

WHAT YOU NEED TO KNOW ABOUT CANAL REQUIREMENTS **from**

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a. Canal Transit

Time is always of importance in the shipping industry and transit of a vessel through the Panama Canal is certainly no exception. It cannot be stressed sufficiently that as much notice of an impending transit of a vessel be given by her Owners or Operators to this Agency in order to provide a complete breakdown of Canal transit expenses so that funds can be transferred in a timely manner, thus securing the earliest possible transit.

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b. Initial Transit

Approval of Plans

(1) The plans for new construction or modification for each vessel or class of vessels should be submitted to the Transit Operations Division for review prior to modification or construction. A minimum of two and a maximum of four sets of copies of each drawing should be submitted. The ACP will retain for its records and files a single set of the drawings submitted and will return only up to three sets of copies of the principal drawings submitted. Failure to comply with this requirement may result in delay or denial of transit because of unsuitable or unsafe arrangements.

(2) The numerous constraints affecting the transit schedules of vessels and tows make it important that information provided in advance of the initial transit include the following documents for approval (a minimum of two copies of each drawing must be submitted):

- General Arrangement (indicating deployed boarding facilities, blue steering light and pilot shelters/platforms)
- Mooring Arrangement (indicating chock/bitt sizes and maximum safe working load/strain capacities)
- Wheelhouse Arrangement (showing required aids to navigation, such as indicators, wipers, horn controls, radar and others)
- Visibility Calculations (indicating compliance with ACP visibility requirements) .
- Section Views showing the vessel inside the lock chamber pressed against both, center and side walls, indicating clearances of protrusions from lock structures and equipment (for vessels with protrusions – the locks chamber drawing may be downloaded from the Panama Canal web page at http://www.pancanal.com/eng/maritime/notices/All_Locks_Composite_Maximum_Clearances_Limiting_Dimensions.pdf).

For reference only (one copy of each drawing retained for our records):

- Midship Section (or Shell Expansion and bilge radius information, if the Midship Section is not

available)

- Engine room plans
- International Tonnage Certificate
- International Load Line Certificate
- Detailed drawings of chocks and bitts showing sizes and maximum strain capacities, if not indicated in the mooring arrangement.

This advance information will minimize the possibility that transit might be denied due to noncompliance with Canal regulations.

(3) Vessels that have had the appropriate plans approved will normally retain such approval unless it is determined by the Transit Operations Division manager that modifications are necessary to ensure safe transit.

(4) The Transit Operations Division accepts electronic drawing submittals via email or by regular mail in diskettes.

(5) The drawings are to be saved in a format type, which minimizes file size and is readable by or compatible with AUTOCAD2002. All drawing and letter files comprising the submittal are to be zipped together into one zip file using the WinZip file compression software. Please note that the Canal e-mail system limits attachment size to less than 1.5MB.

(6) After review, the submittals will be stamped electronically and returned via email, zipped. In this manner the recipient has better control of the number of prints needed for their internal distribution.

Additionally, and for the purpose of admeasurement, vessels transiting the Canal for the first time need to present an International Tonnage Certificate (69) (ITC 69) or a substitute document deemed acceptable by the Authority, based on a system substantially similar to that of the Panama Canal.

These vessels have to provide plans, classification certificates and documents with information stating the Total Volume of the vessel or sufficient information to the Admeasurement Unit (MRTD) to determine this volume through mathematical calculations. For more on this you may refer to Agreement No.2, Article 5 of the "Maritime Regulations for the Operations of the Panama Canal" which may be downloaded from <http://www.pancanal.com/eng/maritime/regula>

[tions/
al/reglamentos/acuerdo2-eng.pdf](#)

and <http://www.pancanal.com/eng/leg>

There is no charge for ACP admeasurement calculations if the 'ITC 69' values submitted are confirmed. If 'ITC 69' values are not confirmed the vessel will have to be admeasured and the ACP will assess appropriate charges.

Herebelow is the list of drawings/documents that have to be submitted to the Admeasurement Unit (MRTD) prior to transit. **This is in addition to the plan approval requirements listed above.**

- Lines Plan (or offsets table, if Lines not available)
- Midship Section (or Shell Expansion and bilge radius info, if Midship not available)
- General Arrangement
- Cargo Securing Manual (container section)
- Capacity Plan
- International Tonnage Certificate
- International Load Line Certificate
- Suez Tonnage Certificate (if it has one)

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c. Pre Arrival Information

We suggest that vessels advise us of their ETA no less than 7 days in advance in order that we may assist Masters in providing all the necessary information with the newly instigated Automatic Data Collection System (ADCS) and submission of the required declarations via the Electronic Data Collection System (EDCS). The ADCS system has been implemented in order to comply with ISPS and IMO regulations and the EDCS System provides the electronic means to submit all required pre-arrival information to visit and/or transit the Panama Canal. These systems enable the Panama Canal Authority (PCA) to provide the highest level of security/service to all customers whilst executing an on-line risk assessment matrix to properly comply with international security regulations, safeguarding the Panama Canal and its customers' assets.

All vessels arriving to canal waters are required to have submitted no less than 96 hours prior to arrival the information contained in the forms listed below. This information should be received

at our agency no less than 120 hours prior to the vessel arrival at canal waters and allow for processing time. Information as to the required format or to obtain a copy of the latest PCA MyEDCS XML Editor OffLine Application software and or updated versions of General Reference Tables, Harmonized Codes or Port Codes, is available in the EDCS portion of the Panama Canal website. <http://www.pancanal.com/eng/maritime/edcs/index.html>

Declaration Forms:

Ship Due Form This form requires general information to include but not limited to, Derat

Cargo Declaration Form This form requires the following information:

General Cargo It is required to specify the Harmonized Code, quantity in metric tones, Port

Dangerous Cargo It is required to specify Proper Shipping Name, designate the UN or BC Cod

Containerized Cargo It is required to specify the containers, Type, Location and below deck

Please note that for large quantities of cargoes or containerized cargo to be declared, information will have to be submitted electronically, via the Canal Internet Gateway (CIG) for those companies that have obtained proper accreditation. For companies without CIG accreditation, sufficient time must be allocated prior to the vessels arrival for the manual entry of the information into the EDCS system. **(All vessels with local visits are required to submit only the dangerous cargo information).**

Crew List Form Name, Birthplace, Birth Date, Capacity, Nationality, Passport or Seaman

Passenger List Form Name, Birthplace, Birth Date and Nationality are the minimum requirements

For large quantities of crew or passenger declarations, information will have to be submitted electronically, via the Canal Internet Gateway (CIG) for those companies that have obtained proper accreditation. For companies without CIG accreditation, sufficient time must be allocated prior to the vessels arrival for the manual entry of the information into the EDCS system.

Small Craft Form A combination of the above vessels under 125 feet Small craft vessels are

The Panama Canal authority has implemented tariffs for security inspections and escort services for vessels that fail to comply with the 96 hour pre-arrival notice or that submit wrong or incomplete information. Failure to provide timely and correct information may trigger escort and

inspection fees and/or delays to a vessel arriving in noncompliance. In addition to these charges, the Canal may also fine the vessel. In order to ensure that sufficient time is allowed for information to be processed and checked, it is important that our agency receive all the required information no less than 120 hours prior to arrival at Canal waters.

Should any additional technical assistance, information about the canal requirements or information regarding the establishment of a CIG (Canal Internet Gateway) or assistance in transmitting the information in a manner that is in accordance with Canal Regulations please don't hesitate to contact us at asa@shipsagent.com

d. Documents Required on Arrival

The Panama Canal Treaty of 1978, which replaced the 1903 Treaty, disestablished the former Canal Zone, the territories and ports reverting to the Republic of Panama on October 1, 1979. Consequently, vessels calling at the Canal now deal with the governmental authorities of the Republic of Panama for any port related activities, as well as with the Panama Canal Authority for transit related formalities. If a vessel is calling for transit, the Authority Boarding Officer will require the following form, which should be completed prior to arrival.

Ship's Information & Quarantine Declaration form - [view form](#)

In addition, the following documents should also be available for inspection:

- Clearance from last port
- Panama Canal Tonnage Certificate
- Ship's Register
- Sanitary Certificates
(Deratting exemption, etc.)

If a vessel is berthing at either of the terminal ports, a boarding party of representatives of the Panamanian Government will also attend. The Panamanian forms are similar to the Canal

forms listed above, with the exception that they are in English and Spanish, will be processed in similar manner.

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e. Radio Pratique

Radio pratique may be granted by the Panama Canal Authority quarantine Office, on request from the vessel through the ship's local agent providing:

- (a) The vessel is free of rats and vermin.
- (b) The deratting certificate or deratting exemption certificate is valid (i.e., date of issue not more than 180 days prior to date of arrival at the Panama Canal).
- (c) Vessels arriving within 15 days from the ports designated in the Aedes Aegypti Indices Bulletins disinfected with an approved aerosol.

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f. VHF Radio Communication

Cristobal and Balboa port traffic is controlled through VHF Channel 12. It is suggested that vessels approaching either port, communicate with the signal station on this frequency, coordinating their movements and reporting their anchoring time. VHF Channel 13 is required for use during Canal transit and is exclusively reserved for that purpose. Our office maintains watch on Channel 12, but after initial contact, communication will be on a mutually agreed alternate channel.

In addition to the above, commercial facilities are available through Panama Radio which offers both international and local telephone service.

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g. Transit Scheduling

The Panama Canal is a lock type canal, and as such, does not employ the convoy system. Each vessel is assigned a transit schedule in accordance with regulations governing pilotage and other restrictions imposed by the vessel's type, size, and/or cargo. The general rule governing transit priority is established on the basis of arrival time, but the need to schedule traffic with large vessels (or those with hazardous cargo) transiting in daylight without meeting oncoming traffic in the Cut, creates a traffic pattern with larger and more restricted vessels being dispatched in the early hours of the morning and others following in the afternoon and during the night. Transit Booking System: In 1983 the Canal adopted, as an option, a transit reservation system which permits a limited number of booked transits each day, which further complicates the traffic pattern.

Full details of all the regulations governing the reservation system are available at the [Booking Regulations](#) section of this site.

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h. Agency

A representative of our organization will board every vessel on its arrival at the Canal. A watch is maintained through VHF Channel 12 during regular hours, supplemented by facilities of the commercial stations after normal office hours. Our duty personnel, who are on standby on a 24-hour basis, may be contacted through these facilities and, in addition, will maintain communication with Canal transit authorities to monitor the vessel's position and progress as she proceeds through the Canal.

To facilitate and expedite arrangements for supplies and services, we request that Master advise all requirements prior to arrival, so that arrangements may be accomplished at the port of arrival, thereby leaving the vessel free to proceed directly to sea once transit has been completed.

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i. Manning

Every vessel navigating the Panama Canal must be sufficiently manned in officers and crew for the safe handling of the vessel. The Master must be on the bridge and the Chief Engineer in the engine room while a vessel is getting underway, anchoring, shifting berth, passing through the locks and Gaillard Cut, and all other officers at their regular stations.

Canal Authority line handlers will be assigned to handle the towing locomotive lines at the locks.

The number of line handlers is determined primarily by the size of the vessel.

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j. Towing Locomotives

Vessels are towed through the locks by electric locomotives (mules) using steel wire towing lines. Canal regulations provide for specific construction and placement of chocks and bits for use in towing through the locks. Vessels carrying deck cargoes should ensure that these chocks and bits are left accessible for use at the Panama Canal.

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k. Pilot Platforms

Unless of unusual configuration, it may be taken as a general rule that all transiting vessels which are over 600 feet in length, and have a beam of 100 feet or more with the bridge aft are required to have pilot platforms erected in the forward part of the vessel for the use of the extra pilots that are assigned.

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l. Pilot Shelters

Vessel's with a beam of 80 feet and over, must provide Pilot Shelters on the bridge wings for the pilot.

In the event that a vessel arrives without such platforms or shelters approved by the Canal Authority, it will be delayed until suitable platforms/shelters are fabricated and installed.

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m. Accidents

In the event of an accident in port or during transit causing damage to the vessel, the Canal, port installations, or personal injuries, the Master should notify us immediately with available details, advising whether damage is such as to require survey or temporary repairs, etc. No claim will be accepted by the Canal Authority once the vessel has departed without an investigation having been held. For more information about accidents & Investigations go to [Link](#).

At time of writing a firm modus operandi for marine accidents has not yet been established by the Port Operators. However under normal circumstances a vessel is permitted to depart if some form of guarantee is made.

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n. PANAMA CANAL MINIMUM VISIBILITY REQUIREMENTS

(1) All vessels transiting the Panama Canal must comply with the following navigation bridge minimum visibility requirements:

(a) If the vessel is laden, the view of the water surface from any conning position in the navigation bridge shall not be obscured by more than one (1) ship length forward of the bow, under all conditions of draft and trim.

Note: Vessels billed at the laden rate are considered laden for the purposes of this requirement.

(b) If the vessel is in ballast (not laden), the view of the water surface from any conning position in the navigation bridge shall not be obscured by more than one and one-half (1.5) ship lengths forward of the bow, under all conditions of draft and trim.

(c) 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 Conning Position 1 shall not exceed 15 degrees.

(d) The side hull plating at the vessel's waterline, fore and aft, shall be visible from bridge wing conning positions.

(e) 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.

(2) Under an ongoing test, which began January 30, 2000, Full Container vessels may be allowed to transit while not in compliance with the visibility requirements in Subsection 4.e(1) above, provided they comply with all of the following requirements and conditions:

(a) Must be 700 feet (213.36m) or more in length.

(b) Must have clear visibility forward; therefore, should not be equipped with centerline cranes or cargo gear, which in any way obstruct forward visibility.

(c) The view of the water surface from conning position No.1 shall not be obscured by more than two (2) ship lengths, or 500 meters, whichever is less, forward of the bow to 10° on either side, under all conditions of draft, trim and deck cargo.

(d) Must have installed, prior to transit, the pilot shelter platforms as required in Article 64 of the "Maritime Regulations for the Operations of the Panama Canal."

(e) Must be equipped with an operational bow thruster, otherwise it may, at pilot request, be assigned and charged for an additional tug through the Gaillard Cut.

(f) Must notify the ACP of their voluntary request to "Exceed ACP Visibility." This notification, which may be included in the remarks section of the ETA message, must be received at least 48 hours prior to arrival stating that they "Exceed ACP Visibility."

(g) Incur a service charge in the amount of \$2,500 to cover the costs resulting from the assignment of additional resources provided adequate notification, as stated in paragraph f, has taken place. If notification is not received at least 48 hours prior to the vessel's arrival, the service charge will be \$6,500.

(h) Vessels failing to meet ACP visibility requirements that nonetheless qualify for this test, but for which notification was not received as required in paragraph (f) above, may be subject to delays and additional charges as well as the \$6,500 service charge.

(i) Requests to modify previous ETA messages, which would change the "Exceed ACP Visibility" status of the vessel, will only be allowed, with no service charge assessed, if notification is received 48 hours prior to arrival.

(3) All vessels that arrive for transit not in compliance with the Panama Canal visibility requirements as outlined above, are subject to the conditions outlined in paragraph 4.a of the ACP "Vessel Requirements," MR's Notice to Shipping No. N-1-2002, as well as the conditions and service charges stated in Item 3 above. 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." Note: Vessel owners are encouraged to raise the height of the navigation bridge of their existing vessels and to have new vessels designed and built with higher navigation bridges so as to provide navigators the best possible visibility.

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o. SIZE AND AIR DRAFT

There are several factors which control the size of vessels that are eligible for Panama Canal transit. The basic factor being the size of the lock chambers which are 1000 feet in length with a width of 110 feet. The size of the lock chambers, the level of water in Gatun Lake and the hull configuration of vessels are thus the controlling factors. The limitations are outlined in a Marine Director's Notice to Shipping, which is issued yearly, and is available from this site, under [Notices to Shipping](#).

Although not normally considered as a restriction, the Bridge of the Americas spans the Canal

at Balboa limiting the **maximum air draft to 190 feet at any state of the tide.**

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p. DRAFT

(1) The maximum permissible draft for Canal transits has been set at 39 feet 6 inches (12.04 m) Tropical Fresh Water (TFW) at a Gatun Lake level of 81 feet 6 inches (24.84 m) or higher. [Gatun Lake density is 0.9954 gms/cc at 85 o F (29.4 o C).] This provides a safe navigational margin of at least 5 feet (1.52 m) over critical elevations in the Canal proper, and a clearance over the south sill of Pedro Miguel Locks of 1 foot 8 inches (0.50 m) at a Miraflores Lake Level of 54 feet 6 inches (16.61 m).

(2) Prior to the initial transit of a vessel whose transit draft will exceed 35 feet 6 inches (10.82 m), owners, operators or agents must supply in full the information required in the Regulation on Navigation in Panama Canal Waters (ACP Navigation Regulations, article 52), and request the maximum authorized transit draft for the vessel (deepest point of immersion TFW) from the Transit Operations Division manager, not later than two weeks prior to the loading of the vessel. This request will be returned with the approved maximum authorized transit draft stamped thereon. To confirm the max transit draft at which your vessel can transit we require the following information:

"A" = HALF BREADTH TO THE OUTSIDE OF SHELL (METERS/FEET & INCHES)

"R" = RADIUS OF TURN OF BILGE (METERS/FEET & INCHES)

"DR" = DEAD RISE AT SIDE OF VESSEL (CENTIMETERS/INCHES)

(3) The initial transit is permitted at or under the approved maximum authorized transit draft. After the initial transit, unless the vessel's agent or owner is notified of any restrictions imposed

by the Canal Authority, this maximum authorized transit draft will remain in effect.

(4) All vessels transiting the Canal should have sufficient ballast to permit safe handling during transit.

(5) A vessel whose ballast draft does not meet the minimum draft requirements established by this section may be accepted for transit on a regular basis, provided the vessel operator is granted permission after submitting the following information to the Transit Operations Division manager:

(a) Principal dimensions of the vessel.

(b) Deepest attainable minimum draft (fore and aft).

(c) Limitations on visibility fore and aft from the navigation bridge.

(d) Necessary excerpts from the vessel's plans, drawings and

maneuvering data that relate to the vessel's suitability for transit.

(6) Table 1 provides the minimum saltwater drafts for vessels anticipating transit. Drag must not adversely affect maneuverability. Any drag beyond 6 ft (1.83 m) is considered adverse drag in the Panama Canal and adjacent waters.

Table I - Minimum Salt Water Drafts

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q. MINIMUM DRAFTS

Up to 425' (129.54 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' (4.3 m) aft, TSW

Over 475' (144.8 m) 18' (5.5 m) forward, 20' (6.1 m) aft, TSW

Over 525' (160.02 m) 20' (6.1 m) forward, 22' (6.71 m) aft, TSW

Over 580' (176.8 m) 22' (6.71 m) forward, 24' (7.32 m) aft, TSW

Over 625' (190.5 m) 24' (7.32 m) forward, 26' (7.93 m) aft, TSW

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r. INDICATORS

All vessels over 150 feet (45.72 m) in length shall be provided with:

(1) Rudder angle indicators as follows:

(a) On vessels less than 80 feet (24.38 m) in beam, at least one of such design and placement that it can be easily read by day or night from all normal conning positions and from the steering station.

(b) On vessels 80 feet (24.38 m) or more in beam, at least one inside the wheelhouse and one on each bridge wing, of such design and placement so that at least one can be easily read by day or night from each conning position and from the steering station.

(c) They shall show in degrees clearly and accurately the position and direction of the rudder or rudders. It shall be noted that indicators located aft of the conning positions will not be considered as meeting this requirement.

(2) Propeller revolution tachometer or variable pitch propeller indicators as follows:

(a) On vessels less than 80 feet (24.38 m) in beam, at least one for each propeller, of such design as to be easily read by day or night from all normal conning positions.

(b) On vessels 80 feet (24.38 m) or more in beam, at least one for each propeller located inside the wheelhouse and one for each propeller located on each bridge wing, of such design and placement so that at least one can be easily read by day or night from each conning position.

(c) Indicators shall show revolutions per minute clearly and shall accurately indicate the

direction of the propeller or propellers. It shall be noted that indicators located aft of the conning positions will not be considered as meeting this requirement.

(d) All vessels with variable pitch control indicators will have them so located as required in (a) and (b) of this subsection.

(3) Indicators must be operational: Vessels with missing or broken indicators may expect transit delays.

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s. WHISTLE CONTROLS

Vessels shall be provided with whistle controls as follows:

(1) On all vessels, one within easy reach on the navigational bridge from Conning Positions 1, 2 and 3, as described in Section 4.d, preferably on the forward bulkhead.

(2) If the beam of the vessel is over 49.2 feet (15 m), additional controls shall be provided within 5 feet (1.52 m) of the extreme end of bridge wings at Conning Positions 4 and 5.

(3) Controls shall make it possible to regulate precisely any required whistle signal.

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t. STEERING LIGHT

(1) All vessels over 328 feet (100 m) in length shall have installed, at or near the stem, a steering range equipped with a fixed blue light which shall be clearly visible from the bridge along the centerline. The height of the light is to be as close as possible to the height of eye level on the bridge. If said range and light so placed would be partially or completely obscured from Conning Position 1, then two such ranges and lights must be installed ahead of Conning Positions 2 and 3. The wheelhouse position directly aft of the steering lights shall be marked with a small labeled plaque on the window sill which can be located in the dark by feel.

(2) Naval or military vessels exempted from the requirements of 72 COLREGS (see ACP Navigation Regulations, article 108) shall also be exempted from the requirements of this article.

(3) The light required shall be capable of being illuminated and extinguished by a suitable rheostat or control switch located either on the navigation bridge or forecastle deck, or both.

(4) The use of this steering light shall be at the discretion of the Canal pilot who has control of the navigation and movement of the vessel.

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u. BOW/STERN THRUSTERS

Vessels equipped with bow/stern thrusters should provide controls located at the extreme ends of the bridge wings, as well as inside the wheelhouse.

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v. COMPASS

(1) Ships of less than 150 gross tonnage (ITC69) shall be fitted with a steering compass and have means for taking bearing.

(2) Ships of 150 gross tonnage (ITC69) and over shall be fitted with a standard magnetic compass and with a steering compass unless the information provided by the standard compass is made available and is clearly readable by the helmsman at Conning Position 1. Means must be available for taking bearings, as nearly as practicable over an arc of the horizon of 360°.

Residual deviation of the magnetic compass must be verified to be less than 7 degrees by swinging the vessel on various headings. Such verification by a recognized calibration authority must have been accomplished, and an accurate deviation table issued, within the previous 12-month period. If necessary, the compass must be adjusted to reduce the observed deviation to less than 7 degrees. Calibration cards issued and signed by the master will be accepted as long as the deviation is less than 6 degrees.

(3) Ships of 500 gross tons (ITC69) and over shall be fitted with a gyro compass. The master gyro compass or a gyro repeater shall be clearly readable by the helmsman from the main conning position. On ships of 1,600 gross tonnage (ITC69) and over, a gyro repeater or gyro repeaters shall be provided and shall be suitably placed for taking bearings as nearly as practicable over an arc of the horizon of 360°. A gyro repeater shall be provided which shall be readily visible and useable by the pilot from Conning Position 1. Maximum residual steady state gyro error shall not exceed 2°. The maximum divergence in reading between the master compass and repeaters under all operational conditions should not exceed plus or minus 0.5°.

(4) Vessels not in full compliance with these requirements should expect transit delays during periods of fog or inclement weather, a common occurrence in the Republic of Panama coincidental with the rainy season (May to December).

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w. SANITARY FACILITIES

a. Vessels transiting the Canal should have suitable sanitary facilities for the pilot(s). This is particularly important for barges, hand lines and other vessels which are not normally so equipped and whose progress is slow.

b. If a transiting ship does not have adequate sanitary facilities, the interval for which each pilot is assigned will be shortened, and significant delays could result.

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x. MOORING LINES

a. Vessels are required to have on deck six manila or synthetic mooring lines forward and six aft prior to commencing transit. The size and strength suitable for the vessel to dock, moor at a lock approach wall or secure in a lock chamber are the vessel's responsibility. The master shall

inform the Boarding Officer whether or not the vessel complies with the above, so that he may advise Marine Traffic Control. Wire ropes, and ropes composed of both wire and fiber or filaments, are not acceptable for Canal operations.

b. These lines are required to be on deck prior to commencing transit and ready for immediate use. Each line shall be at least 250 feet (75 m) in length and shall have an eye of at least five feet (1.50 m) spliced in one end. If one of these lines is 500 feet (150 m) or more in length with an eye in each end, it will qualify as two lines for the purpose of this requirement. They shall be in good condition. Non compliance with this requirement could result in transit delay.

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y. BOARDING FACILITIES

a. The Authority considers proper boarding facilities to be an absolute necessity to insure the safety of operations personnel and others using these facilities in Canal waters. Poorly constructed, installed, maintained or operated boarding facilities are not acceptable for use in Canal waters.

Requirements for boarding facilities are defined in the ACP Navigation Regulations, articles 57 and 58. Vessels with unsafe or inadequate boarding facilities will be required to correct such deficiencies before transiting and lengthy delays may result

Pilot ladders

(a) The ladder shall be safe, convenient and efficient for the purpose of enabling the pilots to embark and disembark safely, kept clean and in good order and may be used by officials and other persons while a ship is arriving or leaving a port.

(b) The ladder shall require a climb of not less than 5 feet (1.5 m) and not more than 30 feet (9 m) above the surface of the water.

(c) The ladder shall be so positioned that it is clear from any possible discharges from the ship, that it is within the parallel mid-body length of the ship and, as far as is practicable, within the mid-ship half-length of the ship.

(d) Each step shall rest firmly against the ship's side; where constructional features, such as rubbing bands, would prevent the implementation of this provision, special arrangements shall be made to the satisfaction of the Authority to ensure that persons are able to embark and disembark safely.

(e) A single length of ladder shall be used capable of reaching the water from the point of access to, or egress from, the ship; in providing for this, due allowance shall be made for all conditions of loading and trim of the ship and for an adverse list of 15 degrees. Whenever the distance from sea level to the point of access to the ship is more than 30 feet (9 m), access from the pilot ladder to the ship shall be by means of an accommodation ladder or other equally safe and convenient means.

(f) The securing strong points, shackles and securing ropes shall be at least as strong as the side ropes.

(g) The steps of the pilot ladder shall comply with the following requirements:

- If made of hardwood, they should be made in one piece, free of knots or other defects. If made of material other than hardwood, they should be of equivalent strength, stiffness and durability to the satisfaction of the Authority.

- The four lowest steps may be made of rubber of sufficient strength and stiffness or other material to the satisfaction of the Authority.

- Steps shall have an efficient non-slip surface, and shall not be painted with an opaque color or high gloss paint. The grain and character of the step shall be visible in order that any cracks or defects may be readily visible to the person using the ladder.

- Should have not less than 16 inches (400 mm) between the inside surfaces of the side ropes. Steps should be not less than 4-1/2 inches (115 mm) wide, and 1 inch (25 mm) in depth, excluding any non-slip device or grooving.

- Should be equally spaced not less than 12 inches (300 mm) nor more than 15 inches (380 mm) apart and be secured in such a manner that each will remain horizontal.

(h) No pilot ladder shall have more than two replacement steps which are secured in position by a method different from that used in the original construction of the ladder, and any steps so secured shall be replaced as soon as reasonably practicable by steps secured at position by the method used in the original construction of the ladder. When any replacement step secured to the side ropes of the ladder by means of grooves in the sides of the steps, such grooves shall be in the longer sides of the steps.

(i) Pilot ladders with more than five steps should have spreader steps not less than 6 feet (1.8 m) long provided at such intervals as will prevent the pilot ladder from twisting. Such spreader steps or battens shall be made of the same material and construction as the other ladders steps. The lowest spreader step shall be on the fifth step from the bottom of the ladder and the interval between any spreader step and the next shall not exceed nine steps.

(j) The side ropes of the ladder shall consist of two uncovered ropes not less than 3/4 inch (20 mm) in diameter on each side. Each rope shall be continuous with no joints below the top step. Two manropes properly secured to the ship and not less than 1 inch (28 mm) in diameter shall be kept at hand ready for use.

(k) Side ropes shall be made of manila or other material of equivalent strength, durability and grip that has been protected against actinic degradation and is satisfactory to the Authority.

(l) A life buoy equipped with a self-igniting light should be kept at hand ready for use, as should a heaving line. Life buoys should not be attached to the ship.

(m) Lighting should be provided such that both the pilot ladder over side and the position where any person embarks or disembarks on the ship are adequately lit.

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z. CONSTRUCTION, NUMBER AND LOCATION OF CHOCKS AND BITTS

a. A vessel passing through the locks shall normally be assisted by electric locomotives using steel towing wires. At the discretion of the Transit Operations Division manager, certain vessels, usually those under 125 feet (38.10 m) in length, may be handled with their own lines either against the lock wall or from both walls in the center of the chamber. Vessels transiting the Canal are required to have chocks and bitts as follows:

(1) All chocks for towing wires shall be of heavy closed construction and shall have a convex bearing surface with a radius of not less than 7 inches (180 mm). The convex surface shall extend so that a wire from the bitt, or from the locks locomotive through the chock, shall be tangent to the 7 inches (180 mm) radius at any angle up to 90 degrees with respect to a straight line through the chock.

(2) No part of the vessel which may be contacted by the towing wires, at any angle, shall have less than a 7-inch (180 mm) radius.

(3) Chocks designated as single chocks shall have a throat opening of not less than 100 square inches (650 square cm) in area — preferred dimensions are 12 x 9 inches (305 x 230 mm) — and shall be capable of withstanding the stress caused by a load of 100,000 pounds (45,360

kg) from the towing wires in any direction.

(4) Chocks designated as double chocks shall have a throat opening of not less than 140 square inches (900 square cm) in area — preferred dimensions are 14 x 10 inches (355 x 255 mm) — and shall be capable of withstanding the stress caused by a load of 140,000 pounds (64,000 kg) from the towing wires in any direction.

(5) Use of existing roller chocks is permissible provided they are not less than 49 feet (15 m) above the waterline at the vessel's maximum Panama Canal draft and provided they are in good condition, meet all of the requirements for solid chocks as specified in Paragraphs 8.a(1), 8.a(2), 8.a(3) and 8.a(4) of this section, as the case may be, and are so fitted that transition from the rollers to the chock body will prevent damage to towing wires. However, roller chocks are not accepted in plans of new constructions which are submitted for approval.

(6) Each single chock shall have an accompanying bitt — preferred diameter of 14 inches (356 mm) — capable of withstanding the stress caused by a load of 100,000 pounds (45,360 kg).

(7) Each double chock located at the stem and the stern, in accordance with Paragraph 8.a(8) of this section, shall have two pairs of accompanying heavy bitts with each bitt of each pair — preferred diameter of 16 inches (406 mm) — capable of withstanding the stress caused by a load of 140,000 pounds (64,000 kg). Other double chocks shall have a pair of accompanying heavy bitts with each bitt capable of withstanding a strain of 140,000 pounds (64,000 kg).

(8) All vessels, except those not requiring locomotives, shall be fitted with a double chock set athwartships right in the stem and another double chock set athwartships right in the stern, except that on vessels of less than 75 feet (22.86 m) in beam, two single chocks may be substituted for each double chock required by this subsection; on vessels of over 75 feet (22.86 m) in beam two double chocks may be substituted. If such substitution is made, the chocks shall be placed port and starboard not more than 8 feet (2.5 m) abaft the stem or 10 feet (3 m) forward of the stern, provided that these chocks are not more than 10 feet (3 m) from the center line of the vessel.

(9) Vessels under 200 feet (60.96 m) in length and less than 50 feet (15.24 m) in beam shall have a double chock or two single chocks at the stem and stern. If the vessel is equipped with

the two single chocks they shall be placed, port and starboard, not more than 8 feet (2.5 m) abaft the stem or 10 feet (3 m) forward of the stern, and not more than 10 feet (3 m) off the center line (see Figure).

(10) Vessels 200 to 400 feet (60.96 to 121.92 m) in length and not exceeding 75 feet (22.86 m) in beam shall have a double chock at the stem and at the stern or two single chocks at the bow and stern, port and starboard, not more than 8 feet (2.5 m) abaft the stem or 10 feet (3 m) forward of the stern and not more than 10 feet (3 m) off the center line and shall have two additional single chocks, port and starboard, 30 to 50 feet (9 to 16 m) abaft the stem and 30 to 50 feet (9 to 16 m) forward of the stern (see Figure).

(11) Vessels 400 to 570 feet (121.92 to 173.74 m) in length and not more than 75 feet (22.86 m) in beam shall have a double chock at the stem and stern or two single chocks at the bow and stern, port and starboard, not more than 8 feet (2.5 m) abaft the stem or 10 feet (3 m) forward of the stern and not more than 10 feet (3 m) off the center line. In addition, these vessels shall have a double chock, port and starboard, 40 to 50 feet (12 to 16 m) abaft the stem, a single chock port and starboard, 80 to 90 feet (24 to 28 m) abaft the stem, and a single chock, port and starboard, 40 to 50 feet (12 to 16 m) forward of the stern (see Figure)

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