

Manned Model Training

Overview of Authorities and Requirements

Pilot Training Program – CCR §215

Every pilot must complete a Board-established training program consisting of **two parts, a Ship Handling Course/Manned Model and a Combination Course**:

- **Part 1 – Ship Handling Course:** Attend a manned scale model ship handling course at least five days in length, conducted at least once every five years, which provides realistic experience with maneuvering characteristics of major commercial vessel types that routinely transit waters under the Board's jurisdiction, under harbor and approach conditions replicating those found in the San Francisco Bay Area.
- **Part 2 – Combination Course:** Attend a combination course at least five days in length, completed at least once every five years, covering the following mandatory topics:
 - **(A)** Bridge Resource Management for pilots
 - **(B)** Ship Handling on a computer-driven ship's bridge simulator, including emergency maneuvering and ship handling in close quarters
 - **(C)** Emergency Medical Response
 - **(D)** Advanced Electronic Navigation Systems
 - **(E)** Causes and hazards of fatigue, means of avoiding or alleviating fatigue, and the duty of pilots to refuse an assignment if too fatigued to complete it safely
 - **(F)** Radar Navigation in low visibility/restricted waters

Fatigue Education Requirement

Under **HNC §1144**, any continuing education program adopted by the Board shall regularly inform pilots of the hazards of fatigue. This requirement is directly reflected in the Combination Course's Fatigue and Sleep Management module.

Feedback from SFBP

The San Francisco Bar Pilots Continuing Education Committee believes these criteria are essential to ensure that a manned model training facility can accurately replicate the uniquely demanding shiphandling environment of San Francisco Bay and its tributaries. Pilots operating in this region routinely encounter strong and rapidly changing tidal currents, shallow water effects, narrow channels, complex bridge transits, confined turning basins, heavy vessel traffic, and significant environmental forces including wind, swell, and wave action. Large vessels crossing the San Francisco Bar may experience quartering seas and ocean swell before transiting constricted waterways such as the Bay entrance, Carquinez Strait, and Sacramento and San Joaquin River channels. Effective training therefore requires facilities capable of realistically modeling hydrodynamic interactions, variable currents, shallow water conditions, tug operations, anchor work, bridge clearances, and vessel traffic restricted waters. The Committee's criteria are intended to identify facilities that can provide a high degree of physical fidelity, support scenario customization to San Francisco Bay-specific operating areas, and furnish objective performance evaluation tools. This level of realism is necessary to maintain and enhance pilot proficiency, strengthen risk management skills, and ensure the continued safe navigation of increasingly large and complex vessels throughout the San Francisco Bay region.

Summary of Requirements for Manned-Model Ship Handling Training Facility

Frequency Requirement: Per **CCR §215(b)(1)**, the manned scale model ship handling course must be attended at least once every five years. Per CCR §215(b)(2), the combination course must also be completed at least once every five years.

Section 1: Facility Requirements

This section focuses on the physical characteristics and operational capabilities required of the training facility.

- **Water Body Specifications:** The training facility must have a body of water with a contoured and scaled bottom consistent with the models used. Water levels must be maintained at a constant level during training. The facility must provide its target or acceptable variation in water level and the total size of the water area in square meters.
- **Simulation Capabilities:** The facility must be able to simulate current (variable in velocity and direction), wind, and wave action — all to scale. It should also be capable of simulating transits through bridges in narrow channels (ditch/Suez canal type).
- **Training Area Details:** The facility must provide the number of narrow channels (with straight and curved sections and length in scale miles), the size and percentage of shallow water training areas relative to the total training area, and operating under-keel clearance expressed as a percentage of draft.
- **Operational Capacity:** The facility must indicate how many manned models can perform exercises simultaneously without interference.
- **Technology and Maintenance:** An accurate position tracking system must be available on models, with the ability to review tracks in a classroom setting. The facility must demonstrate the capability to repair or replace essential equipment on-site and maintain course curriculum. The number of dedicated repair and technical staff must be listed.
- **Certifications and Planning:** Current facility certifications (e.g., Det Norske Veritas, United States Coast Guard) must be listed. Any major modifications or maintenance planned over the next five years should be identified. Typical weather conditions during the operating period and the number of days per year that weather conditions exceed operational scale must be described.

Section 2: Model Requirements

This section addresses the ship and tug models that must be available for training.

Ship Models

For each ship model available, the following information must be provided:

- Ship model type and any multiple configurations
- Scale
- Type of propulsion
- Rudder configuration
- Two-person operation capability
- Bow and stern thrusters
- Anchors to scale, controllable from the conning position
- Capability to be ballasted or de-ballasted to simulate loaded or light conditions
- Availability of an Azipod ship model suitable for cruise ship simulation
- Availability of an Ultra Large Container Vessel (ULCV) model, including Twenty-Foot Equivalent Unit (TEU) or length and beam dimensions

Tug Models

For each tug model available, the following information must be provided:

- Model type (e.g., Azimuthing Stern Drive, Voith Schneider)
- Model scale
- Radio-controlled capability
- Whether tugs are controlled by a dedicated and qualified tug master

Future Plans

The facility must indicate whether any new models are planned (with delivery timelines) and whether any existing models are due to be retired.

Section 3: Curriculum Requirements

This section outlines the training content and instructional expectations.

- **Instructor Ratios:** The facility must provide instructor-to-student ratios for both six-student and eight-student class sizes.
- **Instructor Qualifications:** The number of instructors who are current or former pilots must be provided, along with each instructor's years of experience. All instructors must be able to deliver training and training materials in English.
- **Training Exercises:** The curriculum must be capable of including the following:
 - Meeting, passing, and overtaking in narrow, shallow channels
 - Maneuvering different models, including Ultra Large Container Vessels encountering quartering swells while entering narrow channels such as bar channels
 - Customization to San Francisco Bay-specific locations, including terminals, channels, and basins
 - Docking and undocking exercises with current from ahead, astern, or abeam
 - Emergency ship handling with anchors and/or tugs
 - Working with anchors during docking and undocking
 - Working with tugs during docking, undocking, and in tethered/escort mode
- **Flexibility:** The curriculum must have the flexibility to develop and implement new exercises during the training week.
- **Trainee Evaluation:** Upon completion of each training course, the Board of Pilot Commissioners (BOPC) must receive a written evaluation of each trainee's performance covering the following areas:
 - Maneuvering
 - Learning Efficiency
 - Situational Awareness
 - Safety Awareness
 - Qualitative Remarks

Section 4: Travel Requirements

This section addresses logistical travel considerations for participants traveling from San Francisco.

- The facility must identify nearby airports accessible via air travel from San Francisco.
- Ground travel time from the airport to the point of lodging must be provided.
- Total daily round-trip ground travel time between lodging and the training facility must be provided.
- The facility should indicate whether lodging, meals, and transportation costs (to and from the airport, and between lodging and the training facility) can be included in the training fee quote.
- If the facility is located outside the United States, any required travel documents beyond a valid passport for entry by a U.S. citizen must be identified.

Section 5: Training Capacity and Contractual Requirements

This section covers scheduling, contract terms, insurance, and compliance obligations.

Capacity and Scheduling

- The facility must confirm whether it has available capacity to train up to 18 pilots over two to three sessions.
- Available months for training must be identified.
- Minimum and maximum lead times for booking classes must be provided.
- The number of operational weeks per year must be stated.

Contract Terms

- The facility must indicate the maximum number of years (up to five) for which it is willing to provide a firm quote in response to a Request for Proposal.
- The BOPC expects to pay for each course participant upon the completion of training and the issuance of a written evaluation. The facility must indicate

willingness to enter into a multi-year contract with payment in U.S. dollars, not adjusted for currency fluctuations during the contract term.

Insurance

The facility must be able to provide an insurance certificate with the BOPC designated as the additional insured and certificate holder, evidencing the following coverage (in U.S. dollars):

- Commercial General Liability: \$1 million per occurrence and \$2 million aggregate
- Workers' Compensation and Employers' Liability: \$1,000,000
- Automobile Coverage
- Watercraft Liability

Compliance Certifications

The facility must confirm its ability to comply with and sign forms for the following:

- Iran Contracting Act Verification
- Darfur Contracting Act Certification
- California Civil Rights Laws Certification

Potential Request for Information Question — Manned-Model Ship Handling Training Facility

Section 1: Facility Requirements

1.1 Is the bottom of the body of water used for training contoured and scaled consistent with the models?

1.2 Is the water level in the body of water maintained at a constant level while open for training?

1.3 Provide the facility's target or acceptable variation in water level.

1.4 What is the size of the water area available for training (in square meters)?

1.5 How many manned models can perform exercises simultaneously without interference?

1.6 Does the facility have the ability to simulate the following environmental conditions to scale?

- (a) Current, variable in velocity and direction
- (b) Wind
- (c) Wave action

1.7 Can the facility simulate transits through a bridge or bridges in narrow channels (ditch/Suez canal type)?

1.8 What is the number of narrow channels (ditch/Suez canal type) at the facility? Include the following:

- (a) Number of straight and curved sections
- (b) Length in scale miles

1.9 Provide the following information regarding the facility's shallow water training area:

- (a) Size of the shallow water training area
- (b) Percentage of shallow water training area relative to total training area

- (c) Operating under-keel clearance in the shallow water area, expressed as a percentage of draft

1.10 Does the facility have an accurate position tracking system on models with the ability to review tracks in a classroom setting? What data is tracked?

1.11 Does the facility have the capability to repair or replace course-essential equipment on site and maintain the course curriculum?

1.12 List the number of dedicated repair and technical staff on site.

1.13 List the current certifications held by the facility (e.g., Det Norske Veritas, United States Coast Guard, etc.).

1.14 Are there any major modifications or maintenance planned for the facility in the next five years? If so, please describe.

1.15 Describe typical weather conditions during the operating period. How many days per year do weather conditions exceed operational scale?

Section 2: Models

2A: Ship Models

2.1 List the following information for each ship model available at the facility:

- (a) Ship model type (if some models have multiple configurations, please note)
- (b) Scale
- (c) Type of propulsion
- (d) Rudder configuration
- (e) Two-person operation capability
- (f) Bow and stern thrusters
- (g) Anchors to scale, controllable from the conning position
- (h) Capability to be ballasted or de-ballasted to simulate loaded or light conditions

2.2 Does the facility have an Azipod ship model suitable for cruise ship simulation?

2.3 Does the facility have an Ultra Large Container Vessel (ULCV) model? If yes, provide the following:

- (a) Twenty-Foot Equivalent Unit (TEU) capacity
- (b) Length and beam dimensions

2B: Tug Models

2.4 List the following information for each tug model available for training:

- (a) Model type (e.g., Azimuthing Stern Drive, Voith Schneider, etc.)
- (b) Model scale
- (c) Whether the model is radio controlled

2.5 Are the tugs controlled by a dedicated and qualified tug master?

2C: Future Model Plans

2.6 Are there any new models planned? If yes, provide the timeline for delivery.

2.7 Are any existing models due to be retired? If yes, provide details.

Section 3: Curriculum

3A: Instructor Information

3.1 Provide the instructor-to-student ratio for a six-student class.

3.2 Provide the instructor-to-student ratio for an eight-student class.

3.3 Provide the number of instructors who are current or former pilots and who will be available to provide training and training materials in English. Include each instructor's years of experience as a pilot.

3B: Training Exercises

3.4 Can the training include meeting, passing, and overtaking in narrow, shallow channels (ditch/Suez canal type)?

3.5 Can the training include maneuvering different models, including an Ultra Large Container Vessel model encountering a quartering swell while entering a narrow channel such as a bar channel?

3.6 Can the lake and training course be customized to San Francisco Bay-specific locations, including terminals, channels, and basins?

3.7 Can the curriculum offer docking and undocking exercises with current from ahead, astern, or abeam?

3.8 Does the curriculum offer emergency ship handling with anchors?

3.9 Does the curriculum offer emergency ship handling with tug(s)?

3.10 Does the curriculum offer working with anchors during docking and undocking?

3.11 Does the curriculum offer working with tugs during docking, undocking, and in tethered/escort mode?

3C: Curriculum Flexibility and Evaluation

3.12 Does the curriculum have the flexibility to develop and implement new exercises during the training week?

3.13 Upon completion of a training course, will the Board of Pilot Commissioners (BOPC) receive a written evaluation of each trainee's performance covering the following areas?

- (a) Maneuvering
- (b) Learning Efficiency
- (c) Situational Awareness
- (d) Safety Awareness
- (e) Qualitative Remarks

Section 4: Travel Requirements

4.1 Identify the airport(s) near your facility where air travel from San Francisco could likely terminate.

4.2 Provide the ground travel time required from the airport to the point of lodging for training.

4.3 Provide the total ground travel time required each day between lodging and the training facility (round trip).

4.4 Can lodging, meals, and transportation costs (to and from the airport and between lodging and the training facility) be included with the training fee quote?

4.5 Is the facility located outside of the United States? If yes, other than a valid passport, identify any travel documents required by your country for entry of a U.S. citizen (e.g., tourist visa).

Section 5: Training Capacity and Contractual Requirements

5A: Scheduling and Capacity

5.1 Does the facility have available capacity to provide training for up to 18 pilots over two to three sessions?

5.2 If yes, what months could the training take place?

5.3 What are the minimum and maximum lead times for booking classes?

5.4 How many weeks per year is the facility operational?

5B: Contract and Payment Terms

5.5 What is the maximum number of years (up to five) for which the facility is willing to provide a firm quote in a Request for Proposal to provide the requested training?

5.6 The BOPC expects to pay for each course participant upon the completion of training and the issuance of a written evaluation of the pilot's training performance. Is the facility willing to enter into a multi-year contract with the BOPC to be paid in U.S. dollars, not adjusted for currency fluctuations during the entire term of the contract?

5C: Insurance Requirements

5.7 If awarded a contract for the requested training services, could the facility provide an insurance certificate with the BOPC designated as the additional insured and certificate holder, with no deductible greater than \$1,000.00, evidencing the following coverages (in U.S. dollars)?

- (a) Commercial General Liability insurance with a limit not lower than \$1 million per occurrence and \$2 million aggregate
- (b) Workers' Compensation and Employers' Liability with limits of \$1,000,000
- (c) Automobile Coverage
- (d) Watercraft Liability

5D: Compliance Certifications - 5.8 Would the facility be able to meet the requirements and sign a form containing the Iran Contracting Act Verification (see Attachment 3)?

Summary of Requirements for the Pilot Continuing Education Combination Course

Overview

The Pilot Continuing Education Combination Course is a mandatory training program that must be at least five days in length and completed by each pilot at least once every five years. The course must cover seven mandatory topic areas, align with established competency standards, and incorporate fatigue risk management principles.

Under **CCR §215(b)(2)**, each pilot is required to attend a **Combination Course** that meets the following minimum standards:

- **Minimum Duration:** The course must be at least **five days** in length.
- **Minimum Frequency:** The course must be completed at least **once every five years**.

The Combination Course covers a broader range of mandatory topics, including Bridge Resource Management, computer-driven ship's bridge simulator exercises, Emergency Medical Response, Advanced Electronic Navigation Systems, fatigue risk management, Radar Navigation in low visibility and restricted waters, and Regulatory Review.

Section A: Bridge Resource Management for Pilots

The course must include training in Bridge Resource Management (BRM) specifically tailored for pilots. This aligns with the Bridge Team Management competency standard under CCR §214, which includes the master-pilot relationship. Training should address effective communication, leadership, and coordination on the bridge, ensuring pilots can manage bridge team dynamics and maintain a productive working relationship with the vessel's master and crew. It also supports the Communications competency, which requires proper and timely handling of communications with other vessels, Vessel Traffic Service, and external entities.

Section B: Ship Handling on a Computer-Driven Ship's Bridge Simulator

The course must include ship handling exercises conducted on a computer-driven ship's bridge simulator. This training must specifically cover:

- **Emergency maneuvering**
- **Ship handling in close quarters**

This section supports several competency standards under CCR §214, including:

- **Maneuvering Knowledge** — familiarity with maneuvering characteristics of all vessel types routinely entering pilotage grounds
 - **Environmental Factors** — understanding of wind, current, tide, channel configuration, water depth, and ship interaction
 - **Situational Awareness** — ability to maintain vessel track and contingency planning
 - **Vessel Traffic** — appropriate response to vessel traffic
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Section C: Emergency Medical Response

The course must include training in Emergency Medical Response. This aligns with the Emergency Response competency standard under CCR §214, which encompasses personal safety, first aid, CPR, and hypothermia remediation. Pilots must be prepared to respond to medical emergencies that may occur aboard vessels during pilotage assignments.

Section D: Advanced Electronic Navigation Systems

The course must include training on Advanced Electronic Navigation Systems. This supports the Bridge Equipment competency standard under CCR §214, which requires appropriate use of navigation and collision-avoidance aids, as well as knowledge of their capabilities and limitations. Training should ensure pilots remain proficient with current and emerging electronic navigation technologies.

Section E: Fatigue Risk Management

The course must include dedicated training on fatigue risk management, as required under CCR §214 and §215. This section must specifically address:

- The causes and hazards of fatigue
- Means of avoiding or alleviating fatigue
- The responsibility of pilots to ensure they are rested prior to an assignment
- The need for a sufficient recovery period after awakening
- The duty of pilots to refuse an assignment if they are too fatigued to complete it safely

This section supports the Consistency competency standard, as fatigue directly impacts a pilot's ability to maintain consistent, acceptable performance.

Section F: Radar Navigation in Low Visibility/Restricted Waters

The course must include training in radar navigation under conditions of low visibility and in restricted waters. This supports the Bridge Equipment competency (appropriate use of navigation and collision-avoidance aids), the Situational Awareness competency (maintaining vessel track and contingency planning), and the Environmental Factors competency (understanding channel configuration, water depth, and related conditions that affect navigation in restricted waters).

Section G:Regulatory Review

The course must include a **regulatory review** component. This aligns with the **Regulatory Knowledge** competency standard under CCR §214, which requires familiarity with applicable laws and regulations. This section should ensure pilots are current on all relevant federal, state, and local regulations governing pilotage operations.

Scheduling Requirement — CCR §215(c)

Per CCR §215(c), the Executive Director is responsible for preparing and maintaining a list that names each pilot scheduled to attend required training courses during the following twelve months, along with the dates of attendance. This list must be provided to the Port Agent on a monthly basis, and the Port Agent is responsible for notifying the pilots on the list.

Competency Standards — CCR §214

All pilots and trainees are evaluated against the following ten performance competency areas, which the Combination Course curriculum must collectively support:

Competency Area	Description								
Communications	Proper and timely handling of communications with other vessels, Vessel Traffic Service, and external entities								
Situational Awareness	Ability to maintain vessel track and contingency planning								
Bridge Equipment	Appropriate use of navigation and collision-avoidance aids; knowledge of capabilities and limitations								
Vessel Traffic	Appropriate response to vessel traffic								
Maneuvering Knowledge	Familiarity with maneuvering characteristics of all vessel types routinely entering pilotage grounds								
Environmental Factors	Understanding of wind, current, tide, channel configuration, water depth, and ship interaction								
Bridge Team Management	Including master-pilot relationship								
Regulatory Knowledge	Familiarity with applicable laws and regulations								
Emergency Response	Personal safety, first aid, CPR, and hypothermia remediation								
Consistency	Consistency of acceptable performance								