NAVSEA INSTRUCTION 9997.2A

From: Commander, Naval Sea Systems Command

Subj: DOCKING OBSERVER PROGRAM FOR SUPERVISORS OF SHIPBUILDING, CONVERSION AND REPAIR (SUPSHIPS) AND NAVY REGIONAL MAINTENANCE CENTERS (RMCS)

Ref: (a) MILITARY STANDARD MIL-STD-1625, SAFETY CERTIFICATION PROGRAM FOR DRYDOCKING FACILITIES AND SHIPBUILDING WAYS FOR U.S. NAVY SHIPS
(b) Article 0871 United States Navy Regulations 1990, Department of the Navy, Washington, D.C., Responsibilities for Safety of Ships and Craft at a Naval Station or Shipyard

Encl: (1) Academic Requirements for the Qualification of SUPSHIP/RMC Docking Observers
(2) Practical Requirements for SUPSHIP/RMC Docking Observers
(3) Duties and Responsibilities of SUPSHIP/RMC Docking Observers

1. Purpose. To establish the requirements for the qualification and certification of Docking Observers. This instruction applies to the operations in graving docks, floating dry docks, marine railways, vertical lifts, launching and transfer ways, and other facilities certified for docking, undocking, transferring or launching Navy ships and other service craft when reference (a) is invoked by a contract administered by a SUPSHIP or an RMC. In this instruction, dry docking, undocking, transferring or launching of Navy ships will be referred to as evolutions.


3. Background. Evolutions by commercial shipyards involving Navy ships are the responsibility of the contractor as conveyed by contract requirements. Reference (b) states, in part, that the Supervisors of Shipbuilding, Conversion and Repair (SUPSHIPS) for new construction and the Repair SUPSHIPS (now RMCs) are responsible for ensuring that the contractor facilities, methods, operations and qualifications meet the standards of efficiency and safety prescribed by Navy
directives. Therefore, in order to ensure safety and efficiency, the SUPSHIP/RMC shall have military and/or civilian personnel specifically trained and qualified to check and verify the contractor’s facility and mode of operation during evolutions involving naval ships. These trained and qualified personnel will be responsible to the SUPSHIP/RMC for ensuring the contractor carries out his contractual responsibilities relative to the safe evolution of naval ships.

4. **Policy.** This instruction establishes a cadre of docking personnel, referred to as “Docking Observers”, for the purpose of protecting Navy interests where the evolution could be jeopardized by the action or the inaction of contractor personnel. Docking Observers are required because the SUPSHIP/RMC is responsible for ensuring that contractors under its cognizance use facilities certified and operated under reference (a) in a safe manner and consistent with the Facility Certification Reports. Docking Observers have the authority, delegated to them in writing by the SUPSHIP/RMC, to stop the evolution when the ship’s safety or other Navy interests are jeopardized. To ensure that these responsibilities are carried out, a Docking Observer shall be assigned who is knowledgeable and is responsible to the SUPSHIP/RMC for the safe use of the certified facilities.

   a. The SUPSHIP/RMC shall ensure that qualified personnel responsible for observing evolutions involving naval ships are trained and qualified to the requirements of enclosures (1), (2) and (3) and through the use of locally administered oral or written examinations. In addition, these personnel shall be required to pass the NAVSEA Dry Dock Safety Certification Program course examination administered by NAVSEA 04XQ2 (available to download at [http://www.usnavydrydocks.com](http://www.usnavydrydocks.com)) as a prerequisite to qualification by the SUPSHIP/RMC. Personnel meeting these requirements and certified by the SUPSHIP/RMC, shall be called “Docking Observers” to ensure consistency. Enclosures (1) and (2) provide the minimum initial training for qualification as Docking Observers and refresher training for Docking Observers with previous experience in the evolutions, but who have not maintained their qualifications or who require certification for a type of facility different from that which they are qualified.

   b. Docking Observers shall be certified in writing by the SUPSHIP/RMC to ensure the contractor’s facilities, methods, and operations permit safe evolutions.
c. A Docking Observer shall be assigned for each evolution. The assigned Docking Observer is the Navy's point of contact for all matters relative to the evolution, and therefore must possess the required knowledge, skills and abilities.

d. The Docking Observer is encouraged to use other SUPSHIP/RMC docking observers and codes as necessary to verify adequacy and/or correctness of docking facilities, but the Docking Observer shall retain the primary responsibility for the proper execution of the evolutions.

e. Docking Observers shall meet the following requirements:

(1) Be designated in writing by the SUPSHIP/RMC as the individual responsible to ensure the safe evolution of naval ships.

(2) Be thoroughly familiar with and understand the academic requirements for the qualification of Docking Observers listed in enclosure (1). Demonstrate this knowledge by passing the NAVSEA Dry Dock Safety Certification Program course examination and locally administered oral or written exam administered by the SUPSHIP/RMC.

(3) Be thoroughly familiar with and comply with the practical requirements for the qualification of Docking Observers listed in enclosure (2).

(4) To maintain proficiency, personally observe docking evolutions at least once every six (6) months. Observations of evolutions involving commercial ships at contractor's facilities may be used to fulfill this requirement. When local conditions do not permit the frequency to be performed, the SUPSHIP/RMC may reduce the frequency to a level commensurate with the workload in the area and the ability of the candidate. Attendance and participation in evolutions at other naval shipyards or commercial yards under the cognizance of other SUPSHIPs/RMCs is strongly recommended to meet these requirements.

(5) Be thoroughly familiar with local contractors' facilities, practices, and procedures.

(6) Perform the duties and responsibilities of a Docking Observer as assigned by the SUPSHIP/RMC using enclosure (3) as a guide.
5. **Action.** All SUPSHIPS/RMCs shall implement the requirements of this instruction.

6. **Reports and Forms.** Forms NAVSEA 9997/1 through 9997/6 may be downloaded from website [http://www.usnavydrydocks.com](http://www.usnavydrydocks.com).

\[Signature\]

M. A. HUGEL  
Deputy Commander  
Logistics, Maintenance and  
Industrial Operations

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ACADEMIC REQUIREMENTS FOR THE QUALIFICATION OF SUPSHIP/RMC DOCKING OBSERVERS

1. To be qualified as a Docking Observer, candidates must pass the NAVSEA Dry Dock Safety Certification Program course examination and be familiar with the following:

   a. Duties and responsibilities of the Docking Observer:

      (1) Article 0871 United States Navy Regulations 1990, Department of the Navy, Washington, D.C., Responsibilities for Safety of Ships and Craft at a Naval Station or Shipyard.

      (2) Article 0872 United States Navy Regulations 1990, Department of the Navy, Washington, D.C., Ships and Craft in Drydock.

   b. Specific information on docking and undocking:


      (5) NAVSEA Forms 9997/1 through 9997/5, "Docking Report Forms".

      (6) General specifications for the care of ship during construction or overhaul as applicable:

          (a) General Specifications for Ships of the United States Navy, NAVSEA S9AA0-AA-SPN-010\GEN\SPEC, section 045

          (b) General Specifications for Overhaul of Surface Ships (GSO), NAVSEA S9AA0-AB-GOS-010, section 045

Enclosure (1)
(c) General Overhaul Specifications for Deep Diving SSBN/SSN Submarines, NAVSEA 0902-018-2010, section 9020-2

(7) NAVSEA INSTRUCTION 9997.3, Docking Officer Minimum Qualification Requirements.


c. Drydocking, undocking, transferring and launching of ships.

(1) Standard procedures and principles covering the operation of facilities, emphasizing:

(a) Nomenclature

(b) Safety Precautions

(c) Sequence of operations in the evolution

(d) Developing pumping plans for floating dry docks

(e) Use of divers during drydocking and undocking

(2) Facility Certification Report:

(a) Enclosure III, Operational limitations

(b) Enclosure IV, Organization and manning

(c) Enclosure V, Normal maintenance schedule and procedures

(d) Enclosure VI, Operating procedures

(e) Enclosure VII, Protection of the ship during the lay period

d. Docking drawings for naval ships, to include the following:
(1) Stern Reference Point (SRP).
(2) Utilization of Table of Offsets for side blocks.
(3) Side block build-up (especially relationship among values for points A, B, and C, and bevel across bilge blocks).

 e. Docking Notices, use of tide tables, agenda for Docking Conferences, Undocking Notices and agenda for Undocking Conferences. Preparation of sample documents may be required by the RMC to enhance understanding and proficiency.

 f. Preparation of dry dock layout sheet (block build-up papers) for each major class of ship normally docked or launched at the activity. Specific topics of interest include:

(1) Verification of contractors' build-up of blocks and arrangement in accordance with ship's docking drawing and dock layout sheet.

(2) Docking and undocking calculations in accordance with NSTM Chapter 997, MIL-STD-1625 and other applicable docking or launching calculations.

(3) Selection and construction of keel and bilge blocks and the requirements for cribbing and shoring.

(4) Knuckle loading and loading of launching poppets.

(5) Special blocking techniques such as stern support towers or shoring, hauled or hinged blocks and blocks completed or modified by divers during the evolution.

 g. Unusual conditions and/or circumstances for major occurrences such as:

(1) Hurricane or typhoon.

(2) Earthquake and tsunami.

(3) High winds.

(4) Thunderstorm flash flooding.

 h. Previous drydocking incidents and discussion of causes and ways they might have been avoided.
i. For dry docks that dock nuclear powered ships, demonstrate knowledge of:

(1) Operating requirements of the reactor plant during a docking evolution, dry dock support services required by the reactor plant and required safety precautions.

(2) Radiological procedures and precautions employed when a nuclear powered ship is in dry dock.

j. Casualty procedures on types of facilities used by the contractor under the cognizance of the respective RMC. Procedures should cover the following:

(1) Equipment malfunctions.

(2) Failure of remote control or indicating systems.

(3) Fire in the dry dock or dry dock spaces.

(4) Fire in drydocked ship.

(5) Flooding of dry dock tanks or basin.

(6) Loss of electrical power to all or part of the dock.

k. Factors of drydocking ships, such as:

(1) Trim, list and maximum draft prior to and during the drydocking evolution.

(2) Draft at landing.

(3) Draft of instability.

(4) Maximum keel block loading (LT/FT), including unusual loading conditions due to large overhang or interrupted keel blocks.

(5) Maximum knuckle block loading.

(6) Stability during landing.

(7) Floating dry dock and ship combined stability during the five phases of the docking and undocking evolution.
(8) Differences among various types of docking facilities and their varied effects on ship stability.

(9) Effect of tide on docking facility.

(10) Change of ship's characteristics during the lay period in the dry dock.

(11) Utilization of the ship's damage control books, inclining experiments, tank sounding tables/curves, Displacement and Other (D&O) Curves, and the last docking report.

(12) Changing ship's weight (amount and location) during the lay period.

(13) Selection of various types of blocking, and the types of woods and fastening arrangements used in their construction.

(14) Setting docking block reference plane.

2. General information that shall be reviewed includes:


   b. Operating manuals, data books and damage control books of floating dry docks.

PRACTICAL REQUIREMENTS FOR SUPSHIP/RMC DOCKING OBSERVERS

Prior to qualification as a SUPSHIP/RMC Docking Observer, the candidate shall accomplish the following:

1. Attend and participate in, at a minimum, the following evolutions, as applicable to facilities under SUPSHIP/RMC cognizance:
   a. Two docking conferences.
   b. Three dockings (develop dock layout sheets/build-up papers, check blocks, check calculations, land ship, etc.) including riding the ship as liaison between the SUPSHIP/RMC Docking Observer and the ship's Commanding Officer for one of these dockings.
   c. Two undocking conferences.
   d. Three undockings, including riding the ship as liaison between the SUPSHIP/RMC Docking Observer and the ship's Commanding Officer for one of these undockings.
   e. Two launchings/transfer.

2. Review and understand the following: (Where circumstances allow, candidate may be required to perform and/or prepare the item):
   a. Three calculations and dock layout sheets/build-up papers for docking.
   b. Two docking notices for the particular type of facility being used.
   c. Two undocking notices for the particular type of facility being used.
   d. Two docking reports.
   e. Three pumping plans (for floating dry docks).

3. Perform the duties of Docking Observer for a minimum of four dockings and four undockings under the supervision of a qualified Docking Observer.
NOTE: When it is impractical for prospective Docking Observers to obtain the required practical experience locally in a timely manner, they shall be assigned temporary duty to naval shipyards or commercial yards under the cognizance of other SUPSHIPs/RMCs to meet these requirements. The number of evolutions listed may be increased or decreased at the option of the SUPSHIP/RMC, commensurate with the workload in the area and the ability of the candidate.
DUTIES AND RESPONSIBILITIES OF SUPSHIP/RMC DOCKING OBSERVERS

The duties and responsibilities of a SUPSHIP/RMC Docking Observer must be clearly understood by both the Docking Observer and the contractor's dockmaster. New construction and repair contracts specify that the contractor is responsible for the evolutions involving Navy ships during construction or repair. However, the SUPSHIP/RMC is responsible for the safety of Navy ships and the coordination between the ship's crew and the contractor.

The correlation of all necessary information for evolutions is done by the Docking Observer; therefore, the contractor's Dockmaster and the Docking Observer must keep each other properly informed at all times during the evolution.

1. Prior to Docking:

   a. Prior to the use of any commercial graving dock, floating dry dock, vertical lift, marine railway, transfer way or launchway, the Docking Observer shall ensure that the facility has been certified in accordance with MIL-STD-1625 for a capacity equal to or greater than the ship.

   b. The following information, as required by contract, must be reviewed by the Docking Observer:

      (1) Contractor proposal for docking and undocking.
      (2) Navy letter certifying the facility.
      (3) Facility Certification Report.
      (4) Dockmaster's qualifications.
      (5) Operating procedures.
      (6) Safety precautions for ship while in dock.
      (7) Calculations for the ship being drydocked.
      (8) Contractor requests for deviation from ship's docking drawing.
      (9) Pumping plans for floating dry docks.
      (10) Dock layout sheet for block build.
(11) Current water depth/sounding survey (dry dock and vicinity).

(12) Last docking report and last docking position.

Note: Items (2) through (5) normally are reviewed once by the certifying authority and again during the pre-award survey prior to contract award.

2. Preparatory Information for Docking:

a. For ships in commission, the contractor’s Dockmaster shall conduct a docking conference with the ship’s force and Docking Observer prior to docking to inform the Commanding Officer of:

(1) Tentative time of docking and the facility in which the ship is scheduled to be docked.

(2) The necessity for ship’s force to ensure that retractable projections below the ship’s hull are properly housed and that the propeller blades and shaft(s) are in the docking position (lowest projection below baseline possible).

(3) Maximum permissible trim, list and draft.

(4) Utilization of tugs for docking.

(5) Communication method established between ship and Dockmaster.

(6) Procedures for ship’s line handling during docking.

(7) The requirement that no weights (including tank liquid loads) be shifted, placed onboard, or removed by ship’s force without permission of the contractor’s Dockmaster, via the RMC Docking Observer. Ship’s force is also required to keep a record of weight changes made by ship’s force during the docking lay period. Ship’s force shall report these changes to the contractor’s Dockmaster, via the Docking Observer, at least 24 hours prior to the undocking. A weight change log includes the original and final location and amount of the weight in long tons. Location includes the height above the keel, distance port or starboard from centerline, and the frame number.
(8) The requirement that propellers, rudders, and gun mounts not be rotated by ship's force without the permission of the contractor's Dockmaster, via the Docking Observer, and that all underwater hull apparatuses shall be in the proper position for docking.

(9) The requirement that no underwater hull or over the side work or internal work will take place that would potentially delay the drydocking or endanger the ship or crew during drydocking be accomplished by ship's force without expressed permission of the contractor's Dockmaster, via the Docking Observer.

(10) The requirement that a current liquid loading diagram or sounding sheet, including all liquid storage tanks, be submitted by ship's force to the contractor's Dockmaster, via the Docking Observer, 24 hours prior to docking and undocking.

(11) The requirement that ship's force provide the contractor's Dockmaster, via the Docking Observer, a list of the location of all ammunition and highly flammable liquid aboard the ship.

(12) Contingency plans and procedures to be used in case of emergency, i.e., flood, personnel injury, etc.

(13) Utilization of a pilot and point of control turn over to the Dockmaster for docking and pilot for undocking.

(14) Utilization of divers for alignment and block contact checks, etc.

b. Ensure SUPSHIP/RMC personnel are aboard the ship during all movements and that proper services are provided throughout the evolutions.

3. In preparation for the docking evolution, the Docking Observer shall:

a. Review the procedure that the contractor's Dockmaster intends to follow and ensure that the procedure is sound before permitting the docking to proceed. This review shall be accomplished prior to the Docking Conference and shall be reviewed with ship's force at the Docking Conference.

b. Inspect the facility for debris and loose cap blocks.
c. Check the docking drawing and build-up of the blocking system with the contractor’s Dockmaster, paying particular attention to:

(1) Location of the alignment marks on the dock and the ship for determining the position of the ship with respect to the dock and/or the keel blocks.

(2) Location of the after keel block with respect to the stern reference point.

(3) Location of all bilge blocks from the stern reference point and their half breadths.

(4) The height of all bilge blocks making sure the height is in accordance with the docking drawing and any authorized deviations and will clear the bilge keel of the ship.

(5) Any possible interference between docking blocks and sea valves or other hull fitting and omission of blocks to facilitate accomplishment of contractor's work.

(6) Location of fixed underwater sound apparatus, propellers and any other underwater projections with respect to interference in the dock, making special check of vertical clearance of such locations.

(7) Heights of keel and bilge blocks shall be determined from established bench marks with a transit to ensure that no blocks are unduly high.

(8) If haul blocks are used, ensure that tackle runs are free and blocks will outhaul and inhaul to proper offset.

(9) Any special requirements/dimensions pertaining to removals, e.g. sonar domes, rudder stock, etc.

4. During the docking evolution, the Docking Observer is to:

a. Be present prior to the commencement of the docking evolution (dry dock flooding) to ensure the dry dock is ready to receive the ship. This review should include a last check of the blocking system for adequate fastening, debris left on top of any block, dock floor cleanliness, and interferences on dock floor in way of ship projections.
b. Be present at the time of flooding and throughout the
docking evolution until the dock is pumped out.

Note: The assigned Docking Observer may be relieved by another
qualified Docking Observer during docking or undocking if
circumstances warrant such as lengthy evolutions or injury. The
relieving Docking Observer shall be thoroughly familiar with the
current evolution.

c. Check the blocks as they are submerged and during
hauling operations to ensure that no blocks become adrift.

d. Check with the contractor's Dockmaster that the actual
depth of water over the blocks is sufficient to move the ship
into position over the blocks without damaging projections from
the ship. This check shall include the fall of the tide during
the evolution. Verify the ship's actual drafts and list with
the contractor's Dockmaster prior to the ship's entry into the
dry dock.

e. Check the position of the ship with respect to the dock
and the ship's centering over the keel blocks.

f. Check the drafts and trim as the ship lands to ensure
that there are no obstructions between ship and blocks.

g. Once the ship is fully landed on the blocks, but the
water level in the dry dock has not yet reached the draft of
instability and the side blocks have been fully hauled, review
the report of divers as to the adequacy of the landing of the
ship on the keel and side blocks. The ship may be off center,
or there could be excessive hog or sag causing a significant
number of keel blocks to not be in contact with the ship's keel.
Corrections shall be made for gaps in the keel and side blocks.

h. Immediately after the hauling-up of a railway, the
lifting of a platform or the pumping of a dry dock, the Docking
Observer, with the contractor's Dockmaster, Ship's Commanding
Officer and Ship's Engineer, shall make a complete inspection of
the bottom of the ship, for proper fit of the blocking system,
and correct if necessary. The ship's hull in way of the blocks
shall also be examined for evidence of deflection or buckling
damage due to docking block loads. Floating dry dock pontoon
deck plating shall be inspected for buckling damage due to
transverse bending failure.
5. In preparation for the undocking evolution, the Docking Observer shall:

   a. Review the procedure that the contractor’s Dockmaster intends to follow and ensure that the procedure is sound before permitting the undocking to proceed. This review shall be accomplished prior to the Undocking Conference and shall be reviewed with ship’s force at the Undocking Conference.

   b. Determine with the contractor’s Dockmaster (and Ship Superintendent if one is assigned) that all underwater work will be completed. With the Dockmaster, schedule an Undocking Conference.

   c. Ensure the contractor’s Dockmaster has received all weight data records and sounding sheets, and as a result has compensated for any changes in weight distribution to ensure satisfactory list, trim and stability when the ship is undocked.

   NOTE: Ship’s Engineering Officer shall provide a sounding sheet to the Docking Observer with current tank soundings at least 24 hours prior to undocking, and notification of any updates.

   d. Ensure the contractor’s Dockmaster conducts an Undocking Conference with the ship’s force and Docking Observer prior to undocking to inform the Commanding Officer of:

      (1) Necessity of inspection by ship’s force of the underwater body, sea valves and hull penetrations.

      (2) Time undocking evolution will commence (time of final dock floor walk through).

      (3) Time flooding will commence.

      (4) Sill time.

      (5) Time ship will moor at new berth.

      (6) Procedures for ship’s line handling during undocking.

   e. Review pumping plans for floating dry docks.

   f. Review contingency plans and procedures to be used in case of emergency, i.e., flood, personnel injury, etc.
g. Ensure SUPSHIP/RMC personnel are aboard the ship during all movements and that proper services are provided throughout the evolutions.

h. Verify with the contractor’s Dockmaster and ship’s force that all underwater work has been accomplished and that all underwater hull apparatuses are in the proper position for undocking.

i. Inspect dry dock for debris and loose cap blocks. Some blocks might have been installed during the ship’s dry dock lay period. These blocks need to be fastened down to prevent float off during the undocking.

j. If haul blocks are used, ensure that tackle runs are free and blocks will outhaul to proper offset.

k. Ensure that alignment marks and ship positioning equipment is available in case the undocking must be aborted and the ship re-landed.

6. During the undocking evolution, the Docking Observer is to:

a. Be present prior to the commencement of the undocking evolution (dry dock flooding) to ensure the dry dock is ready to undock the ship. This review should include a last check of the blocking system for adequate fastening and that any blocks moved or modified during the lay period are properly installed and fastened, dock floor cleanliness, and interferences on dock floor in way of ship projections.

b. Be present at the time of flooding and throughout the undocking evolution until the dock is pumped out.

c. Check the drafts and trim as the ship lifts-off to ensure that the ship's afloat condition is as expected.

d. Conduct a post undocking inspection of the dock floor. Blocks shall be examined to assure no block cap material left the dock with the ship.

7. The launching and transferring of Navy ships is normally limited to contractor facilities operating under a new construction ship contract. The information required by the specification for submittal to SUPSHIP/RMC and the degree of participation by the Docking Observer is specified in the contract.