AD-A037 442 OPERATIONS RESEARCH INC SILVER SPRING MD F/G 5/9
TASK ANALYSIS REPORT RELATIVE TO VESSEL COLLISIONS, RAMMINGS, A--ETC(U)
DEC 76 J SMITH, P DANIELS, B PARAMORE DOT-CG-41903-A
UNCLASSIFIED ORI-TR-1049-VOL-3 USCG-D-1-77-VOL-3 NL

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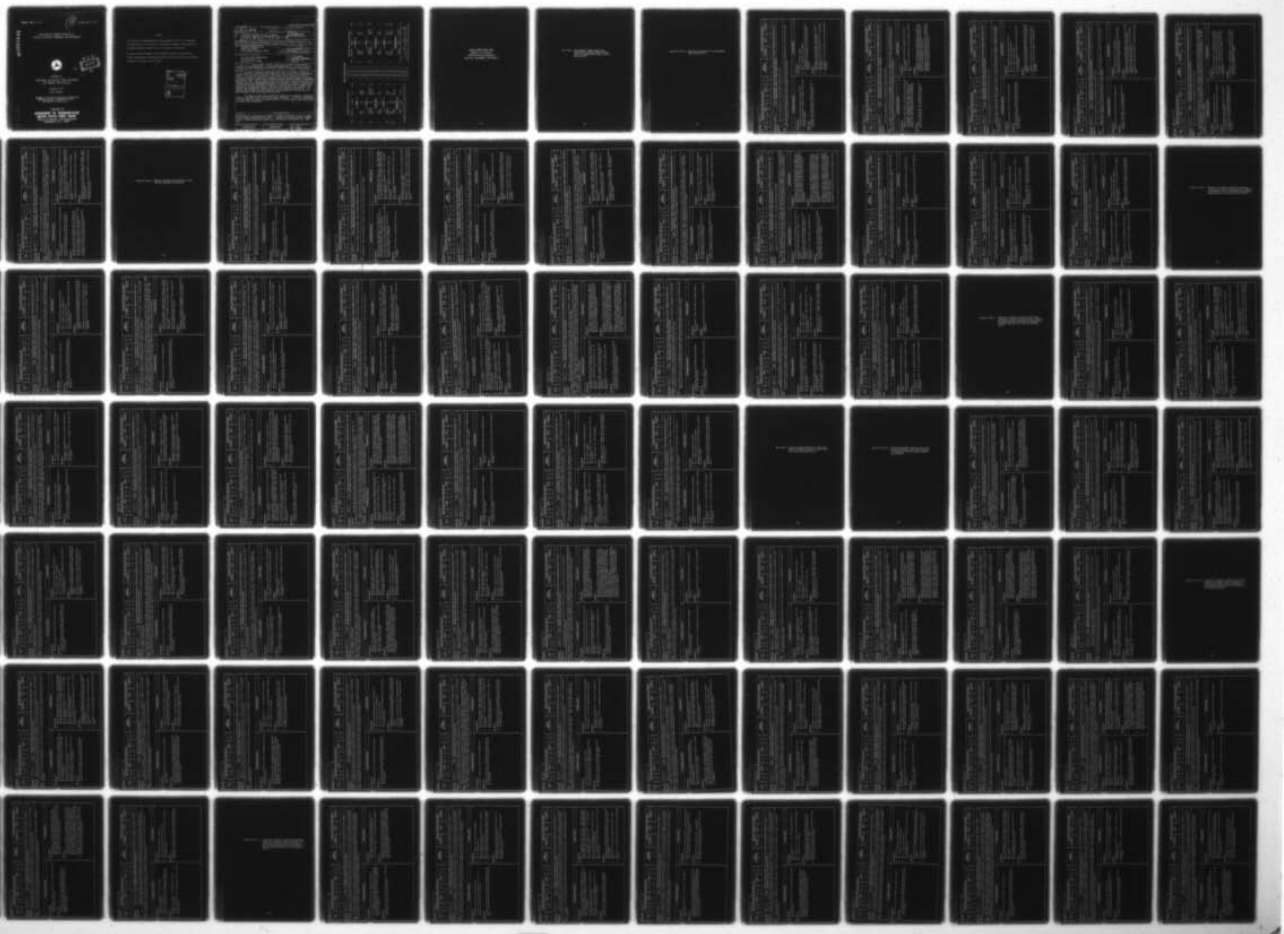

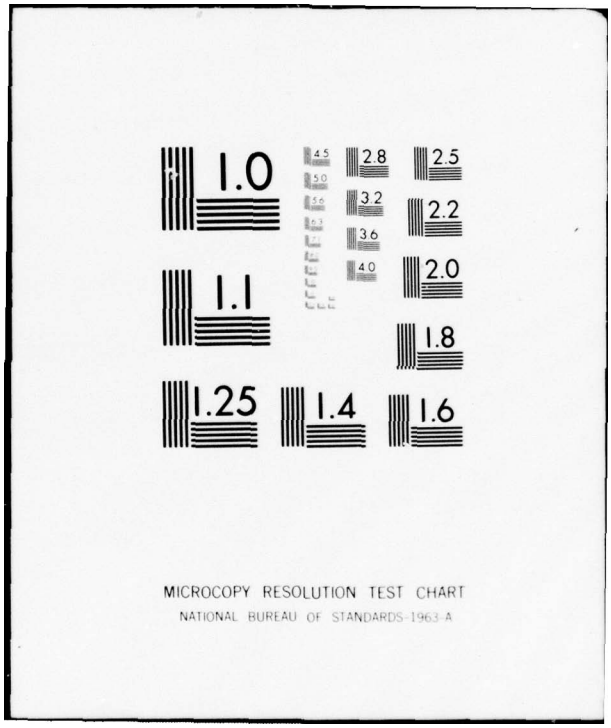
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NATIONAL BUREAU OF STANDARDS-1963-A

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Report No. CG-D-1-77.

(14)

VOLUME III OF III

TASK ANALYSIS REPORT RELATIVE TO VESSEL COLLISIONS, RAMMINGS, AND GROUNDINGS

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APPENDIX G:

FUNCTIONAL JOB ANALYSIS TASK STATEMENTS FOR TOWBOAT CAPTAIN/PILOT

DECEMBER 1976

FINAL REPORT

Document is available to the public through the National Technical Information Service, Springfield, Virginia 22161

Prepared for

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD
Office of Research and Development
Washington, D.C. 20590

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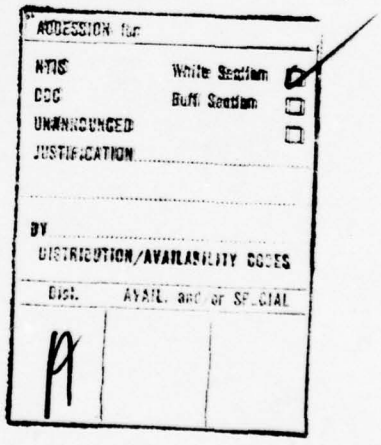

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Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
USCG-D-1-77 - Vol-3	ORI-TR-1049-Vol-3	

4. Title and Subtitle

Task Analysis Report Relative to Vessel Collisions, Rammings, and Groundings - Appendix G Functional Job Analysis Task Statements for Towboat Captain / Pilot

5. Report Date
December 1976

6. Performing Organization Code

7. Author(s)
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8. Performing Organization Report No.
Technical Report No. 1049

9. Performing Organization Name and Address
Operations Research, Inc.
1400 Spring Street
Silver Spring, Maryland 20910

10. Work Unit No. (TRAIS)

11. Contract or Grant No.
DOT-CG-41903-A, Task Order 2

12. Sponsoring Agency Name and Address
U.S. Coast Guard Headquarters
400 7th Street, S.W.
Washington, D.C. 20590

13. Type of Report and Period Covered
Final Report
July 1975-June 1976

14. Sponsoring Agency Code
G-DSA-1

15. Supplementary Notes
Three volumes: Volume I contains an overview of the analysis, findings, and recommendations, plus supporting Appendices A-E. Volumes II and III contain task data in Appendices F and G (for tankers and towboats, respectively).

16. Abstract
The report describes the processes and results of analysis of tasks of bridge personnel on tankers and other deep draft cargo vessels and on towboat-barge arrays. The Functional Job Analysis (FJA) method of task analysis was applied. The report provides a data base of comparable and concise descriptions of the tasks required for vessel control using currently available onboard equipment, information, and external aids. The data base includes, for each task, the action required, the expected result, equipment/materials/sources of information, degree of prescription/discretion involved, performance standards, and general educational background and job-related training requirements. Ratings of task complexity are provided. The analysis was performed at a generalized level for fleet-wide applicability. The analysis was iterated for three scenarios: mooring/unmooring, maneuvering in restricted waters, and coastal/open sea navigation.

The analytic intent was to establish a baseline for systematic, continuing research into human factors in merchant vessel casualties. In addition, recommendations were made of actions that might be taken in the near term to improve the safety of vessel control operations.

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17. Key Words	18. Distribution Statement
Bridge Personnel, Human Factors, Merchant Marine Safety; Tanker Operations; Task Analysis; Towboat Operations; Vessel Control	Document is available to the U.S. public through the National Technical Information Service, Springfield, Va. 22161

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	Vol. I-153 Vol. II-189 Vol. III-113	

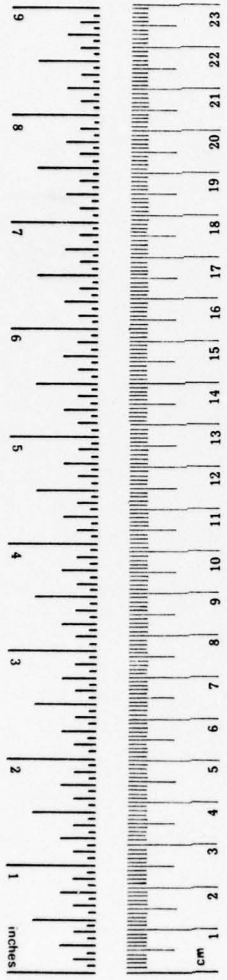
Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

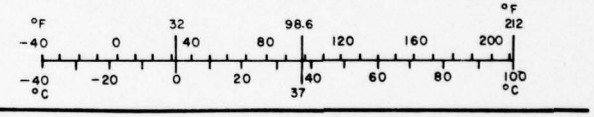
Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



CONTROL TOWBOAT-BARGE ARRAY
MOVEMENT IN EXPEDITIOUS
TRANSPORT WITHOUT ENDANGERING
HUMAN LIFE, ENVIRONMENT, AND PROPERTY

Goal TOW-I: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels

Objective TOW-I.A: Make final preparations to berth/unberth towboat-barge array

TASK CODE: TOW-I.A.1									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3A	75	1A	5	1B	20	2	3	3	1

TASK CODE: TOW-I.A.1	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Make final preparations to berth/unberth towboat-barge array.

TASK: Ascertains the towboat-barge array's draft and calculates the minimum and maximum depth of water in berth area in order to determine the towboat-barge array's underkeel clearance at berth.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Accurately determines drafts and water depth. • Precisely calculates underkeel clearance from drafts and water depths. Numerical: • In 100% of the cases, water depth and draft determinations are made within 0.1 foot accuracy.	Functional: • How to read draft marks. • How to determine water depths. • Understands the rise and fall of the water level as a function of the season of the year at various locations. Specific: • Knowledge of the particular towboat-barge array's draft under various loading conditions. • Knowledge of bottom characteristics of a particular berth area. • Knowledge of the water depths of a particular berthing area.

TASK CODE: TOW-I.A.2

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	80	1A	5	1A	15	3	3	3	4

TASK CODE: TOW-I.A.2	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE:

Make final preparations to berth/unberth towboat-barge array.

TASK: Ascertains area's physical and environmental characteristics, berthing facilities, local navigation rules and practices, aids to navigation, potential navigational hazards, and company policy, using appropriate navigational charts and publications, in order to prepare for berthing/unberthing maneuvers.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Adequately studies charts, publications, and policies. • Is thoroughly acquainted with area's physical characteristics, prevailing environmental situation, local aids to navigation, potential navigational hazards, and local navigation rules and practices. Numerical: • In 100% of the cases, all relevant data are ascertained as dictated by the particular situation.	Functional: • How to read and interpret navigational charts and publications. • How to relate these data to actual physical environment. Specific: • Knowledge of particular berthing area, its aids to navigation and potential navigational hazards, local navigation rules and practices, physical characteristics and environmental conditions. • Knowledge of the towboat-barge array's physical and hydrodynamic characteristics and their interrelationship with the particular berthing area.

TASK CODE: TOW-I.A.3

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	80	1A	5	1A	15	2	2	3	3

TASK CODE: TOW-I.A.3	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Make final preparations to berth/unberth towboat-barge array.

TASK: Estimates wind direction and speed, current velocity, and water depth, using towboat's communications equipment and/or environmental indicators (if available) in order to obtain environmental information within the berthing/unberthing area.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Routinely ascertains current and water depth data. Numerical: • In 100% of the cases, readings and observations are within acceptable limits in accordance with particular situation.	Functional: • How to determine wind speed and direction. • How to obtain current information. • How to obtain water depths. • How to operate various communications circuits such as radiotelephone. Specific: • Knowledge of prevailing environmental conditions and seasonal variations throughout the range of expected values. • Knowledge of particular area's meteorological data. • Knowledge of particular towboat's communications equipment.

TASK CODE: TOW-I.A.4									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
1	30	2	45	2A	25	2	2	2	2

TASK CODE: TOW-I.A.1	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Make final preparations to berth/unberth towboat-barge array.

TASK: Communicates with port authorities in person or using communications equipment, in order to verify arrival/departure time, berth assignment, and readiness of pier, as applicable.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Communication is timely before arrival/departure. Numerical: • In 100% of the cases, all pertinent information is exchanged, understood, and acknowledged.	Functional: • What information must be communicated. • How to operate various ship-to-shore communications equipment such as telephone and radio. Specific: • Knowledge of own towboat-barge array's time of arrival/departure and pier requirements, as applicable. • Knowledge of particular area's services and means to communicate with those services. • Knowledge of particular towboat's communications equipment.

TASK CODE:	TOW-I.A.5

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	50	2	35	1C	15	2	3	3	3

TASK CODE:	TOW-I.A.5	GOAL:	Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Make final preparations to berth/unberth towboat-barge array.

TASK: Exchanges maneuvering information with persons-in-charge of other ships or towboat-barge arrays, using bridge-to-bridge radiotelephones, ship-to-shore communications equipment, whistle signals, or any combination of the three, in order to establish the communications necessary for berthing/unberthing and to ensure understanding of intended movements of all pertinent vessels.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Proper communication procedures are used. • Communications are appropriately timed and complete. Numerical: • In 100% of the cases, clarification is required in all instances of uncertainty. • In 100% of the cases, berthing/unberthing does not proceed until all appropriate communications have been made.	Functional: • How to operate towboat's communication equipment. • Knowledge of standard communications procedures. • Knowledge of navigational terms and phraseology. • Knowledge of required whistle signals and how to sound them. Specific: • Knowledge of radiotelephone on particular towboat. • Knowledge of communications practices/procedures used at the particular terminal.

TASK CODE: TOW-I.A.6

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	80	1A	5	1A	15	3	3	2	2

TASK CODE: TOW-I.A.6 **GOAL:** Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE:
Make final preparations to berth/unberth towboat-barge array.

TASK: Reviews standard and emergency procedures for intended berthing/unberthing maneuvers, relying on own experience and judgment, navigational charts, and any existing company guidelines, in order to be familiar with towboat handling requirements associated with berth approach/departure.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Reviews procedures carefully, precisely and thoroughly. • Familiarization is timely before port arrival/departure. Numerical: • In 100% of the cases, all pertinent data are reviewed.	Functional: • How to use and read navigational charts and publications. • General knowledge of towboat systems and capabilities. • General knowledge of the effect of various atmospheric conditions on towboat operations. Specific: • Knowledge of particular water, traffic characteristics, prevailing land and atmospheric characteristics and conditions in berth area, including seasonal variations throughout range of expected values. • Knowledge of particular towboat-barge array's characteristics, towboat's equipment, and crew capabilities. • Knowledge of particular company guidelines concerning arrival/departure procedures.

TASK CODE: TOW-I.A.7									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
4	90	1A	5	1	5	4	4	3	3

TASK CODE: TOW-I.A.7	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat, or other nearby vessels.

OBJECTIVE: Make final preparations to berth/unberth towboat-barge array.

TASK: Analyzes and evaluates all pertinent information (traffic and obstacles, rules and regulations, weather and water conditions, personnel readiness, other vessel conditions), in order to decide how or whether to proceed with berthing/unberthing maneuvers.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Safety considerations are given priority in decision-making. • Appropriate factors enter into the analysis. • Decision is made in a timely manner. Numerical: • In 100% of the cases, all pertinent variables are considered. • In 100% of the cases, all berthing/unberthing maneuvers, once initiated, are completed without casualty or other negative results, such as inappropriate interference with the movement of other ships and/or towboat-barge arrays.	Functional: • Knowledge of standard procedures for berthing/unberthing. • Knowledge of rules and regulations applicable to terminal areas. • Understanding of effects of conditions on towboat's handling requirements/limitations (e.g., closest point of approach in relation to vessel speeds, current, water depth). Specific: • Knowledge of procedures, rules and regulations applicable in specific location. • Knowledge of maneuvering capabilities of particular towboat-barge array in specific locale as it may be affected by prevailing environmental conditions throughout the range of expected values.

TASK CODE: TOW-I.A.8									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
4	50	5	40	1A	10	4	4	3	3

TASK CODE: TOW-I.A.8	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE:

Make final preparations to berth/unberth towboat-barge array.

TASK: Determines and supervises the making/breaking of the barge array to/from the towboat in order to proceed upriver/downriver or in the Intracoastal Waterway (ICW) with a suitable barge array, following company policy and present governmental regulations, and using own judgment to compensate for various (seasonal) currents, water depths, and weather conditions.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Properly determines and supervises the making/breaking of the barges. • Correctly compensates for seasonal variations in currents, water depths, and weather conditions. Numerical: • In 100% of the cases, ensures that the barges are properly secured to each other and/or the towboat. • In 100% of the cases, ensures that governmental regulations and company policy are followed. • In 100% of the cases, the barge array configuration is adequate for the particular situation.	Functional: • Understands principles of a towboat (push-knee tug) and their effect on various barge arrays. • How to use wire straps, shackles, chain, rope (wire and fiber) cheater bars, and ratchets with toothpicks (bar to rotate ratchet). • Knowledge of governmental regulations and company policy. • Understands the hazards of barge jewelry (equipment). Specific: • Knowledge of the particular towboat and barges, their mooring arrangements and the location of their timberheads (bitts). • Knowledge of mooring lines/equipment of the particular towboat-barge array.

Objective TOW-I.B: Maneuver into/away from wharf/pier, while avoiding rammings and groundings

TASK CODE: TOW-I.B.1									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	70	1A	5	1A	25	3	3	1	1

TASK CODE: TOW-I.B.1	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Maneuver into/away from wharf/pier, while avoiding rammings and groundings.

TASK: Visually scans the waters surrounding the wharf/pier area, utilizing the naked eye, binoculars, and searchlights (for night operations), in order to detect and identify navigational hazards.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Thoroughly scans the surrounding waters. • Accurately and promptly identifies various navigational hazards. Numerical: • In 100% of the cases, all navigational hazards are detected and identified.	Functional: • How to energize and control searchlights. • How to use binoculars. • How to visually recognize hazards such as floating debris, shallow water, etc. Specific: • Knowledge of special hazards to navigation known in particular locale.

TASK CODE: TOW-I.B.2									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	75	1A	5	3A	20	3	3	3	1

TASK CODE: TOW-I.B.2	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Maneuver into/away from wharf/pier, while avoiding rammings and groundings.

TASK: Operates the radar and fathometer in order to detect and identify navigational hazards.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Selects the optimum combination of range scales, sector search, intensity, etc., for the most accurate and prompt detection of navigational hazards. • Accurately detects various navigational hazards on radar. • Accurately detects any navigational hazards (i.e., proximity of bottom) on fathometer. Numerical: • In 100% of the cases, all navigational hazards are detected.	Functional: • How to manipulate radar unit, i.e., vary range scales, sector search selector, intensity, range and bearing circles and lines, true or relative motion mode, etc. • How to manipulate fathometer unit, i.e., vary depth scale, intensity, etc. • How to detect navigational hazards on radar and fathometer. • How to identify navigational hazards and aids to navigation on radar. Specific: • Knowledge of special hazards known in particular locale which present radar targets. • Knowledge of individual towboat's particular radar unit. • Knowledge of individual towboat's particular fathometer unit.

TASK CODE: TOW-I.B.3									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	80	1A	5	1A	15	2	2	3	3

TASK CODE: TOW-I.B.3	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Maneuver into/away from wharf/pier, while avoiding rammings and groundings.

TASK: Estimates wind direction and speed, current velocity, and water depth, using towboat's communications equipment and/or environmental indicators (if available), in order to obtain environmental information within the berthing/unberthing area.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Routinely ascertains current and water depth data. Numerical: • In 100% of the cases, readings and observations are within acceptable limits in accordance with particular situation.	Functional: • How to determine wind speed and direction. • How to obtain current information. • How to obtain water depths. • How to operate various communications circuits such as radiotelephone. Specific: • Knowledge of prevailing environmental conditions and seasonal variations throughout the range of expected values. • Knowledge of particular area's meteorlogical data. • Knowledge of particular towboat's communications equipment.

TASK CODE: TOW-I.B.4

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
1	85	1A	5	1A	10	2	1	2	2

TASK CODE: TOW-I.B.4 **GOAL:** Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Maneuver into/away from wharf/pier, while avoiding rammings and groundings.

TASK: Reads dials of instruments such as compass (if available), rudder angle indicator, throttle position indicator, speed indicator, and RPM indicator; visually scans steering and propulsion system status indicators; looks and listens for steering machinery and propulsion system audio and visual failure alarms, in order to ascertain heading, speed, rudder angle, and propeller speed and to monitor operating conditions of steering and propulsion systems.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Correctly reads and surveys all instrumentation. Numerical: • In 100% of the cases, readings and observations are within acceptable limits in accordance with particular situation.	Functional: • How to read compass, rudder angle indicator, throttle position indicator, speed indicator, and RPM indicator. • How to monitor steering and propulsion system status indicators. • How to recognize audio and visual failure alarms for steering and propulsion system. Specific: • Knowledge of location, arrangement, and characteristics of particular indicators, displays, and alarms on specific towboat.

TASK CODE: TOW-I.B.5

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	85	1A	5	2B	10	3	2	2	2

TASK CODE: TOW-I.B.5 **GOAL:** Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Maneuver into/away from wharf/pier, while avoiding rammings and groundings.

TASK: Monitors voice radio (bridge-to-bridge, ship-to-shore, and vessel traffic system (VTS) network, as applicable) and internal communication systems in order to maintain radio watch during berthing/unberthing maneuvers. (This task includes external radio communications with bridge keepers and lock masters.)

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Is attentive to all voice radio traffic. • Efficiently monitors all communications applicable to own tugboat-barge array and situation. Numerical: • In 100% of the cases, all pertinent communications are detected, understood, and acknowledged.	Functional: • How to operate various radio frequency (rf) equipment. • Knowledge of voice radio communication procedures. Specific: • Knowledge of availability of various rf networks in particular locale. • Knowledge of specific rf equipment provided on particular towboat.

TASK CODE:	TOW-I.B.6

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
5B	90	1A	5	1A	5	5	6	4	3

TASK CODE:	TOW-I.B.6	GOAL:	Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Maneuver into/away from wharf/pier, while avoiding rammings and groundings.

TASK: Examines and evaluates total data input concerning environmental situation, own towboat-barge array characteristics, status of both onboard and external ancilliary equipment, and own towboat's mission (purpose and goals), in order to determine course of action to maneuver into/away from wharf/pier, while simultaneously avoiding rammings and groundings.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Anticipates any and all possibilities which may arise. • Continually maintains mental alertness, i.e., is vigilant. • Maintains sense of proportion among input data and various action options as situation changes or progresses. • Makes decision in timely manner commensurate with situation. Numerical: • In 100% of the cases, all pertinent data are examined and evaluated in accordance with the particular situation before decision is reached.	Functional: • Understands interrelationships which exist among towboats, barges, ancilliary equipment (both onboard and external to the towboat-barge array), and environmental factors as they relate to the controllability of the towboat-barge array in shallow water and alongside wharf/pier. Specific: • Knowledge of specific towboat's hydrodynamic characteristics as they may be affected by particular barge array and prevailing environmental conditions at particular locale and the seasonal variations of those environmental conditions through the range of expected values. • Knowledge of particular towboat's ancilliary equipment and shoreside ancilliary equipment provided in particular locale as they affect towboat-barge array hydrodynamics and as they may be affected by varying local environmental conditions. • Knowledge of particular wharf/pier and adjacent waters.

TASK CODE: TOW-I.B.7									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	45	1A	5	1B	50	1	1	1	1

TASK CODE: TOW-I.B.7	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Maneuver into/away from wharf/pier, while avoiding rammings and groundings.

TASK: Adjusts RPM or pitch (if controllable) of towboat's wheel(s) utilizaing bridge throttles or internal communications circuits in order to change towboat-barge array's speed in maneuvering towboat into/out of berth.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Expeditiously and accurately manipulates equipment to effect speed change. Numerical: • In 100% of the cases, all adjustments are made exactly as ordered (or desired).	Functional: • How to operate bridge throttles and communications circuits. Specific: • Special characteristics and location of own towboat's equipment.

TASK CODE: TOW-I.B.8

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	45	1A	20	1C	50	2	1	1	2

TASK CODE: TOW-I.B.8	**GOAL:** Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Maneuver into/away from wharf/pier, while avoiding rammings and groundings.

TASK: Turns towboat's helm, operates flanking rudders, and reads compass and rate of turn indicators (if provided), in order to change or maintain heading in maneuvering towboat into/out of berth.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Routinely and accurately manipulates helm and flanking rudders to change or maintain course. • Continuously monitors compass, rudder angle, and rate of turn indicator. Numerical: • In 100% of the cases, all readings of instrumentation are within acceptable limits in accordance with particular situation. • In 100% of the cases, all helm adjustments are made exactly as ordered (or desired).	Functional: • How to operate a helm and flanking rudders. • How to read a compass. • How to read a rudder angle indicator and a rate of turn indicator. • How to detect drift off desired heading. Specific: • Knowledge of specific towboat-barge array's handling characteristics, i.e., rudder rate, lateral stability, rate of turn, etc.

TASK CODE: TOW-I.B.9									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
1	15	1	5	1	80	1	1	1	1

TASK CODE: TOW-I.B.9	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Maneuver into/away from wharf/pier, while avoiding rammings and groundings.

TASK: Sounds towboat's whistle and displays other required identification in accordance with Rules of the Road, in order to approach/leave berth safely and according to proper procedure.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Correctly operates whistle and displays appropriate signals. • Operation of whistle and displaying of signals is timely to arrival/departure. Numerical: • In 100% of the cases, all appropriate whistle signals are sounded. • In 100% of the cases, all other appropriate day signals are displayed.	Functional: • How to operate towboat's whistle. • How to identify and use other signals. • Knowledge of Rules of the Road pertaining to whistle and other signals. Specific: • Knowledge of location of whistle controls (automatic and manual) and other day signals on particular towboat.

Objective TOW-I.C: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings, while simultaneously maneuvering towboat-barge array into/away from wharf/pier

TASK CODE: TOW-I.C.1									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	70	1A	5	1A	25	3	3	1	1

TASK CODE: TOW-I.C.1	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings, while simultaneously maneuvering towboat-barge array into/away from wharf/pier.

TASK: Visually scans the waters surrounding the wharf/pier area, utilizing the naked eye, binoculars, and searchlights (for night operations), in order to detect and identify navigational hazards.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Thoroughly scans the surrounding waters. • Accurately and promptly identifies various navigational hazards. Numerical: • In 100% of the cases, all navigational hazards are detected and identified.	Functional: • How to energize and control searchlights. • How to use binoculars. • How to visually recognize hazards such as floating debris, shallow water, etc. Specific: • Knowledge of special hazards to navigation known in particular locale.

TASK CODE: TOW-I.C.2									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	75	1A	5	3A	20	3	3	3	1

TASK CODE: TOW-I.C.2	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings, while simultaneously maneuvering towboat-barge array into/away from wharf/pier.

TASK: Operates the radar and fathometer in order to detect and identify navigational hazards.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Selects the optimum combination of range scales, sector search, intensity, etc., for the most accurate and prompt detection of navigational hazards. • Accurately detects various navigational hazards on radar. • Accurately detects any navigational hazards (i.e., proximity of bottom) on fathometer. Numerical: • In 100% of the cases, all navigational hazards are detected.	Functional: • How to manipulate radar unit, i.e., vary range scales, sector search selector, intensity, range and bearing circles and lines, true or relative motion mode, etc. • How to manipulate fathometer unit, i.e., vary depth scale, intensity, etc. • How to detect navigational hazards on radar and fathometer. • How to identify navigational hazards and aids to navigation on radar. Specific: • Knowledge of special hazards known in particular locale which present radar targets. • Knowledge of individual towboat's particular radar unit. • Knowledge of individual towboat's particular fathometer unit.

TASK CODE: TOW-I.C.3									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	80	1A	5	1A	15	2	2	3	3

TASK CODE: TOW-I.C.3	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings, while simultaneously maneuvering towboat-barge array into/away from wharf/pier.

TASK: Estimates wind direction and speed, current velocity, and water depth, using towboat's communications equipment and/or environmental indicators (if available), in order to obtain environmental information within the berthing/unberthing area.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Routinely ascertains current and water depth data. Numerical: • In 100% of the cases, readings and observations are within acceptable limits in accordance with particular situation.	Functional: • How to determine wind speed and direction. • How to obtain current information. • How to obtain water depths. • How to operate various communications circuits such as radiotelephone. Specific: • Knowledge of prevailing environmental conditions and seasonal variations throughout the range of expected values. • Knowledge of particular area's meteorlogical data. • Knowledge of particular towboat's communications equipment.

TASK CODE: TOW-I.C.4

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
1	85	1A	5	1A	10	2	1	2	2

TASK CODE: TOW-I.C.4

GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings, while simultaneously maneuvering towboat-barge array into/away from wharf/pier.

TASK: Reads dials of instruments such as compass (if available), rudder angle indicator, throttle position indicator, speed indicator, and RPM indicator; visually scans steering and propulsion system status indicators; looks and listens for steering machinery and propulsion system audio and visual failure alarms, in order to ascertain heading, speed, rudder angle, and propeller speed and to monitor operating conditions of steering and propulsion systems.

PERFORMANCE STANDARDS

Descriptive:

- Correctly reads and surveys all instrumentation.

Numerical:

- In 100% of the cases, readings and observations are within acceptable limits in accordance with particular situation.

TRAINING CONTENT

Functional:

- How to read compass, rudder angle indicator, throttle position indicator, speed indicator, and RPM indicator.
- How to monitor steering and propulsion system status indicators.
- How to recognize audio and visual failure alarms for steering and propulsion system.

Specific:

- Knowledge of location, arrangement, and characteristics of particular indicators, displays, and alarms on specific towboat.

TASK CODE: TOW-I.C.5									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	85	1A	5	2B	10	3	2	2	2

TASK CODE: TOW-I.C.5	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings, while simultaneously maneuvering towboat-barge array into/away from wharf/pier.

TASK: Monitors voice radio (bridge-to-bridge, ship-to-shore, and vessel traffic system (VTS) network, as applicable) and internal communication systems in order to maintain radio watch during berthing/unberthing maneuvers. (This task includes external radio communications with bridge keepers and lock masters.)

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Is attentive to all voice radio traffic. • Efficiently monitors all communications applicable to own tugboat-barge array and situation. Numerical: • In 100% of the cases, all pertinent communications are detected, understood, and acknowledged.	Functional: • How to operate various radio frequency (rf) equipment. • Knowledge of voice radio communication procedures. Specific: • Knowledge of availability of various rf networks in particular locale. • Knowledge of specific rf equipment provided on particular towboat.

TASK CODE: TOW-I.C.6									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
1	50	1A	5	2B	45	2	2	2	2

TASK CODE: TOW-I.C.6	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings, while simultaneously maneuvering towboat-barge array into/away from wharf/pier.

TASK: Monitors collision avoidance system (visual and electronic) in order to detect other vessel traffic in vicinity of wharf/pier.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Thoroughly scans the surrounding waters both visually and electronically. • Promptly and accurately detects other vessel traffic in vicinity. Numerical: • In 100% of the cases, all other vessel traffic in vicinity is detected.	Functional: • How to visually recognize other vessel traffic. • How to operate electronic collision avoidance system (including bridge-to-bridge communication system). Specific: • Knowledge of prevailing traffic patterns alongside wharf/pier including seasonal variations. • Knowledge of individual towboat's specific electronic collision avoidance system.

TASK CODE: TOW-I.C.7

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
4	85	1A	5	1A	10	4	5	4	2

TASK CODE: TOW-I.C.7 **GOAL:** Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings, while simultaneously maneuvering towboat-barge array into/away from wharf/pier.

TASK: Assesses all other vessel traffic in vicinity of wharf/pier in order to determine the existence of any real or potential collision hazard.

PERFORMANCE STANDARDS

Descriptive:

- Accurately determines the intentions of all threatening traffic in vicinity.
- Properly ascertains the governing Rules of the Road and considers any other restraints imposed upon own towboat-barge array by local navigation rules, practices, and VTS, if applicable.
- Anticipates possible actions by threatening traffic which may dictate reassessment of situation.
- Makes assessment in timely manner commensurate with situation.

Numerical:

- In 100% of the cases, all pertinent traffic data are assessed for potential collision hazard.

TRAINING CONTENT

Functional:

- Understands principles of relative motion.
- How to determine course and speed of all other vessels.
- Understands applicable Rules of the Road and the limitations they impose upon his towboat-barge array in determining potential collision hazard and possible counter action.

Specific:

- Knowledge of prevailing traffic patterns alongside wharf/pier including seasonal variations.
- Knowledge of local navigation rules, practices, and VTS, if applicable.

TASK CODE:	TOW-I.C.8

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
5B	90	1A	5	1A	5	5	6	4	3

TASK CODE:	TOW-I.C.8	GOAL:	Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE:

Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings, while simultaneously maneuvering towboat-barge array into/away from wharf/pier.

TASK: Examines and evaluates total data input concerning environmental situation, own towboat-barge array's characteristics, status of both onboard and external ancilliary equipment, collision hazards, and own towboat's mission (purpose and goals), in order to determine course of action to maneuver into/away from wharf/pier while simultaneously avoiding collisions, rammings, or groundings.

PERFORMANCE STANDARDS

Descriptive:

- Anticipates any and all possibilities which may arise, especially other vessels' intentions and actions.
- Continually maintains mental alertness, i.e., is vigilant.
- Maintains sense of proportion among input data and various actions options as situation changes or progresses.
- Makes decision in timely manner commensurate with situation.

Numerical:

- In 100% of the cases, all pertinent data are examined and evaluated in accordance with the particular situation before decision is reached.

TRAINING CONTENT

Functional:

- Understands interrelationships which exist among towboat, barges, ancilliary equipment (both onboard and external to the towboat), and environmental factors as they relate to towboat-barge array controllability in shallow water and alongside wharf/pier.

Specific:

- Knowledge of own and other vessels' hydrodynamic characteristics as they may be affected by particular barge array and prevailing environmental conditions at particular locale and the seasonal variations of those environmental conditions through the range of expected values.
- Knowledge of own towboat's ancilliary equipment and shoreside ancilliary equipment provided in particular locale as they affect towboat-barge array hydrodynamics and as they may be affected by varying local environmental conditions.
- Knowledge of particular wharf/pier and adjacent waters.

TASK CODE: TOW-I.C.9									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	45	1A	5	1B	50	1	1	1	1

TASK CODE: TOW-I.C.9	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings, while simultaneously maneuvering towboat-barge array into/away from wharf/pier.

TASK: Adjusts RPM or pitch (if controllable) of towboat's wheel(s) utilizaing bridge throttles or internal communications circuits in order to change towboat-barge array's speed in maneuvering towboat into/out of berth.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Expeditiously and accurately manipulates equipment to effect speed change. Numerical: • In 100% of the cases, all adjustments are made exactly as ordered (or desired).	Functional: • How to operate bridge throttles and communications circuits. Specific: • Special characteristics and location of own towboat's equipment.

TASK CODE: TOW-I.C.10									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	45	1A	20	1C	50	2	1	1	2

TASK CODE: TOW-I.C.10	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings, while simultaneously maneuvering towboat-barge array into/away from wharf/pier.

TASK: Turns towboat's helm, operates flanking rudders, and reads compass and rate of turn indicators (if provided), in order to change or maintain heading in maneuvering towboat into/out of berth.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Routinely and accurately manipulates helm and flanking rudders to change or maintain course. • Continuously monitors compass, rudder angle, and rate of turn indicator. Numerical: • In 100% of the cases, all readings of instrumentation are within acceptable limits in accordance with particular situation. • In 100% of the cases, all helm adjustments are made exactly as ordered (or desired).	Functional: • How to operate a helm and flanking rudders. • How to read a compass. • How to read a rudder angle indicator and a rate of turn indicator. • How to detect drift off desired heading. Specific: • Knowledge of specific towboat-barge array's handling characteristics, i.e., rudder rate, lateral stability, rate of turn, etc.

TASK CODE: TOW-I.C.11									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
1	15	1	5	1	80	1	1	1	1

TASK CODE: TOW-I.C.11	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings, while simultaneously maneuvering towboat-barge array into/away from wharf/pier.

TASK: Sounds towboat's whistle and displays other required identification in accordance with Rules of the Road, in order to approach/leave berth safely and according to proper procedure.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Correctly operates whistle and displays appropriate signals. • Operation of whistle and displaying of signals is timely to arrival/departure. Numerical: • In 100% of the cases, all appropriate whistle signals are sounded. • In 100% of the cases, all other appropriate day signals are displayed.	Functional: • How to operate towboat's whistle. • How to identify and use other signals. • Knowledge of Rules of the Road pertaining to whistle and other signals. Specific: • Knowledge of location of whistle controls (automatic and manual) and other day signals on particular towboat.

Objective TOW-I.D: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maneuvering into/away from wharf/pier when some emergency arises

TASK CODE: TOW-I.D.1									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	70	1A	5	1A	25	3	3	1	1

TASK CODE: TOW-I.D.1	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings, while simultaneously maneuvering into/away from wharf/pier when some emergency arises.

TASK: Visually scans the waters surrounding the wharf/pier area, utilizing the naked eye, binoculars, and searchlights (for night operations), in order to detect and identify navigational hazards.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Thoroughly scans the surrounding waters. • Accurately and promptly identifies various navigational hazards. Numerical: • In 100% of the cases, all navigational hazards are detected and identified.	Functional: • How to energize and control searchlights. • How to use binoculars. • How to visually recognize hazards such as floating debris, shallow water, etc. Specific: • Knowledge of special hazards to navigation known in particular locale.

TASK CODE: TOW-I.D.2									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	75	1A	5	3A	20	3	3	3	1

TASK CODE: TOW-I.D.2	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings, while simultaneously maneuvering into/away from wharf/pier when some emergency arises.

TASK: Operates the radar and fathometer in order to detect and identify navigational hazards.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Selects the optimum combination of range scales, sector search, intensity, etc., for the most accurate and prompt detection of navigational hazards. • Accurately detects various navigational hazards on radar. • Accurately detects any navigational hazards (i.e., proximity of bottom) on fathometer. Numerical: • In 100% of the cases, all navigational hazards are detected.	Functional: • How to manipulate radar unit, i.e., vary range scales, sector search selector, intensity, range and bearing circles and lines, true or relative motion mode, etc. • How to manipulate fathometer unit, i.e., vary depth scale, intensity, etc. • How to detect navigational hazards on radar and fathometer. • How to identify navigational hazards and aids to navigation on radar. Specific: • Knowledge of special hazards known in particular locale which present radar targets. • Knowledge of individual towboat's particular radar unit. • Knowledge of individual towboat's particular fathometer unit.

TASK CODE: TOW-I.D.3

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	80	1A	5	1A	15	2	2	3	3

TASK CODE: TOW-I.D.3

GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings, while simultaneously maneuvering into/away from wharf/pier when some emergency arises.

TASK: Estimates wind direction and speed, current velocity, and water depth, using towboat's communications equipment and/or environmental indicators (if available), in order to obtain environmental information within the berthing/unberthing area.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Routinely ascertains current and water depth data. Numerical: • In 100% of the cases, readings and observations are within acceptable limits in accordance with particular situation.	Functional: • How to determine wind speed and direction. • How to obtain current information. • How to obtain water depths. • How to operate various communications circuits such as radiotelephone. Specific: • Knowledge of prevailing environmental conditions and seasonal variations throughout the range of expected values. • Knowledge of particular area's meteorlogical data. • Knowledge of particular towboat's communications equipment.

TASK CODE: TOW-I.D.4									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
1	85	1A	5	1A	10	2	1	2	2

TASK CODE: TOW-I.D.4	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maneuvering into/away from wharf/pier when some emergency arises.

TASK: Reads dials of instruments such as compass (if available), rudder angle indicator, throttle position indicator, speed indicator, and RPM indicator; visually scans steering and propulsion system status indicators; looks and listens for steering machinery and propulsion system audio and visual failure alarms, in order to ascertain heading, speed, rudder angle, and propeller speed and to monitor operating conditions of steering and propulsion systems.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Correctly reads and surveys all instrumentation. Numerical: • In 100% of the cases, readings and observations are within acceptable limits in accordance with particular situation.	Functional: • How to read compass, rudder angle indicator, throttle position indicator, speed indicator, and RPM indicator. • How to monitor steering and propulsion system status indicators. • How to recognize audio and visual failure alarms for steering and propulsion system. Specific: • Knowledge of location, arrangement, and characteristics of particular indicators, displays, and alarms on specific towboat.

TASK CODE: TOW-I.D.5									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	85	1A	5	2B	10	3	2	2	2

TASK CODE: TOW-I.D.5	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings and groundings while simultaneously maneuvering into/away from wharf/pier when some emergency arises.

TASK: Monitors voice radio (bridge-to-bridge, ship-to-shore, and vessel traffic system (VTS) network, as applicable) and internal communication systems in order to maintain radio watch during berthing/unberthing maneuvers. (This task includes external radio communications with bridge keepers and lock masters.)

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Is attentive to all voice radio traffic. • Efficiently monitors all communications applicable to own tugboat-barge array and situation. Numerical: • In 100% of the cases, all pertinent communications are detected, understood, and acknowledged.	Functional: • How to operate various radio frequency (rf) equipment. • Knowledge of voice radio communication procedures. Specific: • Knowledge of availability of various rf networks in particular locale. • Knowledge of specific rf equipment provided on particular towboat.

TASK CODE:	TOW-I.D.6

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
1	50	1A	5	2B	45	2	2	2	2

TASK CODE: TOW-I.D.6	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maneuvering into/away from wharf/pier when some emergency arises.

TASK: Monitors collision avoidance system (visual and electronic) in order to detect other vessel traffic in vicinity of wharf/pier.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Thoroughly scans the surrounding waters both visually and electronically. • Promptly and accurately detects other vessel traffic in vicinity. Numerical: • In 100% of the cases, all other vessel traffic in vicinity is detected.	Functional: • How to visually recognize other vessel traffic. • How to operate electronic collision avoidance system (including bridge-to-bridge communication system). Specific: • Knowledge of prevailing traffic patterns alongside wharf/pier including seasonal variations. • Knowledge of individual towboat's specific electronic collision avoidance system.

TASK CODE: TOW-I.D.7

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
4	85	1A	5	1A	10	4	5	4	2

TASK CODE: TOW-I.D.7

GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maneuvering into/away from wharf/pier when some emergency arises.

TASK: Assesses all other vessel traffic in vicinity of wharf/pier in order to determine the existence of any real or potential collision hazard.

PERFORMANCE STANDARDS

Descriptive:

- Accurately determines the intentions of all threatening traffic in vicinity.
- Properly ascertains the governing Rules of the Road and considers any other restraints imposed upon own towboat-barge array by local navigation rules, practices, and VTS, if applicable.
- Anticipates possible actions by threatening traffic which may dictate reassessment of situation.
- Makes assessment in timely manner commensurate with situation.

Numerical:

- In 100% of the cases, all pertinent traffic data are assessed for potential collision hazard.

TRAINING CONTENT

Functional:

- Understands principles of relative motion.
- How to determine course and speed of all other vessels.
- Understands applicable Rules of the Road and the limitations they impose upon his towboat-barge array in determining potential collision hazard and possible counter action.

Specific:

- Knowledge of prevailing traffic patterns alongside wharf/pier including seasonal variations.
- Knowledge of local navigation rules, practices, and VTS, if applicable.

TASK CODE:	TOW-I.D.8

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
5B	90	1A	5	1A	5	5	6	4	3

TASK CODE:	TOW-I.D.8	GOAL:	Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maneuvering into/away from wharf/pier when some emergency arises.

TASK: Examines and evaluates total data input concerning environmental situation, own towboat-barge array's characteristics, status of both onboard and external ancilliary equipment, collision hazards, and own towboat's mission (purpose and goals), in order to determine course of action to maneuver into/away from wharf/pier while simultaneously avoiding collisions, rammings, and groundings when a non-towboat-control-related emergency occurs.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Anticipates any and all possibilities which may arise, especially other vessels' intentions and actions. • Continually maintains mental alertness, i.e., is vigilant. • Maintains sense of proportion among input data and various action options as situation changes or progresses. • Makes decision in timely manner commensurate with situation. • Acts effectively and with aplomb under pressure. Numerical: • In 100% of the cases, all pertinent data are examined and evaluated in accordance with the particular situation before decision is reached.	Functional: • Understands interrelationships which exist among towboats, barges, ancilliary equipment (both onboard and external to the towboat), and environmental factors as they relate to towboat-barge controllability in shallow water and alongside wharf/pier. Specific: • Knowledge of own and other vessel's hydrodynamic characteristics as they may be affected by particular barge array and prevailing environmental conditions at the particular locale and the seasonal variations of those environmental conditions through the range of expected values. • Knowledge of own towboat's ancilliary equipment and shoreside ancilliary equipment provided in particular locale as they affect towboat-barge array hydrodynamics and as they may be affected by varying environmental conditions and other vessel traffic. • Knowledge of particular towboat's emergency procedures.

TASK CODE: TOW-I.D.10									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	45	1A	5	1B	50	1	1	1	1

TASK CODE: TOW-I.D.10	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maneuvering into/away from wharf/pier when some emergency arises.

TASK: Adjusts RPM or pitch (if controllable) of towboat's wheel(s) utilizaing bridge throttles or internal communications circuits in order to change towboat-barge array's speed in maneuvering towboat into/out of berth.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Expeditiously and accurately manipulates equipment to effect speed change. Numerical: • In 100% of the cases, all adjustments are made exactly as ordered (or desired).	Functional: • How to operate bridge throttles and communications circuits. Specific: • Special characteristics and location of own towboat's equipment.

TASK CODE: TOW-I.D.11									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	45	1A	20	1C	50	2	1	1	2

TASK CODE: TOW-I.D.11	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maneuvering into/away from wharf/pier when some emergency arises.

TASK: Turns towboat's helm, operates flanking rudders, and reads compass and rate of turn indicators (if provided), in order to change or maintain heading in maneuvering towboat into/out of berth.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Routinely and accurately manipulates helm and flanking rudders to change or maintain course. • Continuously monitors compass, rudder angle, and rate of turn indicator. Numerical: • In 100% of the cases, all readings of instrumentation are within acceptable limits in accordance with particular situation. • In 100% of the cases, all helm adjustments are made exactly as ordered (or desired).	Functional: • How to operate a helm and flanking rudders. • How to read a compass. • How to read a rudder angle indicator and a rate of turn indicator. • How to detect drift off desired heading. Specific: • Knowledge of specific towboat-barge array's handling characteristics, i.e., rudder rate, lateral stability, rate of turn, etc.

TASK CODE: TOW-I.D.12									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
1	15	1	5	1	80	1	1	1	1

TASK CODE: TOW-I.D.12	GOAL: Berth/unberth towboat-barge array expeditiously without damaging wharf/pier, own towboat-barge array, or other nearby vessels.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maneuvering into/away from wharf/pier when some emergency arises.

TASK: Sounds towboat's whistle and displays other required identification in accordance with Rules of the Road, in order to approach/leave berth safely and according to proper procedure.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Correctly operates whistle and displays appropriate signals. • Operation of whistle and displaying of signals is timely to arrival/departure. Numerical: • In 100% of the cases, all appropriate whistle signals are sounded. • In 100% of the cases, all other appropriate day signals are displayed.	Functional: • How to operate towboat's whistle. • How to identify and use other signals. • Knowledge of Rules of the Road pertaining to whistle and other signals. Specific: • Knowledge of location of whistle controls (automatic and manual) and other day signals on particular towboat.

Goal TOW-II: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously

Objective TOW-II.A: Maintain designated track and speed within restricted waterway, modifying as required by conditions in order to avoid rammings and groundings

TASK CODE:	TOW-II.A.1

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	75	1A	5	1A	20	3	3	3	3

TASK CODE: TOW-II.A.1	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Maintain designated track and speed within restricted waterway, modifying as required by conditions in order to avoid rammings and groundings.

TASK: Ascertains intended track, refering to navigational charts/publications as appropriate, in order to acquiant self with local conditions of waterway limitations including revetment characteristics (if any), prevailing environmental situation, aids to navigation, and potential navigational hazards.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Charts and publications are adequately studied. • Is thoroughly familiar with intended track, prevailing environmental situation, local aids to navigation, potential navigational hazards, and local navigation rules and practices. Numerical: • In 100% of the cases, all relevant data are ascertained as dictated by the particular situation.	Functional: • How to read and interpret navigational charts and publications including Notices to Mariners. • How to relate charts to actual physical environment. Specific: • Knowledge of particular waterway revetment characteristics (if any), its aids to navigation and potential navigational hazards, local navigation rules and practices, and prevailing environmental conditions for that particular locale.

TASK CODE: TOW-II.A.2

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	70	1A	5	1C	25	3	3	1	1

TASK CODE: TOW-II.A.2 **GOAL:** Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Maintain designated track and speed within restricted waterway, modifying as required by conditions in order to avoid rammings and groundings.

TASK: Visually scans the waters surrounding the intended track (course) utilizing the naked eye, binoculars, and searchlights (for night operations) in order to detect and identify navigational hazards and aids to navigation.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Thoroughly scans the surrounding waters. • Accurately and promptly identifies various aids to navigation and navigational hazards. Numerical: • In 100% of the cases, all necessary navigational aids and all navigational hazards are detected and identified.	Functional: • How to energize and control searchlights. • How to use binoculars. • How to visually recognize hazards such as floating debris, shallow water, etc. • How to visually recognize various aids to navigation such as fixed and floating channel markers, ranges, etc. Specific: • Knowledge of navigational aids along the track and their particular characteristics. • Knowledge of special hazards to navigation known in particular locale.

TASK CODE: TOW-II.A.3									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	75	1A	5	3A	20	3	3	3	1

TASK CODE: TOW-II.A.3	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.
OBJECTIVE: Maintain designated track and speed within restricted waterway, modifying as required by conditions in order to avoid rammings and groundings.	
TASK: Operates the radar and fathometer in order to detect and identify shallow water, navigational hazards, and aids to navigation.	

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Selects the optimum combination of range scales, sector search, intensity, etc., for the most accurate and prompt detection of navigational hazards and aids to navigation. • Accurately detects various aids to navigation and navigational hazards on radar. • Accurately detects any navigational hazards (i.e., proximity of bottom) on fathometer. Numerical: • In 100% of the cases, all necessary navigational aids and all navigational hazards are detected.	Functional: • How to manipulate radar unit, i.e., vary range scales, sector search selector, intensity, range and bearing circles and lines, true or relative motion mode, etc. • How to manipulate fathometer unit, i.e., vary depth scale, intensity, etc. • How to detect navigational hazards and aids to navigation on radar and fathometer. • How to identify navigational hazards and aids to navigation on radar. Specific: • Knowledge of navigational aids along track or man-made and geophysical characteristics which present good radar targets. • Knowledge of individual towboat's particular radar unit. • Knowledge of individual towboat's particular fathometer unit.

TASK CODE: TOW-II.A.4									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3A	80	1A	5	2A	15	3	3	4	2

TASK CODE: TOW-II.A.4	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Maintain designated track and speed within restricted waterway, modifying as required by conditions in order to avoid rammings and groundings.

TASK: Visually determines ranges to and bearings of fixed aids to navigation (reference points) in order to establish towboat-barge array's navigational position.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Accurately determines the position of the towboat-barge array. Numerical: • In 100% of the cases, navigational position is determined within acceptable limits commensurate with towboat-barge array speed, channel configuration and limitations, and prevailing environmental situation at particular locale.	Functional: • How to select reference points for ranges and bearings. • How to determine the position of the towboat-barge array from selected aids to navigation. Specific: • Knowledge of local fixed aids to navigation. • Knowledge of limits by which the towboat-barge array may vary about the intended track.

TASK CODE: TOW-II.A.5									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	50	1A	5	3A	45	3	3	3	2

TASK CODE: TOW-II.A.5	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Maintain designated track and speed within restricted waterway, modifying as required by conditions in order to avoid rammings and groundings.

TASK: Operates and takes readings from the radar unit, compass (if available) and fathometer in order to determine navigational position.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Accurately and promptly acquires navigational position and water depth. Numerical: • In 100% of the cases, navigational position and water depth are determined and within acceptable limits commensurate with towboat-barge array speed, channel configuration and limitations, and prevailing environmental situation at particular locale.	Functional: • How to operate (i.e., take ranges and bearings) on radar unit. • How to operate (i.e., measure water depth) fathometer. • How to operate a gyro compass. Specific: • Knowledge of local fixed aids to navigation or man-made and geophysical characteristics along track which present good radar targets. • Knowledge of the radar, compass, and fathometer units provided aboard particular towboat.

TASK CODE: TOW-II.A.6

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	80	1A	5	1A	15	2	2	3	3

TASK CODE: TOW-II.A.6	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Maintain designated track and speed within restricted waterway, modifying as required by conditions in order to avoid rammings and groundings.

TASK: Estimates wind direction and speed, current velocity, and water depth, using towboat's communications equipment and/or environmental indicators (if available) in order to obtain environmental information.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Routinely ascertains current and water depth data. Numerical: • In 100% of the cases, readings and observations are within acceptable limits in accordance with particular situation.	Functional: • How to determine wind speed and direction. • How to obtain current information • How to obtain water depths. • How to operate various communications circuits such as radiotelephone. Specific: • Knowledge of prevailing environmental conditions and seasonal variations throughout the range of expected values. • Knowledge of particular area's meteorological data. • Knowledge of particular towboat's communications equipment.

TASK CODE: TOW-II.A.7									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
1	85	1A	5	1A	10	2	1	2	2

TASK CODE: TOW-II.A.7	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Maintain designated track and speed within restricted waterway, modifying as required by conditions in order to avoid rammings and groundings.

TASK: Reads dials of instruments such as compass (if available), rudder angle indicator, throttle position indicator, speed indicator, and RPM indicator; visually scans steering and propulsion system status indicators; looks and listens for steering machinery and propulsion system audio and visual failure alarms, in order to ascertain heading, speed, rudder angle, and wheel speed, and to monitor operating conditions of steering and propulsion systems.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Correctly reads and surveys all instrumentation. Numerical: • In 100% of the cases, readings and observations are within acceptable limits in accordance with particular situation.	Functional: • How to read compass, rudder angle indicator, throttle position indicator, speed indicator, and RPM indicator. • How to monitor steering and propulsion system status indicators. • How to recognize audio and visual failure alarms for steering and propulsion system. Specific: • Knowledge of location, arrangement, and characteristics of particular indicators, displays, and alarms on specific towboat.

TASK CODE: TOW-II.A.8									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	85	1A	5	2B	10	3	2	2	2

TASK CODE: TOW-II.A.8	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Maintain designated track and speed within restricted waterway, modifying as required by conditions in order to avoid rammings and groundings.

TASK: Monitors voice radio (bridge-to-bridge, ship-to-shore, and vessel traffic traffic system (VTS) network, as applicable) and internal communication systems in order to maintain radio watch. (This task includes external radio communications with bridgekeepers and lock masters.)

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Is attentive to all voice radio traffic. • Efficiently monitors all communications applicable to own towboat-barge array and situation. Numerical: • In 100% of the cases, all pertinent communications are detected, understood, and acknowledged.	Functional: • How to operate various radio frequency (rf) equipment. • Knowledge of voice radio communication procedures. Specific: • Knowledge of availability of various rf networks in particular locale. • Knowledge of specific rf equipment provided on particular towboat.

TASK CODE: TOW-II.A.9									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	55	1A	5	2B	40	3	3	2	2

TASK CODE: TOW-II.A.9	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Maintain designated track and speed within restricted waterway, modifying as required by conditions in order to avoid rammings and groundings.

TASK: Surveys (visually, electronically on radar, and from charts and publications) bridges, in order to determine the location of and available navigation distance between bridge supports/wooden piers, and to relate that distance to his towboat-barge array length and breadth.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Promptly and accurately estimates/establishes location of and available distance between bridge supports/wooden piers. • Correctly relates that available distance to towboat-barge array length and breadth. Numerical: • In 100% of the cases, bridge spans are detected and available distances are ascertained to within acceptable limits commensurate with prevailing environmental situation, configuration of particular towboat-barge array, and any local navigation rules or practices.	Functional: • How to visually detect and estimate distance between bridge supports/wooden piers. • How to read various charts and publications and ascertain distances between bridge supports/wooden piers. • How to operate radar, detect bridge supports/piers, and determine distances. Specific: • Knowledge of radar unit on particular towboat. • Knowledge of local charts and publications. • Knowledge of particular bridges along waterway and their radar image characteristics.

TASK CODE: TOW-II.A.10									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	55	1A	5	2B	40	3	3	2	2

TASK CODE: TOW-II.A.10	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Maintain designated track and speed within restricted waterway, modifying as required by conditions in order to avoid rammings and groundings.

TASK: Surveys (visually, electronically on radar, and from charts and publications) canal locks in order to determine the location of locks and their width and length, and to relate those dimensions to own towboat-barge array breadth and length, respectively.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Promptly and accurately estimates/establishes location of and dimensions of canal locks. • Correctly relates those dimensions to towboat-barge array length and breadth. Numerical: • In 100% of the cases, locks are detected and dimensions are ascertained to within acceptable limits commensurate with environmental situation, configuration of particular towboat-barge array, and any local navigation rules or practices.	Functional: • How to visually detect locks and estimate their widths. • How to read various charts and publications and ascertain lock widths and lengths. • How to operate radar, detect locks, and determine dimensions. Specific: • Knowledge of radar unit on particular towboat. • Knowledge of local charts and publications. • Knowledge of particular locks along waterway and their radar image characteristics.

TASK CODE:	TOW-II.A.11

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
5B	90	1A	5	1A	5	5	6	4	3

TASK CODE: TOW-II.A.11	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Maintain designated track and speed within restricted waterway, modifying as required by conditions in order to avoid rammings and groundings.

TASK: Examines and evaluates total data input concerning environmental situation, own towboat-barge array characteristics, status of both onboard and external ancilliary equipment, and own towboat's mission (purpose and goals), in order to determine course of action to maintain desired track or position within the prescribed limits of the waterway.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Anticipates any and all possibilities which may arise. • Continually maintains mental alertness, i.e., is vigilant. • Maintains sense of proportion among input data and various action options as situation changes or progresses. • Makes decision in timely manner commensurate with situation. Numerical: • In 100% of the cases, all pertinent data are examined and evaluated in accordance with the particular situation before decision is reached.	Functional: • Understands interrelationships which exist among towboat, barges, ancilliary equipment (both onboard and external to the towboat-barge array), and environmental factors as they relate to the controllability of the towboat-barge array. Specific: • Knowledge of specific towboat's hydrodynamic characteristics as they may be affected by particular barge array and prevailing environmental conditions at particular locale (including bank suction within locks and eddy currents around bridges), and the seasonal variations of those environmental conditions through the range of expected values. • Knowledge of particular towboat's ancilliary equipment and shoreside ancilliary equipment provided in particular locale as they affect towboat-barge array hydrodynamics and as they may be affected by varying local environmental conditions.

TASK CODE: TOW-II.A.12									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	45	1A	5	1B	50	1	1	1	1

TASK CODE: TOW-II.A.12	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Maintain designated track and speed within restricted waterway, modifying as required by conditions in order to avoid rammings and groundings.

TASK: Adjusts RPM or pitch (if controllable) of towboat's wheel(s) utilizing bridge throttles or internal communications circuits in order to change towboat-barge array's speed.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Expeditiously and accurately manipulates equipment to effect speed change. Numerical: • In 100% of the cases, all adjustments are made exactly as desired.	Functional: • How to operate bridge throttles and communications circuits. Specific: • Special characteristics and location of own towboat's equipment.

TASK CODE: TOW-II.A.13									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	45	1A	20	1C	50	2	1	1	2

TASK CODE: TOW-II.A.13	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely.

OBJECTIVE: Maintain designated track and speed within restricted waterway, modifying as required by conditions in order to avoid rammings and groundings.

TASK: Turns towboat's helm, operates flanking rudders, and reads compass and rate of turn indicators (if provided) in order to change or maintain course.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Routinely and accurately manipulates helm and flanking rudders to change or maintain course. • Continuously monitors compass, rudder angle, and rate of turn indicator. Numerical: • In 100% of the cases, all readings of instrumentation are within acceptable limits in accordance with particular situation. • In 100% of the cases, all helm adjustments are made exactly as desired.	Functional: • How to operate a helm and flanking rudders. • How to read a compass. • How to read a rudder angle indicator and a rate of turn indicator. • How to detect drift off course. Specific: • Knowledge of specific towboat-barge array's handling characteristics, i.e., rudder rate, lateral stability, rate of turn, etc.

TASK CODE: TOW-II.A.14									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	45	1A	5	2C	50	4	4	1	1

TASK CODE: TOW-II.A.14	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Maintain designated track and speed within restricted waterway, modifying as required by conditions in order to avoid rammings and groundings.

TASK: Controls towboat-barge array (varies course and/or speed), utilizing helm, flanking rudders, and speed control system, in order to intentionally run aground for the purpose of holding the entire towboat-barge array or barges only in a stationary position.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Safely brings towboat-barge array to stop upon intentionally grounding. • Towboat-barge array is effectively held stationary. Numerical: • In 100% of the cases, the towboat-barge array is intentionally grounded without any significant damage being incurred on either the towboat or the barges.	Functional: • How to determine quality of bottom characteristics and current in general vicinity of point upon which towboat-barge array is to be grounded. • Understands interrelationships which exist among towboat, barges, onboard ancilliary control equipment, and environmental factors as they relate to the controllability of the towboat-barge array in running itself aground. Specific: • Knowledge of particular towboat-barge array's deceleration and stopping characteristics as they may be affected by bottom contours and characteristics and prevailing environmental conditions at particular locale, and the seasonal variations of those environmental conditions through the range of expected values. • Knowledge of particular towboat's ancilliary control equipment as they affect towboat-barge array's deceleration and stopping characteristics.

TASK CODE: TOW-II.A.15									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	45	1A	5	2C	50	4	4	1	1

TASK CODE: TOW-II.A.15	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Maintain designated track and speed within restricted waterway, modifying as required by conditions in order to avoid rammings and groundings.

TASK: Controls towboat-barge array (varies speed and/or course) utilizing speed control system, helm, or flanking rudders in order to extricate the towboat-barge array from the grounded position.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Towboat-barge array is promptly and safely extricated from grounded position. Numerical: • In 100% of the cases, the towboat-barge array is extricated from the grounded position without any significant damage being incurred on either the towboat or barges.	Functional: • Understands interrelationships which exist among towboat, barges, onboard ancilliary control equipment, and environmental factors as they relate to the controllability of the towboat-barge array in extricating itself from the grounded position. Specific: • Knowledge of particular towboat-barge array's starting and acceleration characteristics as they may be affected by bottom contours and characteristics and prevailing environmental conditions at particular locale, and the seasonal variations of those environmental conditions through the range of expected values. • Knowledge of particular towboat's ancilliary control equipment as they affect towboat-barge array's starting and acceleration characteristics.

TASK CODE:	TOW-II.A.16

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
1	15	1	5	1	80	1	1	1	1

TASK CODE: TOW-II.A.16	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Maintain designated track and speed within restricted waterway, modifying as required by conditions in order to avoid rammings and groundings.

TASK: Sounds towboat's whistle and displays other required identification in accordance with Rules of the Road, in order to maneuver in restricted waters safely and according to proper procedure.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Correctly operates whistle and displays appropriate signals. • Operation of whistle and displaying of signals is timely to changing course or ordering engines astern. Numerical: • In 100% of the cases, all appropriate whistle signals are sounded. • In 100% of the cases, all other appropriate day signals are displayed.	Functional: • How to operate towboat's whistle. • How to identify and use other signals. • Knowledge of Rules of the Road pertaining to whistle and other signals. Specific: • Knowledge of location of whistle controls (automatic and manual) and other day signals on particular towboat.

Objective TOW-II.B: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway

TASK CODE:	TOW-II.B.1								
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	75	1A	5	1A	20	3	3	3	3

TASK CODE: TOW-II.B.1	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Ascertains intended track, refering to navigational charts/publications as appropriate, in order to acquiant self with local conditions of waterway limitations including revetment characteristics (if any), prevailing environmental situation, aids to navigation, and potential navigational hazards.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Charts and publications are adequately studied. • Is thoroughly familiar with intended track, prevailing environmental situation, local aids to navigation, potential navigational hazards, and local navigation rules and practices. Numerical: • In 100% of the cases, all relevant data are ascertained as dictated by the particular situation.	Functional: • How to read and interpret navigational charts and publications including Notices to Mariners. • How to relate charts to actual physical environment. Specific: • Knowledge of particular waterway revetment characteristics (if any), its aids to navigation and potential navigational hazards, local navigation rules and practices, and prevailing environmental conditions for that particular locale.

TASK CODE: TOW-II.B.2									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	70	1A	5	1C	25	3	3	1	1

TASK CODE: TOW-II.B.2	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Visually scans the waters surrounding the intended track (course) utilizing the naked eye, binoculars, and searchlights (for night operations) in order to detect and identify navigational hazards and aids to navigation.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Thoroughly scans the surrounding waters. • Accurately and promptly identifies various aids to navigation and navigational hazards. Numerical: • In 100% of the cases, all necessary navigational aids and all navigational hazards are detected and identified.	Functional: • How to energize and control searchlights. • How to use binoculars. • How to visually recognize hazards such as floating debris, shallow water, etc. • How to visually recognize various aids to navigation such as fixed and floating channel markers, ranges, etc. Specific: • Knowledge of navigational aids along the track and their particular characteristics. • Knowledge of special hazards to navigation known in particular locale.

TASK CODE: TOW-II.B.3									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	75	1A	5	3A	20	3	3	3	1

TASK CODE: TOW-II.B.3	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Operates the radar and fathometer in order to detect and identify shallow water, navigational hazards, and aids to navigation.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Selects the optimum combination of range scales, sector search, intensity, etc., for the most accurate and prompt detection of navigational hazards and aids to navigation. • Accurately detects various aids to navigation and navigational hazards on radar. • Accurately detects any navigational hazards (i.e., proximity of bottom) on fathometer. Numerical: • In 100% of the cases, all necessary navigational aids and all navigational hazards are detected.	Functional: • How to manipulate radar unit, i.e., vary range scales, sector search selector, intensity, range and bearing circles and lines, true or relative motion mode, etc. • How to manipulate fathometer unit, i.e., vary depth scale, intensity, etc. • How to detect navigational hazards and aids to navigation on radar and fathometer. • How to identify navigational hazards and aids to navigation on radar. Specific: • Knowledge of navigational aids along track or man-made and geophysical characteristics which present good radar targets. • Knowledge of individual towboat's particular radar unit. • Knowledge of individual towboat's particular fathometer unit.

TASK CODE: TOW-II.B.4

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3A	80	1A	5	2A	15	3	3	4	2

TASK CODE: TOW-II.B.4

GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Visually determines ranges to and bearings of fixed aids to navigation (reference points) in order to establish towboat-barge array's navigational position.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Accurately determines the position of the towboat-barge array. Numerical: • In 100% of the cases, navigational position is determined within acceptable limits commensurate with towboat-barge array speed, channel configuration and limitations, and prevailing environmental situation at particular locale.	Functional: • How to select reference points for ranges and bearings. • How to determine the position of the towboat-barge array from selected aids to navigation. Specific: • Knowledge of local fixed aids to navigation. • Knowledge of limits by which the towboat-barge array may vary about the intended track.

TASK CODE: TOW-II.B.5									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	50	1A	5	3A	45	3	3	3	2

TASK CODE: TOW-II.B.5	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Operates and takes readings from the radar unit, compass (if available) and fathometer in order to determine navigational position.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Accurately and promptly acquires navigational position and water depth. Numerical: • In 100% of the cases, navigational position and water depth are determined and within acceptable limits commensurate with towboat-barge array speed, channel configuration and limitations, and prevailing environmental situation at particular locale.	Functional: • How to operate (i.e., take ranges and bearings) on radar unit. • How to operate (i.e., measure water depth) fathometer. • How to operate a gyro compass. Specific: • Knowledge of local fixed aids to navigation or man-made and geophysical characteristics along track which present good radar targets. • Knowledge of the radar, compass, and fathometer units provided aboard particular towboat.

TASK CODE: TOW-II.B.6									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	80	1A	5	1A	15	2	2	3	3

TASK CODE: TOW-II.B.6	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Estimates wind direction and speed, current velocity, and water depth, using towboat's communications equipment and/or environmental indicators (if available) in order to obtain environmental information.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Routinely ascertains current and water depth data. Numerical: • In 100% of the cases, readings and observations are within acceptable limits in accordance with particular situation.	Functional: • How to determine wind speed and direction. • How to obtain current information • How to obtain water depths. • How to operate various communications circuits such as radiotelephone. Specific: • Knowledge of prevailing environmental conditions and seasonal variations throughout the range of expected values. • Knowledge of particular area's meteorological data. • Knowledge of particular towboat's communications equipment.

TASK CODE: TOW-II.B.7

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
1	85	1A	5	1A	10	2	1	2	2

TASK CODE: TOW-II.B.7 **GOAL:** Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Reads dials of instruments such as compass (if available), rudder angle indicator, throttle position indicator, speed indicator, and RPM indicator; visually scans steering and propulsion system status indicators; looks and listens for steering machinery and propulsion system audio and visual failure alarms, in order to ascertain heading, speed, rudder angle, and wheel speed, and to monitor operating conditions of steering and propulsion systems.

PERFORMANCE STANDARDS

Descriptive:

- Correctly reads and surveys all instrumentation.

Numerical:

- In 100% of the cases, readings and observations are within acceptable limits in accordance with particular situation.

TRAINING CONTENT

Functional:

- How to read compass, rudder angle indicator, throttle position indicator, speed indicator, and RPM indicator.
- How to monitor steering and propulsion system status indicators.
- How to recognize audio and visual failure alarms for steering and propulsion system.

Specific:

- Knowledge of location, arrangement, and characteristics of particular indicators, displays, and alarms on specific towboat.

TASK CODE: TOW-II.B.8									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	85	1A	5	2B	10	3	2	2	2

TASK CODE: TOW-II.B.8	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Monitors voice radio (bridge-to-bridge, ship-to-shore, and vessel traffic traffic system (VTS) network, as applicable) and internal communication systems in order to maintain radio watch. (This task includes external radio communications with bridgekeepers and lock masters.)

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Is attentive to all voice radio traffic. • Efficiently monitors all communications applicable to own towboat-barge array and situation. Numerical: • In 100% of the cases, all pertinent communications are detected, understood, and acknowledged.	Functional: • How to operate various radio frequency (rf) equipment. • Knowledge of voice radio communication procedures. Specific: • Knowledge of availability of various rf networks in particular locale. • Knowledge of specific rf equipment provided on particular towboat.

TASK CODE: TOW-II.B.9									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	55	1A	5	2B	40	3	3	2	2

TASK CODE: TOW-II.B.9	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Surveys (visually, electronically on radar, and from charts and publications) bridges, in order to determine the location of and available navigation distance between bridge supports/wooden piers, and to relate that distance to his towboat-barge array length and breadth.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Promptly and accurately estimates/establishes location of and available distance between bridge supports/wooden piers. • Correctly relates that available distance to towboat-barge array length and breadth. Numerical: • In 100% of the cases, bridge spans are detected and available distances are ascertained to within acceptable limits commensurate with prevailing environmental situation, configuration of particular towboat-barge array, and any local navigation rules or practices.	Functional: • How to visually detect and estimate distance between bridge supports/wooden piers. • How to read various charts and publications and ascertain distances between bridge supports/wooden piers. • How to operate radar, detect bridge supports/piers, and determine distances. Specific: • Knowledge of radar unit on particular towboat. • Knowledge of local charts and publications. • Knowledge of particular bridges along waterway and their radar image characteristics.

TASK CODE: TOW-II.B.10									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	55	1A	5	2B	40	3	3	2	2

TASK CODE: TOW-II.B.10	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings, while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Surveys (visually, electronically on radar, and from charts and publications) canal locks in order to determine the location of locks and their width and length, and to relate those dimensions to own towboat-barge array breadth and length, respectively.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Promptly and accurately estimates/establishes location of and dimensions of canal locks. • Correctly relates those dimensions to towboat-barge array length and breadth. Numerical: • In 100% of the cases, locks are detected and dimensions are ascertained to within acceptable limits commensurate with environmental situation, configuration of particular towboat-barge array, and any local navigation rules or practices.	Functional: • How to visually detect locks and estimate their widths. • How to read various charts and publications and ascertain lock widths and lengths. • How to operate radar, detect locks, and determine dimensions. Specific: • Knowledge of radar unit on particular towboat. • Knowledge of local charts and publications. • Knowledge of particular locks along waterway and their radar image characteristics.

TASK CODE: TOW-II.B.11

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
1	50	1A	5	2B	45	2	2	2	2

TASK CODE: TOW-II.B.11

GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Monitors collision avoidance system (visual and electronic) in order to detect other vessel traffic in vicinity.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Thoroughly scans the surrounding waters both visually and electronically. • Promptly and accurately detects other vessel traffic in vicinity. Numerical: • In 100% of the cases, all other vessel traffic in vicinity is detected.	Functional: • How to visually recognize other vessel traffic. • How to operate electronic collision avoidance systems (including bridge-to-bridge communication system). Specific: • Knowledge of prevailing traffic patterns along track, including seasonal variations. • Knowledge of individual towboat's specific electronic collision avoidance system.

TASK CODE: TOW-II.B.12									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
4	85	1A	5	1A	10	4	5	4	2

TASK CODE: TOW-II.B.12	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Assesses all other vessel traffic in vicinity and navigational situation in order to determine the existence of any real or potential collision hazard.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Accurately determines the intentions of all threatening traffic in vicinity. • Properly ascertains the governing rules of the road imposed upon own towboat-barge array or other traffic by local navigation rules, practices and VTS, if applicable. • Anticipates possible actions by threatening traffic which may dictate reassessment of situation. • Makes assessment in timely manner commensurate with situation. Numerical: • In 100% of the cases, all pertinent traffic data are assessed for potential collision hazard.	Functional: • Understands principles of relative motion. • How to determine course and speed (i.e., intentions) of all other vessels. • Understands applicable rules of the road and the limitations they impose upon own towboat-barge array in determining potential collision hazard and possible counter action. Specific: • Knowledge of prevailing traffic patterns along track including seasonal variations. • Knowledge of local navigation rules, practices and VTS, if applicable.

TASK CODE: TOW-II.B.13									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
5B	90	1A	5	1A	5	5	6	4	3

TASK CODE: TOW-II.B.13 **GOAL:** Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Examines and evaluates total data input concerning environmental situation, own towboat-barge array's characteristics, status of both onboard and external ancilliary equipment, collision hazards, and own towboat's mission (purpose and goals), in order to determine course of action to maintain desired track or position within prescribed limits of waterway, while simultaneously avoiding collisions, rammings, or groundings.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Anticipates any and all possibilities which may arise, especially other vessels' intentions and actions. • Continually maintains mental alertness, i.e., is vigilant. • Maintains sense of proportion among input data and various action options as situation changes or progresses. • Makes decision in timely manner commensurate with situation. Numerical: • In 100% of the cases, all pertinent data are examined and evaluated in accordance with the particular situation before decision is reached.	Functional: • Understands interrelationships which exist among towboats, barges, ancilliary equipment (both onboard and external to the towboat-barge array), and environmental factors as they relate to the controllability of the towboat-barge array. • How to use regulations, conventions, principles, Rules of the Nautical Road for navigating towboat in restricted waters. Specific: • Knowledge of own and other vessels' hydrodynamic characteristics as they may be affected by particular barge array and prevailing environmental conditions at the particular locale and the seasonal variations of those environmental conditions through the range of expected values. • Knowledge of own towboat's ancilliary equipment and shoreside ancilliary equipment provided in particular locale as they affect towboat-barge array hydrodynamics and as they may be affected by varying environmental conditions and other vessel traffic.

TASK CODE: TOW-II.B.14

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	45	1A	5	1B	50	1	1	1	1

TASK CODE: TOW-II.B.14

GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Adjusts RPM or pitch (if controllable) of towboat's wheel(s) utilizing bridge throttles or internal communications circuits in order to change towboat-barge array's speed.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Expeditiously and accurately manipulates equipment to effect speed change. Numerical: • In 100% of the cases, all adjustments are made exactly as desired.	Functional: • How to operate bridge throttles and communications circuits. Specific: • Special characteristics and location of own towboat's equipment.

TASK CODE: TOW-II.B.15									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	45	1A	20	1C	50	2	1	1	2

TASK CODE: TOW-II.B.15	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Turns towboat's helm, operates flanking rudders, and reads compass and rate of turn indicators (if provided) in order to change or maintain course.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Routinely and accurately manipulates helm and flanking rudders to change or maintain course. • Continuously monitors compass, rudder angle, and rate of turn indicator. Numerical: • In 100% of the cases, all readings of instrumentation are within acceptable limits in accordance with particular situation. • In 100% of the cases, all helm adjustments are made exactly as desired.	Functional: • How to operate a helm and flanking rudders. • How to read a compass. • How to read a rudder angle indicator and a rate of turn indicator. • How to detect drift off course. Specific: • Knowledge of specific towboat-barge array's handling characteristics, i.e., rudder rate, lateral stability, rate of turn, etc.

TASK CODE:	TOW-II.B.16

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	45	1A	5	2C	50	4	4	1	1

TASK CODE: TOW-II.B.16	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Controls towboat-barge array (varies course and/or speed), utilizing helm, flanking rudders, and speed control system, in order to intentionally run aground for the purpose of holding the entire towboat-barge array or barges only in a stationary position.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Safely brings towboat-barge array to stop upon intentionally grounding. • Towboat-barge array is effectively held stationary. Numerical: • In 100% of the cases, the towboat-barge array is intentionally grounded without any significant damage being incurred on either the towboat or the barges.	Functional: • How to determine quality of bottom characteristics and current in general vicinity of point upon which towboat-barge array is to be grounded. • Understands interrelationships which exist among towboat, barges, onboard ancilliary control equipment, and environmental factors as they relate to the controllability of the towboat-barge array in running itself aground. Specific: • Knowledge of particular towboat-barge array's deceleration and stopping characteristics as they may be affected by bottom contours and characteristics and prevailing environmental conditions at particular locale, and the seasonal variations of those environmental conditions through the range of expected values. • Knowledge of particular towboat's ancilliary control equipment as they affect towboat-barge array's deceleration and stopping characteristics.

TASK CODE: TOW-II.B.17									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	45	1A	5	2C	50	4	4	1	1

TASK CODE: TOW-II.B.17	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Controls towboat-barge array (varies speed and/or course) utilizing speed control system, helm, or flanking rudders in order to extricate the towboat-barge array from the grounded position.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Towboat-barge array is promptly and safely extricated from grounded position. Numerical: • In 100% of the cases, the towboat-barge array is extricated from the grounded position without any significant damage being incurred on either the towboat or barges.	Functional: • Understands interrelationships which exist among towboat, barges, onboard ancilliary control equipment, and environmental factors as they relate to the controllability of the towboat-barge array in extricating itself from the grounded position. Specific: • Knowledge of particular towboat-barge array's starting and acceleration characteristics as they may be affected by bottom contours and characteristics and prevailing environmental conditions at particular locale, and the seasonal variations of those environmental conditions through the range of expected values. • Knowledge of particular towboat's ancilliary control equipment as they affect towboat-barge array's starting and acceleration characteristics.

TASK CODE:	TOW-II.B.18

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
1	15	1	5	1	80	1	1	1	1

TASK CODE:	TOW-II.B.18	GOAL:	Navigate through (maneuver in) restricted waters are required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway.

TASK: Sounds towboat's whistle and displays other required identification in accordance with Rules of the Road, in order to maneuver in restricted waters safely and according to proper procedure.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Correctly operates whistle and displays appropriate signals. • Operation of whistle and displaying of signals is timely to changing course or ordering engines astern. Numerical: • In 100% of the cases, all appropriate whistle signals are sounded. • In 100% of the cases, all other appropriate day signals are displayed.	Functional: • How to operate towboat's whistle. • How to identify and use other signals. • Knowledge of Rules of the Road pertaining to whistle and other signals. Specific: • Knowledge of location of whistle controls (automatic and manual) and other day signals on particular towboat.

Objective TOW-II.C: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises

TASK CODE: TOW-II.C.1									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	75	1A	5	1A	20	3	3	3	3

TASK CODE: TOW-II.C.1	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Ascertains intended track, refering to navigational charts/publications as appropriate, in order to acquiant self with local conditions of waterway limitations including revetment characteristics (if any), prevailing environmental situation, aids to navigation, and potential navigational hazards.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Charts and publications are adequately studied. • Is thoroughly familiar with intended track, prevailing environmental situation, local aids to navigation, potential navigational hazards, and local navigation rules and practices. Numerical: • In 100% of the cases, all relevant data are ascertained as dictated by the particular situation.	Functional: • How to read and interpret navigational charts and publications including Notices to Mariners. • How to relate charts to actual physical environment. Specific: • Knowledge of particular waterway revetment characteristics (if any), its aids to navigation and potential navigational hazards, local navigation rules and practices, and prevailing environmental conditions for that particular locale.

TASK CODE: TOW-II.C.2

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	70	1A	5	1C	25	3	3	1	1

TASK CODE: TOW-II.C.2

GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Visually scans the waters surrounding the intended track (course) utilizing the naked eye, binoculars, and searchlights (for night operations) in order to detect and identify navigational hazards and aids to navigation.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Thoroughly scans the surrounding waters. • Accurately and promptly identifies various aids to navigation and navigational hazards. Numerical: • In 100% of the cases, all necessary navigational aids and all navigational hazards are detected and identified.	Functional: • How to energize and control searchlights. • How to use binoculars. • How to visually recognize hazards such as floating debris, shallow water, etc. • How to visually recognize various aids to navigation such as fixed and floating channel markers, ranges, etc. Specific: • Knowledge of navigational aids along the track and their particular characteristics. • Knowledge of special hazards to navigation known in particular locale.

TASK CODE: TOW-II.C.3									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	75	1A	5	3A	20	3	3	3	1

TASK CODE: TOW-II.C.3	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Operates the radar and fathometer in order to detect and identify shallow water, navigational hazards, and aids to navigation.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Selects the optimum combination of range scales, sector search, intensity, etc., for the most accurate and prompt detection of navigational hazards and aids to navigation. • Accurately detects various aids to navigation and navigational hazards on radar. • Accurately detects any navigational hazards (i.e., proximity of bottom) on fathometer. Numerical: • In 100% of the cases, all necessary navigational aids and all navigational hazards are detected.	Functional: • How to manipulate radar unit, i.e., vary range scales, sector search selector, intensity, range and bearing circles and lines, true or relative motion mode, etc. • How to manipulate fathometer unit, i.e., vary depth scale, intensity, etc. • How to detect navigational hazards and aids to navigation on radar and fathometer. • How to identify navigational hazards and aids to navigation on radar. Specific: • Knowledge of navigational aids along track or man-made and geophysical characteristics which present good radar targets. • Knowledge of individual towboat's particular radar unit. • Knowledge of individual towboat's particular fathometer unit.

TASK CODE: TOW-II.C.4									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3A	80	1A	5	2A	15	3	3	4	2

TASK CODE: TOW-II.C.4	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Visually determines ranges to and bearings of fixed aids to navigation (reference points) in order to establish towboat-barge array's navigational position.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Accurately determines the position of the towboat-barge array. Numerical: • In 100% of the cases, navigational position is determined within acceptable limits commensurate with towboat-barge array speed, channel configuration and limitations, and prevailing environmental situation at particular locale.	Functional: • How to select reference points for ranges and bearings. • How to determine the position of the towboat-barge array from selected aids to navigation. Specific: • Knowledge of local fixed aids to navigation. • Knowledge of limits by which the towboat-barge array may vary about the intended track.

TASK CODE: TOW-II.C.5									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	50	1A	5	3A	45	3	3	3	2

TASK CODE: TOW-II.C.5	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Operates and takes readings from the radar unit, compass (if available) and fathometer in order to determine navigational position.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Accurately and promptly acquires navigational position and water depth. Numerical: • In 100% of the cases, navigational position and water depth are determined and within acceptable limits commensurate with towboat-barge array speed, channel configuration and limitations, and prevailing environmental situation at particular locale.	Functional: • *How to* operate (i.e., take ranges and bearings) on radar unit. • How to operate (i.e., measure water depth) fathometer. • How to operate a gyro compass. Specific: • Knowledge of local fixed aids to navigation or man-made and geophysical characteristics along track which present good radar targets. • Knowledge of the radar, compass, and fathometer units provided aboard particular towboat.

TASK CODE: TOW-II.C.6									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	80	1A	5	1A	15	2	2	3	3

TASK CODE: TOW-II.C.6	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Estimates wind direction and speed, current velocity, and water depth, using towboat's communications equipment and/or environmental indicators (if available) in order to obtain environmental information.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Routinely ascertains current and water depth data. Numerical: • In 100% of the cases, readings and observations are within acceptable limits in accordance with particular situation.	Functional: • How to determine wind speed and direction. • How to obtain current information • How to obtain water depths. • How to operate various communications circuits such as radiotelephone. Specific: • Knowledge of prevailing environmental conditions and seasonal variations throughout the range of expected values. • Knowledge of particular area's meteorological data. • Knowledge of particular towboat's communications equipment.

TASK CODE: TOW-II.C.7									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
1	85	1A	5	1A	10	2	1	2	2

TASK CODE: TOW-II.C.7	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Reads dials of instruments such as compass (if available), rudder angle indicator, throttle position indicator, speed indicator, and RPM indicator; visually scans steering and propulsion system status indicators; looks and listens for steering machinery and propulsion system audio and visual failure alarms, in order to ascertain heading, speed, rudder angle, and wheel speed, and to monitor operating conditions of steering and propulsion systems.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Correctly reads and surveys all instrumentation. Numerical: • In 100% of the cases, readings and observations are within acceptable limits in accordance with particular situation.	Functional: • How to read compass, rudder angle indicator, throttle position indicator, speed indicator, and RPM indicator. • How to monitor steering and propulsion system status indicators. • How to recognize audio and visual failure alarms for steering and propulsion system. Specific: • Knowledge of location, arrangement, and characteristics of particular indicators, displays, and alarms on specific towboat.

TASK CODE: TOW-II.C.8

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	85	1A	5	2B	10	3	2	2	2

TASK CODE: TOW-II.C.8	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Monitors voice radio (bridge-to-bridge, ship-to-shore, and vessel traffic traffic system (VTS) network, as applicable) and internal communication systems in order to maintain radio watch. (This task includes external radio communications with bridgekeepers and lock masters.)

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Is attentive to all voice radio traffic. • Efficiently monitors all communications applicable to own towboat-barge array and situation. Numerical: • In 100% of the cases, all pertinent communications are detected, understood, and acknowledged.	Functional: • How to operate various radio frequency (rf) equipment. • Knowledge of voice radio communication procedures. Specific: • Knowledge of availability of various rf networks in particular locale. • Knowledge of specific rf equipment provided on particular towboat.

TASK CODE: TOW-II.C.9									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	55	1A	5	2B	40	3	3	2	2

TASK CODE: TOW-II.C.9	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Surveys (visually, electronically on radar, and from charts and publications) bridges, in order to determine the location of and available navigation distance between bridge supports/wooden piers, and to relate that distance to his towboat-barge array length and breadth.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Promptly and accurately estimates/establishes location of and available distance between bridge supports/wooden piers. • Correctly relates that available distance to towboat-barge array length and breadth. Numerical: • In 100% of the cases, bridge spans are detected and available distances are ascertained to within acceptable limits commensurate with prevailing environmental situation, configuration of particular towboat-barge array, and any local navigation rules or practices.	Functional: • How to visually detect and estimate distance between bridge supports/wooden piers. • How to read various charts and publications and ascertain distances between bridge supports/wooden piers. • How to operate radar, detect bridge supports/piers, and determine distances. Specific: • Knowledge of radar unit on particular towboat. • Knowledge of local charts and publications. • Knowledge of particular bridges along waterway and their radar image characteristics.

AD-A037 442 OPERATIONS RESEARCH INC SILVER SPRING MD F/G 5/9
TASK ANALYSIS REPORT RELATIVE TO VESSEL COLLISIONS, RAMMINGS, A--ETC(U)
DEC 76 J SMITH, P DANIELS, B PARAMORE DOT-CG-41903-A
UNCLASSIFIED ORI-TR-1049-VOL-3 USCG-D-1-77-VOL-3 NL

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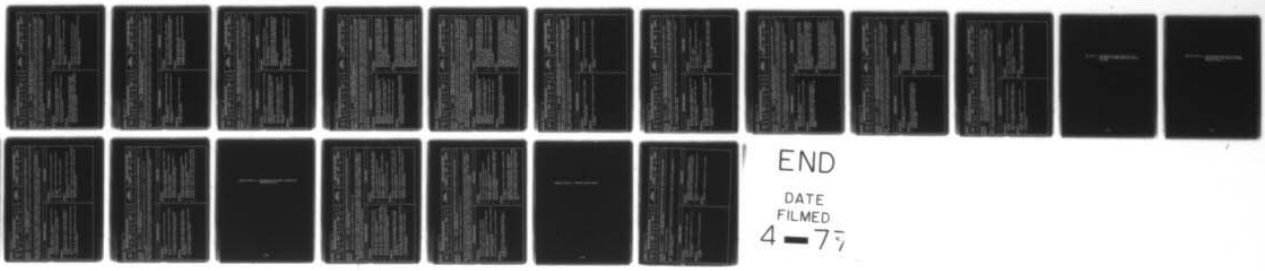

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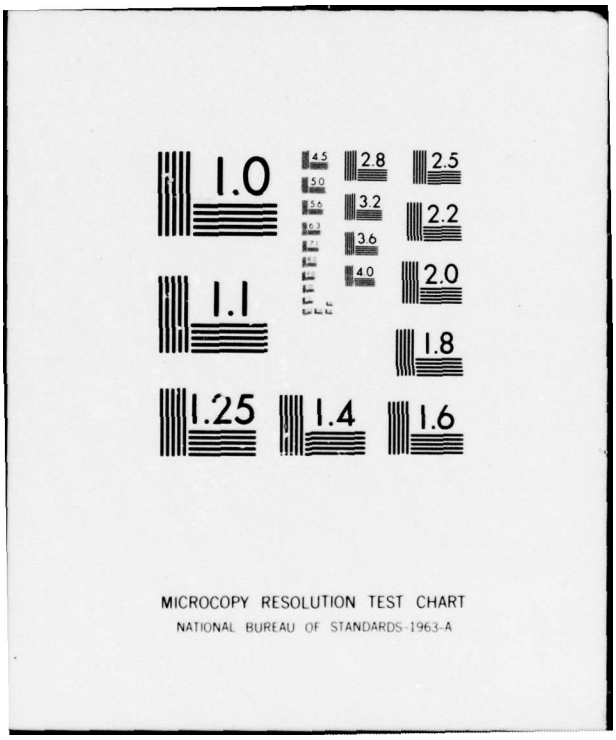
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TASK CODE: TOW-II.C.10									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	55	1A	5	2B	40	3	3	2	2

TASK CODE: TOW-II.C.10	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Surveys (visually, electronically on radar, and from charts and publications) canal locks in order to determine the location of locks and their width and length, and to relate those dimensions to own towboat-barge array breadth and length, respectively.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Promptly and accurately estimates/establishes location of and dimensions of canal locks. • Correctly relates those dimensions to towboat-barge array length and breadth. Numerical: • In 100% of the cases, locks are detected and dimensions are ascertained to within acceptable limits commensurate with environmental situation, configuration of particular towboat-barge array, and any local navigation rules or practices.	Functional: • How to visually detect locks and estimate their widths. • How to read various charts and publications and ascertain lock widths and lengths. • How to operate radar, detect locks, and determine dimensions. Specific: • Knowledge of radar unit on particular towboat. • Knowledge of local charts and publications. • Knowledge of particular locks along waterway and their radar image characteristics.

TASK CODE: TOW-II.C.11

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
1	50	1A	5	2B	45	2	2	2	2

TASK CODE: TOW-II.C.11 **GOAL:** Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Monitors collision avoidance system (visual and electronic) in order to detect other vessel traffic in vicinity.

PERFORMANCE STANDARDS

Descriptive:

- Thoroughly scans the surrounding waters both visually and electronically.
- Promptly and accurately detects other vessel traffic in vicinity.

Numerical:

- In 100% of the cases, all other vessel traffic in vicinity is detected.

TRAINING CONTENT

Functional:

- How to visually recognize other vessel traffic.
- How to operate electronic collision avoidance systems (including bridge-to-bridge communication system).

Specific:

- Knowledge of prevailing traffic patterns along track, including seasonal variations.
- Knowledge of individual towboat's specific electronic collision avoidance system.

TASK CODE: TOW-II.C.12

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
4	85	1A	5	1A	10	4	5	4	2

TASK CODE: TOW-II.C.12 **GOAL:** Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Assesses all other vessel traffic in vicinity and navigational situation in order to determine the existence of any real or potential collision hazard.

PERFORMANCE STANDARDS

Descriptive:

- Accurately determines the intentions of all threatening traffic in vicinity.
- Properly ascertains the governing rules of the road imposed upon own towboat-barge array or other traffic by local navigation rules, practices and VTS, if applicable.
- Anticipates possible actions by threatening traffic which may dictate reassessment of situation.
- Makes assessment in timely manner commensurate with situation.

Numerical:

- In 100% of the cases, all pertinent traffic data are assessed for potential collision hazard.

TRAINING CONTENT

Functional:

- Understands principles of relative motion.
- How to determine *course and speed* (*i.e.*, intentions) of all other vessels.
- Understands applicable rules of the road and the limitations they impose upon own towboat-barge array in determining potential collision hazard and possible counter action.

Specific:

- Knowledge of prevailing traffic patterns along track including seasonal variations.
- Knowledge of local navigation rules, practices and VTS, if applicable.

TASK CODE: TOW-II.C.13

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
5B	90	1A	5	1A	5	5	6	4	3

TASK CODE: TOW-II.C.13 **GOAL:** Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Examines and evaluates total data input concerning environmental situation, own towboat-barge array's characteristics, status of both onboard and external ancilliary equipment, collision hazards, and own towboat's mission (purpose and goals), in order to determine course of action to maintain desired track or position within prescribed limits of waterway, while simultaneously avoiding collisions, rammings, or groundings when a non-towboat-control-related emergency occurs.

PERFORMANCE STANDARDS

Descriptive:

- Anticipates any and all possibilities which may arise, especially other vessels' intentions and actions.
- Continually maintains mental alertness, i.e., is vigilant.
- Maintains sense of proportion among input data and various action options as situation changes or progresses.
- Makes decision in timely manner commensurate with situation.
- Acts effectively and with aplomb under pressure.

Numerical:

- In 100% of the cases, all pertinent data are examined and evaluated in accordance with the particular situation before decision is reached.

TRAINING CONTENT

Functional:

- Understands interrelationships which exist among towboats, barges, ancilliary equipment (both onboard and external to the towboat-barge array), and environmental factors as they relate to the controllability of the towboat-barge array.
- How to use regulations, conventions, principles, Rules of the Nautical Road, for navigating towboat in restricted water.

Specific:

- Knowledge of own and other vessels' hydrodynamic characteristics as they may be affected by particular barge array and prevailing environmental conditions at the particular locale and the seasonal variations of those environmental conditions through the range of expected values.
- Knowledge of own towboat's ancilliary equipment provided at particular locale as they affect towboat-barge array hydrodynamics and as they may be affected by varying environmental conditions and other vessel traffic.
- Knowledge of particular towboat's emergency procedures.

TASK CODE: TOW-II.C.14									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
5B	90	1A	5	1A	5	5	6	4	3

TASK CODE: TOW-II.C.14	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Examines and evaluates total data input concerning environmental situation, own towboat-barge array's characteristics, status of both onboard and external ancilliary equipment, collision hazards, and own towboat's mission (purpose and goals), in order to determine course of action to maintain desired track or position within prescribed limits of waterway while simultaneously avoiding collisions, rammings or groundings when a towboat-barge array control-related emergency (such as loss of propulsive power or steering, or a "breakaway barge") occurs.

PERFORMANCE STANDARDS

Descriptive:

- Anticipates any and all possibilities which may arise, especially other vessels' intentions and actions.
- Continually maintains mental alertness, i.e., is vigilant.
- Maintains sense of proportion among input data and various action options as situation changes or progresses.
- Makes decision in timely manner commensurate with situation.
- Acts effectively and with aplomb under pressure.

Numerical:

- In 100% of the cases, all pertinent data are examined and evaluated in accordance with the particular situation before decision is reached.

TRAINING CONTENT

Functional:

- Understands interrelationships which exist among towboats, barges, ancilliary equipment (both onboard and external to the towboat-barge array), and environmental factors as they relate to the controllability of the towboat-barge array.
- Knowledge of procedures for various towboat-barge array control emergencies.
- How to use regulations, conventions, principles, Rules of the Nautical Road, for navigating towboat in restricted waters.

Specific:

- Knowledge of own and other vessel's hydrodynamic characteristics as they may be affected by prevailing environmental conditions at the particular locale and the seasonal variations of those environmental conditions through the range of expected values.
- Knowledge of own towboat's ancilliary equipment and shoreside ancilliary equipment provided in particular locale as they affect towboat-barge array hydrodynamics and as they may be affected by varying environmental conditions and other vessel traffic.
- Knowledge of particular towboat's emergency procedures.

TASK CODE: TOW-II.C.15

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	45	1A	5	1B	50	1	1	1	1

TASK CODE: TOW-II.C.15	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Adjusts RPM or pitch (if controllable) of towboat's wheel(s) utilizing bridge throttles or internal communications circuits in order to change towboat-barge array's speed.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Expeditiously and accurately manipulates equipment to effect speed change. Numerical: • In 100% of the cases, all adjustments are made exactly as desired.	Functional: • How to operate bridge throttles and communications circuits. Specific: • Special characteristics and location of own towboat's equipment.

TASK CODE: TOW-II.C.16									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	45	1A	20	1C	50	2	1	1	2

TASK CODE: TOW-II.C.16	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Turns towboat's helm, operates flanking rudders, and reads compass and rate of turn indicators (if provided) in order to change or maintain course.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Routinely and accurately manipulates helm and flanking rudders to change or maintain course. • Continuously monitors compass, rudder angle, and rate of turn indicator. Numerical: • In 100% of the cases, all readings of instrumentation are within acceptable limits in accordance with particular situation. • In 100% of the cases, all helm adjustments are made exactly as desired.	Functional: • How to operate a helm and flanking rudders. • How to read a compass. • How to read a rudder angle indicator and a rate of turn indicator. • How to detect drift off course. Specific: • Knowledge of specific towboat-barge array's handling characteristics, i.e., rudder rate, lateral stability, rate of turn, etc.

TASK CODE: TOW-II.C.17									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	45	1A	5	2C	50	4	4	1	1

TASK CODE: TOW-II.C.17	GOAL: Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Controls towboat-barge array (varies course and/or speed), utilizing helm, flanking rudders, and speed control system, in order to intentionally run aground for the purpose of holding the entire towboat-barge array or barges only in a stationary position.

PERFORMANCE STANDARDS

Descriptive:

- Safely brings towboat-barge array to stop upon intentionally grounding.
- Towboat-barge array is effectively held stationary.

Numerical:

- In 100% of the cases, the towboat-barge array is intentionally grounded without any significant damage being incurred on either the towboat or the barges.

TRAINING CONTENT

Functional:

- How to determine quality of bottom characteristics and current in general vicinity of point upon which towboat-barge array is to be grounded.
- Understands interrelationships which exist among towboat, barges, onboard ancilliary control equipment, and environmental factors as they relate to the controllability of the towboat-barge array in running itself aground.

Specific:

- Knowledge of particular towboat-barge array's deceleration and stopping characteristics as they may be affected by bottom contours and characteristics and prevailing environmental conditions at particular locale, and the seasonal variations of those environmental conditions through the range of expected values.
- Knowledge of particular towboat's ancilliary control equipment as they affect towboat-barge array's deceleration and stopping characteristics.

TASK CODE: TOW-II.C.18

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	45	1A	5	2C	50	4	4	1	1

TASK CODE: TOW-II.C.18 **GOAL:** Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Controls towboat-barge array (varies speed and/or course) utilizing speed control system, helm, or flanking rudders in order to extricate the towboat-barge array from the grounded position.

PERFORMANCE STANDARDS

Descriptive:

- Towboat-barge array is promptly and safely extricated from grounded position.

Numerical:

- In 100% of the cases, the towboat-barge array is extricated from the grounded position without any significant damage being incurred on either the towboat or barges.

TRAINING CONTENT

Functional:

- Understands interrelationships which exist among towboat, barges, onboard ancilliary control equipment, and environmental factors as they relate to the controllability of the towboat-barge array in extricating itself from the grounded position.

Specific:

- Knowledge of particular towboat-barge array's starting and acceleration characteristics as they may be affected by bottom contours and characteristics and prevailing environmental conditions at particular locale, and the seasonal variations of those environmental conditions through the range of expected values.
- Knowledge of particular towboat's ancilliary control equipment as they affect towboat-barge array's starting and acceleration characteristics.

TASK CODE:	TOW-II.C.19

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
1	15	1	5	1	80	1	1	1	1

TASK CODE:	TOW-II.C.19	GOAL:	Navigate through (maneuver in) restricted waters as required in order to reach destination safely and expeditiously.

OBJECTIVE: Identify and respond to potentially hazardous conditions in order to avoid collisions, rammings, and groundings while simultaneously maintaining position within the limitations of the restricted waterway when some emergency arises.

TASK: Sounds towboat's whistle and displays other required identification in accordance with Rules of the Road, in order to maneuver in restriced waters safely and according to proper procedure.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Correctly operates whistle and displays appropriate signals. • Operation of whistle and displaying of signals is timely to changing course or ordering engines astern. Numerical: • In 100% of the cases, all appropriate whistle signals are sounded. • In 100% of the cases, all other appropriate day signals are displayed.	Functional: • How to operate towboat's whistle. • How to identify and use other signals. • Knowledge of Rules of the Road pertaining to whistle and other signals. Specific: • Knowledge of location of whistle controls (automatic and manual) and other day signals on particular towboat.

Goal TOW-III: Train/supervise towboat personnel in the safe conduct of towboat-barge array throughout voyage

Objective TOW-III.A: Impart knowledge about specific features, characteristics, and procedures of towboat-barge array control

TASK CODE: TOW-III.A.1									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
4	30	5	65	1A	5	4	4	3	4

TASK CODE: TOW-III.A.1	GOAL: Supervise/train towboat personnel in the safe conduct of towboat-barge array throughout voyage.

OBJECTIVE: Impart knowledge about specific features, characteristics, and procedures of towboat-barge array controllability.

TASK: Interviews/evaluates new personnel using own judgment within guidelines of company policy, regulations, and accepted practice, in order to find out their needs for orientation, specific training, and performance monitoring, relevant to towboat-barge array operating requirements.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Personnel needs for orientation, training, and supervision are determined promptly, thoroughly and accurately. • Effective communication is established. Numerical: • In 100% of the cases, specific knowledge and skills of all personnel are evaluated and established.	Functional: • Knowledge of responsibilities prescribed for various towboat personnel and general content of tasks that go with those responsibilities. • How to conduct informal interview procedure. Specific: • Knowledge of towboat-barge array design and operating procedures. • Knowledge of safety features and procedures. • Knowledge of company policy and pertinent regulations. • Knowledge of content of manuals and other information sources used onboard towboat.

TASK CODE:	TOW-III.A.2

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
4	40	4B	40	1A	20	5	5	3	4

TASK CODE:	TOW-III.A.2	GOAL:	Train/supervise towboat personnel in the safe conduct of towboat-barge array throughout voyage.

OBJECTIVE: Impart knowledge about specific features, characteristics and procedures of towboat-barge array controllability.

TASK: Walks personnel through towboat, explains layout and special equipment, and demonstrates operations related to specific job, using all available aids, and discretion concerning how detailed orientation/indoctrination should be, in order to orient personnel to towboat and procedures.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Indoctrination to towboat-barge array is conducted clearly, thoroughly, and efficiently. Numerical: • In 100% of the cases, all personnel acquire necessary orientation.	Functional: • Knowledge of towboat-barge array systems, functions, operations, and personnel responsibilities. • How to teach and demonstrate skills. • Understanding of importance of thorough indoctrination to towboat-barge array. Specific: • Knowledge of specific towboat-barge array control systems, functions, operations, and procedures. • Knowledge of specific personnel responsibilities, knowledge, and experience. • Knowledge of aids available aboard towboat to assist in task performance.

TASK CODE: TOW-III.A.3

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
3B	65	2	20	1A	15	3	3	1	4

TASK CODE: TOW-III.A.3

GOAL: Train/supervise towboat personnel in the safe conduct of towboat-barge array throughout voyage.

OBJECTIVE: Impart knowledge about specific features, characteristics, and procedures of towboat-barge array controllability.

TASK: Orders, posts, and/or maintains in specified location(s) on vessel standard sources of reference information, (equipment diagrams, standing orders, operations and safety manuals), following vessel, company, and governmental regulations about required materials, in order to ensure that the information is available when needed.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Standard information is posted, stowed, updated and replaced promptly and accurately. • Availability and condition of information sources is checked thoroughly on a regular basis. Numerical: • In 100% of the cases, all prescribed information is in designated location or known status whenever needed. • In 100% of the cases, changes are made upon notification. • In 100% of the cases, replacements are ordered as soon as known to be required.	Functional: • How to obtain and distribute standard information sources. • Knowledge of purposes for which difference sources are used. • How to order, update and replace documents. Specific: • Knowledge of information sources required and used aboard towboat. • Knowledge of locations for various types of information. • Knowledge of towboat procedures for information acquisition and access control.

TASK CODE: TOW-III.A.4									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
4	55	4B	35	1A	10	5	5	3	4

TASK CODE: TOW-III.A.4	GOAL: Train/supervise towboat personnel in the safe conduct of towboat-barge array throughout voyage.

OBJECTIVE: Impart knowledge about specific features, characteristics, and procedures of towboat-barge array controllability.

TASK: Provides on-the-job training (OJT) throughout voyage following standard operating procedures and using discretion within guidelines of company policy, regulations and personnel's interest in developing skills above minimum.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Is sensitive to personnel's work-related needs, interests. • Is clear and accurate in demonstrations and explanations. • Is sensible in selecting time, place for on-the-job training so as not to disrupt operations. Numerical: • In 100% of the cases, informal talks are held at prescribed intervals with all personnel, to check their needs. • In 100% of the cases, all departures from standards of personnel performance are noted.	Functional: • Knowledge of towboat-barge array systems, functions, and personnel responsibilities. • How to conduct on-the-job training and "hands-on demonstration" techniques. • Knowledge of onboard documentation available to assist in task learning performance. Specific: • Knowledge of specific towboat control systems, functions, operations and procedures. • Knowledge of specific personnel responsibilities, capabilities, and experience. • Knowledge of specific performance standards for tasks. • Knowledge of company policy and pertinent regulations.

Objective TOW-III.B: Examine/evaluate trainee's knowledge and performance on site

TASK CODE:	TOW-III.B.1

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
4	60	5	35	1A	5	5	5	4	4

TASK CODE:	TOW-III.B.1	GOAL:	Train/supervise towboat personnel in the safe conduct of towboat-barge array throughout voyage.

OBJECTIVE: Examine/evaluate trainee's knowledge and performance on site.

TASK: Watches and listens to trainees at work and queries them and others about their performance, using judgment in handling problems within the guidelines of established performance standards, regulatory requirements, and operating circumstances, in order to make sure performance is maintained to standards and prevent any deficiency in skill and knowledge, individual attitude, and work relationships.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Thorough observations are made on a regular basis. • Standards are applied consistently and objectively, but with due regard for circumstances. • Personnel are stopped, replaced, or corrected immediately if their actions are judged to jeopardize safety. • Personnel are informed promptly, clearly, and purposefully of departures from performance standards and of the correction requirements or suggestions. Numerical: • In 100% of the cases, emergency drills are always conducted as required by company and Coast Guard regulations. • Daily informal observations made of personnel performance and departures from standards are noted. • In 100% of the cases, all inferior performance is corrected immediately.	Functional: • Knowledge of towboat-barge array operational requirements and associated task performance requirements. • How to observe behavioral characteristics. • Knowledge of communication skills. • Knowledge of regulations and customs pertaining to personnel responsibilities. • How to constructively criticize trainees. Specific: • Knowledge of performance standards for specific tasks. • Knowledge of towboat-barge array capabilities, operations, and current status. • Knowledge of regulations applicable to vessel personnel. • Knowledge of company policy regarding personnel performance and its evaluation.

TASK CODE:	TOW-III.B.2

WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
4	35	5	60	1A	5	5	5	1	4

TASK CODE:	TOW-III.B.2	GOAL:	Train/supervise towboat personnel in the safe conduct of towboat-barge array throughout voyage.

OBJECTIVE: Examine/evaluate trainee's knowledge and performance on site.

TASK: Talks with trainee about job performance and any problems, using established performance standards, knowledge of contractual and regulatory requirements, knowledge of operating circumstances and of personnel background, capabilities, and physical and mental/emotional state, and using full discretion in applying those guidelines, in order to provide feedback on performance evaluation and to find out needs, grievances, and trainee's attitudes.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Performance reviews are held as required. • Informal feedback is provided frequently. • Appropriate times are selected for both formal and informal review/feedback. • Is perceptive of and open to indications for trainee's desire for communication. • Any criticism is fair, objective, and constructive. Numerical: • In 100% of the cases, no detected grievance or problem and no question goes without an attempt to resolve it.	Functional: • Knowledge of task requirements. • How to observe behavioral characteristics. • Knowledge of communication skills. • Knowledge of regulations and customs pertaining to personnel responsibilities. • Knowledge of fundamentals of psychology of human interaction in worker-supervisor relationships, including importance of feedback. Specific: • Knowledge of specific performance standards for tasks of trainees. • Knowledge of specific background, responsibilities, capabilities, personality traits, workload, and physical and attitudinal/emotional condition of trainee. • Knowledge of company policy regarding personnel performance and evaluation and pertinent regulatory requirements.

Objective TOW-III.C: Maintain required records

TASK CODE: TOW-III.C.1									
WORKER FUNCTION LEVEL AND ORIENTATION						WORKER INSTRUCTIONS	GENERAL EDUCATIONAL DEVELOPMENT		
DATA	%	PEOPLE	%	THINGS	%		REASONING	MATH	LANGUAGE
2	75	1A	20	1	5	1	1	1	2

TASK CODE: TOW-III.C.1	GOAL: Train/supervise towboat personnel in the safe conduct of towboat-barge array throughout voyage.

OBJECTIVE: Maintain required records.

TASK: Records required information in specified log at end of each watch in order to have legal documentation of towboat's maneuvering.

PERFORMANCE STANDARDS	TRAINING CONTENT
Descriptive: • Is complete, accurate, and legible in recording entries. • Records information at appropriate time, i.e., end of each watch. Numerical: • In 100% of the cases, all required information is recorded.	Functional: • Knowledge of information to be recorded in log (distance traveled during watch, position of towboat-barge array, arrival/departure of personnel, etc.). • Knowledge of standard phraseology required for each entry. Specific: • Knowledge of information specific to own towboat.