restricted for other reasons, will be permitted to meet Regular, Supers and Panamax vessels in Gatun Lake between Gamboa Signal Station and Gatun or Agua Clara Locks, for a maximum combined beam of up to 220 feet.

d. *Supers* and Panamax vessels of 800 feet or more in length overall, and all Panamax Plus and Neopanamax vessels will only be permitted to meet opposing traffic in reaches with a minimum width of 1000 feet.

e. The Cut tug assigned to *Supers* and Panamax 800 feet or more in LOA, to Panamax Plus and Neopanamax vessels transiting Gatun Lake during the hours of darkness, shall be available to and from Buoy 62. Southbounds shall not be scheduled (as updated at the time the vessels are underway in Gatun Lake) to transit any part of Gatun Lake during the hours of darkness if the required tug assistance is not available.

f. When a Super or Panamax vessel 800 feet or more in LOA do not comply with the visibility requirements, or when a Panama Plus or Neopanamax develop a deficiency that would result in the vessel not complying with the provisions of this section, the vessel shall proceed to the nearest anchorage, unoccupied tie-up station or unoccupied mooring station to correct the deficiency prior to proceeding with the transit.

g. Control pilots of dead tows allowed under this section will have a minimum qualification of CP-04-08. .

h. Except as prescribed in section 2.38(h), control pilots of Panamax Plus and Neopanamax vessels permitted in this section will have a minimum qualification of CP-04-09, CP-04-10 or CP-04-11 including the established experience requirements.

2.43 Meetings in Gaillard Cut

In addition to meetings permitted by Operations Directive D-1-2008 - Operating Procedures, other meetings are permitted in the Gaillard Cut as specifically provided in this section.

Table XIII applies to meetings in Gaillard Cut when the available navigable channel is at least 630 feet in width:

MEETINGS IN GAILLARD CUT				
Range	Daylight			Hours of Darkness
Beam \ LOA	< 900'	< 650'	650' - 899.99'	< 800'
100' - 106.19'		Combined Beam 187'	Meet vessels with less than 80' in beam (*)	
95.0' - 99.99'	Combined Beam 180'			Combined Beam 170'
91.0' - 94.99'	Combined Beam 190'			
Less than 91.0'	No meeting restrictions in Gaillard Cut due to draft or vessel dimensions provided the other vessel is also less than 91' in beam			
(*) The regular vessel in the meeting(s) shall be a refrigerated vessel, a container vessel, a passenger ship, a warship, or a fishing vessel.				

TABLE XIII – Meetings in Gaillard Cut

a. The following meetings may be permitted in the Gaillard Cut only during *daylight*, provided the conditions of this section are met:

- (1) *Supers* of 91 feet or more, but less than 95 feet in beam, may meet other vessels in Gaillard Cut provided the combined beams do not exceed 190 feet;
- (2) *Supers* of 95 feet or more, but less than 100 feet in beam, may meet other vessels in Gaillard Cut provided the *combined beams* do not exceed 180 feet;
- (3) *Supers* 100 feet or more, but less than 106.2 feet in beam and less than 650 feet LOA, may meet other vessels in Gaillard Cut provided the combined beams do not exceed 187 feet; and
- (4) *Supers* 100 feet or more, but less than 106.2 feet in beam and less than 900 feet LOA, may meet a refrigerated vessel, a container vessel, a passenger ship, a warship, or a fishing vessel provided these vessels are less than 80 feet in beam.

b. The following meetings may be permitted in Gaillard Cut during the hours of darkness, if the conditions prescribed in this section are met:

(1) Vessels less than 91 feet in beam (Regulars) and a draft of more than 38 feet TFW, but not exceeding their allowed draft limit (ADL): Unless not permitted by other restrictions, these vessels may meet other vessels in Gaillard Cut, provided the other vessels are also less than 91 feet in beam; and

(2) Supers 91 feet or more, but less than 100 feet in beam and less than 800 feet LOA: These vessels may meet other vessels in the Gaillard Cut, provided the combined beams do not exceed 170 feet.

NOTE: If the available navigable channel is less than 630 feet in width, the following will be applied:

- Vessels less than 91 feet in beam may continue to meet at day or night without restrictions; unless exceeding 80 feet in beam and 38 feet in draft, when it will have a clear cut restriction at night

- Supers 91 feet or more, but less than 95 feet in beam, may meet other vessels in the Cut during daylight, provided the combined beams do not exceed 170 feet.

2.44 Panamax Plus and Neopanamax Vessel Movements In and Out of Balboa and Cristobal Harbors

a. The procedures established in this section are to be utilized for *Neopanamax* and Panamax Plus vessels.

b. The following restrictions shall apply to *Panamax Plus* or *Neopanamax* vessels of up to 48.77 m (160 feet) in beam proceeding between Buoy No. 1 at the Pacific Entrance and Balboa Channel up to Cocoli Locks.

(1) Panamax Plus and Neopanamax vessels will have clear channel restriction between the Bridge of the Americas and the basin of the Port of Balboa.

(2) Panamax Plus and Neopanamax vessels up to 43.6 m (143 feet) in beam, will be allowed to meet other vessels for a combined beam of up to 70.7 m (232 feet).

(3) Neopanamax vessels with beams exceeding 43.6 m (143 feet) will have a Clear Channel restriction.

(4) Vessels shall have a minimum under keel clearance of five 5 feet (1.52 meters).

(5) For reasons of safety and expediency, it is preferable to dock Panamax Plus and Neopanamax vessels port side to at Balboa Dock 16 and starboard side to at Balboa Dock 17.

c. The following restrictions shall apply to Panamax Plus or Neopanamax vessels between the Mole buoy and Agua Clara Locks.

(1) Panamax Plus and Neopanamax vessels will have a restriction of 265 feet of combined beam between the junction buoy and the Mole buoy in the Atlantic Channel when the navigational channel has a minimum width of 984 feet and is free of obstructions, and the vessel has a minimum UKC of 5 feet.

2.45 Attachments

The following forms and charts are provided for reference:

- *Balboa Harbor (page 95)*
- *Third Locks Mooring Area (page 96)*

