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OPNAVINST 9010.327A
N42
6 May 08

OPNAV INSTRUCTION 9010.327A

From: Chief of Naval Operations

Subj: T-AO 187 CLASS FLEET OILER, TOP LEVEL REQUIREMENTS

Ref: (a) OPNAVINST 9010.300A

Encl: (1) T-AO 187 Class Fleet Oiler Top Level Requirements

1. Purpose. To reflect the Top Level Requirements (TLRs) for the TAO 187 Class Fleet Oiler.
2. Cancellation. OPNAVINST C9010.327.
3. Discussion. Enclosure (1) has been formatted to comply with reference (a). The Office of the Chief of Naval Operations (OPNAV) N42 is responsible for the content of this document and revisions. Recommended changes should be submitted to OPNAV N42.
4. Action. OPNAV N42 is directed to ensure that the design for the T-AO 187 Class ship fully supports the TLRs.

A handwritten signature in black ink, appearing to read "M.K. Loose".

M.K. LOOSE
Vice Admiral, CEC U.S. Navy
Deputy Chief of Naval Operations
(Fleet Readiness and Logistics)

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6 May 08

TOP LEVEL REQUIREMENTS

FOR

T-AO 187 CLASS PROGRAM

Enclosure (1)

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SECTION 1

OVERVIEW

1.1 Objectives and Scope

This document sets forth the Top Level Requirements for the Fleet Oiler T-AO 187 Class. It is applicable to the T-AO 187 in the Fiscal Year 1982 and follow-year shipbuilding programs. This document includes the ship's mission, operational requirements, major configuration constraints, the plan for use, the maintenance concept, manning limitations, and minimum operational standards.

To accomplish the T-AO 187 program objectives, the T-AO 187 ship design and acquisition program is constrained to execution within the objectives, thresholds, and milestones documented in the ship's required operational capabilities. Thresholds shall not be breached without the specific approval of the Chief of Naval Operations.

1.2 Constraints. In addition to the Navy program constraints, there are additional thresholds established by (OSD). However, execution of the T-AO 187 Class acquisition program within the Navy program constraints will satisfy the OSD program constraints, which are addressed in the Navy Decision Coordinating Paper dated August 16, 1982.

1.3 Design Guidance. Proven commercial shipbuilding standards and equipment shall be used for all shipboard systems except those directly related to the Logistics mission area and those related to the Command, Control, and Communications(C3) mission area. The military standards in the C3 mission area shall be limited to only those elements that impact the ability of the T-AO to maintain communications with fleet units. In non-mission areas, maximum adherence to commercial and (MSC) agreements is required, incorporating only those non-commercial features needed to assure safety in the fleet oiler alongside-mission role.

1.4 Summary of Major Ship Characteristics. The ship design shall include the following characteristics:

- Sustained speed: 20 knots;
- Endurance (at 20 knots): 6000 nm;
- Maximum draft: 36 feet;
- Liquid Cargo (bulk): 180,000 bbl (Single Hull)
153,000 bbl (Double Hull);
- Dry Cargo: 430 tons of non-refrigerated, palletized, drummed liquids and bottled gases;
- Refrigerated containers: minimum of 7 (20 feet (ISO)).

SECTION 2

MISSION STATEMENT

2.1 Mission. The mission of the T-AO Class Fleet Oiler is to provide a replenishment capability for carrier and expeditionary strike groups and surface forces operating independently of strike groups.

2.2 Primary Tasks. The tasks in carrying out this mission for the T-AO 187 Class ships include:

- Transport Petroleum, Oil and Lubricants (POL), received from shore depots or suitably-equipped tankers, to Fast Combat-Support ships (T-AOEs), and Dry Cargo and Ammunition ships(T-AKE), delivering and consolidating while under way;
- Deliver bulk fuels at satisfactory rates to combat and support forces under way;
- Transport and deliver fresh water;
- Provide, by Connected Replenishment (CONREP) and by Vertical Replenishment (VERTREP), mail, personnel, and dry and refrigerated provisions;
- Replenish ships in port with POL and dry cargo;
- Be capable of self-defense consistent with COCOM and MSC's Naval Fleet Auxiliary Force policies.

2.3 Secondary Tasks. Secondary tasks include:

- Conduct limited towing/salvage/rescue operations in accordance with MSC policy, the operations to include search and rescue in a non-combat environment and the recovery of personnel overboard;
- Provide equipment and trained crewmen for first-aid assistance to the complements both of its own ship and of other units;
- Provide fleet training services, including acting as a delivery or receiving ship for (UNREP) training;
- Technical guidance and training assistance to itself and other fleet units in cargo handling and underway-replenishment operations, including underway training to the extent that accommodations are available.

SECTION 3

TOTAL SHIP REQUIREMENTS AND CHARACTERISTICS

3.1 Warfare Area Capabilities, including C3

- Warfare, which is a secondary area for a fleet oiler;
- Mobility, a primary area;
- Command, control, and communications, a primary area;
- Intelligence, a secondary area;
- Logistics, a primary area;
- Fleet-support operations, a secondary area;
- Non-combat operations, a secondary area.

3.1.1 Anti-Air Warfare (AAW). The T-AO 187 shall have space and weight reserved for the Close-In Weapon System (CIWS) MK 15 Mod 2. No direct offensive role is planned for the ship.

3.1.2 Anti-Surface Warfare. The CIWS MK 15, if installed, is only for limited self-protection against low-flying missiles and aircraft (AAW) and small surface ships. The spaces reserved shall be located so that weapon coverage shall extend all around the ship and shall overlap to the maximum extent that is practicable.

3.2 Detectability. Not applicable for this class of ship.

3.3 Survivability, including Passive Protection. Insofar as is practical, the weapon systems shall be located so that an ammunition explosion would not set fire to the cargo. The T-AO 187 shall have a Torpedo Countermeasure System (NIXIE) AN/SLQ-25 installed.

3.4 Mobility. The general mobility requirement for the T-AO 187 is twofold: (1) it shall be capable of delivering POL to logistic support ships wherever the Fleet is operating; and, (2) it shall be capable of replenishing all Navy ships, either in port or underway.

3.5 Operating Environment. The T-AO 187 shall be capable of operating in the weather and sea conditions encountered throughout the world's navigable oceans. However, it will not be expected to operate in ice fields without icebreaker support.

3.6 Utilization and Operational Availability

3.6.1 Utilization

The T-AO 187 Class may be based in the Continental United States (CONUS) or overseas. Overseas operations for indefinite periods of time may be required except that, if necessary, the ship will return to the most convenient port for required (USCG) inspections.

At times, as the need arises, the ship will operate with an underway-replenishment group. During peacetime operations, whether the ship is CONUS or overseas based, the schedule of operations is planned as follows:

- Between regular overhauls, the ship shall be available for 325 days of operation per year, 75 percent of which shall be devoted to underway operations;
- Generally, 2 days in port will be allowed between each delivery run;
- The ship shall be dry-docked twice every 5 years in conjunction with the ABS and USCG special periodical survey.

During emergency employment, the underway time may equal nearly all of the time available in continuous periods of up to 60 days.

3.6.2 Availability. Basing the design on proven conventional commercial design criteria and building to commercial standards using current technology will enhance availability of the ship. Standard systems and equipment having proven reliability and maintainability histories will be used. Availability of all systems is basic to the readiness of the ship to get underway for routine operations. For operations in response to a non-combat emergency alert, readiness consists of, at a minimum, availability of the main-propulsion plant (one shaft), a navigational system, and a communications system.

3.6.3 Readiness Conditions. The T-AO 187 Class shall adhere to the following MSC conditions of readiness:

- Cruising: Securing of selected fittings below deck whenever the ship is cruising (1) in heavy traffic, (2) in conditions of low visibility, (3) in combat or danger zones, or (4) into or out of a port. At other times, in order to avoid interference with the work of the ship, the master may modify these conditions.
- Emergency: Securing, or "buttoning up", to obtain maximum watertight integrity and machinery redundancy is used whenever the entire ship is in danger.

3.7 Logistic Support

Logistic support of the ship systems and mission equipment will be the responsibility of MSC. Provisioning technical documentation required from the shipbuilder will be the minimum necessary for construction of the allowance parts list and coordinated shipboard allowance lists meeting MSC standards. Onboard spare parts allowances for the Navy communications equipment will be based on existing Navy stocking criteria, while onboard allowances for all other equipment will be based on a 1-year endurance level. Repair and spare parts for government-furnished mission equipment will be available through the Navy supply system.

Stowage space shall be sufficient for stocking enough of the following stores and provisions to meet the ship's needs over the corresponding number of days:

- Dry provisions, 90 days;
- Chilled provisions, 45 days;
- Frozen provisions, 90 days;
- Repair parts/equipment-related consumables, as specified;
- Non-equipment related consumables, 90 days.

3.8 Manning. The T-AO 187 Class shall be manned with civilian employees of MSC. The crew shall be of sufficient size and skills to operate and maintain

the ship (except for its communication equipment and CIWS if installed) for the level of ship operations described in section 3.6. Selection of crew, in regard to both size and skills, shall follow a compromise between (1) cost minimization; (2) an operational reliability equivalent to the AO-177 Class; and (3) adherence to MSC standards and USCG requirements. The crew shall be capable of maintaining UNREP operations, in peacetime, for 32 hours a week, at each of the following levels:

- Five fuel (STREAM) stations in operation while deployed, three fuel STREAM for CONUS operations/training; or
- Three fuel STREAM stations in operation, concurrent with transfer of pre-staged dry cargo from one of the cargo STREAM stations at the rate of 40 loads per hour, or from the VERTREP station at the rate of 40 loads per hour; or
- Break-out and transfer of dry cargo from the two cargo STREAM stations at a sustained rate of 80 loads per hour, and from a cargo STREAM station and a VERTREP station at a combined rate of 80 loads per hour.

It is expected that wartime manning will be increased to fully exploit the capabilities of the installed UNREP facilities.

The Navy complement shall be of such size, and of such grades, rates, ratings, and Navy enlisted classifications as necessary to support the specified operations of the ship's operations, or any regularly scheduled maintenance requirements associated with the AN/SLQ-25 (NIXIE) and the CIWS.

Minimum manning and maximum number of people permitted on-board will be listed on the USCG Certificate of Inspection.

3.9 Flexibility for Change, including Space and Weight Reservations

Capacity for the stowage of cargo fuels shall be at least 180,000 barrels (Single Hull) and 153,000 barrels (Double Hull). Five fuel STREAM stations shall be provided - three to port with double 7-inch fuel hoses and two to starboard with single 7-inch fuel hoses. Three fuel receiving 7-inch, double probe receivers shall be provided to starboard. Provision shall be made to effect liquid-cargo transfer (send and receive) with ships of NATO and other U.S. allies. Stowage shall be provided in the ship for dry cargo and provisions, mail, fleet freight, drummed lubricants, potable water, feed water, and bottled gas; and the ship shall be capable of stowing refrigerated cargo in 20-foot ISO Containers or MILVANS loaded on deck. Two dry-cargo STREAM stations shall be provided for transferring this cargo, one on each side.

Baseline cargo-fuel stowage shall be 60 percent F-76 and 40 percent JP-5, with the capability to readily convert sufficient F-76 stowage to JP-5 to stow 48 percent F-76 and 52 percent JP-5. Convertibility will also permit stowage of 70 percent F-76 and 30 percent JP-5. Convertibility shall involve only tank cleaning, piping flushing, and such rearrangements of piping connections as the ship's force can accomplish while the ship is at a fuel depot.

3.9.1 Liquid Cargo Stowage. Stowage of fresh water shall meet USPHS standards for the ship's own use plus 105,000 gallons of potable water and 88,000 gallons of feed water for delivery to ships alongside. Separate cargo

tanks for cargo fresh water and fresh water for the ships own use is not required.

3.9.2 Dry-Cargo Stowage

Suitable cargo stowage with fire protection systems shall be provided for at least 270 tons of palletized cargo, 110 tons of drummed POL, and 50 tons of bottled gas. Stowage arrangements shall be suitable to accommodate mail and fleet freight.

Additional cargo stowage of refrigerated provisions shall be provided in deck-loaded containers suitably located to facilitate safe storage, removal, and movement of cargo between the containers and the CONREP and VERTREP transfer stations. Deck arrangements shall provide for loading of at least seven 20-foot ISO containers and shall allow for the lift-off and lift-on of containers by shore side container-handling equipment.

3.10 Training. Navy qualification requirements shall be met in the training of crews in mission areas, MSC/commercial standards in non-mission areas. An UNREP Ship Qualification Acceptance Trial is required. MSC will develop a training and phasing plan identifying required training for the civilian MSC crew. No formal training plan is envisioned except for the Navy communications detachment. Navy assistance for familiarization with UNREP operations will be provided by Naval training Centers and detachments.

SECTION 4

SUBSYSTEM REQUIREMENTS AND CHARACTERISTICS

4.1 Structure. The T-AO 187 Class ship will be ice-strengthened Class C and shall also be certified by the USCG to operate in the carriage of combustible liquids of Grade E on ocean routes, and it shall comply with the latest appropriate International Maritime Organization rules. In regard to navigational lights and other aids to ensure safe navigation, the ship shall comply with the 1972 International Regulations for Prevention of Collisions at Sea (72 COLREGS) (NOTAL), and it shall be certified for transit of both the Suez Canal and the Panama Canal.

4.2 Propulsion System. Main propulsion from two medium-speed diesel engines, with geared reduction drive to twin shafts equipped with controllable-pitch propellers, arranged for split-plant operation. Capable of unattended engine room operation with independent-manual control for emergencies.

4.3 Electrical Plant. An electrical generating plant sized to carry the electric-power load during replenishment operations, with one generator off the line, and an emergency generator that meets USCG standards.

4.4 Command and Surveillance. Command, control, and communications equipment shall be adequate for the ship to accomplish its missions to operate as a unit of an underway replenishment group, and to operate independently in transporting and delivering commodities to combatants and support ships underway. The ship shall have the capability to:

- Function as Officer in Tactical Command (OTC) for coordination and control of replenishment operations;
- Serve as a center for the control and direction of helicopters operating from other ships;
- Serve either as on-scene commander or as back-up vessel in search and rescue efforts by commercial ships;
- Carry out emergency destruction of classified material and equipment rapidly and efficiently;
- Employ Identification Friend or Foe/Selective Identification Feature, (transponder only);
- Provide tactical voice communications;
- Maintain visual communications using standard Navy signal facilities with an enclosed signal shelter, and visibility from the shelter unobstructed to the maximum extent practical;
- Maintain uncovered radio teletype/continuous wave communications;
- Maintain full-duplex, cryptographically covered high-frequency teletype circuits;
- Process message traffic; and
- Maintain multi-channel, cryptographically covered teletype receive circuits for Fleet Broadcast.

4.5 Auxiliary Systems. Commercial equipment for controlling fire and flooding in accordance with MSC damage control policy, a HALON 1301 system for propulsion and petroleum product pumping spaces, and AFFF systems for fighting oil fires on the UNREP deck and flight deck. The steering system, for safety purposes during alongside operations while the ship is under way, shall have the reliability and redundancy of steering systems designed for Navy oilers.

4.6 Outfit and Furnishings. Facilities for housing, feeding, and otherwise caring for the crew, (which may be as large as 135 members including the military detachment and civilian personnel), in accordance with MSC and USCG requirements.

4.7 Armament. Small arms allowance shall be suitably increased for limited self-defense, with stowage provided for small arms and small arms ammunition.