MARINE SAPETY MANUAL

CHAPTER 4. VESSEL TRAFFIC MANAGEMENT

A. General Traffic Management Concepts.

1. Introduction. Vessel traffic management encompasses a wide range of Coast Guard activities and tools including aid. to navigation, vessel routing systems, Regulated Navigated Area. (RNA's), Navigation Rules, voice communications, and Vessel Traffic Services (VTS). Vessel traffic management attempts to establish two basic principles: good order and predictability. The objectives served by these principles include:

   a. Reduction in the rate of collisions, rammings, and groundings, and ensuing environmental harm;

   b. Facilitation of vessel traffic movement;

   c. Provision for all-weather navigation capability in certain areas; and

   d. Reduction in the rate of fire, explosion, and pollution casualties, and the probability of a port or waterway catastrophe.

2. Management Levels. Coast Guard vessel traffic management exists on two distinct levels: passive and active.

   a. Passive Management. Passive traffic management is any form of traffic management where extent of compliance is vested solely with the user. The "rules of the road," traffic separation schemes, and RNA's are all forms of passive management. Depending on the configuration of a particular port or waterway and the complexity of its vessel traffic patterns, one or more passive management techniques or procedures may be established to achieve a desired level of safety and protection of the environment. Passive traffic management can be very cost-effective, in that government resources are required only to administer and enforce requirements.

   b. Active Management. Active traffic management involves direct interaction between the government and the user to ensure compliance with government requirements. Active traffic management is used only in those areas where passive management techniques and procedures are inadequate to provide a desired level of safety and protection of the environment. When personnel not aboard a vessel become involved in its operation, either directly or indirectly, vessel traffic management becomes active. VTS is the most common form of active traffic management. A VTS provides the person in charge of a vessel with information critical to safe navigation which would not normally be available without the VTS. Examples of such information include notification of hazards to navigation, traffic advisories, and aids to navigation (ATON) discrepancies. [NOTE: Such assistance notwithstanding, it remains the ultimate responsibility of the master to control the movement of the vessel to ensure its safe passage.

3. Ports And Waterways Safety Act Of 1972 (NSA). The NSA, as amended by the Port and Tanker Safety Act of 1978 (PTSA) (33 U.S.C. 1221 et seq.), provides the basic authority for the Waterways Management (WWN) Program, particularly to establish and operate VTSe5, to establish traffic separation schemes and fairways, RNA's, and safety zones, and to require carriage of specified navigation and communication equipment.

B. Aids To Navigation.

1. Federally-Maintained Aids. The ATON Program of the Coast Guard is two-faceted: the audio-visual element facilitates the safe and expeditious passage of marine traffic in coastal areas, inland waterways, and harbors through the use of buoys, daymarkers, fog signals, lighthouses, and beacons; the electronic element serves mariners by providing continuous, all-weather position-fixing capability through the use of long range aid to navigation (LORAN) and radio beacons (RACON's). The statutory authority for the ATON Program is contained in 14 U.S.C. 2, 81, and 83. The establishment, maintenance, and operation of aids to navigation has been authorized by the Commandant to mark the navigable waters of the United States, the waters over the Outer Continental Shelf (OCS), and U.S. territories and possessions. Aids to navigation are. established, maintained, and operated by the Coast Guard when necessary for the safety of navigation, useful for commerce of a substantial and permanent character, and justified in terms of public benefit to be derived therefrom.

2. Privately-Maintained Aids. Private aids to navigation are those which are legally required or personally desired by a property owner to be displayed. They are assigned one of the. following classifications:

a. Class I. Aids to navigation on marine structures or other works which the owners are legally obligated to establish, maintain, and operate, as prescribed by 33 CFR 66 and 67.

b. Class II. Aids to navigation, exclusive of Class I, that are located in waters ordinarily used for general navigation.

c. Class III. Aids to navigation, exclusive of Class I, not ordinarily used for general navigation.

Applications to establish, maintain, discontinue, change, or transfer ownership of a private aid to navigation shall be made to the appropriate district commander. Form CG-2554, Private Aids to Navigation Application, shall be used in these instances. Instructions for completing the form are found on its reverse side. The Aids to Navigation Manual, Commandant Instruction (CONDTINST) M16500.7, contains additional information on the administration of private aids to navigation.

3. Captain Of The Port (COTP), Officer In Charge, Marine Inspection (OCMI), VTS Involvement. Although the COTP, OCMI, and VTS are not charged specifically with ATON responsibilities, they are in an ideal position to relay pertinent information to district ATON personnel. Since aids to navigation play a great part in marine safety, it is important for these officers to maintain contact with the district ATON branch; likewise, they should be apprised of changes in aids within their zones. Marine safety personnel frequently receive comments and suggestions about aids to navigation from mariners; these

comments should be forwarded to the district ATON branch. The COTP, OCMI and VTS should encourage their personnel to transit the area, whenever practicable. This provides insight into the ATON system and familiarity with the area.

4. Reported ATON Discrepancies. Due to the close association with marine interests, the OCMI, COTP or VTS will occasionally receive reports of ATON discrepancies. Such reports should note, as a minimum, how far and in what direction buoys may be off-station; what components on buoys or structures have been damaged; what signals or features are improper or inoperative, and what is the current signal or status; the suspected cause of the malfunction or improper stationing of the buoy; on-scene weather conditions; hazardous conditions created; the name of the person or vessel reporting; and the identity (if known) of the party causing the damage. This information should be immediately relayed to the district ATON branch. Since certain aids are more critical than others, immediate action cannot be taken to correct all discrepancies. However, they must be recorded so that appropriate response will occur.

C. Navigation Rules. The regulations, formerly referred to as the "Rules of the Road," have the primary purpose of preventing collisions between vessels. Under authority of the Inland Navigational Rules Act of 1980 (33 U.S.C. 151-221 and 2001 et seq., as amended), the old Inland, Western River, and Great Lakes Rules were combined into the new unified Inland Navigation Rules. These rules became effective on 24 December 1981 with the exception of the Great Lakes, which became effective on 1 March 1983. The Inland and International Rules have been reprinted in COMDTINST M16672.2 (Series). Enforcement authority for these rules is vested in the Coast Guard. With respect to the International Rules, enforcement authority is currently limited to actions pursuant to Section 4450, Revised Statutes of the United States (46 U.S.C. Chapter 77). The Navigation Rules, combined with aids to navigation, constitute the most basic form of traffic management. No vessel traffic management system relieves shipboard personnel from compliance with these Navigation Rules.

D. Voice Communications.

1. Vessel Bridge-To-Bridge Radiotelephone Act. The purpose of the Act (33 U.S.C. 1201 et seq.) is to provide a positive means whereby operators of approaching vessels can communicate their intentions to one another. Regulations for the enforcement of this Act and for the use of vessel radiotelephones are contained in 33 CFR 26. Information for vessels operating on the Great Lakes is found in the Agreement Between the United States of America and Canada for Promotion of Safety on the Great Lakes by Means of Radio, 1973, as amended in 1978. Regulations which specify operating and technical conditions and characteristics, frequencies, and the power of radiotelephone equipment required under the law are described by the Federal Communications Commission (FCC) in 47 CFR 81 and 83.

2. Use Of VHF Channel 13. VHF-PM Channel 13 (156.65 mHz) has been designated as the vessel bridge-to-bridge radiotelephone frequency (see 33 CFR 26.04). Two exceptions to this are the use of Channel 16 on the Great Lakes and Channel 67 on the Lower Mississippi River (Baton Rouge area). Generally, Coast Guard shore units, with the exception of those providing VTS, may not use these frequencies; authorization for such units to use them must be obtained from Commandant (G-N).

E. Vessel Routing Systems. Ship routing is a complex series of measures concerning routes aimed at reducing the risk of casualties. It includes traffic separation schemes, two-way routes, tracks, areas to be avoided, inshore traffic zones, and deepwater routes. The International Maritime Organization (IMO) is recognized as the international body responsible for establishing and recommending measures concerning ships' routing. The IMO publication Ships' Routing contains definitions, symbols, and guidance for establishing routing measures. Ship routing measures within U.S. waters are established through the regulatory process; all proposed routing measures, whether in international or inland waters, must be submitted to Commandant (G-N) for review and approval.

F. Use Of RNA's. RNA's are discussed in chapter 1 of this volume.

G. Coast Guard VTS. The PWSA was passed by Congress to prevent damage to, or the destruction or loss of any vessel, bridge, or other structure on or in the navigable waters of the United States. This is the major goal and objective of a VTS. Using installed communications and surveillance equipment, and COTP or VTS specific regulatory authority when necessary, the VTS is able to help prevent vessel collisions and in some cases, groundings, before they happen. VTS's also have the capability to undertake defense-related responsibilities specified by Maritime Defense Zone (MDZ) commanders, monitor aids to navigation and anchorages, and provide search and rescue (SAR) and law enforcement assistance.

1. Vessel Control Considerations. Chapter 1 of this volume discusses the parameters to be considered by district commanders and COTP's in exercising control of vessel traffic during hazardous circumstances. In areas where a VTS has been established, restrictions and control of vessel movement during emergency situations should be coordinated through the Vessel Traffic Center (VTC) to the maximum extent possible. Several VTS's have specific regulatory authority to control vessel traffic when necessary. In those VTS where specific VTS regulatory authority has not been established, the COTP must ensure provision is made to enable a VTS watchstander to issue immediate directions when necessary to control and supervise traffic during conditions of vessel congestion, adverse weather, reduced visibility, or other hazardous circumstances; and to specify times when vessels may enter, move within or through, or depart the VTS area. (This may be accomplished through a forum of "Standing Orders" or other means as the COTP deems appropriate consistent with the guidelines laid out in chapter 1 of this volume.) The VTC should have the authority to direct a vessel in an emergency to slow, stop, anchor, or otherwise proceed to avoid a dangerous situation; however, the master will at all times remain responsible for the safe and prudent maneuvering of the vessel. The master may choose to disregard an order to the extent necessary to avoid endangering persons, property, or the environment, and must report all such actions promptly to the VTC.

2. VTS Operating Procedures And Regulations.

a. Commandant (G-WWM). Commandant (G-WWM), as the VTS Program Manager, is responsible for ensuring VTS procedures and operations are standardized as closely as possible, and remain consistent with Coast Guard vessel traffic management policies and internationally approved guidelines. It is therefore necessary that VTS operating procedures, user manuals, and regulations are reviewed and approved as appropriate by Commandant (G-WWM) prior to publication.

b. VTS Participation. Participation in Coast Guard operated VTS is generally aimed at those vessels required to comply with the Vessel Bridge-To-Bridge Radiotelephone Act (see section 4.D above). Vessels required, or expected to participate in the VTS will be clearly defined in the applicable VTS regulations, and the individual VTS user manual. VTS commanding officers (CO's) and COTP's should place a high priority on maximizing VTS participation through regular contact with the maritime industry. Participation rate may be defined in broad terms as the percentage of vessels targeted for VTS participation which check-in and avail themselves of any services provided by the VTC. While in most cases this level of participation should enable the watchstander to track a vessel and include it in traffic analysis and advisories, CO's should encourage vessels to fully participate according to the procedures published in the user manual.

c. VTS Operating Procedures. Each VTS shall publish internal operating procedures for use by VTS watchstanders. These procedures should be approved by the district commander, operational commander, or CO, as decided locally. District commanders shall ensure Commandant (G-WWM) is provided copies of the current operating procedures.

d. User Manuals. Each VTS shall publish and distribute a user manual. This manual should include at a minimum: a general description of the VTS, its purpose, applicability, and capabilities; chartlets showing area and sector boundaries, and appropriate reporting points; primary and secondary frequencies; and a thorough description of the procedures required for a vessel to participate in the VTS. Regulations applicable to the VTS should be included in an appendix, as should anchorage procedures or regulations, and any other navigational information for the VTS area that may be of interest to participants. The current edition and publication date should be noted.

e. VTS Regulations. Individual VTS's may be made mandatory by regulations. The issue of mandatory versus voluntary participation may only be decided after a thorough evaluation on a local level and a complete analysis of VTS effectiveness by Commandant (G-WWM). In general, VTS with high user acceptance and participation will result in a high level of effectiveness, making voluntary participation the preferred approach. Other factors such as legislation requirements, international agreements, and low user acceptance and participation may require regulatory action. Where the district commander feels a change in status is desirable, appropriate recommendations should be forwarded to Commandant (G-WWM) after consultation with established advisory committee's and other maritime interests as appropriate.

f. Changes To VTS Operating Procedures Or Regulations. After establishment of a VTS, changes to VTS operating procedures, user manuals, or regulations may be necessary to fine-tune VTS operations. These changes could be the result of operating experience, increased or decreased port activity, or recommendations from the maritime community or advisory committees. Regulations should only be published after a thorough evaluation of operating procedures. Changes to the regulations should be minimized and be made only when absolutely necessary. A goal of a minimum of 5 years between changes is desirable. The following

guidelines shall be adhered to in making changes to VTS operating procedures, user manuals, or regulations:

(1) As VTS Program Manager, Commandant (G-WWM) is responsible for preparation and processing of VTS regulations. All new regulations and any changes to existing regulations must be processed under the procedures established by the Administrative Procedure Act, 5 U.S.C. 551. Unilateral district or VTS action which may modify existing regulations, or make VTS-related activities mandatory through issuance of Notice to Mariners shall be initiated only after consultation with Commandant (G-WWM) and district legal staff.

(2) District commanders shall ensure copies of changes to the VTS operating procedures and revised user manuals are forwarded to Commandant (G-WWM) as soon as they are approved.

3. Operations.

a. General. Operation of the VTS shall conform to applicable federal regulations, district commander's or COTP's Orders, and shall be consistent with the goals, objectives, and policies of the VTS program. Any apparent conflict between the VTS operating procedures and legal requirements shall be brought to the attention of the district commander for resolution. The VTS is responsible for the safe movement of vessels in its area; to this end, the VTC shall maintain direct communications with every vessel required to, or choosing to, participate in the service. The objective of a VTS is the safe and efficient flow of traffic through a waterway. Other Coast Guard activities (such as SAR coordination, anchorage administration, and ATON surveillance) may be handled through the VTC; this should be done only on a not-to-interfere basis with traffic management operations.

b. Relaying Information. The VTC shall promptly relay all orders from the COTP or district commander to vessels in the area. If the VTC watch supervisor determines the order cannot or should not be followed due to conditions in the waterway, the supervisor shall advise the COTP or district commander of the situation immediately. After evaluating this information, the COTP or district commander shall determine the actions to be taken. The principle that the vessel's master or the pilot controlling the vessel's maneuvers is the final authority for the vessel's safe navigation will not be supplanted or usurped.

4. System Requirements. Commandant (G-WWM) has established basic Specific Operating Requirements (SOR's) for VTS radars, communications, television, computers and the VTC. These SOR's document equipment requirements which are supplemented or modified as necessary for each particular project in the actual Statement of Work (SOW). District commanders responsible for equipment replacement projects should consider these SOR's in project planning. Deviations as necessary should be coordinated with Commandant (G-WWM).

5. System Communications.

a. General. A vessel movement reporting system (VMRS) is the keystone of any VTS. It consists generally of a VHF-FM radio communications network that permits contact with vessels in the VTS area. Participating vessels provide the VTC with information as to their locations, intended movements, dimensions, cargoes, and conditions that may adversely affect safe navigation (such as discrepancies in aids to navigation and obstructions in the shipping lanes). The CO shall ensure an absolute minimum amount of time is required to provide the necessary exchange of information between the VTC and participants. This will encourage high voluntary participation since masters will need minimal time communicating, or attempting to communicate with the VTS.

b. Operative Requirements. Vessels participating in a mandatory VTS must maintain a continuous radio watch on the designated VTS frequency while transiting the VTS area. Vessels participating in a voluntary VTS should be encouraged to continuously monitor the designated VTS frequency. Continuous radio guards serve also as a "party line" arrangement in which masters and pilots can readily "pass the word" from the VTC to one another concerning movements of vessels in the area. In waterways where the number of participating vessels is great, the VTS area is sectorized and vessels shift frequencies as they cross sector boundaries. Another way of limiting excessive interference is to provide low level, low power radio sites which limit the range of the VTC's transmissions. This type of system is only effective when system users also limit their transmissions to the lowest possible power setting. Except for those VTS's that use Channel 13 as the designated VTS frequency, Channel 13 is used as a backup for communications between the VTC and a participating vessel. 47 CFR 83.224 relieves vessels in a VTS of the requirement to guard the distress and calling frequency, VHF-FM Channel 16, as long as they are fully participating in the system. The VTC is responsible for informing vessels of information/Local Notice to Mariners transmitted on Channel 16 of interest to VTS participants.

6. Personnel. The Coast Guard has staffed its VTC's with personnel who serve in watch sections on an around-the-clock basis. Personnel may be military, civilian, or a combination of both. Each VTS is staffed with sufficient personnel to staff each watch position assigned in the VTC on a 24-hour a day basis. Required changes in staffing may be coordinated with Headquarters. Sufficient personnel to staff each watch position must be on board at all times.

a. Operational Needs. VTS personnel operate in a stressful environment that demands total concentration. Visitors should be permitted in the operations center only on a not-to-interfere basis. Collocated functions should not normally be imposed upon VTC's; district commanders and COTP's must give careful consideration to the impact of other operational requirements upon VTS personnel.

b. Civilian Personnel. VTS civilian watchstanders have been classified at the GS-11 level for supervisor, and GS-9 level for operators. While civilians may be hired at grade levels less than 05-11 and GS-9 based on individual qualification levels, provisions must be made for these employees to reach the GS-9 or GS-11 level (as appropriate) as their qualifications level increases without having to recompete. In those VTC's with civilian personnel, care must be exercised to evenly balance overtime use of military and civilian personnel to cover short-term staffing

deficiencies, such as leave or turnover. Workload will be evenly distributed between military and civilian personnel. Due to the inherent safety responsibilities of the VTS, district commanders must place the highest priority on hiring of civilian watchstanders to minimize the duration of vacancies.

7. Statistics Gathering.

a. Standardized Statistical Data. Each VTS is required to gather standardized statistical information for program documentation, planning, and analysis. A minimum of five categories of information are required:

(1) Transit Statistics. Information on the vessel movements within a VTS area specifying vessel type and type of movement. Vessel types are defined as tanker (any self-propelled vessel carrying oil or hazardous materials in bulk as cargo or residual), cargo (bulk dry cargo, container, break-bulk, carriers, roll-on roll-off (RORO), lighter aboard ship (LASH), etc.),".tug without tow (participants only), tug with tow (any number of barges unless it requires special VTS handling), ferries (calculated or counted), miscellaneous (naval vessels and all other VTS participating vessels that are not classified in another category). Transits are defined in three categories. These are:

(a) Transits. Vessel movements into or out of the VTS area or vessels moving through the VTS area without breaking their voyage within the VTS area.

(b) Intra-VTS Transits. Vessel movements from anchorage outside a port area to berth, or the reverse; or movements from one port area to another port area within a VTS's given area of responsibility. An example of an intra-VTS transit would be a vessel movement from Seattle to Tacoma. This is a movement from one distinct port to another in the VTS area.

(c) Port Movements. Vessel movements solely within the geographic confines of one port area within a VTS area.

(2) Participation Rate. See definition in subparagraph 4.G.2.b above.

(3) Secondary Functions. Information dealing with associated functions performed in support of other Coast Guard programs, and in support of federal and non-federal government agencies.

(4) Equipment Status. Information gathered to monitor VTS equipment in relation to the VTS Program availability standard. A minimum percentage of on-air time is required for radars, television, relay systems, VHF-FM communications, and data processing systems.

(5) Casualty Data. A short description of all collisions, rammings, and groundings in a VTS area.

b. Subjective Data. In addition to the standardized statistical data, subjective data is also required. Information on near misses," instances where more sophisticated VTS equipment or procedures may have helped prevent a casualty, and other instances that in the opinion of the VTS CO may help support the VTS program, should also be included in the quarterly report.

c. Reporting Requirements. The statistical and subjective data will be gathered and reported on a quarterly basis to Commandant (G-WWM) within 30 days of the end of the quarter. The statistics may be transmitted by electronic means to be used in development of the VTS National Data Base. VTS units will be allowed access to this data base on request. The statistical categories and parameters will be reviewed for adjustment on a yearly basis. The revisions will be provided to each VTS one quarter before any change is required. This system is designed to allow free exchange of statistical data between Headquarters, districts, and VTS units.

8. VTS Support Of Other Coast Guard And Government Activities. The primary goal of the VTS Program is to prevent vessel collisions, rammings, and groundings. The VTS, however, is capable of performing numerous other functions in support of other Coast Guard and government activities. While this support is encouraged, district commanders should carefully consider the impact of these operations on vessel safety in the VTS area. During the planning process for new or replacement equipment, district commanders should consider equipment needs for these other activities which may exceed those necessary to carry out VTS responsibilities. Additional capabilities are more efficiently included as part of a routine equipment replacement rather than retrofitting after the fact.

a. Maritime Defense Zone (MDZ). VTS's have the capabilities to perform several tasks relative to mobilization. Each VTS is, or will be, equipped with extensive surveillance capabilities including radar and low-light level closed circuit television (CCTV), an extensive VHF-PM communications system, and a large command center. VTS can perform:

(1) Surveillance of critical facilities, including terminals and bridges.

(2) Surveillance of security zones, and vessels carrying critical mobilization related equipment and personnel.

(3) Offshore surveillance.

(4) Vectoring of SAR, surveillance, and interdiction vessels and aircraft.

(5) As command center for MDZ sectors and/or sub-sectors, collocating Naval Control of Shipping, Fishing Vessel Control, Military Traffic Management Command (MTMC), Military Sealift Command (MSC), and other MDZ-related activities.

(6) COTP's and district commanders should consider these capabilities in development of their MDZ operation plans (OPLANS).

b. SAR And Maritime Law Enforcement (MLE). Extensive surveillance and VHF communication capabilities provide mission coordinators with a valuable tool to assist in SAR and MLE activities. Use of the VTS may significantly reduce boat and aircraft search time in some cases, and provide surveillance capability during routine and other MLE activities.

c. Aids To Navigation And Anchorage Administration. The VTS frequently receives notices of ATON discrepancies, and has the capability to monitor ATON positioning and anchorage areas. Procedures should be established to report ATON discrepancies expeditiously to the appropriate ATON facility. The VTS may also assist the COTP in anchorage management, particularly in ensuring vessels are monitored for dragging anchor.