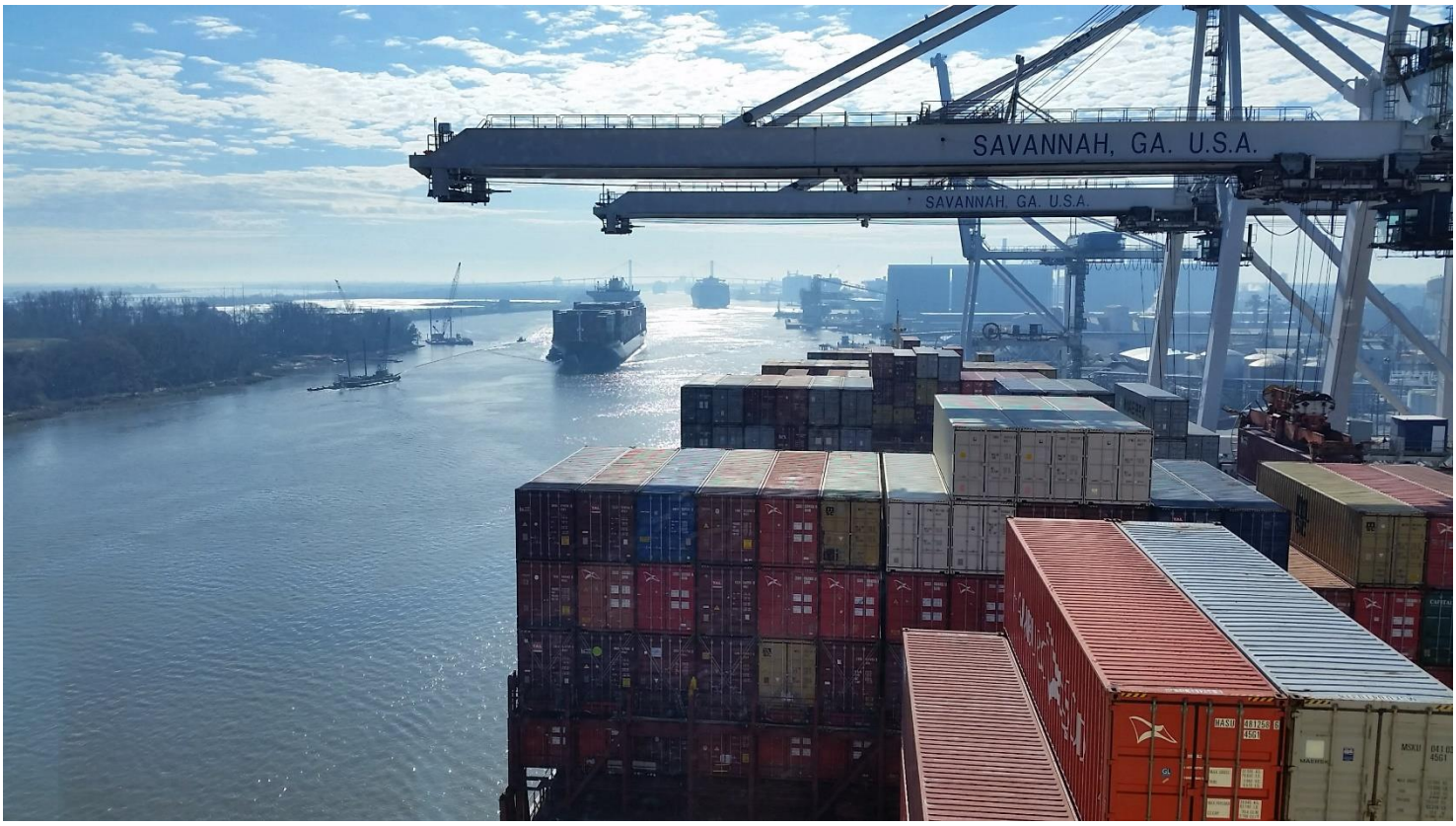
MASSACHUSETTS
Maritime Academy

SUMMER SEA TERM III
2018 COMMERCIAL SHIPPING PROJECT



Port of Savanah, GA from bridge of the Maersk Seletar – Photo by Braden Foster – MMA Class of 2019

CADET _____

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COMMERCIAL SHIPPING PROJECT SUBMISSION SHEET
SUMMER 2018

Cadet Name: _____ Ship Assigned: _____

Check ALL SECTIONS to ensure **at least half** the questions (calculations for Cel Nav) have been answered:

☐ Piloting Section ☐ Cel Nav ☐ Ship's Business (A) ☐ Ship Fam Gen (B)
☐ Bridge Equip (C) ☐ Bridge Ops (D) ☐ Cargo Ops (E) ☐ Firefighting (F)
☐ Rules (G) ☐ Journal

NOTE: IF ANY SECTION ABOVE IS COMPLETELY MISSING OF IF FEWER THAN HALF THE QUESTIONS (OR REQUIRED CALCULATIONS FOR CEL NAV) ARE ANSWERED IN ANY ONE SECTION, THE CADET WILL RECEIVE A FAILING GRADE FOR THE PROJECT.

Chart(s) that accompany this project: _____

ELECTRONIC COPY OF ALL WRITTEN DATA AND PHOTOS included? Yes No (Circle One)

Copy of Master's Evaluation(s) included? Yes No (Circle One)

Sea Service Letter (USCG Discharge) included? Yes No (Circle One)

DO ANY OTHER ITEMS ACCOMPANY THIS PROJECT? Yes No (Circle One)

If yes, please list here: _____

Copies made of all completed STCW Control Sheets and original documents and certificates (if enclosed). Originals given to Cadet Yes No (Circle One)

Date Received by Evaluator / Faculty Member _____

Evaluator/Faculty Member _____(print) _____ (signature)

Cadet given a copy of this submission/custody sheet upon receipt of project? Yes No (Circle One)

ORIGINAL SUBMISSION SHEET ALWAYS REMAINS WITH THE PROJECT

Evaluator finished assessing: Evaluator's Initials _____ Date _____

Evaluator reviewed project and grade with cadet: Initials of CADET after reviewing:_____

Date _____

Navigation Notebook ONLY returned to cadet, if wanted: Cadet Initials _____ Date _____

Grade turned into Registrar: Grade _____ Date _____

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Introduction Letter

FROM: Chair, Department of Marine Transportation

TO: Cadets Participating in Sea Term III

SUBJ: Commercial Shipping Program – Summer 2018

The Commercial Shipping Program is of vital interest to the Department of Marine Transportation and the Academy. This program allows the industry to view the quality of the cadets at our institution and, in turn, allows the institution to view trends and developments within the industry. Some of you have the opportunity to sail with companies new to the Massachusetts Maritime Academy Commercial Shipping Program. Some placements will be on foreign ships working with multi-national crews. This is a golden opportunity for you and the Academy to open new employment opportunities for our graduates in the global economy. Utilize this chance to demonstrate the quality and character of the Academy and its students.

You are privileged to be afforded the opportunity to experience a commercial sea term. Make the most of this unique experience. Please read through the entire project before attempting the assignments. This will help you in organizing the format of your project. Complete instructions for the Sea Term Project and grading criteria are provided. Follow the directions of each part carefully. Review APPENDIX III for grading criteria. The appendix will help you determine what is needed to fulfill the project requirements.

You must submit your completed **individual** sea project that represents only your work, to your personal EVALUATOR – IN PERSON, no later than **1600** on **Tuesday, September 4, 2018** if you signed off your ship on or before August 28, 2018**.** However, if you sign off your ship on **August 29, 2018** ***or later,*** **you will have seven (7) days from your sign off date (date on your USCG Discharge/Sea Service Certificate) to submit your project.** Your evaluator will be assigned at our pre-departure conference. Your evaluator or another faculty member must be there to sign in your project and issue you a receipt for your project providing proof you turned it in on time. You should e-mail your evaluator in advance to set up a time to submit your project to be sure he/she will be available when you are.

Projects will NOT be accepted late. If the project is not submitted by the appropriate deadline , it will be considered a Failure and the Cadet will be required to repeat Sea Term III on board T.S. KENNEDY.

NOTE: Turn in a copy of your discharge and/or sea service letter and your MMC to CDR Huhnke upon your return immediately. Place a copy of your discharge/sea service letter in your project and keep the original. Turn in copies of completed STCW Assessments along with a copy of the Assessor's Certificate to LT Mayhoffer; leave a copy in your sea project, and you keep the originals.

You may not collaborate with other cadets while working on the project. (see Item #12 on page 10 for more details)

Should you receive a failing grade for the Sea Term you may be required to make up Sea Term III aboard the Academy training vessel. Remember, this is a prerequisite for Applied Shiphanding (MT-3231) and this is a prerequisite for Sea Term IV. Deep Sea Navigation (MT-2121) is a prerequisite for Sea Term III.

Other than in an extraordinary circumstance, you are expected to remain aboard the vessel to which you have been assigned **for 60 days**. Should such a circumstance arise that prohibits you from attaining 60 sea days, you are to contact Captain Lima or Captain Dooley's office for permission to leave the vessel early, and you should know that the missing days must be made up before you can graduate**.** The department chair will be available by email during the Summer at lletourneau@maritime.edu.

You must complete at least 40 days aboard your vessel(s) to submit a sea project. Failure to do so will result in you being required to register and complete another full Sea Term III. The sea time from your first Commercial Ship will not count towards this 40 day minimum.

Remember that, as a cadet, you are a guest on board. ACT ACCORDINGLY. There is no task from which you will not learn. Be willing to assist the Ship's Officers in any way. VOLUNTEER to help out! Everyone has a job to do on board, and any time that they dedicate to your education is a gift. Try to repay that debt. Seek out work from the Chief Mate. Do not expect him/her to create learning jobs for you. Take the good with the bad. He/she is responsible for getting the vessel's work done, and you are an employee assigned to his/her department. Earn your keep! You won't regret it.

You must remain aware of the U.S. Coast Guard regulations on DRUG AND ALCOHOL ABUSE. Your pre-employment drug test has been completed; however, the policy has four more criteria for further testing:

> Routine, Random, Probable Cause, and Post Accident. Alcohol limits are established at 0.04 Blood/Alcohol content. Many company policies are stricter. Find out what the company policy is.

Should you encounter harassment, hazing, or any conditions that make you feel uncomfortable or threatened in any way, follow procedures of the company and contact the VP of Academic Affairs immediately at: CMDRE Bradley Lima 508-830-5012 blima@maritime.edu

If he is not immediately available contact:

CAPT John Dooley	508-830-5000 ext 6457	jdooley@maritime.edu
CDR Linda Letourneau	508-830-5000 ext 2107	lletourneau@maritime.edu
Capt. John Korn	508-830-5000 ext 5016	jkorn@maritime.edu
CDR Marie Huhnke	508-830-5000 ext 5071	mhuhnke@maritime.edu
Ms. Elizabeth Benway	508-830-5000 ext 5086	ebenway@maritime.edu

Should you contact via email, copy all the above on the email. Please keep documentation of any type of incident and subsequent communications.

Do everything you can to make this one of the most rewarding periods of your training at MMA. Work very hard, be professional, ask questions, and have some fun.

Should you be "fired" from the vessel for whatever reason, your project WILL RECEIVE A GRADE OF 'F' and you will face disciplinary actions when returning to Mass. Maritime Academy.

Sea Project General Guidelines
Follow These Simple Steps:

FOLLOW PROJECT INSTRUCTIONS CAREFULLY.

1. The Project consists of two parts, Navigation and Vessel Operations. Each part has specific instructions. Follow them. The sum of the two parts will account for 75 percent of your Sea Term grade. We are not going to weigh the Project, so content, not mass is the standard. You should be prepared to orally defend your Project before a board comprised of members of the Department of Marine Transportation.
   You are required to have two (2) notebooks for the project: one for each part. The first is for terrestrial and celestial navigation (Nav Notebook - provided) and the second is for vessel operations. It is best to get a 3-inch 3- ring loose leaf binder with section partitions for the vessel operations section. Label each section of the project on the section partitions.

2. Place the following parts of your project notebook in this order:
   a. Project Submission/Custody Sheet - with your name and ship assigned filled in (Page 3 of project)
   b. Your unsealed copy of the Master's evaluation and any other evaluations or rankings given you while aboard.
   c. A copy of your "Sea Service Letter" and/or USCG Discharge (keep the original and deliver a copy along with your MMC to CDR Huhnke's office shortly after you return to MMA).
   d. STCW Sign-offs completed with copies of assessor's certification (keep the originals, place a copy in your project, and submit copies to LT Mayhoffer).
   e. Any Certifications or Training Records (keep originals for your records and place copies in your project.)
   f. Vessel Vital Statistics and associated information (Page 12 of project)
   g. Ship's Log Page (Page 14 of project)
   h. Your photo and photo of your ship – (See bottom of page 14 of project)
   i. Entire Appendix III - Grading Sheets, in order (Pages 7 – 125 of project)
   j. Journal

   Part I - Navigation
   k. Voyage Plan / Piloting Section
   l. Celestial Navigation Section (Whatever doesn't go into the Navigation Workbook)

   Part II – Vessel Operations
   m. Section A – Ship's Business
   n. Section B - Ship Familiarization - General
   o. Section C - Ship Familiarization - Bridge Equipment
   p. Section D - Bridge Operations
   q. Section E - Cargo Operations
   r. Section F - Firefighting & Lifesaving
   s. Section G - Rules of Road
   t. Addenda
   u. Photos – Any extra photos just of the vessel and not supporting your projects documentation.

   NOTE: PHOTOS, diagrams, sketches, copies ***that support your write up*** MUST be printed in your project either with the question they support, on the page immediately following the question they support, or at the end of the SECTION that the question is in. To receive credit for photos and sketches, they must be labeled and described in the project itself.

3. You are to maintain a daily journal (Section ”j” above) of your activities for each day aboard the vessel. Place these sheets in chronological order immediately behind the GRADING SHEETS SECTION. Use a separate sheet or sheets for each day. Describe the activities that occurred that day: maintenance, watch, drills, training, and anything that happened to you during that day. Don't fall behind on this. We expect a minimum of one half page for each day, but would expect that you cannot describe all that happened to you during that day within one half page. Pages are to be typed (computer) and **double spaced** with at least half inch margins.

4. Read over APPENDIX I. (Master’s Evaluation Page 66). The Master or his/her designee will be grading your performance and attitude while you are aboard. THIS EVALUATION IS 25% OF YOUR SEA TERM GRADE. **(This means make a good impression at all costs!)** Although the Master will look for input from his/her officers, and in some cases delegate this responsibility to the Chief Mate, it should be noted that only this evaluation will be used for grading purposes. A few days after joining the vessel, when opportunity permits, make an appointment with the Master and with the Chief Mate to review this evaluation, and to seek their expectations of you. Later, be sure to request a meeting with them mid-way through your tour on the vessel, to go over the evaluation and see how you are doing, and where you need improvement. Request a final meeting to review their final evaluation of you ***prior to*** reaching your last port. Port calls are exceptionally busy for the ship's officers, and they will most likely NOT have time to do this ***in*** your last port. Make sure you get a copy of your final evaluation to place in your Sea Project after he/she reviews it with you. Follow through with this in a timely manner, but do not be a pest.

   EVALUATIONS:
   A. Original goes to CDR Linda Letourneau, the MT Department Chair, in the envelope provided with this project. The Master should sign his/her signature over the seal, place transparent tape over the signature and give the envelope to you. You should place it, unopened, in the front of your binder.
   B. Copy given to you to place, opened, in your project.
   C. The Master of your vessel may most likely keep a copy of the evaluation as well.
   D. Keep a copy for yourself, outside the notebook, just in case and for future use with your resumes.

   If a master refuses to follow this procedure, document the fact, and the reasons why in your Sea Project.

5. You must officially document your sea time aboard your ship to certify that you have sufficient sea time to qualify to sit for your USCG Third Mate MMC/license. You must ensure you receive a USCG Discharge form from the Master when you sign off the vessel or have them complete a “Sea Service Letter” following guidance from CDR Huhnke’s office. A copy or your discharge/sea service letter shall be placed in your project (Section “c” above). A copy shall be delivered to CDR Huhnke’s office upon your return to MMA. You should keep the original.

6. Cadets assigned to tank vessels carrying dangerous liquid cargo are encouraged to document experience, “sea time,” towards a Tankerman-PIC endorsement. Appendix II is provided as guidance as to how to document your cargo operation time. Should the tank vessel you are assigned to not have their own forms for documenting these transfers, samples of two are in this appendix. You can type up your own, based upon the wording and format of these.

7. The projects will be graded during the academic semester following your sea term and the final grade will be submitted to the Registrar before all grades are due for that semester. You will be able to check your grades on Webadvisor after they are posted. Grades will be in the format of:

A 93.0 – 100.0	A - 90.00 – 92.99	B - 80.00 – 82.99
B+ 87.00 – 89.99	B 83.00 –86.99	C - 70.00 – 72.99
C+ 77.00 – 79.99	C 73.00 – 76.99	D - 60.00 – 62.99
D+ 67.00 – 69.99	D 63.00 – 66.99	

This is a 60 % project with a D- needed to pass. It is worth 6 academic credits.

8. All sections of the sea project must be at least 50% complete. Do not attempt to leave a section out because you feel the time required to do that section is not worth the assigned points.

If you leave any section out, or fail to answer at least half the questions (calculations in Cel Nav) in any part, the sea project is deemed incomplete and thus a failing grade will be issued.

9. Your Sea Project, charts and photos will become the property of the Marine Transportation Department. If you want a copy of your project, make one before submitting it for grading. It is suggested that you copy any special original certificates obtained while aboard, that are included with your Sea Project before submitting the project. The originals, will be returned to you after they are verified and copied. Your Navigation Notebook may be returned to you for future use upon your request after project review.

10. Appendix IV includes three STCW assessments that go with Sea Term III. You should successfully complete as many of these as possible while aboard your vessel. Should you not complete any or all of them, you will not be penalized, but be aware, that you must complete them on Sea Term IV (senior cruise) aboard *TS KENNEDY* and/or at MMA, or you WILL NOT GRADUATE on time! Thus, it makes things much better for you if you do complete them on your Commercial Shipping Assignment. Only ship's officers who have completed a USCG-approved qualified assessor's training course can assess you and sign off on your assessments. A copy of the officer's Qualified Assessor's Training Certificate must be included with any completed assessments in order to get credit.

11. In addition to submitting your completed printed project to your evaluator as described above, you must include a "Flash Drive" with your complete written project on it including any photos and scanned documents.

12. You must also:
    - Submit an electronic copy of the written project to Turnitin anti-plagiarism software at http://www.turnitin.com.
    - Name your file "*yourname-shipname*"
    - Put your answers in a single text file (MS Word or pdf). **DO NOT include a repeat of the questions**. Just put in everything you have written for each part.
    - Save any diagrams and photos, if included, to a separate file.
    - Before you can submit files to Turnitin, you will need to register using the class ID of 18105845 and key word Project.
    - Your electronic copy of your projects must be submitted to Turnitin between September 4, 2018 and September 18, 2018. (REMEMBER, YOUR WRITTEN PROJECT IS DUE ON September 4, 2018)
    - ***NO submission = A failing grade***
    - ***You must send a copy of your e-mail confirmation of submission to Turnitin to your evaluator***

    Turnitin accepts work in the following formats: MS Word, PostScript, PDF, HTML, RTF, and plain text. PDF files work best followed by MS Word. Files are limited to approximate 10Mb in size. This limit will not normally be an issue unless your project contains a large number of uncompressed images. This is why you should save your photos be in a separate file which does not need to be submitted to Turnitin.

You will be graded only on what is written in the printed project turned in to your evaluator. NOTHING IN YOUR ELECTRONIC FILES WILL BE COUNTED TOWARDS YOUR GRADES. So if you want credit for any photos and diagrams, they should be IN THE PRINTED PROJECT, properly labeled and described.

13. The Department of Marine Transportation, in lieu of a Massachusetts Maritime Academy Policy, is using the following guidelines for academic misconduct:

    a. The sea project you hand in must be written in your own words. If you photocopy a drawing or document **you must cite the original source of the document**. If at any time you are not sure cite a reference.
    b. The department does not distinguish between cheaters who copy others' work and cheaters who allow their work to be copied. In this type of situation both projects may receive an F for the grade.

14. Lastly, it would be greatly appreciated if any pictures utilized in the project, and any others taken aboard ship that show the vessel, its equipment, operations and ports, or other ships, would be submitted in digital format as well. MT might be able to utilize some of these views to better demonstrate future classes.

TIPS

- BACK UP YOUR COMPUTER INFO AFTER EVERY ENTRY! **Losing your data by computer crashes is not as an excuse for late or insufficient submissions. Carry your report back in two copies in two locations**
- **Diagrams are to be hand drawn. (***unless otherwise specified in these project instructions*.**) Copies of ship's manuals or drawings cannot be substituted for required hand drawings** *unless otherwise specified in these project instructions*.
- **Photographs add a great deal but** *must be clearly explained* **to improve the value of your grade.**
- All sections of the sea project must be completed in order to receive a passing grade. Do not attempt to leave a section out because you feel the time required to do that section is not worth the assigned points. ***If you leave any section out, the sea project is deemed incomplete and thus a failing grade will be issued*.**

TOP TEN list for failing sea projects:

1. Not completing at least one half of the questions (calculations in Cel Nav) in any section of the project. -- Automatic FAILURE
2. Failing to do the Tides Section in the piloting section -- 5 points
3. Failing to place EVERYTHING that is listed in the piloting section ON THE CHART with your voyage plan.
4. Not completing and recording all compass observations in the back of the Navigation Journal
5. Failing to use the Celestial Navigation Observation Record Sheet (Page 79) -- 20 % Navigation Section point deduction if not completed
6. Not doing the proper CARGO OPERATIONS Section for the type of vessel you are on
7. Expecting material only in electronic format to be used during the grading process
8. Failing to do Five Rules of the Road situations with plotting sheets properly initialed
9. Turning in a project beyond the due date or failing to submit your project to Turnitin.
10. Getting Fired off the vessel – FAILURE -- DON'T DO DRUGS, DON'T RETURN TO THE VESSEL INTOXICATED!!

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Vessel Vital Statistics – Worth 2 points

CADET NAME _____

VESSEL NAME _____

Days on Board _____ Days at Sea _____

Watch(s) Stood _____ With Which Mate(s) _____

Name of Ship _____ Classification Society _____

Port of Registry _____ Official Number _____

Call Sign _____

LOA _____ LBP _____

Depth of Hull _____ Breadth _____

Light Draft _____ Max. Summer Draft _____

TPI (light) _____ MTI (loaded) _____

Propulsion System _____ H.P. _____

Boiler Manufacturer _____ Diesel Manufacturer _____

Builder _____ Year Built _____

Gross Tonnage _____ Net Tonnage _____

International Tonnage _____ DWT _____

Blades on Prop _____ Draft for 100% Prop Immersion _____

Name of Master _____ Name of Chief Mate _____

OBTAIN a copy of the vessel's posted maneuvering characteristics diagram and place behind this page.
With the maneuvering characteristics, **describe your observations of how the ship maneuvered as compared to the maneuvering diagram.**

Comments pertinent to uniqueness of this ship and its particular operations during the period which the cadet was assigned and which should be considered with the grading parameters:

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Ship's Log - Keep Up to Date – Worth 2 points

Day	Activity	Day	Activity	Day	Activity
1		21		41	
2		22		42	
3		23		43	
4		24		44	
5		25		45	
6		26		46	
7		27		47	
8		28		48	
9		29		49	
10		30		50	
11		31		51	
12		32		52	
13		33		53	
14		34		54	
15		35		55	
16		36		56	
17		37		57	
18		38		58	
19		39		59	
20		40		60	

Activities - At anchor, In Shipyard, Departing, Arriving and In Port (NOTE the port name each time) Discharging Cargo, Loading Cargo, UNREPing etc.

With this portion, **submit a photo of you, can be with other MMA cadets preferably while you were aboard the vessel**. Also, **submit a photo of the vessel itself – your choice of views.** These may go up on our new world bulletin board in the Harrington Building.

<u>Provide an electronic copy of both pictures in the picture file in the electronic version of your project.</u>

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PART I - Navigation

INSTRUCTIONS

1. During the entire time on board the commercial vessel you are required to maintain a NAVIGATION WORKBOOK for both terrestrial and celestial work. All work pertinent to navigation shall be worked directly into the NAVIGATION WORKBOOK. Do not work on scratch paper then copy to the workbook. This workbook should contain both celestial and terrestrial calculations.

2. The evaluators of the workbook fully understand your skill will increase during the voyage; therefore, do not hold back attempting a particular form of navigation for fear incorrect work will affect your grade. Poor results at first are a form of learning.

3. Masters on merchant ships usually assign Cadets to one half their time on Bridge watch so **daily** entries are expected.

4. If you are assigned to a vessel constrained in rivers or inland waters, never venturing offshore, you ***are not*** exempt from this section. You are expected to fulfill all the requirements that are shown in this section for a conducting a "Pilotage" trip. ***In order to follow this inland waters program, you must have a note signed by the master stating that your vessel never ventured into offshore waters during the time period you were assigned to the vessel.***

NAVIGATION WORKBOOK FORMAT

1. You are required to utilize the standardized NAVIGATION WORKBOOK for the completion of the Navigation portion of the project. Substitutes are not authorized. The workbook will be issued to you at our pre-departure meeting. Should you need more pages or more room on the compass observation page, there is a pdf copy of each at the end of this project.

2. ***The results of all azimuths/amplitudes and observed geographic ranges shall be entered on the last page of the workbook.*** You must determine deviation of the standard magnetic compass with each azimuth, amplitude and range you observe. This practice is identical to maintaining a Compass Observation Book similar to that on the bridge. Follow the instructions given in APPENDIX VI Compass Observation for how to complete this section. ***You will not get credit for an azimuth, amplitude or geographic range without recording the proper compass observation information in the back of the navigation workbook.***

3. Use time diagrams for all celestial work. Diagrams are preprinted in the workbook. One page to a problem. WRITE DOWN THE DR position for THE TIME OF THE PROBLEM. Don't write the morning DR and use it for evening stars, (unless the ship is not underway)

4. When doing precomps (LAN or other bodies) you MUST calculate the exact time of transit and the expected Ho (altitude). If these are not both provided, you will NOT receive credit for the work.

5. You should bring your own copy of the 2018 Nautical Almanac.

6. You are required to record your progress by making entries in the Celestial Navigation Observation Record Sheet found on page 79. When completing a requirement, place the date and the Navigation Notebook page for that item in the appropriate box. **Failure to use these tables will result in a 20 % reduction for the Navigation Part of the project.** It is suggested that you attach these tables to your navigation workbook and make the entries as the sights and observations are performed.

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Section A - Voyage Plan (*20 Points*)

A. You must submit one voyage plan detailing your work for either:
   1. A transit of at least three hour's length through pilotage waters or
   2. Making landfall, from first lights sighted until point of arrival.
   3. Arrival from point of arrival until dock
   4. Departure voyage from dock to point of departure

Provide one or more charts detailing the above voyage plan. You are encouraged to buy the chart(s) of an area frequented by the vessel before joining the ship.
The voyage planning chart shall include, but not be limited to, ***the labeling of the chart*** with:

ITEM	Pilotage	Landfall	Arrival/ Departure
Intended track lines with true courses	X	X	X
Distance to run for each leg	X	X	X
Waypoints identified by letter or numeral with total distance to go to end of transit	X	X	X
Prominent navigation aids for visual bearings	X	X	X
Optimal radar contours for radar fixing and parallel indexing (When available)	X		X
Parallel indexing information on each leg (When available)	X		X
Significant navigation events like passing a buoy close aboard or conspicuous hydrographic features	X	X	X
Turn bearings on objects nearly ahead or astern on the next leg adjusted for the ship's advance and transfer at transit speed and water depth	X		X
Calculated stage of tide by table for each leg	X	X	X
The minimum depth along the track on each leg	X		X
Minimum depth contours, all areas with depths less than the predetermined minimum depth, along the entire transit and mark the minimum depth contours with a bright high-lighter pen	X	X	X
Graphic indication of expected set and drift of current on each leg	X	X	X
Danger bearings if available and identify same on the chart	X		X
Emergency anchoring locations on the chart (When available)	X	X	X
Areas on the chart where because of very shallow water or traffic, extra precautions must be observed and speed reductions considered	X		X
Computation of luminous and computed geographic visibility of each primary navigation light during approach and label arcs of visibility		X	
Locations where VHF communications with VTS (port authorities) are mandated.	X	X	X
Informational notations regarding but not limited to:			
• deceleration points if applicable,	X	X	X
• pilot boarding/embarkation locations, if applicable,			X
• where to call the captain,		X	X
• where to test gear		X	
• call out the gang	X	X	X
• tugs alongside	X		X

REMEMBER: The above information ***MUST BE DRAWN ON THE CHART*** to count.
The Charted Voyage Plan is worth **11 points**.

An accompanying SPREAD SHEET/WAYPOINT LIST - for ready reference is also REQUIRED to accompany the chart work. This is needed to show all the information needed at hand for executing a voyage plan. An example can be found in the APPENDIX IX - Voyage Plan Spreadsheet/Waypoint List Example.
A written narrative may be included, but is not required.

The Spread Sheet/Waypoint List of your voyage plan is worth **4 points**.

B. Tidal height and predicted current at the docking/undock times **for each port and every time the port is visited** by the vessel and the minimum under keel clearance during the passage. However, should your vessel visit the same ports repeatedly, only four different docking and four different undocking calculations ***for each port*** are required. Calculations are also required for the transit of your voyage plan.

   THESE CALCULATIONS MUST BE DONE BY TABLE: A computer printout may accompany and back up each tide and current calculation, but the table work must be done. If your ship does not have a table, you can do these when you get back before the due date already listed, however, NO extension of time will be given for this. Tide and Current Table interpolation tables are included in the appendix.

Tide and Current calculations of your voyage plan are worth **5 points**.

SECTION B - CELESTIAL NAVIGATION (*20 Points*)

A. A Navigation Notebook is required for this section. Each notebook page will be labeled with the following:

FOR EACH CALCULATION/OBSERVATION DONE ON THE PAGE :

1. ZT, ZD, Day and date in upper right corner.
2. ***Vessel's DR, and time of that DR,*** for the work on that problem. (If more than one calculation done, then each will have its own DR.
   DO NOT have one DR early in the day used for every problem that day.
3. Vessel's course and speed below DR.
4. Label WHAT THE SIGHT IS

B. There are a total of 126 calculations in this section of the project. You must do all of them to be eligible to earn the entire 20 points for the Celestial Navigation section of the project.

C. REMEMBER! A good navigator is a neat navigator. IF WE CAN'T READ IT YOU WON'T GET CREDIT FOR IT! You probably will be assigned a bridge watch at least four hours each day. **Do not restrict your navigation to those hours only.** A properly maintained navigation notebook should form a log of the vessel's travel by showing navigation for each day at sea. *If the weather makes celestial navigation impossible on a particular day, you must note it in your notebook, but still complete all available calculations. For example: sunrise; sunset; pre-computed morning and evening stars; LAN; noon slip*

D. If you are on a vessel that does not have a gyro compass, does not have gyro repeaters, or does not have gyro repeaters that are capable of obtaining azimuths or amplitudes, **document this by pictures AND a note from the master explaining why they weren't available**.
Utilize the Geographic Ranges to compute compass errors.

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PART II - VESSEL OPERATIONS

INSTRUCTIONS

1. Cadets are encouraged to document through observations/experiences a more in depth analysis of the vessel's procedures, cargo operations, ship business, bridge equipment, etc., which reflects his/her efforts to maximize the unique learning experience called "commercial shipping."

2. You are required to answer the following questions in a separate and distinct portion of Sea Project Section. In addressing each question, the depth and breadth of your answers will affect the grades for each section. Don't mince words. If a question does not directly apply to your vessel, answer the question as to a normal merchant ship, then answer the question as to how your vessel handles this particular item. i.e.: Your ship might not have a Certificate of Inspection (COI). But, describe what it is and answer the questions asked about the COI, then explain what your ship has and how it handles those same items of interest.

3. To answer these questions you will undoubtedly be required to have at least one conference with the Master in addition to further research. Make sure you set up an appointment with the master well in advance. Masters of vessels are very busy when arriving and departing ports. A good time to meet with the master is usually in the middle of an ocean leg of the voyage.
   REMEMBER, don't rely solely upon the Master's interview for your answers.
   ALSO, if they don't have the answer, don't stop there. Research the question through all available means.

4. The following should be brought to sea with you to fulfill the minimums:

   a. American Merchant Seaman's Manual
   b. Coastal/Deep Sea Navigation and Celestial Navigation Notes
   c. Either: Tanker Operations or Marine Cargo Operations
   d. A Three-Ring Binder, page dividers and 100 sheets of paper
   e. Colored pencils or markers
   f. Plotting tools and/or drafting set
   g. Plotting Sheets
   h. Empty Flash Drive
   i. Radar Plotting Sheets/Maneuvering Boards
   j. Camera (cell phone)
   k. 2018 Nautical Almanac
   l. Nautical Charts for your voyage if you know where the ship will trade ahead of time.

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SECTION A - SHIP'S BUSINESS (*10 Points*)

1. What is the purpose of the Certificate of Documentation? What are operational endorsements is your vessel is documented? Who issues the document? (Or equivalent for foreign flagged vessels). How is this document updated and/or renewed?

2. What is the Official Logbook? Who maintains it? What entries are required by law? Where is it kept and what is done with it after the voyage? What is the difference between the Official Logbook and Company logbook (smooth log)? Describe logbook procedures for your vessel. Copy or sketch a sample (blank) page of your ship's company logbook, and include in this section. (Or equivalent for foreign flagged vessels). What is purpose of these numbers?

3. What is your ship's official number, issued by the USCG? What is its IMO number? Where are these numbers posted and why? What are their functions? Provide photos and/or sketches of both. (Or equivalent for foreign flagged vessels).

4. Describe as much as possible who performs the duties of the Vessel Security Officer and what are his/her duties/ Who is your vessel's Company Security Officer and what are his/her duties? Did you have security duties as a cadet? If so, explain. What instructions and guidance on the vessel security did you receive on board?

5. What security levels has your ship encountered while you were aboard? How would your ship be notified if a port's security level has changed? Is the crew of your vessel aware of current security levels? Do they take it seriously? Is there an active gangway watch? Have you witnessed, or has the ship previously been involved in a security threat? What are the basic security procedures that your vessel has available to it? What additional items are added as threat levels are increased? What is done during a security drill? What special security precautions are in place on your vessel? What happens aboard your ship or in a port facility when security levels change in a port?

6. Name and describe all union(s) onboard and their representation structure on board. Describe how these unions work aboard, how the crew and officers feel about them, how they help or hinder relations and work. Is there segregation aboard?. If serving aboard a foreign vessel, describe the nationalities of officers and crew. Describe their working and non-working relationships and how cultural differences between ratings and officers (if any) helped or hindered operations. Describe how the foreign officers are assigned to the vessel: Unions, Ship management agencies or by companies. Describe their length of tours and vacations and general working conditions.

7. Discuss the shipboard familiarization procedures from signing on board until assuming his/her first watch under STCW and ISM. Do this for you as a cadet, and for a typical officer and crewman signing on.

8. Discuss the following documents: Note of Protest, Notice of Readiness, Certified Crew List, and Cargo Manifest. (Or equivalent for foreign flagged vessels). Provide copies of completed forms if possible, or blanks if not.

9. What are the STCW95 regulations pertaining to rest periods, generally, and to your vessel and its operations specifically. Discuss measures taken on your vessel to deal with STCW rest period issues. How did the Capt. manage his mates to ensure the most rested officer would be on the bridge when the Mate was deeply fatigued from cargo ops? Provide a copy of a rest hours log, include your own completed form if used.

10. Fully describe the vessel's Certificate of Inspection (or equivalent for foreign flag vessels). Include a photocopy in your sea project. Who issues it? Where is it required to be posted? What are the manning requirements for your vessel? What tonnage requirements do the officers need to serve aboard your vessel? Describe the work necessary by the vessel to prepare for issuance of the certificate of inspection (COI). Why is it an important document?

11. Describe the ship's Pollution Response Plan. Who wrote it? What would your ship do in the event of a spill? Who is your QI? How would the call be made? Are there emergency procedures for other events? Provide copies if possible.

12. Describe the ship's Waster Management Plan. Who wrote it? Explain completely how your vessels disposes of all types shipboard waste and garbage covered by the plan. Include a copy of the Garbage Record Log.

13. Provide copies of your vessel's Standing Orders, Captain Specific Standing Orders (If any), Night Orders.

SECTION B - SHIP FAMILIARIZATION - GENERAL (*15 Points*)

1. Describe in detail (include copies of any plans) vessel's anchor windlass. What type is it: Electric, Steam, Hydraulic? What training on them does a newly joining crew member receive? What is the heaving capacity of your windlass. What is the Maximum brake holding power of the windlass? How much chain is on each windlass? how much chain can the windlass heave? Can it pick the anchor and the entire chain straight up off the bottom? How fast can the windlass heave in the anchor? Describe the anchoring procedures for your vessel in shallow and deep water. .

2. Describe in detail (include copies of any plans) vessel's mooring winches. What type are they: Electric, Steam, Hydraulic, Self-tensioning? What training on them does a newly joining crew member receive? Provide copy of operating instructions: Provide:
    - Max Brake Holding Power - and at what layer of line is that?
    - Max Heaving Power
    - Max Size line winch can hold
    - Size and type of line on the winch, with a copy of the line's certificate, which will show breaking strength etc.
    - Procedures for testing the winch brakes
    - Policy for inspecting and replacing wires or lines, end for ending
    - Info on any Mooring Pendants - size, construction, breaking strength, stretch and special shackles used (describe their deployment and retrieval if used)

3. Describe and sketch all the types of mooring fittings on board: chocks, bitts, fairleads, etc, Describe their use and limitations. List their maximum capacities. List problems pros and cons for each type.

4. Describe the ship's steering gear. Obtain and include copies of general arrangement plans if possible. What do the regulations say regarding tankers and cargo vessels? Are they the same for both? How do they differ? Describe in detail the ship's change over procedures, emergency and manual. Describe in detail the ship's procedures for testing steering gear (pre-arrival & pre-departure). Who wrote the procedures? When are these operations done? What places aboard ship are they performed? Who does them? Supply a copy of both ship's procedures. Were those procedures posted, and where? Where can the vessel be steered from? Are there any navigational areas where special procedures (i.e., man in the steering gear flat) are followed. How does the bridge and engine room monitor the performance of the steering gear? (video cameras, alarms). Describe any failures that occurred while you were aboard, and actions taken. What is the maximum degrees your ship's rudder can turn? When the command is given for hard right or left, how far does the master want the rudder to go? Why?

5. Load lines regulations are an important consideration for cargo ships. How are drafts logged in the vessel's log book? By whom? When are they recorded? Provide an example (copy) or write exactly how your ship logs its departure and arrival drafts. (Word for Word). Sketch, describe and comment on all lines/symbols painted on the side of your ship? Does your ship have a changeable tonnage? Does it have two load lines. Which tonnage's (International or Domestic) are used for most of your ship's work? What do the pilot's require and why? Discuss differences in numbers for both systems for your vessel and why they are there.

6. Explain all emergency escape routes from all spaces on the ship. Include engine room spaces, steering gear, inside houses. Describe emergency lighting methods and markings of all escape routes. Which routes are marked, and why? In the engine room, describe the normal entry and exit points. Who uses these and when are they not used?

7. Describe your ship's propellers (diameter and pitch, right hand/left hand, material, replaceable blades). If a variable pitch, describe its operation and special precautions. If twin screw, describe special maneuvering and operations with them. How is the prop attached to the shaft? What maintenance if any is done to the prop? Explain in detail how maintenance is done. Has the ship ever lost or damaged a prop? If so, how was it repaired or replaced? If not, is a spare kept aboard or where can ship obtain replacement?

8. Describe in detail the bow thruster(s) that your vessel was equipped with. Include manufacturer, type, horsepower, maneuvering effectiveness diagrams (bridge). Describe in detail the actual operation from call out of manpower to check and line up, to start up operation and securing details. How effective was the bow thruster(s) on your vessel. Describe any malfunctions or unusual operations with the thrusters.

9. Describe in detail what type of power plant your vessel was equipped with. How did it affect maneuvering and operation of the vessel? What was the Critical Range of RPMs if any and how were load up and load down procedures incorporated on a diesel equipped vessel? How did minimum RPM (dead slow) affect your maneuvering on a diesel equipped vessel? Describe in detail the operation and control of your vessels propulsion? Where could it be controlled? What benefits were obtained from this type of propulsion system? Are there any drawbacks to the system? Describe its operation in detail. Describe any problems or unusual occurrences that happened while you were aboard. What was the horsepower and loaded deadweight of your vessel? Did the ship's officers consider the horsepower adequate for the size of the vessel? If not, why? Include a complete description of the vessel's generators including number, types, size, and operation.

10. Did your ship come under any Ballast Water Exchange requirements? Describe in detail, the procedures for ballast water exchange if required for your vessel. (Not only if it occurred while you were onboard). Provide a copy of any procedures, certificates and/or logbook entries associated with this operation.

11. Arrange to spend at least part of one maneuvering watch in the engine room to witness the activities within the engine room during a transit. Discuss who was on watch there, and why. What duties did each perform? Were there double checks? List and describe all activities occurring during your observations: blowing tubes, tip cleaning, slow downs, speed ups, manual control. Describe any major alarms that went off while you were there and their causes. List all the "little" alarms that occurred. Describe any problems or special operations that occurred while you were in the engine room.

12. Fully describe the emergency towing arrangement for your vessel. Explain the vessel's emergency towing procedures. Has it ever been deployed? If so, when-fully describe the situation? Are any drills or practice of rigging conducted?

13. Select and trace one of the following systems; Bilge (engine room and/or cargo spaces), Ballast, or Fire Main. Draw a neat diagram using a straightedge and standard symbols that accurately reflects the system. Thoroughly explain purpose of system.

SECTION C - SHIP FAMILIARIZATION BRIDGE EQUIPMENT (*15 Points*)

1. Provide a copy (readable electronic photo or photocopy) of your vessel's posted maneuvering characteristics. Was this information used by your vessel's navigating officers?

2. Describe the installation and use of ECDIS aboard your vessel, if so equipped. Describe why your vessel is not completely qualified to sail without paper charts, (If it does not have an official ECDIS system). If not completely equipped for ECDIS, describe in detail all the equipment that your vessel has for electronic navigation: include charts, chart systems, radars, ECDIS type monitors. How are chart corrections done with the electronic charts? Who is responsible for correcting the electronic charts, and how are the corrections received? How does your vessel make use of electronic charts and ECDIS type monitors? What problems have been encountered with them, and what special precautions are in place with their use, if any?

3. Describe in detail the ship's magnetic compass(es), and the binnacle they sit in. Include manufacturer, position aboard ship, ability to view from helm, lights, covers etc. What type of compensation system did it have. Include pictures or sketches of the binnacle and its adjusting devices: Flinders Bar, Magnets, Quadrantal Spheres, etc. Detail how magnetic compasses are actually used in the day to day navigation of the vessel. When was last "swinging of the compass"? Did you observe? If so, detail the operation observed. If not, describe, from someone who was there, how the ship swung her compass for compensation purposes. Provide a copy of the Compass Deviation card(s) in place on your vessel for each magnetic compass mounted. Copy the log book entries that were made for the compass swinging and/or compensation.

4. Describe in detail the rate of turn indicator your vessel is fitted with. How was it used while aboard? Used for constant rate turns? Check on swing by helmsman? Etc.

5. Describe in detail the fathometer onboard. Who made it and what features did it have? Did it have a recording machine? How and when was the recording mode used? Was the paper initialed by officer starting it up? Was fathometer checked/tested as part of pre departure or pre-arrival equipment checks? How was the testing actually done, and how was the test logged? Any calibration done with the fathometer while aboard? When was it used? Were depth alarms used? Describe their use. Were problems with false alarms encountered? How were they overcome? What unit of measurement was commonly used: Meters, feet, fathoms. Were the fathometer readings normally checked against positions obtained by the officers? Where is(are) the sensor(s) located on the ship's hull?

6. Describe in detail the radars installed. Types, manufactures, ability to cross over. Where were scanners placed, and how did this limit their effectiveness? Were there any blind spots or problems/difficulties observed with the radars while you were aboard? How were radars used when at sea and in port? Who used which radars and why. How was long range scanning used when in reduced visibility? What scales were commonly used while at sea, making landfall, in reduced visibility and/or in pilotage waters? Was parallel indexing commonly used? Describe in detail the normal usage of the ship's radars: Were EBLs and/or Nav Lines used?

7. What type of weather fax machine did your vessel carry, if any? Who obtained wx faxes and when? What was the quality of these faxes, and were any difficulties observed when attempting to receive them? Did your vessel subscribe to a routing service that recommended a specific route based upon forecasted weather? Detail how vessel utilized this service. Detail ship's personnel's experience with the service. Provide a copy of one of the advisories from your ship's routing service. Did your ship file NOAA weather reports? If so who did it when? If not, why not?

8. Describe in detail the autopilot used aboard your ship. Manufacture, options, controls etc. Provide a photo or sketch labeling all controls and features. Who adjusted the autopilot? Did it have the capability of making pre computed course changes? When was the ship normally put on and taken off auto-pilot? When was it required to be off? Who is allowed to engage or disengage the autopilot? Did you observe this practice? Describe any unusual occurrences or operations of your vessel's autopilot

9. Was your vessel equipped with a Voyage Data Recorder? Describe its normal operation. Where is it located, what does it look like? What information does it record? Does it record information from other spaces than inside the bridge? Where and what? How is the information sent, recorded, and/or stored? Can the company monitor the VDR from the home office? Can it do so in real time? What is the shipboard or company policy on pushing the "Save" button. Who determines that this will be done? When would it be done? Describe any unusual occurrences with the VDR while you were aboard, or prior.

10. Was your vessel equipped with a Bridge Navigation Watch Alarm System? Where was it located? Fully and completely describe the use of this system.

11. Describe in detail any reduced visibility listening devices if fitted. (Big Ears). Describe how it was used in actual practice if observed. How is the reliability? If no special devices fitted, then describe normal procedure for achieving safe speed and posting of lookout, especially with regards to sound, during reduced visibility.

12. Describe in detail the Speed Log(s) provided aboard your ship. How many are there? Manufacturer, features, how many axis, how identifies motion? Bottom or water reading? Specifically observe and report if your Speed Log displayed athwartship motion (at the bow and stern) when on both bottom track AND water track. How accurate is it? Where is(are) the sensor(s) physically located? What is the theory behind its operation? How is it actually used aboard ship? In pilotage waters, at sea, and when docking. Any special precautions for their use?

13. Describe the mooring diagrams used aboard your vessel. (Plans showing where lines go for tying up to a specific dock). How were they used? Were they reviewed prior to each docking? Who makes them? Provide a copy of those used for the ports your vessel visited. If your ship does not have them, make your own mooring diagrams. Show bitts, chocks, fairleads, winches on the ship, and where all the lines went ashore.

14. Describe in detail the equipment and use of AIS on your vessel's bridge. Provide a diagram, sketch or photo of the unit. Was your AIS a MKD (minimum Keyboard Display) type? Who was the manufacturer, and what information could you retrieve from the AIS? Who onboard your vessel updates your own ship's AIS information? When is it done? Were they ever forgotten? How easy was it to retrieve important information from your AIS? What was the most frequently utilized information from the AIS? Did you observe ships transmitting obviously WRONG AIS data? Describe these incidents.
    a. How is this piece of equipment integrated into the actual bridge equipment, and how is it actually used by the ship's officers in the safe navigation and maneuvering of the vessel. Describe any limitations and problems observed with the AIS system on your vessel. How did AIS affect your vessel's maneuvering and observation of the Rules of the Road.

15. Describe in detail, the ship's gyro compass or compass that was normally used for navigating: flux gate/ GPS etc. Provide photo if possible. Detail manufacturer, where and how mounted, observation practices: was compass checked before relieving the watch? What was the normal practice of checking this compass for error? Describe procedures for start up and shut down at the dock and at sea. Describe the transmission system and the repeaters. How many and where were they? Describe Course
    a. Recording device. Manufacturer, location, and how it was used on watches. Provide photo if possible. Was recorder initialed at any time? When and where and why?

16. Describe the bridge layout, indicating where all equipment is placed. Provide sketch, CAD drawing of layout, or copy of the layout showing where radars, ECDIC, helm, compasses, etc. are located. Top view minimum. Can provide side view if necessary.

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SECTION D - BRIDGE OPERATIONS (*15 Points*)

1. Describe in detail the position fixing methods used as observed. Detail when they were used, and how frequently. Including but not limited to, compass checks, azimuths/amplitudes, comparisons to magnetic compass, computation and comparison of Deviation found to the table. Provide a copy of your ship's deviation table and a copy of a page from the Compass Observation Book (preferably with one of your entries in it). Did mates take visual bearings, radar fixes, GPS exclusively etc. How was ECDIS or electronic charts incorporated into the routine? How or did mates double check the GPS? How?

2. SEXTANTS – Did your ship have its own sextant? Describe manufacturer, approximate age and type. Was the ship's sextant used, other than by you, during your time aboard. If so describe how and when it was used. Did the master require practice use with the sextant of the mates on board? If so, how much and when? Did any of the mates, or the master, have their own sextant aboard? Did they use it? How and when? Is there any company, shipboard or master's policy of use of the sextant? If so, provide a copy of them. If the sextant was used by the ship's officers how accurate were the positions that resulted from that use?

3. Describe in detail all tug operations with your vessel: Escort, docking, towing etc. What types of tugs were utilized, when and where? How were escorts provided? Who was in control of the tugs? What type of communications were required for escort tugs. Were any special precautions taken with any of the tugs? i.e.: bollard size and location vs. tugs horsepower? Describe the largest and the smallest horsepower tug that was used while you were aboard. Describe how tugs were made fast to your vessel by your vessel's crew. Did your ship use messengers, tugger winches etc, to pull the lines aboard? Describe any special safety precautions utilized while making tugs fast or letting them go. Describe the use of tugs (placement and lines put out), and why they were done that way.

4. Describe routine of anchor watches observed while aboard. How was anchor position picked out before hand, (when coming in) and how was it ensured that vessel was "on the spot" when dropping the anchor? Where was the watch and mate stationed? Was mate allowed to leave the bridge? What frequencies were monitored while at anchor. How was it ensured that vessel was not dragging anchor? GPS alarm, Rag on chain, watch, radar nav lines, ECDIS, electronic charts, visual bearings, radar ranges. What did deck watch do during anchor period?

5. Describe in detail any vessel interaction with a port control, VTS etc. Where were call in points, what information was required, what frequencies were communications made on, what was the time line for communications? Who was responsible for these communications? What authority did each of these port controls have over the vessel? Was vessel required to follow their directions, if not why?

6. Describe in detail the watch condition system used aboard your vessel for varying conditions.

7. Describe a typical piloting transit with pilot aboard: Who does what? Who remains on bridge? How are reliefs done under piloting situations? Who goes down to pick up or send off the pilot? Are watch conditions maintained, or allowed to slip for this operation? Who cons the ship? Is the watch officer informed who has the con and when it changes? Is this information logged? Is there a pre-arrival and pre-departure conference done with all the officers involved with the operation? If not, how is important information passed down? If there was a change in the voyage plan, how are the other navigating officers informed? Are turn bearings precomputed? Are wheel over points plotted and/or used? Are turning rates pre-calculated and/or used. Provide a sample of one of the ships piloting and one of its offshore voyage plans. Was a Master/Pilot exchange card completed prior to pilot boarding? If so, provide a copy of one used. How did the master conduct the master/pilot exchange of information, if indeed it was done? Describe the routine. Were tug escort conferences conducted? Describe those in detail.

8. Describe the pilot ladder(s) used aboard your vessel. Describe their construction, how they were rigged etc. (tag lines, on a reel, with accommodation ladder). Describe lighting of pilot ladder for night operations. Describe IMO requirements for pilot ladders. Comment on whether your vessel's ladders complied with IMO requirements. Who rigged the ladders? Under who's supervision were they rigged? What arrangements, if any, are in place to hold the pilot ladder alongside the vessel? Describe in detail any pilot hoists in use.

9. Describe your vessel's company's requirements for under keel clearance (UKC). Did they have them? What were they? How was UKC calculated aboard ship? Did shoreside management issue clearances? Were there any UKCs issued by port authorities? What and When? What method does your vessel use to calculate squat? Provide a sample squat calculation for your vessel's transit of a shallow channel.

10. Did your vessel pick up any pilots via helicopter. What ports and when? Describe the precautions taken by the vessel prior to delivery and pick up of pilot. Where was pilot drop off and pick up point on the vessel? Describe maneuvering required by vessel (seas, relative wind, speed etc) for pilot exchanges. What was the maximum weather conditions that allow a helicopter transfer? Did the pilot service utilize both boats and helicopters? If so, when did they use each.

11. Was your vessel equipped with a Voyage Data Recorder? Was it a simplified VDR or full VDR? What information does it record? Does it record information from other spaces than inside the bridge? Where and what? How is the information sent, recorded, and/or stored? How long does it record? Can the company monitor the VDR from the home office? Can it record if the vessel loses power, how? Where is it located, what does it look like? How does it float free? What happens when it releases? What is the shipboard or company policy on pushing the "Save" button. Who determines that this will be done? When would it be done? Describe any unusual occurrences with the VDR while you were aboard, or prior.

12. Provide copies of your ship's PRE-ARRIVAL and PRE-DEPARTURE gear test checklists.

SECTION E - CARGO GEAR AND OPERATIONS (*20 Points)*

Complete one (or more) of the following cargo operations sections: (Tanker, LNG, Container, Bulk Carrier, General Cargo, RO/RO, Passenger, OSV, Tugs and Towing, Tugs and Towing Inland, or Other) depending upon which is applicable to your vessel.

Should you have a question as to which type of vessel questions you are to complete, clarify that with your Evaluator before leaving on assignment, or via email or telephone after you are on the ship. If you are in doubt, and cannot contact your Evaluator, then ***do as many types of vessels that would cover your vessel's cargo operations***.

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CARGO OPERATIONS - TANKER

1. Draw/sketch diagrams of the cargo and ballast systems both above and below deck. Include sizes of lines, types of valves, locations of suctions within tanks for ballast and cargo. Draw/sketch on deck and pumproom bunker piping.

2. Describe the general routine that occurs on board ship in preparing for the next load. Describe loading orders received. How are they sent, who receives them, in what form? What is included in them? Who determines how and where the cargo has to go for the voyage. Describe pre-voyage stress calculations. What type of stability program is in use, and who uses it? Describe the Preplanning operations done by the Chief Mate, including his drawing up the loading plan. Include write up on all paperwork associated with the pre-loading routing. Include copies (completed) of all paperwork done (DOI, Cargo Orders, etc.). Describe in detail how stability of your vessel is assured. Include pre-planning, during load, underway. Describe who is responsible, who does the calculations, equipment/programs used to calculate stability. Is data fed automatically to computer device? When and how is stability logged in your vessel's logbook? Include a copy of such an entry. What CFRs refer to the logbook entry of stability of your vessel? Describe the Required GM and any other special stability requirements of your vessel. Include, if possible a copy of a stability plan for one of your ports. Provide a copy of a completed stability plan for a loaded and a light voyage. If the long form is used, provide a copy of this. Does your vessel require any special stability considerations (loaded, unloaded, free surface effects etc).

3. Describe preloading/predischarging procedures. What checklists are used? What precautions are in place to detect and correct human errors? What company, USCG, local, and or shipboard regulations and procedures are used? Who checks line up and when? What method is used in marking, labeling valves and how are valve positions indicated on deck and in the control room? What methods are there to secure valves in one position or another? Include copies (completed) of all forms used, including but not limited to DOI form, all check lists, procedures, etc.

4. Describe topping off and stripping procedures in detail. How are they done? How are tanks gauged during the process? What is the order of topping off and stripping tanks? In topping off, what allowance is made for list and or trim corrections to ensure proper final ullages. What rates are used in loading and topping off? What discharge rates can your ship achieve, and what is normally used for a discharge rate during stripping? What type of communications are used? Describe the emergency substitute methods? Are stress calculations done prior, during and after the topping off and stripping?

5. Describe in detail the ship’s tank gauging system. Include a schematic if electronic. How is the system tested? When and by whom are the systems tested? When do applicable USCG regulations require testing of the system? How is the system used in loading and discharging? How is it used for official gauging of the ship?

6. Describe in detail the shipboard procedure for inerting your vessel. (Monitoring, testing, setting alarm points). Describe in detail all equipment and meters used in interting. Describe the processes for;
   - Initial inerting from a gas free ship
   - Inerting during discharge of cargo
   - Inerting, venting or vapor balance during loading operations
   - Inerting for hydrocarbon removal prior to gas freeing
   - Inerting for topping up pressure while at sea
   - Venting/Purging and gas freeing procedures

7. Describe in detail your ship's Vapor Balance/Exchange System. Include hand-drawn diagrams of all piping. Include descriptions of: Deck Water Seal, isolation Valves, vent masts, pressure gages, vapor exchange risers, any compressors used, PV valves/bullets and PV breaker. How is it ensured the vapor hose is connected to the correct header and that no other hose can be connected to that header?

8. Describe in detail the type of Crude Oil Washing System that was onboard your vessel. If you had none, detail why none was aboard. What type of COW guns were supplied. Where were they located. Describe a shadow diagram for COW. What types of COW operations occurred on your vessel. Detail the types of washings, upper, lower, mid-level that were done. What were the liquid levels when starting each phase? What were the purposes: Change of cargo, Required for inspection, sludge control? Detail how COW operations were run: People in Charge, Pre-testing of lines, Start up , changing limits on machines, ensuring proper operation and rotation of machines, switching sets, monitoring liquid levels in tanks, stripping of tanks, switching of sets, finishing operations, draining of lines, logging of operations in Oil Discharge Record Book. Were there special requirements from the port or dock if you were COWing there? Was there any maintenance performed on COW equipment when there? Describe. Include any checklists associated with COW operations onboard and/or ashore.

9. Describe the procedures utilized for Tank Cleaning (non-COW) onboard your vessel for: Tank entry, Cargo Changes, Repairs.
   a. Describe:
      - Washing methods: Butterworth, fixed, portable, drops.
      - Preparation of equipment: Megging hoses
      - Special tools used, non-sparking, saddles, wrenches etc
      - Methods of ensuring removal of washings
      - Where were slops pumped to?
      - Where did slops eventually go?
      - Use of Oil Record Book for recording operations.
      - Use of gas testing equipment for pre-washing, washing and post watching pre-entry and during entry
   b. Provide a copy of the Oil Record Book entry for a tank cleaning operation that occurred while you were aboard.

10. Did your ship come into ports that were sensitive to the release of hydrocarbon vapors? How would your vessel lessen tank pressure when pressures increased up to the limits of your Pressure Vacuum Valves? Describe procedures of any port authority or company monitoring personnel inspecting your vessel for release of vapors. Were there any accidental or deliberate releases of vapor while you were aboard? Describe conditions and incidents. Was your vessel required to test the IGS system for leakage? If so, when and how often? Who onboard was responsible for the inert gas operations? Who onboard actually started the gas plant and sent it to deck? Detail gas pressure set points of all equipment and describe why they are set to those pressures. Describe isolation procedures for tank cleaning and entry. Describe safety precautions for use of IGS. Describe operations when sending gas ashore or to a lightering vessel.

11. Were grounding cables used when alongside a dock or another vessel? Describe what a grounding cable is and how it should and/or was used. Particularly discuss the order of connection and closing the cable switch. What was the actual practice found aboard your vessel?

12. Describe in detail the Oily-water monitor for your vessel. Describe the manufacturer, and all settings required by IMO. When and how is it used and tested? What is logged concerning its use? How reliable a device is it? Describe an operation with its use while you were aboard, if one occurs? Provide a copy from the Oil Record Book illustrating its use.

13. What type of framing system was use on your vessel? Where do the frame numbers start? Stem or Stern? Did your vessel require any special construction techniques to its framing? Describe the double bottoms and double hull on your vessel, if provided. Compare the size of them to the size required by the CFRs. What methods are there for filling, venting and pumping out these spaces? How are they protected from corrosion?

14. Describe the general construction of your ship: Hull Plating, Keel, Deck Plating, superstructure etc. Detail any unusual construction methods, doubling, riveting, aluminum/steel bonding, special steel, etc.

15. Was your vessel equipped with an emergency towing package? Describe in detail its construction, use of and any training required by ship's personnel for its use. Has it been used onboard your vessel before? If so, describe what happened from someone who observed it. If it is used or tested while you are aboard, describe its operation in detail.

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CARGO OPERATIONS - LNG VESSEL

1. Draw/sketch diagrams of:
   - The cargo system both above and below deck
   - The ballast system above and below deck
   - The nitrogen system
   - LNG Spray cooling system
   - Cargo pump and Emergency Cargo pump (if carried)
   - Bunkering system

   FOR ALL ABOVE: Include sizes of lines, types of valves, locations of suctions within tanks for ballast and cargo. Also, if not constructed of mild steel, indicate what these items are constructed of.

2. Draw/sketch diagram of the ship's primary containment system. Include materials and method of construction. Describe fully, the types of tanks utilized to carry the cargo. Compare your ships tanks to the other types of LNG cargo tanks Moss vs. Membrane and discuss the pros and cons of each. How does your ship's tank construction allow for thermal contraction and expansion? How is your tank insulated?

3. Draw/sketch diagram of the ship's secondary containment system. Include full description of how any leakage is detected and dealt with. Write up any observations of tank leakage while aboard. Describe how your vessel prevents the accumulation of gas vapors in the insulated area.

4. Describe in full the types of cargoes carried while you were aboard. What temperature and what pressure where they carried at? What was their vapor pressure, density, molecular formula, boiling point, specific gravity at boiling point, specific gravity of vapor at 0° Celsius? Are there any restrictions to types of cargoes that your vessel can carry?

5. Describe the vessel's vapor system. Explain its purpose. Why is it needed? How was it operated while you were aboard?

6. What type of power plant propelled your vessel? Was your vapor boil off used as fuel on your voyage? When? How is this accomplished? Provide sketch of piping system. What percentage of fuel could be gas? Compare efficiencies of burning boil off vs. straight fuel.

7. Describe the vessel's cool down system. Explain its purpose. Why is it needed? How was it operated while you were aboard?

8. Describe in detail the vessel's Emergency Shutdown System. Where are controls? How do they work, once activated? What do they control? Who can activate them? Can they be automatically activated? When are they tested? Describe the test procedures and schedule for testing if any?

9. Describe the general routine that occurs on board ship in preparing for the next load. Describe loading orders received. How are they sent, who receives them, in what form? What is included in them? Unless it is a full load, who determines how and where the cargo has to go for the voyage. Can your ship carry less than a full tank at sea? Are there sloshing precautions taken?

10. Describe pre-voyage stress calculations. What type of stability program is in use, and who uses it? Describe the Preplanning operations done by the Chief Mate, including his drawing up the loading plan. Include write up on all paperwork associated with the pre-loading routing. Include copies (completed) of all paperwork done (DOI, Cargo Orders, etc.). Describe in detail how stability of your vessel is assured. Include pre-planning, during load, underway. Describe who is responsible, who does the calculations, equipment/programs used to calculate stability. Is data fed automatically to computer device? When and how is stability logged in your vessel's logbook? Include a copy of such an entry. What CFRs refer to the logbook entry of stability of your vessel? Describe the Required GM and any other special stability requirements of your vessel. Include, if possible a copy of a stability plan for one of your ports. Provide a copy of a completed stability plan for a loaded and a light voyage. If the long form is used, provide a copy of this. Does your vessel require any special stability considerations (loaded, unloaded, free surface effects etc.)?

11. Describe the differences in crew and officers directly related to LNG vessels: Cargo Officers etc. Describe duties and responsibilities of all officers and crew on vessel.

12. Describe preloading/predischarging procedures. What checklists are used? What precautions are in place to detect and correct human errors? What company, USCG, local, international and or shipboard regulations and procedures are used? Who checks line up and when? What method is used in marking, labeling valves and how are valve positions indicated on deck and in the control room. What methods are there to secure valves in one position or another? Include copies (completed) of all forms used, including but not limited to DOI form, all check lists, procedures, etc.

13. Describe topping off and stripping procedures in detail. How are they done? How are tanks gauged during the process? What is the order of topping off and stripping tanks? If tanks are not stripped, how much heel is left in them? Does this amount vary? If so, why? In topping off, what allowance is made for list and or trim corrections to ensure proper final ullages. What rates are used in loading and topping off? What discharge rates can your ship achieve, and what is normally used for a discharge rate during stripping? What type of communications are used? Describe the emergency substitute methods? Are stress calculations done prior, during and after the topping off and stripping?

14. Describe all pressure relief systems associated with the cargo on your vessel? What spaces were protected with these devices? How was this protection accomplished? What types of PV Valves were used? Provide sketch, or labeled photo of all PV valves associated with the cargo system. What were their relief settings? Where did they vent to? Atmosphere, Tanks?

15. Describe all the precautions taken (by construction and operational procedures) to protect vessel from gas vapors. How is gas kept from getting into engine room, accommodations, on deck with crew? How are these areas monitored? What procedures are in place for entering spaces that might contain dangerous gasses?

16. Describe in detail the ship’s tank gauging system. Include a schematic if electronic. How is the system tested? When and by whom are the systems tested? When do applicable USCG regulations require testing of the system? How is the system used in loading and discharging? How is it used for official gauging of the ship?

17. Describe in detail the "Custody Transfer System" (CTS) that was used on your vessel. What was the purpose of it? Why was this used instead of the traditional gaging of tanks? Provide a copy of a completed CTS if possible.

18. Special Operations: Describe in detail the procedures and actions taken (if observed) during tank entering, drying, cool-down, warm-up and purging. Describe in detail the procedures and actions taken during cargo line cool down.

19. Describe fully the procedures for cargo-arm hook up and release. What special precautions are taken at the cargo riser/arm area while discharging or loading to prevent the vessel from any accidental releases?

20. Describe any special training you got concerning LNG cargoes and the LNG vessel you were assigned. Describe fully the training, who gave it to you, who certified that you had actually acquired the necessary knowledge from that training, and how did they do it.

21. Describe in detail the shipboard procedure for inerting your vessel. (Monitoring, testing, setting alarm points). Describe in detail all equipment and meters used in inerting. Describe how the inert gas is produced, its components (percentages) and procedures for:
    Initial inerting from a gas free ship
    Venting/Purging and gas freeing procedures

22. Were grounding cables used when alongside a dock or another vessel? Describe what a grounding cable is and how it should and/or was used. What was the actual practice found aboard your vessel?

23. Describe in detail the Oily-water monitor for your vessel. Describe the manufacturer, and all settings required by IMO. When and how is it used and tested? What is logged concerning its use? How reliable a device is it? Describe an operation with its use while you were aboard, if one occurs?

24. Describe the general construction of your ship: Hull Plating, Keel, Deck Plating, superstructure etc. Detail any unusual construction methods, doubling, riveting, aluminum/steel bonding, etc.

25. What type of framing system was use on your vessel? Where do the frame numbers start? Stem or Stern? Where is the official number permanently affixed to your vessel? Did your vessel require any special construction techniques to its framing? Describe the double bottoms and double hull on your vessel, if provided. Compare the size of them to the size required by the CFRs. What methods are there for filling, venting and pumping out these spaces? How are they protected from corrosion?

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CARGO OPERATIONS - CONTAINER

1. Explain the holds and hatch covers of your vessel. How many and what types. How are hatch covers opened and closed? Does your vessel have "open holds"? On a vessel with open holds, what arrangements are made to ensure water can be pumped out of the holds to prevent floundering?

2. Thoroughly explain the lay-out of your vessel – Bays, Row, Tiers. Explain how each container's stowage position is identified. Include a copy of a Bay Plan for your vessel.

3. What were your vessel's stack weight limitations and what were her lashing limits? Where was this information available? Sketch several container lashing profiles to be followed by the stevedores for securing containers on deck. Describe the procedure for securing the cargo for sea after the last container is loaded.

4. Assist the Mate in his scheduled lashing gear inventory. Provide a copy of same and discuss where the excess lashing gear is stowed. Discuss how semi-automatic twist locks work if available. Is there a scheduled maintenance plan for the lashing gear?

5. Discuss the computerized load program available on your vessel. Does the same program handle stability? How about Dangerous Cargo compatibility? Provide a copy of a final load plan complete with computed stability information.

6. Did you accompany the Mate or Chief Engineer on a cell guide damage survey? Why is this important to conduct a cell guide damage survey frequently? Did the Mate or Chief Engineer discover any fractures on deck in the vicinity of the hatch coamings? Discuss why these must be repaired ASAP.

7. What assistance was provided by shore-side layout staff regarding Dangerous Cargo Materials stowage? What is the Chief Mate responsible for and what reference books can he use? Discuss how much time the Mate must dedicate to Dangerous Cargo Manifest on your particular vessel.

8. Describe the ship procedures for loading refrigerated cargo. Include how the mate on watch records the locations, temperatures and explain how the mate can detect a problem with a refrigerated container.

9. What is the maximum list acceptable for cargo operations to continue? Why? What was the maximum you experienced while aboard? What actions were taken to relieve the list?

10. Describe in detail the ballast system on board the ship. What tanks and capacities, pumps and maximum rates? Who operates the ballast system? Include an example ballast water plan. Did the vessel have an automatic heeling system? If so, describe its operation.

11. Describe what special arrangements or equipment your vessel has on board for fighting fires in containers? Fully describe how a fire in a container above deck would be fought and how a fire in a container below deck would be fought.

12. Describe in detail the bunkering operations for your vessel. Include what all crewmembers/departments do. Who has a PIC?

13. Describe in detail how stability of your vessel is assured. Include pre-planning, during load, underway. Describe who is responsible, who does the calculations, equipment/programs used to calculate stability. Is data fed automatically to computer device? When and how is stability logged in your vessel's logbook? Include a copy of such an entry. What CFRs refer to the logbook entry of stability of your vessel? Describe the Required GM and any other special stability requirements of your vessel. Include, if possible a copy of a stability plan for one of your ports. Provide a copy of a completed stability plan for a loaded and a light voyage. If the long form is used, provide a copy of this. Does your vessel require any special stability considerations (loaded, unloaded, free surface effects etc).

CARGO OPERATIONS - BULK CARRIERS

1. Draw/sketch diagrams of the cargo holds:
   Include arrangement of bilge system (rose boxes), reinforced areas, scantlings of plating used, structures, frames longitudinal, corrugated bulkheads, hopper/upper wing tanks.

2. Draw/sketch, in detail, arrangements and operation of hatch covers. What hazards are there in operation of hatch covers? What requirements must be met with securing hatch covers? Who manufactured them, what type are they, how are they powered, sealed, secured? Any dangers in their use? How are they tested for weather-tight integrity, when and by whom?

3. Capacities:
   What is the capacity of your holds in volume and weight? What cargoes, if any, provide for a "full & down" load?

4. Describe preloading procedures:
   Tank Cleanliness, residual cargoes, hatches opened prior to dockside, and ventilation.
   Were tanks/holds inspected by an agency such as the National Cargo Bureau prior to loading? Detail what the inspector does during his/her inspection and report on any findings that occurred while you were aboard. Provide a copy of the inspector's report if available.

5. Describe in full, the types of cargoes carried while you were aboard. What were the stowage factors and what was the Transportation Moisture Limit (TML)? What hazards, cautions or cares must be taken with these cargoes? Were cargoes fumigated? If so describe process in detail.

6. What cargoes has your vessel carried in the past? Are there any restrictions to types of cargoes that your vessel can carry?

7. Draw/sketch diagrams of your ballast system. Include tank and piping diagrams. Describe how your vessel is ballasted when discharging and deballasted when loading. Include order of filling/discharging and reasons why. How are tank levels indicated in the ballast tanks? Describe the pumps for the ballast system.

8. Describe fully the methods used to load your vessel: Clamshells, magnets, conveyors, spouts, trains, etc. What precautions are taken when loading to avoid any damage to the holds? Are there any areas more susceptible to damage than others? What are they and how are these concerns addressed? What order were holds loaded, and how. Detail methodology. Are stresses a big concern? Was a Grain Stability Calculation Form completed by the Master/Chief Mate? Include a copy of a completed form if possible. If not, describe one in detail.

9. Describe how the vessel was spotted at the facilities you loaded at. Describe fully each facility, its mooring points, dock faces, loading arms/methods. Did your vessel have to be warped up the dock face or alongside another vessel? If so, how was this done?

10. How is cargo loaded and discharged measured? What type of bills of lading are given the vessel? Provide a copy of one if possible.

11. Describe fully the methods used to unload your vessel: self-unloading, pay loaders, clamshells, etc. If vessel had self-unloading crane, were there stability issues with use of this unloading device? If so describe them and how they were addressed. What precautions are taken when unloading to avoid any damage to the holds? Are there any areas more susceptible to damage than others? What are they and how are these concerns addressed? What order were holds discharged? If your vessel was a self-unloader, describe in detail the conveyor and tunnel systems. How were these made water tight? What difficulties were encountered with the conveyor systems? How many were there on the ship?

12. Describe the clean-up routines that occur after loading. Any special cargoes that were especially troublesome?

13. Were there any ballast water exchanges required during your stay aboard? Describe fully the ballast water exchange procedure for your vessel. If it does not have one, detail the reasons why not.

14. How is possible shifting of cargoes addressed with the different cargoes you loaded? What was the angle of repose for the cargoes you loaded, and how was it avoided? How high could cargo be loaded in the holds? Why? During any loads were there any partially-filled cargo holds? If so, what methods were used to trim the cargo surface? What measures were taken to prevent shifting; strapping, horizontal bulkheads, saucers – describe in detail.

CARGO OPERATIONS - GENERAL CARGO

1. Describe in detail the arrangement of your vessel – number of holds, decks in each hold, etc. What were the cubic capacities of each cargo space aboard your vessel? What were the deck load capacities for each deck? How was it assured the deck load capacities were not exceeded?

2. Discuss the types of cargo gear aboard your vessel with a focus toward maximum lifting capabilities, holds or deck areas serviced by your cargo gear and types of cargo which could be lifted. Define the phrase, a self-sustaining ship.

3. Discuss necessary stability calculations prior to attempting a heavy lift. If your vessel has heavy lift capability, is there a heeling system available to offset list due to very heavy loads?

4. How is the placement of cargo determined? Who does the load planning? Is the load plan provided by shore-side cargo planners or prepared by the ship? If provided by shore, how is it checked by the ship's officers? If prepared on board, what steps and considerations are taken when planning the load? Provide a copy of a vessel cargo load plan. Describe any incidents of over-stowed or over-carried cargo.

5. Did your vessel carry any dangerous or hazardous cargo? What types & classes? How was it assured this cargo was stowed in the correct location?

6. Describe the cargo bilge system on board your vessel. What type of suctions does it have? Where are they located in the cargo holds? How does the ship know if there is water in the bilge wells – soundings or automatic alarms? Who takes soundings and how often, who checks the bilge alarms and when? Where to bilge alarms sound? Did a bilge alarm go off at any time during your time on board? What was done in reaction to the alarm? Make a drawing of the bilge arrangement or copy the ship's drawing.

7. Discuss in detail how cargo was secured/lashed aboard your vessel. What type of lashings were used on what types of cargo? What are the capacities of each type? Who made the lashing plan? Provide examples of lashing plans and/or orders. Was there an inventory of the lashing gear? Provide a copy. What inspection and maintenance was performed on the lashing gear?

8. How many longshoremen typically came aboard the vessel to work the cargo? How many gangs were there and how many in each gang? Who was the boss? How did the Chief Mate and ship's officers work with the longshoremen? Describe any issues with the longshoremen.

9. Did you accompany the Mate or Chief Engineer on a damage survey? Why are frequent damage surveys important? Did the Mate or Chief Engineer discover any fractures on deck in the vicinity of the hatch coamings? Discuss why these must be repaired ASAP.

10. Describe in detail how stability of your vessel is assured. Include pre-planning, during load, underway. Describe who is responsible, who does the calculations, equipment/programs used to calculate stability. Is data fed automatically to computer device. When and how is stability logged in your vessel's logbook. Include a copy of such an entry. What CFRs refer to the logbook entry of stability of your vessel? Describe the Required GM and any other special stability requirements of your vessel. Include, if possible a copy of a stability plan for one of your ports. Provide a copy of a completed stability plan for a loaded and a light voyage. If the long form is used, provide a copy of this. Does your vessel require any special stability considerations (loaded, unloaded, free surface effects etc.)?

CARGO OPERATIONS - RO/RO CARGO

1. Describe in detail the arrangement of your vessel – number of decks, fixed movable, etc. Could cargo be loaded on the weather deck? If so, how much? What were the cubic capacities of each deck? What were the deck heights of each deck? Did your vessel have a capacity in LIMs? What was it? What were the deck load capacities for each deck? How was it assured the deck load capacities were not exceeded?

2. Describe in detail the interior ramps, ramp covers, and bulkhead doors on board your ship. Where were each located? Where any ramps moveable? Could cargo be stowed on the ramps? If so, how much? Where any ramp doors or bulkhead doors watertight? Which ones? Why are some of them watertight? Who operated the ramps and doors? What are the steps/procedures for operating the interior doors and ramps?

3. Describe in detail the exterior ramps on board your vessel. What were their capacities? Who operated them? What are the steps/procedures for operating the ramps and associated doors? What does the Mate on Watch have to monitor/check on the ramps during cargo operations?

4. Describe in detail the ballast system on board the ship. What tanks and capacities, pumps and maximum rates? Who operates the ballast system? Include an example ballast water plan. Did the vessel have an automatic heeling system? If so, describe its operation.

5. How is the placement of cargo determined? Who does the load planning? Is the load plan provided by shore-side cargo planners or prepared by the ship? If provided by shore, how is it checked by the ship's officers? If prepared on board, what steps and considerations are taken when planning the load? Provide a copy of a vessel cargo load plan.

6. Did your vessel carry any dangerous or hazardous cargo? What types & classes? How was it assured this cargo was stowed in the correct location?

7. Describe the cargo bilge system on board your vessel. What type of suctions does it have? Where are they located in the cargo holds? How does the ship know if there is water in the bilge wells – soundings or automatic alarms? Who takes soundings and how often, who checks the bilge alarms and when? Where to bilge alarms sound? Did a bilge alarm go off at any time during your time on board? What was done in reaction to the alarm? Make a drawing of the bilge arrangement or copy the ship's drawing.

8. Discuss in detail how cargo was secured/lashed aboard your vessel. What type of lashings were used on what types of cargo? What are the capacities of each type? Who made the lashing plan? Provide examples of lashing plans and/or orders. Was there an inventory of the lashing gear? Provide a copy. What inspection and maintenance was performed on the lashing gear?

9. Describe in detail the ventilation system aboard your vessel. What were the procedures used to operate, secure and ensure that it was functioning correctly? Draw a diagram of the ventilation system.

10. Describe in detail how stability of your vessel is assured. Include pre-planning, during load, underway. Describe who is responsible, who does the calculations, equipment/programs used to calculate stability. Is data fed automatically to computer device? When and how is stability logged in your vessel's logbook? Include a copy of such an entry. What CFRs refer to the logbook entry of stability of your vessel? Describe the Required GM and any other special stability requirements of your vessel. Include, if possible a copy of a stability plan for one of your ports. Provide a copy of a completed stability plan for a loaded and a light voyage. If the long form is used, provide a copy of this. Does your vessel require any special stability considerations (loaded, unloaded, free surface effects etc.).

CARGO OPERATIONS - PASSENGER VESSELS

1. Draw/sketch diagrams of the water tight subdivisions used aboard your vessel. How do the actual subdivisions compare to those required in the CFRs?

2. Describe in detail, the construction, operation and use of the passenger ship's Water Tight Doors. Include ALL types, automatic and manual. Who is allowed to close the automatic type doors? Who is allowed to open them? When and how are they tested?

3. Describe in detail, the construction, operation and use of the passenger ship's Fire Doors. Include ALL types, automatic and manual. Who is allowed to close the automatic type doors? Who is allowed to open them? When and how are they tested?

4. Who is the ship's safety officer? Describe in detail the duties of the safety officer. What special training did he/she receive? What areas is the safety officer responsible for?

5. Who is the ship's Environmental Officer? Describe in detail the duties of the Environmental Officer. What special training did he/she receive? What areas are the Environmental Officer responsible for?

6. Describe the special STCW training required of maritime personnel working aboard a large passenger vessel, i.e., medical, crowd control, etc.

7. Draw/sketch diagrams of the vessel's fire detection system. Describe in detail, the type, construction, operation and use of the system. When and how is it tested?

8. Describe how the vessel ensures only ticketed passengers are on board the vessel at departure. How is it ensured any visitors or other non-crew, non-passengers, unauthorized persons are not on board the vessel? How is it ensured no unauthorized items are smuggled aboard in passenger luggage or in delivered stores/supplies?

9. Describe the various unions/employment contracts encountered aboard your vessel, licensed, unlicensed and professional.

10. Describe in detail bunkering procedures used aboard the vessel. What personnel are involved in the bunkering?

11. Describe in detail the paperwork required of the Master or purser when entering and/or departing port.

12. If your vessel has a special propulsion system, describe it and its operation in detail.

13. Describe in detail how stability of your vessel is assured. Include pre-planning, during load, underway. Describe who is responsible, who does the calculations, equipment/programs used to calculate stability. Is data fed automatically to computer device? When and how is stability logged in your vessel's logbook? Include a copy of such an entry. What CFRs refer to the logbook entry of stability of your vessel? Describe the Required GM and any other special stability requirements of your vessel. Include, if possible a copy of a stability plan for one of your ports. Provide a copy of a completed stability plan for a loaded and a light voyage. If the long form is used, provide a copy of this. Does your vessel require any special stability considerations (loaded, unloaded, free surface effects etc.)?

14. Describe in detail at least one, preferably more unique stability situation(s) such as when a maximum number of passengers are on board and/or when a full load of food and supplies is loaded on board. How is it ensured stability requirements are met? Who does these calculations? Include an example(s) of these calculations.

CARGO OPERATIONS - OFFSHORE SUPPLY VESSELS

1. Fully describe the cargo capacities of your vessel; deck cargo capacity in $ft.^2/m^2$ and weight, dry and liquid (mud, diesel oil, rig water, fresh water, sewage, etc.) bulk in gallons/barrels/ft^3/m^3 and weight. Include a copy of the vessel's capacity plan. Comment on whether the ship can carry a maximum of all deck and bulk cargo at once for a full load or if only certain amounts or combinations of cargos to reach a full load.

2. How was stability and maximum draft calculated on board prior to loading outbound cargo as well as before back loading cargo? Who performed these calculations? Include a copy of a calculation. When/how were drafts checked and logged. How was it assured the vessel was not loaded beyond her deep draft?

3. Describe in detail the layout of the cargo deck (include a photo and/or drawings). What where it's dimensions? What was the deck made of? Where there cargo securing fixtures built into the deck? What kind and how many? Fully describe how locations on the cargo deck were identified and segregated. Describe the special features installed on the deck to assist in cargo operations or safety such as a "headache bar."

4. Deck cargo operations: Describe in detail the process of loading deck cargo in port. Where was cargo loaded? How did the vessel find out when and what was to be loaded? Was a list of cargo provided? Was a manifest prepared, by whom? Include a copy of the list/manifest. How was the deck cargo load planned? How was it determined where outbound cargo would be placed on deck? Who was responsible for this plan? Where special arrangements made for placing dangerous or hazardous cargo on board vs. general cargo?

5. Deck cargo operations: Describe in detail the process of back loading deck cargo from a rig. How did the vessel find out when and what was to be loaded? Was a list of cargo to be back loaded provided by the rig? Was a manifest prepared for the inbound voyage, by whom? Include a copy of the list/manifest. How was the deck cargo load planned? How was it determined where back loaded cargo would be placed on deck? Who was responsible for this plan? Where special arrangements made for placing dangerous or hazardous cargo on board vs. general cargo? What are the maximum weather and sea conditions before cargo operations are halted?

6. Deck cargo operations: Who worked on deck during cargo operations? What PPE did they wear? What training was required before they could work on deck? Describe any equipment used on deck to assist with cargo operations. Where you involved in deck cargo operations? How so? Who was responsible for signaling the crane?

7. Deck cargo operations: Fully describe how deck cargo was secured on deck. How many chains were used? What are the breaking strains of the chains? Where were they connected to the ship? Who secured the cargo? Where was the cargo securing equipment stowed on board? Where any inspections or checks made of the securing equipment? Were there any incidents of adrift deck cargo? If so, fully describe including what was done to re-secure the cargo.

8. Deck cargo operations: List examples of deck cargo units transferred such as cuttings boxes, drill pipe, riser pipe, chill boxes, etc.

9. Was your vessel involved in any special cargo operations such as maintenance and repair, ROV work, or offshore construction? If so, describe these operations fully including the specific operation and equipment involved. Did the vessel have an on board crane? If so, what was its capacity and range? Include a copy/photo of the lifting diagram. Who operated the crane? What training did they receive before operating the crane?

10. Bulk cargo: Describe in detail (include photos and/or drawings) the bulk (dry and liquid) cargo arrangement on your vessel. Number of tanks, tank capacities, location on board, number of pumps, types of pumps, etc.

11. Bulk cargo operations: Describe in detail the process of loading and discharging dry and liquid bulk cargos. Who is responsible on board for bulk cargo operations? If bulk cargo ops is the responsibility of the ship's engineers, spend time in the engine/bulk cargo spaces working with them to find out how bulk cargo is transferred. How is dry bulk cargo transferred? Explain in detail how dry bulk is "pumped." What is the typical and maximum rate of discharge? What is the typical and maximum loading rate? Does the vessel have to do anything with dry bulk to ensure it can be pumped like "fluff" the tanks? If so, how is this done? How is the amount of dry bulk cargo loaded or discharged monitored? What are the pumping rates for liquid bulk cargo? Can more than one pump be used at a time? What is the normal and maximum loading rate for bulk liquid cargo? How is the amount of liquid bulk cargo loaded or discharged monitored?

12. Fully describe the process of approaching an offshore installation for cargo operations. How far off did the vessel wait until being called in? What checks must be conducted before approaching the rig? Where you involved in these checks? Include a copy of a completed checklist. Once receiving the ok to approach the rig, what were the steps taken to move the vessel into position to transfer cargo? What distance off was normal for cargo operations? How far off was the closest the ship ever came to the rig? Once in position, what paperwork was exchanged between your vessel and the rig? Where personnel transferred? Who?

13. Describe in detail the vessel's navigation equipment used to monitor the vessel's position while alongside the rig? Fully describe the vessel's propulsion system/arrangement used to keep the vessel in position, number, types, and power of thrusters as well as main engine propulsion.

14. Tell one story about cargo operations such as transferring deck cargo in heavy weather, a spill of bulk cargo, dropped lift, etc.

CARGO OPERATIONS - TUG / TUGS AND BARGES

1. Identify the type of unit you are sailing on, ATB, ITB, conventional Tug and Barge, Harbor Tug. Fully explain the differences between each type of unit as well as the advantages and disadvantages of each. Where did you operate? Where can you operate?

2. Fully describe the vital characteristics of your vessel; size, horse power, steering system, maneuvering capabilities, cargo type and capacity, etc. What arrangements did the boat have to make her mission easier; second wheelhouse, twin screws or Z-drives, fendering system, winches, etc?

3. What is the nature of your work day? If on a harbor tug, do you stay on the boat all day or go ashore? What is the call back time, if applicable? If on an ocean-going unit or an inland unit, fully identify and describe your typical work day.

4. Fully describe the connection devices your unit uses.
   a. If on an ATB or ITB, what is the size of the lock arms? What type of braking system is there? What is the holding power? Who designed the system?
   b. If on a conventional tug and tow, describe the towing arrangement, single or bridle, towing winch manufacture horse power, size of wire, length of wire, braking system and strength, etc. How often is the wire/bridle replaced?
   c. If on a harbor tug, what kind of lines does your boat have and for what purpose? What are the breaking strains of each? When/how often are the lines replaced? Does your unit have tension winches? If so describe in detail the settings.

5. Include a picture or detailed diagram of:
   a. If on an ATB or ITB, the locking arm/pins (connection) either with or without the badge connected.
   b. If on a conventional tug and tow, the barge made up "in the notch", alongside, or towed astern.
   c. If on a harbor tug, the boat made up to a ship for dock assist.

6. Make up and break apart. ATB/ITB, fully describe the steps for connecting and disconnecting the tug and barge. Conventional tow, what are the primary factors used in deciding to tow or push? Fully describe the steps for each, both making up and disengaging Harbor tug, fully describe the steps for making up and disengaging from a ship.

7. What safety precautions are taken by those crewmembers who work on deck during all vessel operations and what equipment/vessel arrangements is/are provided to make their jobs safer?

8. Tell one interesting story about operations on board, difficulty connecting to the barge, breaking the tow wire, parting a line, or similar.

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CARGO OPERATIONS - TUG / TUGS AND BARGES - INLAND

1. Identify the type/style of boat you are sailing on; a fleet boat, a jackup boat, a Viking style, etc.? Fully explain the differences between each type of boat as well as the advantages and disadvantages of each

2. Fully describe the vital characteristics of your vessel; size, year built, horse power, steering system, maneuvering capabilities, maximum barges it can move, etc. What arrangements did the boat have to make her mission easier; second wheelhouse, steering wheels or levers, twin screws or Z-drives, fendering system, winches, etc.?

3. What is the nature of your work day? What hours do you work, where do you report, what do you do, etc. Fully identify and describe your typical work day.

4. What kind of run are you on? Is it a scheduled run, are you on charter, a line-haul boat, turn boat etc., and explain what that run entails, and what rivers, and ports you visit.

5. Print out a map of the continental United States and highlight all the rivers you navigated on, and write a brief synopsis on each river. Describe the river flow rate, was the river natural, or was it man made? Were there any interesting landmarks, historical areas etc.

6. Fully describe the stages of all the rivers you were on during your voyage. Describe how much water was running at that time, was it high water, or low water?

7. Describe in detail your vessel's procedures for entering and exiting locks. How many men were required to bring the tow in? Did you have to break tow to fit? How many lines were used? What was the names of the locks you visited during your voyage?

8. Fully describe the tow configuration. Did the barges have fixed rigging, or did you need portable rigging? How many parts where required per coupling? What leads were used at each coupling, do you have a towing lead on the head, or a backing? During your transit, did you use safety lines? If so; how many, and where were they placed?

9. Include a detailed drawing of your tow made up identifying all rigging and connection points.

10. Spend time in the wheelhouse observing the Pilot or Captain make bends Was the tow ever so long that they needed to flank in order to make the bend? Describe this maneuver and why it is used.

11. Did your vessel have an engineer? If so was he/she non-licensed? If it did not, who was the Deckengineer? Did you do engine checks? What was required when making rounds of the engine room? Did you do any engine maintenance?

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CARGO OPERATIONS - OTHER - NOT UNDER ONE OF THE PREVIOUS CATERGORIES

1. Describe, in detail, the type of vessel you are assigned to.

2. Describe the original purpose of the construction of your vessel. Was it designed for the purpose it is being used for now? If not what was it used for. How was it altered to fit the purpose it is being used for presently?

3. Describe in detail the special construction of your vessel required for its present purpose.

4. Describe in detail the special operations your ship engaged in while you were assigned.

5. Does your vessel have any special maneuvering characteristics? Provide a copy of the maneuvering diagram that is posted on the bridge. Was this referred to by the conning officers and/or pilots? How did the actual ship respond compared to the diagram? What special techniques are utilized by the shiphandler for maintaining position, station keeping, docking, undocking, turning, etc.

6. Is your vessel equipped with any special directional control devices? : Bow thrusters, Stern thrusters, Dynamic Positioning Systems, Directional Controls, special helm devices etc. Describe these in full, and also describe their use as you observed.

7. If you vessel occasionally goes to sea, to transit to another port for work, or shipyard, what special precautions must the crew take to ready it for a sea passage? Safety, securing, hatches, ports etc.

8. Due to the construction of your vessel, what special safety precautions must be taken to protect the crew while undergoing "Cargo Operations"? Describe how these are enforced, crew attitudes towards them, and any incident you observed aboard the vessel.

9. Describe in detail the navigational equipment used to monitor the vessel's position while undergoing "Cargo Operations".

10. Describe in detail the "Cargo Handling" equipment used aboard the vessel. How was it operated? What does it do? How many people are needed to run it? What maintenance is required of it? Did it break down while you were aboard? Did it break down recently? Why, and how was it repaired?

11. If allowed the opportunity to shiphandle describe in detail handling characteristics and how the vessel responded to your commands.

REMEMBER: If you are utilizing this section, you must have the Master document that the vessel, rarely, if ever, traveled outside the sea buoy.

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SECTION F - FIREFIGHTING & LIFESAVING (*15 points*)

Complete the following by explanation and drawings/photographs as required/necessary.

1. Describe AND LIST what SOLAS and/or the US CFRs require aboard a vessel of the type and size of the ship you are on in regard to lifeboats, liferafts, and liferings. Does your vessel comply fully with them, and if it differs, how and why?

2. During monthly lifeboat/safety inspections, accompany the ship's officer conducting these inspections. Record results and include a copy of paper work and examples of log entries.

3. Was your vessel equipped with a "Rapid-Release" off-the-stern type lifeboat? If so, detail its construction and equipment. Include details on davit data, testing, special training etc that would be required for a mate onboard a vessel with this special lifeboat. Describe special USCG regulations regarding these craft: When are they required to be released? How are they recovered? How many are required? Where must they be located? Did your vessel release the boat while you were aboard. Describe in detail the operation of that actual release, or one that a crew member can describe to you that occurred previously.

4. Describe all liferafts found on your vessel. How many people did they hold? Detail who was assigned to these rafts (if anyone). Why were the liferafts placed where they were? How were they to be launched? How were they secured? Describe the hydrostatic release mechanisms if equipped. Describe the weak links provided. Did your vessel have any trouble with liferafts in the past? How frequently are the life rafts serviced? Who does this and when? Provide a photo or sketch of a typical installation.

5. Write up a complete synopsis of the Fire/Boat Drill for your vessel from the captain's and chief mate's planning of the drill to any required log entries, and company notification.

6. Identify who is the safety officer under ISM aboard your vessel and what his/her duties entail. Write up a short synopsis of a monthly safety meeting and detail all company paper work and notification relative to the safety meeting.

7. Explain in detail operations associated with and include copies of any forms relative to:
   - Tank entry procedures for your vessel.
   - Going aloft procedures for your vessel.
   - Lock out Tag out
   - Working over the side procedures for your vessel.
   - Any other operations that require permitting and or completion of forms.

8. List the location of all the Emergency Equipment Lockers aboard your vessel. List the equipment required by SOLAS or the US CFRs to be in the locker. List all additional equipment found in the locker(s) on your ship.

9. Describe all Personal Protective Equipment (PPE) required by your vessel's company. i.e.: Hard hats, safety shoes, gloves, long sleeves, safety glasses etc. How were these requirements enforced? Did the crew accept them, or was there resistance to them? What were the reasons behind the resistance?

10. Describe the USCG and FCC required GMDSS Equipment found aboard your vessel. What tests are required: daily, weekly and monthly, to ensure proper GMDSS equipment operation and describe in ***detail*** how they are done. How are repairs handled with this equipment? Does your vessel have a licensed person aboard who can repair it? How are normal messages handled? Does your ship have the capability to send and receive email? Was this ability extended to the crew? Who could send what and when? Does your vessel receive chart corrections, and/or notice to mariners over the satellite system? Did your ship receive any distress calls over the GMDSS system while you were aboard? How were they handled? How was the NAVTEX used for both weather and safety information. Were specific areas selected? Who set them? Did you have an opportunity to change areas while aboard? Was the information provided by NAVTEX of use to your vessel?

11. Describe in detail any special precautions taken for Piracy while aboard. If you did not have first hand experience with these, detail how your vessel handles traveling and working within waters that have a piracy threat.

12. Describe the Fast Rescue Craft aboard your vessel if so equipped. Was it used while aboard? Who maintains and tests it? What procedures are there for lowering and raising the craft? What is its capacity? What type of engine and Horse Power is it equipped? What is the top speed? Who aboard your vessel has Fast Rescue Craft certification?

SECTION G - RULES OF THE ROAD (*10 points*)

1. Describe at least **FIVE** actual situations under varying conditions in which you observed the application of the steering and sailing rules.
   Provide a RAPID RADAR PLOT of each case clearly illustrating the situation and resolution. The written report referencing time of day, sea room, number of vessels involved, visibility, and action taken. Specifically state which rule applied to the situation, how your ship handled that rule and the results of the action. You are encouraged to quote pertinent sections of the COLREGS in your discussion.
   Have each report initialed by officer of the watch on which the cited incident occurred with his/her comments.

Describe in detail your vessel's Rules of the Road equipment. Specifically address in your description the following:

2. Describe: the construction of lights; materials of cases and lenses; manufacturers; wattage of bulbs in different lights. How are lights powered? Which systems power the lights? Emergency power is found where? What if total loss of power occurs? What are minimum ranges of lights on your vessel? How are lights tested? When are they tested? How are these tests logged? Who logs them? What is normal practice of operation of these lights? What procedures are there should one of the lights burn out, or become damaged? Are there any special safety considerations?

3. Describe the construction of day shapes. List the day shapes your vessel has on board? Which shapes did you see used? How were they displayed? How are other shapes displayed? Who is responsible for the upkeep of the day shapes? Where are they stowed?

4. Describe sound signal apparatus on board – whistle, horn – their manufacturer, type (steam, air, etc.). When are they used in Rules of the Road situations? Describe the automatic sounding mechanisms. Describe the manual sound signaling apparatus aboard for making the prescribed sound signals. Regarding bells and gongs, describe their construction and use on board your vessel. Are there any automatic sound signaling devices aboard that mimic the bells and gongs? Describe it and its operation fully. Provide photo or sketch of bell and gong.

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APPENDIX I - Master's Evaluation

FROM: Chairman, Department of Marine Transportation
TO: Master of Vessel Participating in Commercial Shipping Program
SUBJ: Cadet Evaluation

Dear Captain:

I would like to thank you and your officers for your efforts in making this cadet's Sea Term a positive educational experience. The Department of Marine Transportation at Massachusetts Maritime Academy is working diligently toward "shipping out" a young man or woman with the best possible skills and attitude. Hopefully, a cadet with these qualities will be able to learn a great deal about your ship and the profession of a merchant marine officer while contributing to the vessel's operation.

To enhance the cadet's learning processes while on board, we have required that the cadet complete a Sea Term Project for grading upon return to the Academy. The Project stresses Navigation, Vessel Familiarization, Safety, and Cargo Operations. It is independent in nature, guiding the cadet in gaining the most out of his or her time while aboard. We request that you take the above into consideration while completing the Academy's Cadet Evaluation Form. The grade you award the cadet in this evaluation will be averaged as one quarter of the Sea Term grade. Due to the large percentage of the cadet's grade awarded by you, we request you offer him/her a mid-voyage evaluation to review performance and to allow for improvement, if required.

The assignment of this cadet within the watch or work schedule is your decision. We would like you to consider placing him/her on an eight-hour day minimum, possibly four hours on the bridge watch and the remainder on licensed type deck work. This particular arrangement will provide for maximum exposure to different functions aboard your ship. Other than under extraordinary circumstances, the cadet is expected to be assigned to your vessel for a minimum of 60 days.

The cadet has been tasked with completing several assessments while aboard your vessel, should you or your officers be willing to assist with them. If you or your officers are willing and are qualified assessors, we appreciate the assistance provided in training and assessing the cadet. The cadet will provide an assessment sheet detailing the assessment criteria which should be signed when they have satisfactorily completed the assessment. They will also need a copy of the assessor's qualified assessor certification in order to get credit for completing the assessment. We thank you in advance for any assessments that you or your crew are willing and able to perform.

I have tasked the cadet with the responsibility to arrange a time with you prior to his/her discharge for a review of your final evaluation. Please review your final evaluation with the cadet and provide him/her with a copy for their project. Please insert another copy into the envelope addressed to me, Linda Letourneau, seal it, sign over the seal and place clear tape over your signature and then give this to the cadet as well.

If you or your officers are in any way dissatisfied with the cadet's performance, please contact me immediately so that the appropriate action may be taken.

Sincerely,

Linda Letourneau

CDR Linda Letrouneau
Chairman, Department of Marine Transportation
Tel. 508-830-5000, Ext. 2107: email: lletourneau@maritime.edu

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APPENDIX 1 - Master's Evaluation - MMA - MT - COMMERCIAL SHIPPING PROGRAM

Cadet Name _____ Vessel Name _____

Date Joined: _____ Date Discharged: _____ Days aboard_____

Please grade the above cadet in reference to the categories listed: ***Grade A thru F, A being best, F being worst.*** Use grades of A, A-, B+, B, B-, C+, C, C-, D+, D, D-, or F. Equivalent number values can be found in the grading section of this project. Please place a **N/A if not applicable** or **N/O for no opportunity to observe.**

Personal Skills: How did this cadet perform in the following personal skills compared to other cadets you have sailed with?

CATAGORY	COMMENTS	GRADE
Attitude		
Appearance		
Initiative		
Punctuality		
Orderliness		
Ability to work with unlicensed		
Ability to work with Officers		
Ability to Communicate Effectively		
Ability to solve problems		
Ability to seek help at proper time		
Ability to follow orders		
Ability for following through		
Creativity and Critical Thinking		
Interest in the job		
Ability to accept criticism		
Computer Skills		

Professional skills: How did this cadet perform in the following professional skills compared to other cadets you have sailed with?

CATAGORY	COMMENTS	GRADE
Safety		
Watchstanding - Overall		
Lookout		
Piloting - Terrestrial		
Celestial Navigation		
Rules of the Road		
Radar/ARPA		
ECDIS/AIS		
Radio - GMDSS - Coms		
Cargo - specify oil/dry or RoRo		
Seamanship Skills		
Shipboard Nomenclature		

You are encouraged to include any additional comments on the back of this form, or by attachments.

_____ _____

Signature of evaluator Printed name of evaluator

Ship's Seal

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APPENDIX II - Requirements for "Tankerman PIC" Eligibility: Experience

Documentation of Service and Recency requires presenting seaman discharges.
Documentation of Transfers requires presenting letters from either the company or vessel's master stating the applicant has participated in transfer(s) of dangerous liquid cargoes. The service letters must include a list of transfer dates, number of transfers, classification of cargo (DL or LNG), kinds of transfers the candidate participated in, and the number of transfers that involved commencements or completions.
[Title 46, Volume 1, Parts 1 to 40]
[Revised as of October 1, 1998]
From the U.S. Government Printing Office via GPO Access
[CITE: 46CFR13.203]
[Page 222]

TITLE 46 - SHIPPING

CHAPTER I - COAST GUARD
DEPARTMENT OF TRANSPORTATION

PART 13 – CERTIFICATION OF TANKERMEN – Table of Contents

Subpart B – Requirements for "Tankerman-PC" Endorsement
Sec. 13.203 Eligibility: Experience

Each applicant for a "Tankerman-PIC" endorsement for DL or LG shall meet the requirements of either paragraphs (a) and (b) or paragraph (c) of this section.

(a) Each applicant shall present evidence of –
  (1) At least 90 days of service as a licensed deck officer or a licensed engineering officer on one or more tankships or self-propelled tank vessels certified to carry DL or LG appropriate to the endorsement applied for;
  (2) At least 90 days of unlicensed or cadet service on deck or in the engine department on one or more tankships or self-propelled tank vessels certified to carry DL or LG appropriate to the endorsement applied for; or
  (3) A combination of the service in paragraphs (a)(1) and (2) of this section.
(b) Each applicant shall present evidence of participation, under the supervision of a "Tankerman-PIC," in at least 10 transfers of liquid cargo in bulk of the classification desired on tankships or self- propelled tank vessels, including at least –
  (1) Five loadings, and five discharges;
  (2) Two commencements of loading and two completions of loading; and
  (3) Two commencements of discharge and two completions of discharge.
(c) Each applicant already holding an MMD endorsed "Tankerman-PIC" for DL and seeking an endorsement of LG, or the converse, shall –
  (1) Provide evidence of at least half the service required by paragraph (a) of this section; and
  (2) Comply with paragraph (b) of this section, except that he or she need provide evidence of only three loadings and three discharges along with evidence of compliance with paragraphs (b)(2) and (3) of this section.

  [CG 79-116, 60 FR 17142, Apr. 4, 1995, as amended by CGD 79-116, 62 FR 25134, May 8, 1997]

Polar Tankers, Inc.
3900 Kilroy Airport Way
Suite 210
Long Beach, CA 90806
T. 562 2
F. 562 2

To: Officer in Charge – Marine Inspection – REC
U.S. Coast Guard

From: [redacted] - Master
M/T Polar Discovery

To Whom it May Concern,

[redacted] has observed the transfer of cargo and ballast on the dates indicated below while serving in the position of Deck Cadet aboard the Motor Tanker Polar Discovery. The Polar Discovery is classed +A1 E "Oil Carrier" by the American Bureau of shipping and carries Dangerous Liquid Cargoes.

Loads:	Discharges:
1/1/05	1/6/05
1/19/05	1/10/05
2/6/05	1/11/05
	1/27/05
	1/29/05

Commencements:	Completions:
1/1/05	1/6/05
1/19/05	1/27/05

[redacted] has demonstrated to my satisfaction to be fully capable of: supervising the transfer of liquid cargo, pre-transfer inspection and conference, execution of the declaration of inspection, connection of cargo hoses or loading arms, line-up of cargo system for loading or discharge, start of liquid flow during loading, start of cargo pumps and increase to normal working pressure, calculation of loading rates, monitoring and topping off of cargo tanks during loading, stripping of cargo tanks, ballasting and de-ballasting and securing of cargo systems.

Respectfully Submitted,

Master's full Name

License number

Master's signature & date

Polar Discovery
Vessel

1137026
Official number

85,387MT
Gross Tonnage

PTI Letterhead Rev – 1 (10/03)

Company Name U.S. Shipping LLC Company Address P.O

Ed

Tel: 1-8

FAX: (7

Date: February 20, 2004

PROOF OF SERVICE LETTER
TANKERMAN-PIC ENDORSEMENT APPLICATION

To Whom It May Concern:

Per the requirements for application for the Tankerman - PIC endorsement as referenced in 46CFR 13.127 (a); 46CFR 13.203; and 46CFR 13.205, please be guided by the following:

Cadet _____ SSN _____, was

Assigned to the vessel ITB Philadelphia, from December 21, 2003

To February 20, 2004 and participated in: 14 transfers of the following bulk

Liquid oil and/or chemical product(s) from commencement through completion of the transfer(s):

DATE	PORT	PRODUCT	OPERATION
12/21/03 - 12/22/03	Port Everglades, FL	Low Sulphur Diesel, Premium and Reg. Gasoline	Commencement of Discharge and Stripping
12/25/03 - 12/26/03	Norco, LA	Low Sulphur Diesel, Premium and Reg. Gasoline	Commencement of Loading and Topping off
12/31/03 - 12/31/03	Port Everglades, FL	Low Sulphur Diesel, Premium and Reg Gasoline	Commencement of Discharge and Stripping
1/4/04 - 1/5/04	Norco, LA	Low Sulphur Diesel, Premium and Reg Gasoline	Commencement of Loading and Topping Off
1/9/04 - 1/10/04	Port Everglades, FL	Low Sulphur Diesel, Premium and Reg Gasoline	Commencement of Discharge and Stripping
1/13/04 - 1/15/04	Norco, LA	Low Sulphur Diesel, Premium and Reg Gasoline	Commencement of Loading and Topping Off
1/18/04 - 1/19/04	Port Everglades, FL	Low Sulphur Diesel, Premium and Reg Gasoline	Commencement of Discharge and Stripping
1/22/04 - 1/23/04	Norco, LA	L.S. Diesel, Jet Fuel Premium and Regular Gasoline	Commencement of Loading and Topping Off
1/25/04 - 1/27/04	Port Everglades, FL	L.S. Diesel, Jet Fuel Premium and Reg Gasoline	Commencement of Discharge and Stripping
1/31/04 - 2/01/04	Norco, LA	L.S. Diesel, Premium and Regular Gasoline	Commencement of Loading and Topping off

The above named Cadet satisfactorily demonstrated he/she is fully capable of supervising transfers of liquid cargo including [Cross out any item that does not apply.]:
(1) Pre-transfer inspection; (2) Pre-transfer conference and execution of the Declaration of Inspection; (3) Connection of cargo hoses or loading arms; (4) Line-up of the cargo system for loading and discharge; (5) Start of liquid flow during loading; (6) Start of cargo pump and increase of pressure to normal discharge pressure; (7) Calculations of loading-rates; (8) Monitoring; (9) Topping-off of cargo tanks during loading; (10) Stripping of cargo tanks; (11) Ballasting and deballasting, if appropriate; (12) Disconnection of cargo hoses or loading arms; and Securing of cargo systems.

PHILADELPHIA Official #654192 NEW YORK, N.Y.

Mass. Maritime Academy
101 Academy Drive
Buzzards Bay, MA 02562
(508) 830-5040
FAX: (508) 830-5042

Sincerely,

_____
Master

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APPENDIX III
Commercial Shipping Program
Grade Sheet Summary

Name of Cadet: _____

Name of Vessel: _____

	Points Available	**Points Awarded**
Journal	**6**	
Vessel Information	**4**	
Navigation		
Voyage Plan	**20**	
Celestial Navigation	**20**	
Ship's Business	**10**	
Ship Familiarization - General	**15**	
Ship Familiarization - Bridge Equipment	**15**	
Bridge Operations	**15**	
Cargo Operations	**20**	
Fire Fighting & Lifesaving	**15**	
Rules of the Road	**10**	
Extra Credit		
Sea Project Score	**150**	
Masters Evaluation	**50**	
Total Score	**200**	
Total Score divided by 2	**100**	
Letter Grade		

Evaluator: Name _____ Signature _____

Date _____

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Cadet Name _____

Navigation Total -- Voyage Plan Portion	**MAX PTS 15**	
Voyage Plan Spreadsheet	**MAX PTS 4**	
Voyage Plan with Chart Submitted	**MAX PTS 11**	

As a minimum, chart preparation shall include labeling of:

ITEM	Pilotage	Landfall	Arrival/ Departure
Intended track lines with true courses	X	X	X
Distance to run for each leg	X	X	X
Waypoints identified by letter or numeral with total distance to go to end of transit	X	X	X
Prominent navigation aids for visual bearings	X	X	X
Optimal radar contours for radar fixing and parallel indexing (When available)	X		X
Parallel indexing information on each leg (When available)	X		X
Significant navigation events like passing a buoy close aboard or conspicuous hydrographic features	X	X	X
Turn bearings on objects nearly ahead or astern on the next leg adjusted for the ship's advance and transfer at transit speed and water depth	X		X
Calculated stage of tide by table for each leg	X	X	X
The minimum depth along the track on each leg	X		X
Minimum depth contours, all areas with depths less than the predetermined minimum depth, along the entire transit and mark the minimum depth contours with a bright high-lighter pen	X	X	X
Graphic indication of expected set and drift of current on each leg	X	X	X
Danger bearings if available and identify same on the chart	X		X
Emergency anchoring locations on the chart (When available)	X	X	X
Areas on the chart where because of very shallow water or traffic, extra precautions must be observed and speed reductions considered	X		X
Computation of luminous and computed geographic visibility of each primary navigation light during approach and label arcs of visibility		X	
Locations where VHF communications with VTS (port authorities) are mandated.	X	X	X
Informational notations regarding but not limited to:			
• deceleration points if applicable,	X	X	X
• pilot boarding/embarkation locations, if applicable,			X
• where to call the captain,		X	X
• where to test gear		X	
• call out the gang	X	X	X
• tugs alongside	X		X

Tidal height and predicted current at the docking/undock time **for each port** visited by the vessel every time visited. No more than four for each docking or four undocking at any one port. ***MUST BE HAND CALCULATED!!!***	**MAX PTS 5**		

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Celestial Navigation Observation Record Sheet

Observation Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Pre-compute A.M. Star Time															
Pre-compute Sunrise															
***Pre-compute any celestial body other than the sun @ transit(ie. Venus)															
***Pre-compute LAN time and altitude at LAN															
Pre-compute Sunset															
Pre-compute PM Star time															
Amplitude of sun and comparison															
Azimuth of sun and comparison															
Observation of a geographic range and comparison															
Azimuth of Polaris and comparison															
Azimuth of Star and comparison															
Noon/Daily Position report including propeller Slip															

WRITE THE DATE AND THE NAVIGATION JOURNAL PAGE NUMBERS OF WHERE EACH OBSERVATION IS CALCULATED IN THE APPROPRIATE SQUARES ON THIS SHEET.

***Precomputation of LAN and any other body at transit MUST include the exact time of transit and the expected altitude of transit.

NOTE: See scoring pages that follow. Failure to complete this sheet will result in a 20% point reduction for this section

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Cadet Name _____

Total Calcula-tions	**Number Provided**	**Celestial Navigation**	**MAX. PTS 20**	
		Rising/Setting/Transit Phenomena	Max. Pt Value	Points Awarded
15		Pre-compute A.M. Star Time	2	
15		Pre-compute Sunrise	2	
8		Pre-compute any celestial body other than the sun @ transit (e.g. Venus)	1	
15		Pre-compute LAN and altitude at LAN	2	
15		Pre-compute Sunset	2	
15		Pre-compute PM Star time	2	
8		Amplitude of sun and comparison	1	
15		Azimuth of sun and comparison	2	
7		Observation of a geographic range and comparison *(Refer to American Practical Navigator, Bowditch for explanation)*	1.5	
4		Azimuth of Polaris and comparison	1.5	
4		Azimuth of Star and comparison	2	
Optional		Amplitude of any celestial body other than the sun and comparison - *optional*		
5		Noon Position report including propeller Slip	1	
126		**TOTAL POINTS AWARDED**	**20**	

NOTE: The Maximum Points shown on the right side of the table is *for A work*. Less than that will be adjusted accordingly to arrive at your total.

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Cadet Name _____

SHIP'S BUSINESS	**MAX PTS 10**		
	Max. Pt. Value	Points Awarded	COMMENTS
1. What is the purpose of the Certificate of Documentation? What are operational endorsements if your vessel is documented? Who issues the document? (Or equivalent for foreign flagged vessels). How is this document updated and/or renewed?	**0.5**		
2. What is the Official Logbook? Who maintains it? List the entries required by law. What is its ultimate disposition? What is the difference between Official Logbook and company logbook? Describe logbook procedures for your vessel. Copy or sketch a sample (blank) page of your ship's company logbook, and include in this section	**1.0**		
3. What is your ship's official number issued by the USCG? What is its IMO number? Where are these numbers posted and why? What are their functions? Provide photos and/or sketches of both.	**0.5**		
4. Describe as much as possible who performs the duties of the Vessel Security Officer and what are his/her duties? Who is your Company Security Officer and what are his/her duties. Did you have security duties as a cadet? If so, explain. What instructions and guidance on the vessel security did you receive on board?	**1.0**		
5. What security levels has your ship encountered while you were aboard? How would your ship be notified if a port's security level has changed? Is the crew of your vessel aware of current security levels? Do they take it seriously? Is there an active gangway watch? Have you witnessed, or has the ship previously been involved in a security threat? What are the basic security procedures that your vessel has available to it? What additional items are added as threat levels are increased? What is done during a security drill? What special security precautions are in place on your vessel? What happens aboard your ship or in a port facility when security levels change in a port?	**1.0**		
6. Name and describe all union(s) on board and their representation structure on board. Describe how these unions work aboard, how the crew and officers feel about them, how they help or hinder relations and work. Is there segregation aboard?	**1.0**		
7. Discuss the shipboard familiarization procedures from signing onboard until assuming his/her first watch under STCW and ISM. Do this for you as a cadet, and for a typical officer and crewman signing on.	**1.0**		
8. Discuss the following documents: Note of Protest, Notice of Readiness, Certified Crew List, and Cargo Manifest. Provide copies of completed forms if possible, or blanks if not	**0.5**		
9. What are the STCW 95 regulations pertaining to rest periods, generally, and to your vessel and its operations specifically. Discuss measures taken on your vessel to deal with STCW rest period issues. How did the Capt. manage his mates to ensure the most rested officer would be on the bridge when the Mate was deeply fatigued from cargo ops? Provide a copy of a rest hours log, including your own completed form if used.	**1.0**		

SHIP'S BUSINESS (Cont.)	**MAX PTS 10**		COMMENTS
10. Fully describe the vessel's Certificate of Inspection. Include a photocopy in your sea project. Who issues it? Where is it required to be posted? What are the manning requirements for your vessel? What tonnage requirements do the officers need to serve aboard your vessel? Describe the work necessary by the vessel to prepare for issuance of the certificate of inspection (COI). Why is it an important document?	**1.0**		
11. Describe the ship's Pollution Response Plan? Who wrote it? What would your ship do in the event of a spill? Who is your QI? How would the call be made? Are there emergency procedures for other events? Provide copies if possible.	**0.5**		
12. Describe the ship's Waster Management Plan. Who wrote it? Explain completely how your vessels disposes of all types shipboard waste and garbage covered by the plan. Include a copy of the Garbage Record Log.	**0.5**		
13. Provide copies of your vessel's Standing Orders, Captain Specific Standing Orders (If any), Night Orders.	**0.5**		

Cadet Name _____

SHIP FAMILIARIZATION - GENERAL	**MAX PTS 15**		
	Max. Pt. Value	Points Awarded	COMMENTS
1. Describe in detail (include copies of any plans) vessel's anchor windlass. What type is it: Electric, Steam, Hydraulic? What training on them does a newly joining crew member receive? What is the heaving capacity of your windlass. What is the Maximum brake holding power of the windlass? How much chain is on each windlass? how much chain can the windlass heave? Can it pick the anchor and the entire chain straight up off the bottom? How fast can the windlass heave in the anchor? Describe the anchoring procedures for your vessel in shallow and deep water.	**1.0**		
2. Describe in detail (include copies of any plans) vessel's mooring winches. What type are they: Electric, Steam, Hydraulic, Self-tensioning? What training on them does a newly joining crew member receive? Provide copy of operating instructions: Provide: • Max Brake Holding Power - and at what layer of line is that? • Max Heaving Power • Max Size line winch can hold Size and type of line on the winch, with a copy of the line's certificate, which will show breaking strength etc. • Procedures for testing the winch brakes • Policy for inspecting and replacing wires or lines, end for ending • Info on any Mooring Pendants - size, construction, breaking strength, stretch and special shackles used (describe their deployment and retrieval if used)	**1.5**		
3..Describe and sketch all the types of mooring fittings on board: chocks, bitts, fairleads, etc,. Describe their use and limitations. List their maximum capacities. List problems pros and cons for each type.	**1.5**		
4. Describe the ship's steering gear. Obtain and include copies of general arrangement plans if possible. How do regulations affect tankers' steering gear, vs. cargo vessels? (Change over, duplication etc.) Describe in detail, ship's change over procedures, emergency and manual. Describe in detail ship's procedures for testing steering gear, (pre-arrival & pre-departure). Who wrote the procedures? When are these operations done, where are they done, who does them? Supply a copy of the ship's procedures if available. Were those procedures posted, and where? Where can the vessel be steered from? Are there any navigational areas where special procedures (i.e. man in the steering gear flat) are followed? How does the bridge and engine room monitor the performance of the steering gear? (video cameras, alarms). Describe any failures that occurred while you were aboard, and actions taken. What is the maximum degrees your ship's rudder can turn? When the command is given for hard right or left rudder, how far does the master want the rudder put over? Why?	**1.5**		

SHIP FAMILIARIZATION GENERAL (Cont.)	Max. Pt. Value	Points Awarded	COMMENTS
5. Load lines. How are drafts logged in the vessel's log book? By who? When? Sketch, describe and comment on all lines/symbols painted on the side of your ship? Does your ship have a changeable tonnage? Does it have two load lines? Which tonnages (International or Domestic) are used for most of your ship's work? What do the pilot's require and why? Discuss differences in numbers for both systems for your vessel and why they are there	**1.0**		
6. Explain all emergency escape routes from all spaces on the ship. Include engine room spaces, steering gear, inside houses. Describe emergency lighting methods and markings of all escape routes. Which routes are marked? and why. In engine room, describe the normal entry and exit points. Who uses these and when are they not used?	**1.0**		
7. Describe your ship's propellers (diameter and pitch, right hand/left hand, material, replaceable blades). If a variable pitch, describe its operation and special precautions. If twin screw, describe special maneuvering and operations with them. How is the prop attached to the shaft? What maintenance if any is done to the prop? Explain in detail how maintenance is done. Has the ship ever lost or damaged a prop? If so, how was it repaired or replaced? If not, is a spare kept aboard or where can ship obtain replacement?	**1.0**		
8. Describe in detail the bow thruster(s) that your vessel was equipped with. Include manufacturer, type, horsepower, maneuvering effectiveness diagrams (bridge). Describe in detail the actual operation from call out of manpower to check and line up, to start up operation and securing details. How effective was the bow thruster(s) on your vessel. Describe any malfunctions or unusual operations with the thrusters.	**1.0**		
9. Describe in detail what type of power plant your vessel was equipped with. How did it affect maneuvering and operation of the vessel? What was the Critical Range of RPMs if any and how were load up and load down procedures incorporated on a diesel equipped vessel? How did minimum RPM (dead slow) affect your maneuvering on a diesel equipped vessel? Describe in detail the operation and control of your vessels propulsion? Where could it be controlled? What benefits were obtained from this type of propulsion system? Are there any drawbacks to the system? Describe its operation in detail. Describe any problems or unusual occurrences that happened while you were aboard. Did the ship's officers consider the horsepower adequate for the size of the vessel? If not, why? Include a complete description of the vessel's generators including number, types, size, and operation.	**1.5**		
10. Did your ship come under any Ballast Water Exchange requirements? Describe in detail, the procedures for ballast water exchange if required for your vessel. (Not only if it occurred while you were onboard). Provide a copy of any procedures, certificates and/or logbook entries associated with this operation.	**1.0**		

SHIP FAMILIARIZATION GENERAL (Cont.)	Max. Pt. Value	Points Awarded	COMMENTS
11. Arrange to spend at least part of one maneuvering watch in the engine room to witness the activities within the engine room during a transit. Discuss who was on watch there, and why. What duties did each perform? Were there double check? List and describe all activities occurring during your observation: Blowing tubes, tip cleaning, slow downs, speed ups, manual control. Describe any major alarms that went off while you were there and their causes. List all the "little" alarms that occurred. Describe any problems or special operations that occurred while you were in the engine room.	**1.0**		
12. Fully describe the emergency towing arrangement for your vessel. Explain the vessel's emergency towing procedures. Has it ever been deployed? If so, when – describe the situation? Are any drills or practice of rigging conducted?	**1.0**		
13. Select and trace one of the following systems; Bilge (engine room and/or cargo spaces), Ballast, or Fire Main. Draw a neat diagram using a straightedge and standard symbols that accurately reflects the system. Thoroughly explain purpose of system.	**1.0**		

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Cadet Name _____

SHIP FAMILIARIZATION - BRIDGE EQUIPMENT	**MAX PTS 15**		
	Max. Pt. Value	Points Awarded	COMMENTS
1. Provide a copy (readable electronic photo or photocopy) of your vessel's posted maneuvering characteristics. Was this information used by your vessel's navigating officers?	**0.5**		
2. Describe the installation and use of ECDIS aboard your vessel, if so equipped. Describe why your vessel is not completely qualified to sail without paper charts, (If it does not have an official ECDIS system). If not completely equipped for ECDIS, describe in detail all the equipment that your vessel has for electronic navigation: include charts, chart systems, radars, ECDIS type monitors. How are chart corrections done with the electronic charts? Who is responsible for correcting the electronic charts, and how are the corrections received? How does your vessel make use of electronic charts and ECDIS type monitors? What problems have been encountered with them, and what special precautions are in place with their use, if any?	**1.5**		
3. Describe in detail the ship's magnetic compass(es), and the binnacle they sit in. Include manufacturer, position aboard ship, ability to view from helm, lights, covers etc. What type of compensation system did it have. Include pictures or sketches of the binnacle and its adjusting devices: Flinders Bar, Magnets, Quadrantal Spheres, etc. Detail how magnetic compasses are actually used in the day to day navigation of the vessel. When was last "swinging of the compass"? Did you observe? If so, detail the operation observed. If not, describe, from someone who was there, how the ship swung her compass for compensation purposes. Provide a copy of the Compass Deviation card(s) in place on your vessel for each magnetic compass mounted. Copy the log book entries that were made for the compass swinging and/or compensation.	**1.5**		
4. Describe in detail the rate of turn indicator your vessel is fitted with. How was it used while aboard? Used for constant rate turns? Check on swing by helmsman? Etc.	**0.5**		
5. Describe in detail the fathometer onboard. Who made it and what features did it have? Did it have a recording machine? How and when was the recording mode used? Was the paper initialed by officer starting it up? Was fathometer checked/tested as part of pre departure or pre-arrival equipment checks? How was the testing actually done, and how was the test logged? Any calibration done with the fathometer while aboard? When was it used? Were depth alarms used? Describe their use. Were problems with false alarms encountered? How were they overcome? What unit of measurement was commonly used: Meters, feet, fathoms. Were the fathometer readings normally checked against positions obtained by the officers? Where is(are) the sensor(s) located on the ship's hull?	**1.0**		

SHIP FAMILIARIZATION BRIDGE EQUIPMENT (Cont.)	Max. Pt. Value	Points Awarded	COMMENTS
6. Describe in detail the radars installed. Types, manufactures, ability to cross over. Where were scanners placed, and how did this limit their effectiveness? Were there any blind spots or problems / difficulties observed with the radars while you were aboard? How were radars used when at sea and in port? Who used which radars and why. How was long range scanning used when in reduced visibility? What scales were commonly used while at sea, making landfall, in reduced visibility and/or in pilotage waters? Was parallel indexing commonly used? Describe in detail the normal usage of the ship's radars: Were EBLs and/or Nav Lines used?	**1.5**		
7. What type of weather fax machine did your vessel carry, if any? Who obtained wx faxes and when? What was the quality of these faxes, and were any difficulties observed when attempting to receive them? Did your vessel subscribe to a routing service that recommended a specific route based upon forecasted weather? Detail how vessel utilized this service. Detail ship's personnel's experience with the service. Did your ship file NOAA weather reports? If so who did it when? If not, why not? Provide a copy of a wx fax your ship obtained, and/or a routing map.	**1.0**		
8. Describe in detail the autopilot used aboard your ship. Manufacture, options, controls etc. Provide a photo or sketch labeling all controls and features. Who adjusted the autopilot? Did it have the capability of making pre computed course changes? When was the ship normally put on and taken off auto-pilot? When was it required to be off? Who is allowed to engage or disengage the autopilot? Did you observe this practice? Describe any unusual occurrences or operations of your vessel's autopilot	**1.0**		
10. Was your vessel equipped with a Bridge Navigation Watch Alarm System? Where was it located? Fully and completely describe the use of this system.	**0.5**		
11. Describe in detail any reduced visibility listening devices. (Big Ears). Describe how it was used in actual practice if observed. How is the reliability? If no special devices fitted, then describe normal procedure for achieving safe speed and posting of lookout, especially with regards to sound, during reduced visibility.	**0.5**		

SHIP FAMILIARIZATION BRIDGE EQUIPMENT (Cont.)	Max. Pt. Value	Points Awarded	COMMENTS
12. Describe in detail the Speed Log(s) provided aboard your ship. How many are there? Manufacturer, features, how many axis, how identifies motion? Bottom or water reading? Specifically observe and report if your Speed Log displayed athwartship motion (at the bow and stern) when on both bottom track AND water track. Was it only on Bottom track? How accurate is it? Where is(are) the sensor(s) physically located? What is the theory behind its operation? How is it actually used aboard ship? In pilotage waters, at sea, and when docking. Any special precautions for their use?	**1.0**		
13. Describe the mooring diagrams used aboard your vessel. (Plans showing where lines go for tying up to a specific dock). How were they used? Were they reviewed prior to each docking? Who makes them? Provide a copy of those used for the ports your vessel visited. If your ship does not have them, make your own mooring diagrams. Show bitts, chocks, fairleads, winches on the ship, and where all the lines went ashore.	**1.0**		
14. Describe in detail the equipment and use of AIS on your vessel's bridge. Provide a diagram, sketch or photo of the unit. Was your AIS a MKD (Minimum Keyboard Display) type? Who was the manufacturer, and what information could you retrieve from the AIS? Who onboard your vessel updates your own ship's AIS information? When is it done? Were they ever forgotten? How easy was it to retrieve important information from your AIS? What was the most frequently utilized information from the AIS? Did you observe ships transmitting obviously WRONG AIS data? Describe these incidents. How is this piece of equipment integrated into the actual bridge equipment, and how is it actually used by the ship's officers in the safe navigation and maneuvering of the vessel. Describe any limitations and problems observed with the AIS system on your vessel. How did AIS affect your vessel's maneuvering and observation of the Rules of the Road.	**1.0**		
15. Describe in detail, the ship's gyro compass or compass that was normally used for navigating: flux gate/ GPS etc. Provide photo if possible. Detail manufacturer, where and how mounted, observation practices: was compass checked before relieving the watch? What was the normal practice of checking this compass for error? Describe procedures for start up and shut down at the dock and at sea. Describe the transmission system and the repeaters. How many and where were they? Describe Course Recording device. Manufacturer, location, and how it was used on watches. Provide photo if possible. Was recorder initialed at any time? When and where and why?	**1.5**		
16. Describe the bridge layout, indicating where all equipment is placed. Provide sketch, CAD drawing of layout, or copy of the layout showing where radars, ECDIC, helm, compasses, etc are located. Top view (floor plan) minimum. Can provide side view if necessary.	**1.0**		

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Cadet Name _____

BRIDGE OPERATIONS	**MAX PTS 15**		
	Max. Pt. Value	Points Awarded	COMMENTS
1. Describe in detail the position fixing methods used as observed. Detail when they were used, and how frequently. Including but not limited to, compass checks, azimuths/amplitudes, comparisons to magnetic compass, computation and comparison of Deviation found to the table. Provide a copy of your ship's deviation table and a copy of a page from the Compass Observation Book (preferably with one of your entries in it). Did mates take visual bearings, radar fixes, GPS exclusively etc. How was ECDIS or electronic charts incorporated into the routine? How or did mates double check the GPS? How?	**2.0**		
2. SEXTANTS – Did your ship have its own sextant? Describe manufacturer, approximate age and type. Was the ship's sextant used, other than by you, during your time aboard. If so describe how and when it was used. Did the master require practice use with the sextant of the mates on board? If so, how much and when? Did any of the mates, or the master, have their own sextant aboard? Did they use it? How and when? Is there any company, shipboard or master's policy of use of the sextant? If so, provide a copy of them. If the sextant was used by the ship's officers how accurate were the positions that resulted from that use?	**0.5**		
3. Describe in detail all tug operations with your vessel: Escort, docking, towing etc. What types of tugs were utilized, when and where? How were escorts provided? Who was in control of the tugs? What type of communications were required for escort tugs. Were any special precautions taken with any of the tugs? i.e.: bollard size and location vs. tugs horsepower? Describe the largest and the smallest horsepower tug that was used while you were aboard. Describe how tugs were made fast to your vessel by your vessel's crew. Did your ship use messengers, tugger winches etc, to pull the lines aboard? Describe any special safety precautions utilized while making tugs fast or letting them go. Describe the use of tugs (placement and lines put out), and why they were done that way.	**2.0**		
4. Describe routine of anchor watches observed while aboard. How was anchored position picked out (when coming in) and how was it ensured that vessel was "on the spot" when dropping the anchor? Where was the watch and mate stationed? Was mate allowed to leave the bridge? What frequencies were monitored while at anchor. How was it ensured that vessel was not dragging anchor? GPS alarm, Rag on chain, watch, radar nav lines, ECDIS, electronic charts, visual bearings, radar ranges. What did deck watch do during anchor period?	**1.5**		
5. Describe in detail any vessel interaction with a port control, VTS etc. Where were call in points, what information was required, what frequencies were communications made on, what was the time line for communications? Who was responsible for these communications? What authority did each of these port controls have over the vessel? Was vessel required to follow their directions, if not why?	**1.0**		

BRIDGE OPERATIONS (Cont.)	Max. Pt. Value	Points Awarded	COMMENTS
6. Describe in detail the watch condition system used aboard your vessel for varying conditions. Ex: Watch Condition A, B or C	**1.0**		
7. Describe a typical piloting transit with pilot aboard: Who does what? Who remains on bridge? How are reliefs done under piloting situations? Who goes down to pick up or send off the pilot? Are watch conditions maintained, or allowed to slip for this operation? Who cons the ship? Is the watch officer informed who has the con and when it changes? Is this information logged? Is there a pre-arrival and pre-departure conference done with all the officers involved with the operation? If not, how is important information passed down? If there was a change in the voyage plan, how are the other navigating officers informed? Are turn bearings precomputed? Are wheel over points plotted and/or used? Are turning rates pre-calculated and/or used. Provide a sample of one of the ships piloting and one of its offshore voyage plans. Was a Master/Pilot exchange card completed prior to pilot boarding? If so, provide a copy of one used. How did the master conduct the master/pilot exchange of information, if indeed it was done? Describe the routine. Were tug escort conferences conducted? Describe those in detail.	**2.0**		
8. Describe the pilot ladder(s) used aboard your vessel. Describe their construction, how they were rigged etc. (tag lines, on a reel, with accommodation ladder). Describe lighting of pilot ladder for night operations. Describe IMO requirements for pilot ladders. Comment on whether your vessel's ladders complied with IMO requirements. Who rigged the ladders? Under who's supervision were they rigged? What arrangements, if any, are in place to hold the pilot ladder alongside the vessel? Describe in detail any pilot hoists in use.	**1.5**		
9. Describe your vessel's company requirements for under keel clearance (UKC). Did they have them? What were they? How was UKC calculated aboard ship? Did shoreside management issue clearances? Were there any UKCs issued by port authorities? What and When? What method does your vessel use to calculate squat? Provide a sample squat calculation for your vessel's transit of a shallow channel.	**1.0**		
10. Did your vessel pick up any pilots via helicopter. What ports and when? Describe the precautions taken by the vessel prior to delivery and pick up of pilot. Where was pilot drop off and pick up point on the vessel? Describe maneuvering required by vessel (seas, relative wind, speed etc) for pilot exchanges. What was the maximum weather conditions that allow a helicopter transfer? Did the pilot service utilize both boats and helicopters? If so, when did they use each?	**1.0**		
11. Was your vessel equipped with a Voyage Data Recorder? Was it a simplified VDR or full VDR? What information does it record? Does it record information from other spaces than inside the bridge? Where and what? How is the information sent, recorded, and/or stored? How long does it record? Can the company monitor the VDR from the home office? Can it record if the vessel loses power, how? Where is it located, what does it look like? How does it float free? What happens when it releases? What is the shipboard or company policy on pushing the "Save" button. Who determines that this will be done? When would it be done? Describe any unusual occurrences with the VDR while you were aboard, or prior.	**1.0**		
12. Provide copies of your ship's Pre-Arrival AND Pre-departure gear test checklists	**0.5**		

Cadet Name _____

CARGO OPERATIONS - TANKER	**MAX PTS 20**		
	Max. Pt. Value	Points Awarded	COMMENTS
1. Draw/sketch diagrams of the cargo and ballast systems both above and below deck. Include sizes of lines, types of valves, locations of suctions within tanks for ballast and cargo. Draw/sketch on deck and pumproom bunker piping.	**3.5**		
2. Describe the general routine that occurs on board ship in preparing for the next load. Describe loading orders received. How are they sent, who receives them, in what form? What is included in them? Who determines how and where the cargo has to go for the voyage. Describe pre-voyage stress calculations. What type of loadicator is in use, and who uses it? Describe the Preplanning operations done by the Chief Mate, including his drawing up the loading plan. Include write up on all paperwork associated with the pre-loading routing. Include copies (completed) of all paperwork done. (DOI, Cargo Orders, etc.) Describe in detail how stability of your vessel is assured. Include pre-planning, during load, underway. Describe who is responsible, who does the calculations, equipment/programs used to calculate stability. Is data fed automatically to computer device? When and how is stability logged in your vessel's logbook? Include a copy of such an entry. What CFRs refer to the logbook entry of stability of your vessel? Describe the Required GM and any other special stability requirements of your vessel. Include, if possible a copy of a stability plan for one of your ports. Provide a copy of a completed stability plan for a loaded and a light voyage. If the long form is used, provide a copy of this. Does your vessel require any special stability considerations (loaded, unloaded, free surface effects etc.).	**1.5**		
3. Describe preloading/predischarging procedures. What checklists are used? Two man checks? What company, USCG, local, and or shipboard regulations and procedures are used? Who checks line up and when? What method is used in marking, labeling valves and how are valve positions indicated on deck and in the control room? What methods are there to secure valves in one position or another? Include copies (completed) of all forms used, including but not limited to DOI form, all check lists, procedures etc.)	**1.5**		
4. Describe topping off and stripping procedures in detail. How are they done? How are tanks gauged during the process? What is the order of topping off and stripping tanks? In topping off, what allowance is made for list and or trim corrections to ensure proper final ullages? What rates are used in loading and topping off? What discharge rates can your ship achieve, and what is normally used for a discharge rate during stripping? Communications used? Emergency substitute methods? Are stress calculations done prior, during and after the topping off and stripping?	**1.5**		
5. Describe in detail, the ship's tank gauging system. Include a schematic if electronic. How is the system tested? When and by who? When do applicable USCG regulations require testing of the system? How is the system used in loading and discharging? How is it used for official gauging of the ship?	**1.5**		

CARGO OPERATIONS - TANKER (Cont.)	Max. Pt. Value	Points Awarded	COMMENTS
6. Describe in detail the shipboard procedure for inerting your vessel. (Monitoring, testing, setting alarm points). Describe in detail all equipment and meters used in inerting. Describe the processes for; Initial inerting from a gas free ship Inerting during discharge of cargo Inerting, venting or vapor balance during loading operations Inerting for hydrocarbon removal prior to gas freeing Inerting for topping up pressure while at sea Venting/Purging and gas freeing procedure	**1**		
7. Describe in detail your ship's Vapor Balance/Exchange System. Include hand-drawn diagrams of all piping. Include descriptions of: Deck Water Seal, isolation Valves, vent masts, pressure gages, vapor exchange risers, any compressors used, PV valves/bullets and PV breaker. Fully describe the vapor hose and riser. How is it ensured the vapor hose is connected to the correct header and that no other hose can be connected to that header?	**1**		
8. Describe in detail the type of Crude Oil Washing System that was onboard your vessel. If you had none, detail why none was aboard. What type of COW guns were supplied. Where were they located. Describe a shadow diagram for COW. What types of COW operations occurred on your vessel. Detail the types of washings, upper, lower, mid-level that were done. What were the liquid levels when starting each phase? What were the purposes: Change of cargo, Required for inspection, sludge control? Detail how COW operations were run: People in Charge, Pre-testing of lines, Start up , changing limits on machines, ensuring proper operation and rotation of machines, switching sets, monitoring liquid levels in tanks, stripping of tanks, switching of sets, finishing operations, draining of lines, logging of operations in Oil Discharge Record Book. Were there special requirements from the port or dock if you were COWing there? Was there any maintenance performed on COW equipment when there? Describe. Include any checklists associated with COW operations onboard and/or ashore.	**1.5**		
9. Describe the procedures utilized for Tank Cleaning (non-COW) onboard your vessel for: Tank entry, Cargo Changes, Repairs. Describe: Washing methods: Butterworth, fixed, portable, drops. Preparation of equipment: Megging hoses Special tools used, non-sparking, saddles, wrenches etc Methods of ensuring removal of washings. Where were slops pumped to? Where did slops eventually go? Use of Oil Record Book for recording operations. Use of gas testing equipment for pre-washing, washing and post watching pre-entry and during entry. Provide a copy of the Oil Record Book entry for a tank cleaning operation that occurred while you were aboard.	**1.5**		

CARGO OPERATIONS - TANKER (Cont.)	Max. Pt. Value	Points Awarded	COMMENTS
10. Did your ship come into ports that were sensitive to the release of hydrocarbon vapors? How would your vessel lessen tank pressure when pressures increased up to the limits of your Pressure Vacuum Valves? Describe procedures of any port authority or company monitoring personnel inspecting your vessel for release of vapors. Were there any accidental or deliberate releases of vapor while you were aboard? Describe conditions and incidents. Was your vessel required to test the IGS system for leakage? If so, when and how often? Who onboard was responsible for the inert gas operations? Who onboard actually started the gas plant and sent it to deck? Detail gas pressure set points of all equipment and describe why they are set to those pressures. Describe isolation procedures for tank cleaning and entry. Describe safety precautions for use of IGS. Describe operations when sending gas ashore or to a lightering vessel.	**1**		
11. Were grounding cables used when alongside a dock or another vessel? Describe what a grounding cable is and how it should and/or was used. Particularly discuss the order of connection and closing the cable switch. What was the actual practice found aboard your vessel?	**0.5**		
12. Describe in detail the Oily-water monitor for your vessel. Describe the manufacturer, and all settings required by IMO. When and how is it used and tested? What is logged concerning its use? How reliable a device is it. Describe an operation with its use while you were aboard, if one occurs? Provide a copy of the Oil Record Book entry illustrating its use.	**1**		
13. What type of framing system was use on your vessel? Where do the frame numbers start? Stem or Stern? Did your vessel require any special construction techniques to its framing? Describe the double bottoms and double hull on your vessel, if provided. Compare the size of them to the size required by the CFRs. What methods are there for filling, venting and pumping out these spaces? How are they protected from corrosion?	**1.5**		
14. Describe the general construction of your ship: Hull Plating, Keel, Deck Plating, superstructure etc. Detail any unusual construction methods, doubling, riveting, aluminum/steel bonding, special steel, etc.	**1**		
15. Was your vessel equipped with an emergency towing package? Describe in detail its construction, use of and any training required by ship's personnel for its use. Has it been used onboard your vessel before? If so, describe what happened from someone who observed it. If it is used or tested while you are aboard, describe its operation in detail.	**0.5**		

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Cadet Name _____

CARGO OPERATIONS - LNG VESSEL	**MAX PTS 20**		
	Max. Pt. Value	Points Awarded	COMMENTS
1. Draw/sketch diagrams of: The cargo system both above and below deck The ballast system above and below deck The nitrogen system LNG Spray cooling system Cargo pump and Emergency Cargo pump (if carried) Bunkering system FOR ALL ABOVE: Include sizes of lines, types of valves, locations of suctions within tanks for ballast and cargo. Also, if not constructed of mild steel, indicate what these items are constructed of.	**2.0**		
2. Draw/sketch diagram of the ship's primary containment system. Include materials and method of construction. Describe fully, the types of tanks utilized to carry the cargo. Compare your ships tanks to the other types of LNG cargo tanks Moss vs. Membrane and discuss the pros and cons of each. How does your ship's tank construction allow for thermal contraction and expansion? How is your tank insulated?	**1.4**		
3. Draw/sketch diagram of the ship's secondary containment system. Include full description of how any leakage is detected and dealt with. Write up any observations of tank leakage while aboard. Describe how your vessel prevents the accumulation of gas vapors in the insulated area.	**1**		
4. Describe in full the types of cargoes carried while you were aboard. What temperature and what pressure where they carried at? What was their vapor pressure, density, molecular formula, boiling point, specific gravity at boiling point, specific gravity of vapor at 0° Celsius? Are there any restrictions to types of cargoes that your vessel can carry?	**1**		
5. Describe the vessel's vapor system. Explain its purpose. Why is it needed? How was it operated while you were aboard?	**1**		
6. What type of power plant propelled your vessel? Was your vapor boil off used as fuel on your voyage? When? How is this accomplished? Provide sketch of piping system. What percentage of fuel could be gas. Compare efficiencies of burning boil off vs. straight fuel.	**0.6**		
7. Describe the vessel's cool down system. Explain its purpose. Why is it needed? How was it operated while you were aboard?	**1**		
8. Describe in detail the vessel's Emergency Shutdown System. Where are controls? How do they work, once activated? What do they control? Who can activate them? Can they be automatically activated? When are they tested? Describe the test procedures and schedule for testing if any?	**0.5**		

CARGO OPERATIONS LNG VESSEL (Cont.)	Max. Pt. Value	Points Awarded	COMMENTS
9. Describe the general routine that occurs on board ship in preparing for the next load. Describe loading orders received. How are they sent, who receives them, in what form? What is included in them? Unless it is a full load, who determines how and where the cargo has to go for the voyage. Can your ship carry less than a full tank at sea? Are there sloshing precautions taken?	**1**		
10. Describe pre-voyage stress calculations. What type of stability program is in use, and who uses it? Describe the Preplanning operations done by the Chief Mate, including his drawing up the loading plan. Include write up on all paperwork associated with the pre-loading routing. Include copies (completed) of all paperwork done (DOI, Cargo Orders, etc.). Describe in detail how stability of your vessel is assured. Include pre-planning, during load, underway. Describe who is responsible, who does the calculations, equipment/programs used to calculate stability. Is data fed automatically to computer device? When and how is stability logged in your vessel's logbook? Include a copy of such an entry. What CFRs refer to the logbook entry of stability of your vessel? Describe the Required GM and any other special stability requirements of your vessel. Include, if possible a copy of a stability plan for one of your ports. Provide a copy of a completed stability plan for a loaded and a light voyage. If the long form is used, provide a copy of this. Does your vessel require any special stability considerations (loaded, unloaded, free surface effects etc).	**1.5**		
11. Describe the differences in crew and officers directly related to LNG vessels: Cargo Officers etc. Describe duties and responsibilities of all officers and crew on vessel.	**0.3**		
12. Describe preloading/predischarging procedures. What checklists are used? What precautions are in place to detect and correct human errors? What company, USCG, local, international and or shipboard regulations and procedures are used? Who checks line up and when? What method is used in marking, labeling valves and how are valve positions indicated on deck and in the control room. What methods are there to secure valves in one position or another? Include copies (completed) of all forms used, including but not limited to DOI form, all check lists, procedures, etc.	**1**		
13. Describe topping off /stripping procedures in detail. How are they done? How are tanks gauged during the process? What is the order of topping off and stripping tanks? If tanks are not stripped, how much heel is left in them? Does this amount vary? If so, why? In topping off, what allowance is made for list and or trim corrections to ensure proper final ullages. What rates are used in loading and topping off? What discharge rates can your ship achieve, and what is normally used for a discharge rate during stripping? What type of communications are used? Describe the emergency substitute methods? Are stress calculations done prior, during and after the topping off and stripping?	**1.3**		
14. Describe all pressure relief systems associated with the cargo on your vessel? What spaces were protected with these devices? How was this protection accomplished? What types of PV Valves were used? Provide sketch, or labeled photo of all PV valves associated with the cargo system. What were their relief settings? Where did they vent to? Atmosphere, Tanks?	**1**		

CARGO OPERATIONS - LNG VESSEL (Cont.)	Max. Pt. Value	Points Awarded	COMMENTS
15. Describe all the precautions taken (by construction and operational procedures) to protect vessel from gas vapors. How is gas kept from getting into engine room, accommodations, on deck with crew? How are these areas monitored? What procedures are in place for entering spaces that might contain dangerous gasses?	**0.5**		
16. Describe in detail the ship's tank gauging system. Include a schematic if electronic. How is the system tested? When and by whom are the systems tested? When do applicable USCG regulations require testing of the system? How is the system used in loading and discharging? How is it used for official gauging of the ship?	**0.5**		
17. Describe in detail the "Custody Transfer System" (CTS) that was used on your vessel. What was the purpose of it? Why was this used instead of the traditional gaging of tanks? Provide a copy of a completed CTS if possible.	**0.5**		
18. Special Operations: Describe in detail the procedures and actions taken (if observed) during tank entering, drying, cool-down, warm-up and purging. Describe in detail the procedures and actions taken during cargo line cool down.	**0.5**		
19. Describe fully the procedures for cargo-arm hook up and release. What special precautions are taken at the cargo riser/arm area while discharging or loading to prevent the vessel from any accidental releases?	**0.5**		
20. Describe any special training you got concerning LNG cargoes and the LNG vessel you were assigned. Describe fully the training, who gave it to you, who certified that you had actually acquired the necessary knowledge from that training, and how did they do it.	**0.5**		
21. Describe in detail the shipboard procedure for inerting your vessel. (Monitoring, testing, setting alarm points). Describe in detail all equipment and meters used in inerting. Describe how the inert gas is produced, its components (percentages) and procedures for; Initial inerting from a gas free ship and Venting/Purging and gas freeing procedures.	**0.5**		
22. Were grounding cables used when alongside a dock or another vessel? Describe what a grounding cable is and how it should and/or was used. Particularly discuss the order of connections and closing the cable switch. What was the actual practice found aboard your vessel?	**0.3**		
23. Describe in detail the Oily-water monitor for your vessel. Describe the manufacturer, and all settings required by IMO. When and how is it used and tested? What is logged concerning its use? How reliable a device is it? Describe an operation with its use while you were aboard, if one occurs?	**0.5**		
25. Describe the general construction of your ship: Hull Plating, Keel, Deck Plating, superstructure etc. Detail any unusual construction methods, doubling, riveting, aluminum/steel bonding, etc.	**0.5**		
26. What type of framing system was use on your vessel? Where do the frame numbers start? Stem or Stern? Where is the official number permanently affixed to your vessel? Did your vessel require any special construction techniques to its framing? Describe the double bottoms and double hull on your vessel, if provided. Compare the size of them to the size required by the CFRs. What methods are there for filling, venting and pumping out these spaces? How are they protected from corrosion? Describe the general construction of your ship: Hull Plating, Keel, Deck Plating, superstructure etc.	**0.6**		

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Cadet Name _____

CARGO OPERATIONS - CONTAINER	**MAX PTS 20**		
	Max. Pt. Value	Points Awarded	COMMENTS
1. Explain the holds and hatch covers of your vessel. How many and what types. How are hatch covers opened and closed? Does your vessel have "open holds"? On a vessel with open holds, what arrangements are made to ensure water can be pumped out of the holds to prevent floundering?	**1.5**		
2. Thoroughly explain the lay-out of your vessel – Bays, Row, Tiers. Explain how each container's stowage position is identified. Include a copy of a Bay Plan for your vessel.	**1.5**		
3. What were your vessel's stack weight limitations and what were her lashing limits? Where was this information available? Sketch several typical container lashing profiles to be followed by the stevedores for securing containers on deck. Describe the procedure for securing the cargo for sea after the last container is loaded.	**2.0**		
4. Assist the Mate in his scheduled lashing gear inventory. Provide a copy of same and discuss where the excess lashing gear is stowed. Discuss how semi-automatic twist locks work if available. Is there a scheduled maintenance plan for the lashing gear?	**1.5**		
5. Discuss the computerized load program available on your vessel. Does the same program handle stability? How about Hazmat compatibility? Provide a copy of a final load plan complete with computed stability information.	**1.5**		
6. Did you accompany the Mate or Cheng. on a cell guide damage survey? Why is this important to conduct a cell guide damage survey frequently? Did the Mate or Cheng discover any fractures on deck in the vicinity of the hatch coamings? Discuss why these must be repaired ASAP.	**1.0**		
7. What assistance was provided by shore-side layout staff regarding Hazardous Materials stowage? What is the Chief Mate responsible for and what reference books can he use? Discuss how much time the Mate must dedicate to Hazmat on your particular vessel.	**1.0**		
8. Describe the ship's procedures for loading refrigerated cargo. Include how the mate on watch records the locations, temperatures, and explain how the mate can detect a problem with a refrigerated container.	**1.5**		
9. What is the maximum list acceptable for cargo operations to continue? Why? What was the maximum you experienced while aboard? What actions were taken to relieve the list?	**1.5**		
10. Describe in detail the ballast system on board the ship. What tanks and capacities, pumps and maximum rates? Who operates the ballast system? Include an example ballast water plan. Did the vessel have an automatic heeling system? If so, describe its operation.	**2.0**		
11. Describe in detail the bunkering operations for your vessel. Include what all crewmembers/departments do. Who has a PIC?	**1.5**		

CARGO OPERATIONS - CONTAINERS (Cont.)	Max. Pt. Value	Points Awarded	COMMENTS
12. Describe what special arrangements or equipment your vessel has on board for fighting fires in containers? Fully describe how a fire in a container above deck would be fought and how a fire in a container below deck would be fought.	**1.5**		
13. Describe in detail how stability of your vessel is assured. Include pre-planning, during load, underway. Describe who is responsible, who does the calculations, equipment/programs used to calculate stability. Is data fed automatically to computer device. When and how is stability logged in your vessel's logbook. Include a copy of such an entry. What CFRs refer to the logbook entry of stability of your vessel. Describe the Required GM and any other special stability requirements of your vessel. Include, if possible a copy of a stability plan for one of your ports. Provide a copy of a completed stability plan for a loaded and a light voyage. If the long form is used, provide a copy of this. Does your vessel require any special stability considerations (loaded, unloaded, free surface effects etc.).	**2.0**		

Cadet Name _____

CARGO OPERATIONS - BULK CARRIER	**MAX PTS 20**		
	Max. Pt. Value	Points Awarded	COMMENTS
1. Draw/sketch diagrams of the cargo holds: Include arrangement of bilge system (rose boxes), reinforced areas, scantlings of plating used, structures, frames longitudinal, corrugated bulkheads, hopper/upper wing tanks Draw/sketch, in detail, arrangements and operation of hatch covers. What hazards are there in operation of hatch covers? What requirements must be met with securing hatch covers. Who manufactured them, what type are they, how are they powered, sealed, secured? Any dangers in their use? How are they tested for weather-tight integrity, when and by whom?	**2.5**		
2. Capacities: What is the capacity of your holds in volume and weight? What cargoes, if any, provide for a "full & down" load?	**0.5**		
3. Describe preloading procedures: Tank Cleanliness, residual cargoes, hatches opened prior to dockside, ventilation, . Were tanks/holds inspected by an agency such as the National Cargo Bureau prior to loading? Detail what the inspector does during his/her inspection and report on any findings that occurred while you were aboard. Provide a copy of the inspector's report if available.	**1.5**		
4. Describe in full, the types of cargoes carried while you were aboard. What were the stowage factors and what was the Transportation Moisture Limit (TML)? What hazards, cautions or cares must be taken with these cargoes? Were cargoes fumigated? If so describe process in detail.	**1.0**		
5. What cargoes has your vessel carried in the past? Are there any restrictions to types of cargoes that your vessel can carry?	**0.5**		
6. Draw/sketch diagrams of your ballast system. Include tank and piping diagrams. Describe how your vessel is ballasted when discharging and deballasted when loading. Include order of filling/discharging and reasons why. How are tank levels indicated in the ballast tanks? Describe the pumps for the ballast system.	**2.0**		
7. Describe fully the methods used to load your vessel: Clamshells, magnets, conveyors, spouts, trains etc. What precautions are taken when loading to avoid any damage to the holds? Are there any areas more susceptible to damage than others? What are they and how are these concerns addressed? What order were holds loaded, and how. Detail methodology. Are stresses a big concern? Was a Grain Stability Calculation Form completed by the Master/Chief Mate? Include a copy of a completed form if possible. If not, describe one in detail.	**3.0**		
8. Describe how the vessel was spotted at the facilities you loaded at. Describe fully each facility, its mooring points, dock faces, loading arms/methods. Did your vessel have to be warped up the dock face or alongside another vessel? If so, how was this done?	**1.5**		
9. How is cargo loaded and discharged measured? What type of bills of lading are given the vessel? Provide a copy of one if possible.	**1.0**		

CARGO OPERATIONS - BULK CARRIER (Cont.)	Max. Pt. Value	Points Awarded	COMMENTS
10. Describe fully the methods used to unload your vessel: self unloading, payloaders, clamshells, etc. If vessel had self unloading crane, were there stability issues with use of this unloading device? If so describe them and how they were addressed. What precautions are taken when unloading to avoid any damage to the holds? Are there any areas more susceptible to damage than others? What are they and how are these concerns addressed? What order were holds discharged? If your vessel was a self-unloader, describe in detail the conveyor and tunnel systems. How were these made water tight? What difficulties were encountered with the conveyor systems? How many were there on the ship?	**3.0**		
11. Describe the clean up routines that occur after loading. Any special cargoes that were especially troublesome?	**0.5**		
12. Were there any ballast water exchanges required during your stay aboard? Describe fully the ballast water exchange procedure for your vessel. If it does not have one, detail the reasons why not.	**1.0**		
13. How is possible shifting of cargoes addressed with the different cargoes you loaded? What was the angle of repose for the cargoes you loaded, and how was it avoided? How high could cargo be loaded in the holds? Why? During any loads were there any partially-filled cargo holds? If so, what methods were used to trim the cargo surface? What measures were taken to prevent shifting; strapping, horizontal bulkheads, saucers – describe in detail.	**2.0**		

Cadet Name _____

CARGO OPERATIONS - GENERAL CARGO	**MAX PTS 20**		
	Max. Pt. Value	Points Awarded	COMMENTS
1. Describe in detail the arrangement of your vessel – number of holds, decks in each hold, etc. What were the cubic capacities of each cargo space aboard your vessel? What were the deck load capacities for each deck? How was it assured the deck load capacities were not exceeded?	**2.5**		
2. Discuss the types of cargo gear aboard your vessel with a focus toward maximum lifting capabilities, holds or deck areas serviced by your cargo gear and types of cargo which could be lifted. Define the phrase, a self-sustaining ship.	**2.5**		
3. Discuss necessary stability calculations prior to attempting a heavy lift. If your vessel has heavy lift capability, is there a heeling system available to offset list due to very heavy loads?	**1**		
4. How is the placement of cargo determined? Who does the load planning? Is the load plan provided by shore-side cargo planners or prepared by the ship? If provided by shore, how is it checked by the ship's officers? If prepared on board, what steps and considerations are taken when planning the load? Provide a copy of a vessel cargo load plan. Describe any incidents of over-stowed or over-carried cargo	**2**		
5. Did your vessel carry any dangerous or hazardous cargo? What types & classes? How was it assured this cargo was stowed in the correct location?	**1**		
6. Describe the cargo bilge system on board your vessel. What type of suctions does it have? Where are they located in the cargo holds? How does the ship know if there is water in the bilge wells – soundings or automatic alarms? Who takes soundings and how often, who checks the bilge alarms and when? Where to bilge alarms sound? Did a bilge alarm go off at any time during your time on board? What was done in reaction to the alarm? Make a drawing of the bilge arrangement or copy the ship's drawing.	**2**		
7. Discuss in detail how cargo was secured/lashed aboard your vessel. What type of lashings were used on what types of cargo? What are the capacities of each type? Who made the lashing plan? Provide examples of lashing plans and/or orders. Was there an inventory of the lashing gear? Provide a copy. What inspection and maintenance was performed on the lashing gear?	**2.5**		
8. How many longshoremen typically came aboard the vessel to work the cargo? How many gangs were there and how many in each gang? Who was the boss? How did the Chief Mate and ship's officers work with the longshoremen? Describe any issues with the longshoremen.	**2**		
9. Did you accompany the Mate or Chief Engineer on a damage survey? Why are frequent damage surveys important? Did the Mate or Chief Engineer discover any fractures on deck in the vicinity of the hatch coamings? Discuss why these must be repaired ASAP.	**2**		

CARGO OPERATIONS - GENERAL CARGO (Cont)	Max. Pt. Value	Points Awarded	COMMENTS
10. Describe in detail how stability of your vessel is assured. Include pre-planning, during load, underway. Describe who is responsible, who does the calculations, equipment/programs used to calculate stability. Is data fed automatically to computer device. When and how is stability logged in your vessel's logbook. Include a copy of such an entry. What CFRs refer to the logbook entry of stability of your vessel. Describe the Required GM and any other special stability requirements of your vessel. Include, if possible a copy of a stability plan for one of your ports. Provide a copy of a completed stability plan for a loaded and a light voyage. If the long form is used, provide a copy of this. Does your vessel require any special stability considerations (loaded, unloaded, free surface effects etc.).	**2.5**		
11. Discuss any incidents that occurred onboard and how they were dealt with.	**Extra Points**		

Cadet Name _____

CARGO OPERATIONS - RO/RO CARGO	**MAX PTS 20**		
	Max. Pt. Value	Points Awarded	COMMENTS
1. Describe in detail the arrangement of your vessel – number of decks, fixed movable, etc. Could cargo be loaded on the weather deck? If so, how much? What were the cubic capacities of each deck? What were the deck heights of each deck? Did your vessel have a capacity in LIMs? What was it? What were the deck load capacities for each deck? How was it assured the deck load capacities were not exceeded?	**2.5**		
2. Describe in detail the interior ramps, ramp covers, and bulkhead doors on board your ship. Where were each located? Where any ramps moveable? Could cargo be stowed on the ramps? If so, how much? Where any ramp doors or bulkhead doors watertight? Which ones? Why are some of them watertight? Who operated the ramps and doors? What are the steps/procedures for operating the interior doors and ramps?	**2.5**		
3. Describe in detail the exterior ramps on board your vessel. What were their capacities? Who operated them? What are the steps/procedures for operating the ramps and associated doors? What does the Mate on Watch have to monitor/check on the ramps during cargo operations?	**1**		
4. Describe in detail the ballast system on board the ship. What tanks and capacities, pumps and maximum rates? Who operates the ballast system? Include an example ballast water plan. Did the vessel have an automatic heeling system? If so, describe its operation. Make a drawing of the ballast system or copy the ship's drawing.	**2**		
5. How is the placement of cargo determined? Who does the load planning? Is the load plan provided by shore-side cargo planners or prepared by the ship? If provided by shore, how is it checked by the ship's officers? If prepared on board, what steps and considerations are taken when planning the load? Provide a copy of a vessel cargo load plan. Describe any incidents of over-stowed or over-carried cargo	**2**		
6. Did your vessel carry any dangerous or hazardous cargo? What types & classes? How was it assured this cargo was stowed in the correct location?	**1**		
7. Describe the cargo bilge system on board your vessel. What type of suctions does it have? Where are they located in the cargo holds? How does the ship know if there is water in the bilge wells – soundings or automatic alarms? Who takes soundings and how often, who checks the bilge alarms and when? Where to bilge alarms sound? Did a bilge alarm go off at any time during your time on board? What was done in reaction to the alarm?	**2**		
8. Discuss in detail how cargo was secured/lashed aboard your vessel. What type of lashings were used on what types of cargo? What are the capacities of each type? Who made the lashing plan? Provide examples of lashing plans and/or orders. Was there an inventory of the lashing gear? Provide a copy. What inspection and maintenance was performed on the lashing gear?	**2.5**		

CARGO OPERATIONS RO/RO CARGO CONT.	Max. Pt. Value	Points Awarded	COMMENTS
9. Describe in detail the ventilation system aboard your vessel. What were the procedures used to operate, secure and ensure that it was functioning correctly? Draw a diagram of the ventilation system.	**2**		
10. Describe in detail how stability of your vessel is assured. Include pre-planning, during load, underway. Describe who is responsible, who does the calculations, equipment/programs used to calculate stability. Is data fed automatically to computer device. When and how is stability logged in your vessel's logbook. Include a copy of such an entry. What CFRs refer to the logbook entry of stability of your vessel. Describe the Required GM and any other special stability requirements of your vessel. Include, if possible a copy of a stability plan for one of your ports. Provide a copy of a completed stability plan for a loaded and a light voyage. If the long form is used, provide a copy of this. Does your vessel require any special stability considerations (loaded, unloaded, free surface effects etc.).	**2.5**		
11. Discuss any incidents that occurred onboard and how they were dealt with.	**Extra Points**		

Cadet Name _____

CARGO OPERATIONS - PASSENGER VESSELS	**MAX PTS 20**		
	Max. Pt. Value	Points Awarded	COMMENTS
1. Draw/sketch diagrams of the water tight subdivisions used aboard your vessel. How do the actual subdivisions compare to those required in the CFRs?	**2.0**		
2. Describe in detail, the construction, operation and use of the passenger ship's water tight doors (WTD). Include ALL types onboard, automatic and manual. Who is allowed to close the automatic type doors? Who is allowed to open them? When and how are they tested?	**1.5**		
3. Describe in detail, the construction, operation and use of the passenger ship's Fire Doors. Include ALL types onboard, automatic and manual. Who is allowed to close the automatic type doors? Who is allowed to open them? When and how are they tested?	**1.5**		
4. Who is the ship's safety officer? Describe in detail the duties of the Safety Officer. What special training did he/she receive? What areas are the Safety Officer responsible for?	**1.5**		
5. Who is the ship's Environmental officer? Describe in detail the duties of the Environmental Officer. What special training did he/she receive? What areas are the Environmental Officer responsible for?	**1.5**		
6. Describe the special STCW training required of maritime personnel working aboard a large passenger vessel, i.e.: medical crowd control, etc.	**1.0**		
7. Draw/Sketch diagrams of the vessel's fire detection system. Describe in detail, the type, construction, operation and use of the system. When and how is it tested?	**2.0**		
8. Describe how the vessel ensures only ticketed passengers are on board the vessel at departure. How is it ensured any visitors or other non-crew, non-passengers, unauthorized persons are not on board the vessel? How is it ensured no unauthorized items are smuggled aboard in passenger luggage or in delivered stores/supplies?	**1.0**		
9. Describe the various unions/employment contracts encountered aboard your vessel, licensed, unlicensed and professional.	**1.5**		
10. Describe in detail bunkering procedures used aboard the vessel. What personnel are involved in the bunkering?	**1.0**		
11. Describe in detail the paperwork required of the Master or purser when entering and/or departing port.	**1.5**		
12. If your vessel has a special propulsion system, describe it and its operation in detail	**1.5**		

CARGO OPERATIONS PASSENGER VESSELS (Cont)	Max. Pt. Value	Points Awarded	COMMENTS
13. Describe in detail how stability of your vessel is assured. Include pre-planning, during load, underway. Describe who is responsible, who does the calculations, equipment/programs used to calculate stability. Is data fed automatically to computer device. When and how is stability logged in your vessel's logbook. Include a copy of such an entry. What CFRs refer to the logbook entry of stability of your vessel. Describe the Required GM and any other special stability requirements of your vessel. Include, if possible a copy of a stability plan for one of your ports. Provide a copy of a completed stability plan for a loaded and a light voyage. If the long form is used, provide a copy of this. Does your vessel require any special stability considerations (loaded, unloaded, free surface effects etc).	**1.5**		
14. Describe in detail at least one, preferably more unique stability situation(s) such as when a maximum number of passengers are on board and/or when a full load of food and supplies is loaded on board. How is it ensured stability requirements are met? Who does these calculations? Include an example(s) of these calculations.	**1.0**		

Cadet Name _____

CARGO OPERATIONS - OFFSHORE SUPPLY VESSELS	**MAX PTS 20**		
	Max. Pt. Value	Points Awarded	COMMENTS
1. Fully describe the cargo capacities of your vessel; deck cargo capacity in $ft.^2/m^2$ and weight, dry and liquid (mud, diesel oil, rig water, fresh water, sewage, etc.) bulk in gallons/barrels/ft^3/m^3 and weight. Include a copy of the vessel's capacity plan. Comment on whether the ship can carry a maximum of all deck and bulk cargo at once for a full load or if only certain amounts or combinations of cargos to reach a full load.	**0.5**		
2. How was stability and maximum draft calculated on board prior to loading outbound cargo as well as before back loading cargo? Who performed these calculations? Include a copy of a calculation. When/how were drafts checked and logged. How was it assured the vessel was not loaded beyond her deep draft?	**1.0**		
3. Describe in detail the layout of the cargo deck (include a photo and/or drawings). What where its dimensions? What was the deck made of? Where there cargo securing fixtures built into the deck? What kind and how many? Fully describe how locations on the cargo deck were identified and segregated. Describe the special features installed on the deck to assist in cargo operations or safety such as a "headache bar."	**1.0**		
4. Deck cargo operations: Describe in detail the process of loading deck cargo in port. Where was cargo loaded? How did the vessel find out when and what was to be loaded? Was a list of cargo provided? Was a manifest prepared, by whom? Include a copy of the list/manifest. How was the deck cargo load planned? How was it determined where outbound cargo would be placed on deck? Who was responsible for this plan? Where special arrangements made for placing dangerous or hazardous cargo on board vs. general cargo?	**2.5**		
5. Deck cargo operations: Describe in detail the process of back loading deck cargo from a rig. How did the vessel find out when and what was to be loaded? Was a list of cargo to be back loaded provided by the rig? Was a manifest prepared for the inbound voyage, by whom? Include a copy of the list/manifest. How was the deck cargo load planned? How was it determined where back loaded cargo would be placed on deck? Who was responsible for this plan? Where special arrangements made for placing dangerous or hazardous cargo on board vs. general cargo? What are the maximum weather and sea conditions before cargo operations are halted?	**2.5**		
6. Deck cargo operations: Who worked on deck during cargo operations? What PPE did they wear? What training was required before they could work on deck? Describe any equipment used on deck to assist with cargo operations. Where you involved in deck cargo operations? How so? Who was responsible for signaling the crane?	**1.0**		

CARGO OPERATIONS - OFFSHORE SUPPLY VESSELS (Cont)	Max Pt. Value	Points Awarded	COMMENTS
7. Deck cargo operations: Fully describe how deck cargo was secured on deck. How many chains were used? What are the breaking strains of the chains? Where were they connected to the ship? Who secured the cargo? Where was the cargo securing equipment stowed on board? Where any inspections or checks made of the securing equipment? Were there any incidents of adrift deck cargo? If so, fully describe including what was done to re-secure the cargo.	**2.0**		
8. Deck cargo operations: List examples of deck cargo units transferred such as cuttings boxes, drill pipe, riser pipe, chill boxes, etc.	**0.5**		
9. Was your vessel involved in any special cargo operations such as maintenance and repair, ROV work, or offshore construction? If so, describe these operations fully including the specific operation and equipment involved. Did the vessel have an on board crane? If so, what was its capacity and range? Include a copy/photo of the lifting diagram. Who operated the crane? What training did they receive before operating the crane?	**1.0**		
10. Bulk cargo: Describe in detail (include photos and/or drawings) the bulk (dry and liquid) cargo arrangement on your vessel. Number of tanks, tank capacities, location on board, number of pumps, types of pumps, etc.	**1.0**		
11. Bulk cargo operations: Describe in detail the process of loading and discharging dry and liquid bulk cargos. Who is responsible on board for bulk cargo operations? If bulk cargo ops is the responsibility of the ship's engineers, spend time in the engine/bulk cargo spaces working with them to find out how bulk cargo is transferred. How is dry bulk cargo transferred? Explain in detail how dry bulk is "pumped." What is the typical and maximum rate of discharge? What is the typical and maximum loading rate? Does the vessel have to do anything with dry bulk to ensure it can be pumped like "fluff" the tanks? If so, how is this done? How is the amount of dry bulk cargo loaded or discharged monitored? What are the pumping rates for liquid bulk cargo? Can more than one pump be used at a time? What is the normal and maximum loading rate for bulk liquid cargo? How is the amount of liquid bulk cargo loaded or discharged monitored?	**3.0**		
12. Fully describe the process of approaching an offshore installation for cargo operations. How far off did the vessel wait until being called in? What checks must be conducted before approaching the rig? Where you involved in these checks? Include a copy of a completed checklist. Once receiving the ok to approach the rig, what were the steps taken to move the vessel into position to transfer cargo? What distance off was normal for cargo operations? How far off was the closest the ship ever came to the rig? Once in position, what paperwork was exchanged between your vessel and the rig? Where personnel transferred? Who?	**2.0**		
13. Describe in detail the vessel's navigation equipment used to monitor the vessel's position while alongside the rig? Fully describe the vessel's propulsion system/arrangement used to keep the vessel in position, number, types, and power of thrusters as well as main engine propulsion.	**2.0**		
14. Tell one story about cargo operations such as transferring deck cargo in heavy weather, a spill of bulk cargo, dropped lift, etc.	**Extra Points**		

Cadet Name _____

CARGO OPERATIONS - TUGS / TUGS AND BARGES	**MAX PTS 20**		
	Max. Pt. Value	Points Awarded	
1. Identify the type of unit you are sailing on, ATB, ITB, conventional Tug and Barge, Harbor Tug. Fully explain the differences between each type of unit as well as the advantages and disadvantages of each. Where did you operate? Where can you operate?	**2.5**		
2. Fully describe the vital characteristics of your vessel; size, horse power, steering system, maneuvering capabilities, cargo type and capacity, etc. What arrangements did the boat have to make her mission easier; second wheelhouse, twin screws or Z-drives, fendering system, winches, etc?	**2.5**		
3. What is the nature of your work day? If on a harbor tug, do you stay on the boat all day or go ashore? What is the call back time, if applicable? If on an ocean-going unit or an inland unit, fully identify and describe your typical work day.	**2.0**		
4. Fully describe the connection devices your unit uses. a. If on an ATB or ITB, what is the size of the lock arms? What type of braking system is there? What is the holding power? Who designed the system? b. If on a conventional tug and tow, describe the towing arrangement, single or bridle, towing winch manufacture horse power, size of wire, length of wire, braking system and strength, etc. How often is the wire/bridle replaced? What type of winch does the vessel have, capacity and settings? c. If on a harbor tug, what kind of lines does your boat have and for what purpose? What are the breaking strains of each? When/how often are the lines replaced? Does your unit have tension winches? If so describe in detail the capacities and settings.	**4.0**		
5. Include a picture or detailed diagram of: a. If on an ATB or ITB, the locking arm/pins (connection) either with or without the badge connected. b. If on a conventional tug and tow, the barge made up "in the notch", alongside, or towed astern. c. If on a harbor tug, the boat made up to a ship for dock assist.	**2.0**		
6. Make up and break apart. ATB/ITB, fully describe the steps for connecting and disconnecting the tug and barge. Conventional tow, what are the primary factors used in deciding to tow or push? Fully describe the steps for each, both making up and disengaging Harbor tug, fully describe the steps for making up and disengaging from a ship.	**4.0**		
7. What safety precautions are taken by those crewmembers who work on deck during all vessel operations and what equipment/vessel arrangements is/are provided to make their jobs safer?	**2.0**		
8. Tell one interesting story about operations on board, difficulty connecting to the barge, breaking the tow wire, parting a line, or similar.	**1.0**		

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Cadet Name _____

CARGO OPERATIONS - TUGS AND BARGES-INLAND	**MAX PTS 20**		
	Max. Pt. Value	Points Awarded	
1. Identify the type/style of boat you are sailing on; a fleet boat, a jackup boat, a Viking style, etc? Fully explain the differences between each type of boat as well as the advantages and disadvantages of each	**2.0**		
2. Fully describe the vital characteristics of your vessel; size, year built, horse power, steering system, maneuvering capabilities, maximum barges it can move, etc. What arrangements did the boat have to make her mission easier; second wheelhouse, steering wheels or levers, twin screws or Z-drives, fendering system, winches, etc?	**2.0**		
3. What is the nature of your work day? What hours do you work, where do you report, what do you do, etc. Fully identify and describe your typical work day.	**2.0**		
4. What kind of run are you on? Is it a scheduled run, are you on charter, a linehaul boat, turn boat etc., and explain what that run entails, and what rivers, and ports you visit.	**1.0**		
5. Print out a map of the continental United States and highlight all the rivers you navigated on, and write a brief synopsis on each river. Describe the river flow rate, was the river natural, or was it man made? Were there any interesting landmarks, historical areas etc.	**1.5**		
6. Fully describe the stages of all the rivers you were on during your voyage. Describe how much water was running at that time, was it high water, or low water?	**1.5**		
7. Describe in detail your vessel's procedures for entering and exiting locks. How many men were required to bring the tow in? Did you have to break tow to fit? How many lines were used? What was the names of the locks you visited during your voyage?	**2.0**		
8. Fully describe the tow configuration. Did the barges have fixed rigging, or did you need portable rigging? How many parts where required per coupling? What leads were used at each coupling, do you have a towing lead on the head, or a backing? During your transit, did you use safety lines? If so; how many, and where were they placed?	**3.0**		
9. Include a detailed drawing of your tow made up identifying all rigging and connection points.	**1.0**		
10 Spend time in the wheelhouse observing the Pilot or Captain make bends Was the tow ever so long that they needed to flank in order to make the bend? Describe this maneuver and why it is used.	**2.0**		
11. Did your vessel have an engineer? If so was he/she non-licensed? If it did not, who was the Deckengineer? Did you do engine checks? What was required when making rounds of the engine room? Did you do any engine maintenance?	**2.0**		

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Cadet Name _____

CARGO OPERATIONS - OTHER	**MAX PTS 20**		
	Max. Pt. Value	Points Awarded	COMMENTS
1. Describe, in detail, the type of vessel you are assigned to.	**2**		
2. Describe the original purpose of the construction of your vessel. Was it designed for the purpose it is being used for now? If not what was it used for. How was it altered to fit the purpose it is being used for presently?	**2**		
3. Describe in detail the special construction of your vessel required for its present purpose.	**2**		
4. Describe in detail the special operations your ship engaged in while you were assigned.	**2**		
5. Does your vessel have any special maneuvering characteristics? Provide a copy of the maneuvering diagram that is posted on the bridge. Was this referred to by the conning officers and/or pilots? How did the actual ship respond compared to the diagram? What special techniques are utilized by the shiphandler for maintaining position, station keeping, docking, undocking, turning, etc?	**2**		
6. Is your vessel equipped with any special directional control devices? : Bow thrusters, Stern thrusters, Dynamic Positioning Systems, Directional Controls, special helm devices etc. Describe these in full, and also describe their use as you observed.	**1.7**		
7. If you vessel occasionally goes to sea, to transit to another port for work, or shipyard, what special precautions must the crew take to ready it for a sea passage? Safety, securing, hatches, ports etc.	**1.5**		
8. Due to the construction of your vessel, what special safety precautions must be taken to protect the crew while undergoing "Cargo Operations"? Describe how these are enforced, crew attitudes towards them, and any incident you observed aboard the vessel.	**1.8**		
9. Describe in detail the navigational equipment used to monitor the vessel's position while undergoing "Cargo Operations"	**1.5**		
10. Describe in detail the "Cargo Handling" equipment used aboard the vessel. How was it operated? What does it do? How many people are needed to run it? What maintenance is required of it? Did it break down while you were aboard? Did it break down recently? Why and how was it repaired?	**2**		
11. If allowed the opportunity to shiphandle describe in detail handling characteristics and how the vessel responded to your commands.	**1.5**		

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Cadet Name _____

FIREFIGHTING & LIFESAVING	**MAX PTS 15**		
	Max. Pt. Value	Points Awarded	COMMENTS
1. Describe AND LIST what SOLAS and/or the US CFRs require aboard a vessel of the type and size of the ship you are on in regard to lifeboats, liferafts, and liferings. Does your vessel comply fully with them, and if it differs, how and why?	**1.5**		
2. During monthly lifeboat/safety inspections, accompany the ship's officer conducting these inspections. Record results and include a copy of paper work and examples of log entries.	**1.5**		
3. Was your vessel equipped with a "Rapid-Release" off-the-stern type lifeboat? If so, detail its construction and equipment. Include details on davit data, testing, special training etc that would be required for a mate onboard a vessel with this special lifeboat. Describe special USCG regulations regarding these craft: When are they required to be released? How are they recovered? How many are required? Where must they be located? Did your vessel release the boat while you were aboard? Describe in detail the operation of that actual release, or one that a crew member can describe to you that occurred previously.	**1.0**		
4. Describe all liferafts found on your vessel. How many people did they hold? Detail who was assigned to these rafts (if anyone). Why were the liferafts placed where they were? How were they to be launched? How were they secured? Describe the hydrostatic release mechanisms if equipped. Describe the weak links provided. Did your vessel have any trouble with liferafts in the past? How frequently are the life rafts serviced? Who does this and when? Provide a photo or sketch of a typical installation.	**1.0**		
5. Write up a complete synopsis of the Fire/Boat Drill for your vessel from the captain's and chief mate's planning of the drill to any required log entries, and company notification.	**1.0**		
6. Identify who is the safety officer under ISM aboard your vessel and what his duties entail. Write up a short synopsis of a monthly safety meeting and detail all company paper work and notification relative to the safety meeting.	**1.5**		
7. Explain and include copies of any forms relative to: Tank entry procedures for your vessel. Going aloft procedures for your vessel. Lock out tag out Working over the side procedures for your vessel. Any other operations that require permitting and or completion of forms.	**1.5**		
8. List the location of all the Emergency Equipment Lockers aboard your vessel. List the equipment required by SOLAS or the US CFRs to be in the locker. List all additional equipment found in the locker(s) on your ship.	**1.0**		

FIREFIGHTING & LIFESAVING (Cont)	Max. Pt. Value	Points Awarded	COMMENTS
9. Describe all Personal Protective Equipment (PPE) required by your vessel's company. i.e.: Hard hats, safety shoes, gloves, long sleeves, safety glasses etc. How were these requirements enforced? Did the crew accept them, or was there resistance to them? What were the reasons behind the resistance?	**1.0**		
10. Describe the USCG and FCC required GMDSS Equipment found aboard your vessel. What tests are required: daily, weekly and monthly, to ensure proper GMDSS equipment operation and describe in ***detail*** how they are done. How are repairs handled with this equipment? Does your vessel have a licensed person aboard who can repair it? How are normal messages handled? Does your ship have the capability to send and receive email? Was this ability extended to the crew? Who could send what and when? Does your vessel receive chart corrections, and/or notice to mariners over the satellite system? Did your ship receive any distress calls over the GMDSS system while you were aboard? How were they handled? How was the NAVTEX used for both weather and safety information. Were specific areas selected? Who set them? Did you have an opportunity to change areas while aboard? Was the information provided by NAVTEX of use to your vessel?	**2.0**		
11. Describe in detail any special precautions taken for Piracy while aboard. If you did not have first-hand experience with these, detail how your vessel handles traveling and working within waters that have a piracy threat.	**1.0**		
12. Describe the Fast Rescue Craft aboard your vessel if so equipped. Was it used while aboard? Who maintains and tests it? What procedures are there for lowering and raising the craft? What is its capacity? What type of engine and Horse Power is it equipped? What is the top speed? Who aboard your vessel has Fast Rescue Craft certification?	**1.0**		

Cadet Name _____

RULES OF THE ROAD	**MAX PTS 10**		
	Max. Pt. Value	Points Awarded	COMMENTS
1. Describe at least **FIVE** actual situations under varying conditions in which you observed the application of the steering and sailing rules. Provide a RAPID RADAR PLOT of each case clearly illustrating the situation and its resolution. The written report referencing time of day, sea room, number of vessels involved, visibility, and action taken. Specifically state which rule applied to the situation, how your ship handled that rule and the results of the action. You are encouraged to quote pertinent sections of the COLREGS in your discussion. Have each report initialed by officer of the watch on which the cited incident occurred with his/her comments..	**3.5**		
Rules of the Road Equipment - Ship Specific			
2. Describe: the construction of lights; materials of cases and lenses; manufacturers; wattage of bulbs in different lights; How are lights powered? Which systems power the lights? Emergency power is found where? What if total loss of power occurs? What are minimum ranges of lights on your vessel? How are lights tested? When are they tested? How are these tests logged? Who logs them? What is normal practice of operation of these lights? What procedures are there should one of the lights burn out, or become damaged? Are there any special safety considerations?	**2.5**		
3. Describe the construction of day shapes. List the day shapes your vessel has on board? Which shapes did you see used? How were they displayed? How are other shapes displayed? Who is responsible for the upkeep of the day shapes? Where are they stowed?	**2**		
4. Describe sound signal apparatus on board – whistle, horn – their manufacturer, type (steam, air, etc.). When are they used in Rules of the Road situations? Describe the automatic sounding mechanisms. Describe the manual sound signaling apparatus aboard for making the prescribed sound signals. Regarding bells and gongs, describe their construction and use on board your vessel. Are there any automatic sound signaling devices aboard that mimic the bells and gongs? Describe it and its operation fully. Provide photo or sketch of bell and gong.	**2**		

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Cadet Name _____

Master's Evaluation – Grading Sheet

A = 100	B+ = 90	C+ = 80	D+ = 70	F = 57
A- = 93	B = 87	C = 77	D = 67	
	B- = 83	C- = 73	D- = 63	

CATAGORY	GRADE	NUMBER
Attitude		
Appearance		
Initiative		
Punctuality		
Orderliness		
Ability to work with unlicensed		
Ability to work with Officers		
Ability to Communicate Effectively		
Ability to solve problems		
Ability to seek help at proper time		
Ability to follow orders		
Ability for following through		
Creativity and Critical Thinking		
Interest in the job		
Ability to accept criticism		
Computer Skills		

CATAGORY	GRADE	NUMBER
Safety		
Watchstanding - Overall		
Lookout		
Piloting - Terrestrial		
Celestial Navigation		
Rules of the Road		
Radar/ARPA		
ECDIS/AIS		
Radio - GMDSS - Coms		
Cargo - specify oil/dry or RoRo		
Seamanship Skills		
Shipboard Nomenclature		
	TOTAL	
	Total/56	

Evaluator Grading Sheet

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APPENDIX IV

Massachusetts Maritime Academy
TABLE A-II/1 Specification of Minimum Standard of Competencies
OFFICER IN CHARGE OF A NAVIGATIONAL WATCH

STCW Competence	Knowledge, Understanding and Proficiency (KUP)	Assessment		Academy Course	Completed
		Number	Task		Date
	Steering Control System – Adjustment of controls for optimum performance	OICNW-1-6A	Steering gear test	MT 4271 / 3372	
	Steering Control System- Adjustment of controls for optimum performance	OICNW-1-6B	Set weather controls	MT 4271 / 3372	
	Echo Sounders -- Ability to operate the equipment and apply the information correctly	OICNW-1-4D	Echo Sounder Demo	MT 4271 / 3372	

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Assessment OICNW-1-6A

Steering gear test

Assessed in MT-4371 Sea Term IV: Marine Transportation
or MT-3372. Shall be completed by the end of MT-4371.

Condition
On a vessel or a full mission ship simulator.

Performance Requirements

Behavior	Standard
The student will:	*During assessment, the student shall, at a minimum:*
Conduct the pre-departure test of the vessel's steering gear.	1. The steering control system is turned on. 2. The steering gyro repeater is aligned with the master gyro-compass. 3. After the required warm up period, the controls for switching pumps and motors between the port and starboard steering systems are tested. 4. Both port and starboard steering systems are tested as follows: a. When the control is switched to hand steering, the rudder is tested throughout its full range of motion. b. When the control is switched to non follow-up, the rudder is tested throughout its full range of motion.

Supports Table A-II/1 officer in charge of a navigation watch

Competence	Knowledge, Understanding & Proficiency	Task
Plan and conduct a passage and determine position	A1.08 *Steering control systems* Knowledge of steering control systems, operational procedures and change-over from manual to automatic control and vice versa. Adjustment of controls for optimum performance	Steering gear test

Published: 2016-10-28-04:00

By signing below indicating satisfactory completion of an assessment, the assessor also attests to the fact that he/she is a Qualified Assessor eligible to conduct assessments.

_____ _____

Candidate SSN

_____ _____

Assessor Position

_____ _____ _____

Vessel License No. Date

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Assessment OICNW-1-6B

Set weather controls

Assessed in MT-4371 Sea Term IV: Marine Transportation

or MT-3372. Shall be completed by the end of MT-4371.

Condition

On a ship underway or a full mission ship simulator, while in auto-pilot.

Performance Requirements

Behavior	Standard
The student will:	*During assessment, the student shall, at a minimum:*
Set the rudder and weather controls that are most suitable for the weather and sea conditions.	1. The weather control is set in accordance with the manufacturer's recommendations for the prevailing sea conditions. 2. The rudder control is set in accordance with the manufacturer's recommendations for the prevailing sea conditions for the area transited or simulated. 3. The rate of turn control (if fitted) is set in accordance with the standing orders.

Supports Table A-II/1 officer in charge of a navigation watch

Competence	Knowledge, Understanding & Proficiency	Task
Plan and conduct a passage and determine position	A1.08 *Steering control systems* Knowledge of steering control systems, operational procedures and change-over from manual to automatic control and vice versa. Adjustment of controls for optimum performance	Set weather controls

Published: 2016-10-28-04:00

By signing below indicating satisfactory completion of an assessment, the assessor also attests to the fact that he/she is a Qualified Assessor eligible to conduct assessments.

_____ _____

Candidate SSN

_____ _____

Assessor Position

_____ _____ _____

Vessel License No. Date

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Assessment OICNW-1-4D

Use of echo sounder

Assessed in MT-4371 Sea Term IV: Marine Transportation

or MT-3372. Shall be completed by the end of MT-4371.

Condition

On a ship underway using an echo sounder that meets IMO performance standards or a part task trainer that realistically simulates all the functions and controls of an echo sounder that meets IMO performance standards.

Performance Requirements

Behavior	Standard
The student will:	*During assessment, the student shall, at a minimum:*
Turn on, test, and operate the echo sounder.	1. The system was turned on. 2. The echo sounder was tested in accordance with manufacturer recommendations. 3. The correct GMT is noted on the echo sounder paper (if fitted). 4. The scale selected was the lowest appropriate for the vessel's draft and the depth of water of the area of transit. 5. The sensitivity was adjusted to obtain proper depth reading on the display and correct trace on the paper (if fitted).

Supports Table A-II/1 officer in charge of a navigation watch

Competence	Knowledge, Understanding & Proficiency	Task
Plan and conduct a passage and determine position	A1.05 *Echo Sounders* Ability to operate the equipment and apply the information correctly	Use of echo sounder

Published: 2016-10-28-04:00

By signing below indicating satisfactory completion of an assessment, the assessor also attests to the fact that he/she is a Qualified Assessor eligible to conduct assessments.

_____ _____

Candidate SSN

_____ _____

Assessor Position

_____ _____ _____

Vessel License No. Date

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APPENDIX V STEERING RECORD

Cadet _____ Vessel _____
SS # _____ Official #_____
MMA Class of _____ Vessel Cond._____(light, loaded, by the head)

CADET _____ HAS PHYSICALLY STEERED THE ABOVE VESSEL FROM _____ (time) UNTIL _____(time) ON _____(date). DURING THIS TIME, THE VESSEL WAS LOCATED _____

THE ABOVE CADET PROPERLY PERFORMED THE FOLLOWING:
(Initial in ALL boxes that apply. Draw a line through any boxes that DO NOT apply).

- ☐ Properly Relieved the Helm.
- ☐ Steered during daylight hours - (15 mins. minimum. Stayed within 2° either side of course as recorded on course recorder)
- ☐ Steered during darkness - (15 mins. minimum. Stayed within 2° either side of course as recorded on course recorder)
- ☐ Steered using magnetic compass only - (15 mins. minimum. Stayed within 5° either side of course as recorded on course recorder)
- ☐ Steered on ranges
- ☐ Steered during Heavy Weather (Beaufort Force 8 and greater)
- ☐ Steered in a narrow channel
- ☐ Steered in shallow water (Depth less than or equal to 1.5 x draft)
- ☐ Steered using Non Follow up system
- ☐ Steered using Emergency system
- ☐ Described proper procedures for loss of steering
- ☐ Properly executed all helm orders as commanded
- ☐ Properly executed course changes of 10° or greater
- ☐ Shifted from autopilot to hand steering
- ☐ Shifted from hand steering to autopilot
- ☐ Other (Explain)

REMARKS:_____

_____ _____
Assessing Officer (Print Name) Date

This record documents competencies as required under STCW Table A-II/4

_____ _____
Assessing Officer (Signature) Assessing Officer's USCG License #

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APPENDIX VI Compass Observation

BOB (Back of Book) or how to enter a compass observation

Date	ZT	Lat	Long	True Bear	Gyro Bear	Gyro Err	Gyro Head	True Head	Stand Head	Stand Err (CE)	Var	Stand Dev	Steer Head (CE)	Steer Err	Steer Dev	Body
7/23	1736	34.5N	070.2W	153.7°	156.0°	2.3°W	287.0°	284.7°	292.0°	7.3°W	0.8°W	6.5°W				Sun

Typically your vessel will not have a Steering Compass, only a combination steering and standard compass. If it does have both, then leave in the shaded three columns dealing with steering compass. You will have to complete those parts too. Otherwise, we will not use the Steering Compass Columns.

Cross out the Steering Deviation Column label and write in ZT Time. In this column you will enter the ZT, hour and minutes (not seconds) of the observation. This column is just to help get a rough idea of the time you took it, so you do not need to put in seconds.

Cross out the Steering Err label and write Deviation by Table

In the example above, your ship is on a pgc (per gyro course) of 287.0° checking 292.0° PSC

You take an azimuth or geographic range (Range on the shoreline) and it bears 156.0° pgc. It should have been bearing 153.7° True.

Computing your GE (Gyro Error) you get 2.3° W (Note tenths of degrees)

Now, taking your pgc heading of 287° and applying the 2.3° W GE to it, you find you are really on a True heading of 284.7° True.

Comparing this True heading to your PSC heading, you can find your compass error.

Once compass error is known, determine your actual variation from the chart (Make sure to adjust for the current year) and apply. This will leave you with your deviation which goes into the Stand Dev column

By using the ship's deviation table/chart compute what the table/chart says the deviation should be on the same magnetic heading, and enter it into the old Steering Err column which is now the Deviation by Table column.

How did the deviations compare?

YOU MUST ENTER EVERY AZIMUTH, AMPLITUDE, RANGE, COMPASS OBSERVATION IN THE BACK OF THE BOOK, OR IT WILL NOT COUNT TOWARDS YOUR GOAL.

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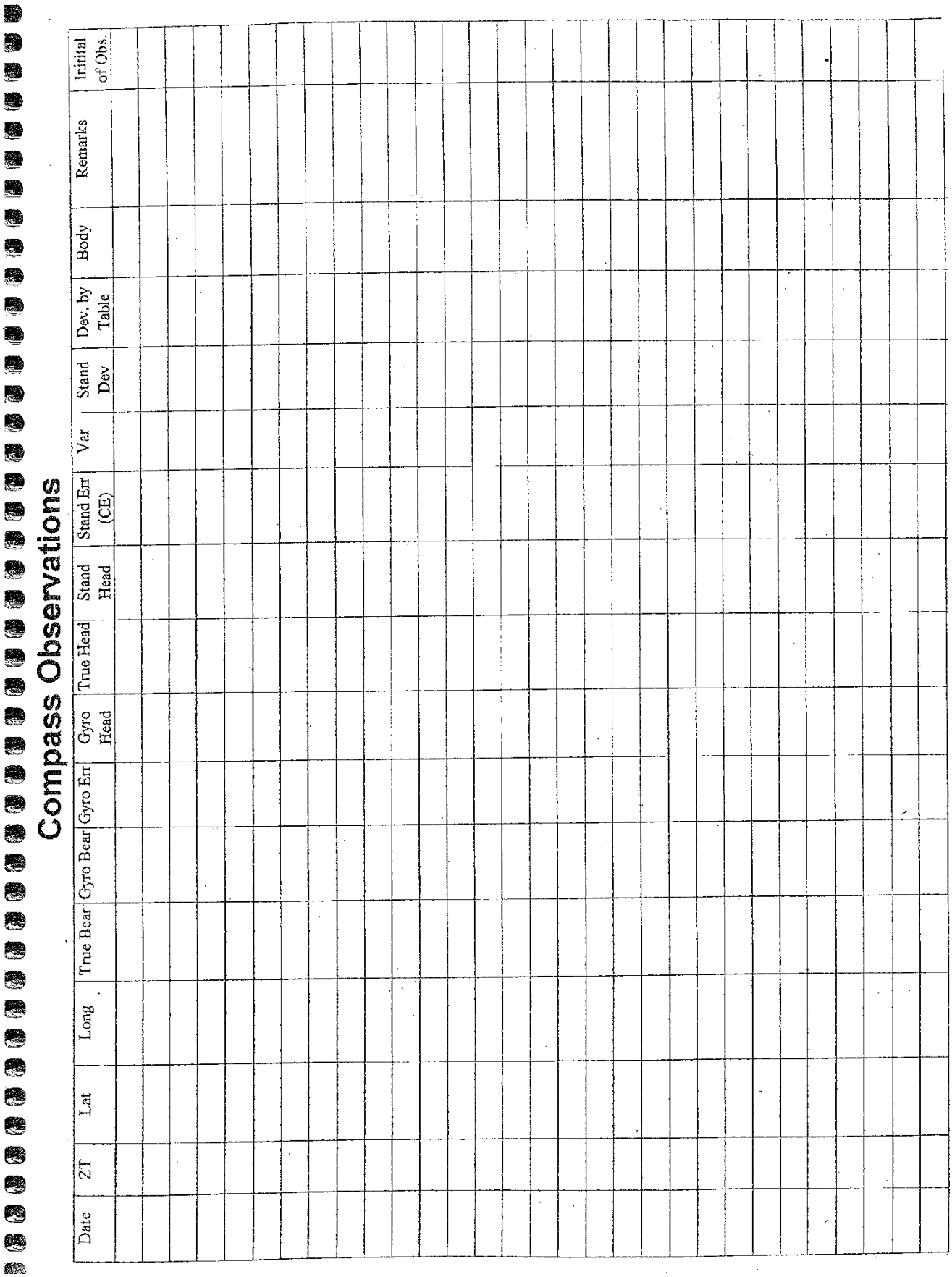
APPENDIX VII - Compass Observation Sheet



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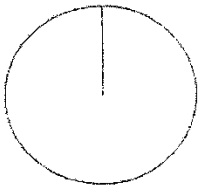
APPENDIX VIII - Nav Journal Blank Page

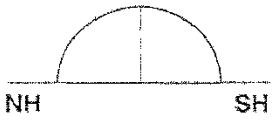
S/S M/V _____ From _____ To _____

Date _____ DR Pos Lat _____ Long _____ Course _____ Spd _____

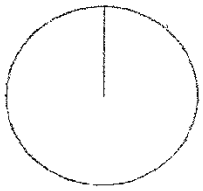
m



Z



m



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APPENDIX IX - Voyage Plan Spreadsheet/Waypoint List Example

Passage Planning Sheet

From :
To :
Vessel:
Total Distance:
Estimated Speed:
Draft : FWD
AFT
Estimated time of transit:

W.P. No.	Latitude		Longitude		Course	Distance	Distance to go	Speed	UKC	Passage Notes(alter course points,hazards,depths,ATONS, parallel indexes etc.)
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
						0.00				

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TABLE 3. —HEIGHT OF TIDE AT ANY TIME

EXPLANATION OF TABLE

Although the footnote of table 3 may contain sufficient explanation for finding the height of tide at any time, two examples are given here to illustrate its use.

Example 1.—Find the height of the tide at 0755 at New York (The Battery), N.Y., on a day when the predicted tides from table 1 are given as:

Low Water	
Time h.m.	*Height* ft
0522	0.1
1741	0.6

High Water	
Time h.m.	*Height* ft
1114	4.2
2310	4.1

An inspection of the above example shows that the desired time falls between the two morning tides

The duration of rise is $11^h\ 14^m - 5^h\ 22^m = 5^h\ 52^m$.

The time after low water for which the height is required is $7^h\ 55^m - 5^h\ 22^m = 2^h\ 33^m$.

The range of tide is 4.2 – 0.1 = 4.1 feet.

The duration of rise or fall in table 3 is given in heavy-faced type for each 20 minutes from $4^h\ 10^m$ to $10^h\ 40^m$. The nearest tabular value to $5^h\ 52^m$, the above duration of rise, is $6^h\ 00^m$; and on the horizontal line of $6^h\ 00^m$, the nearest tabular time to $2^h\ 33^m$ after low water for which the height is required is $2^h\ 36^m$ Following down the column in which this $2^h\ 36^m$ is found to its intersection with the line of the range 4.0 feet (the nearest tabular value to the above range of 4.1 feet), the correction is found to be 1.6 feet, which being reckoned from low water, must be added, making 0.1 + 1.6 = 1.7 feet or 52 centimeters which is the required height above mean lower low water, the datum for New York.

Example 2. —Find the height of the tide at 0300 at Somewhere, U.S.A. on a day when the predicted tides are given as:

High Water	
Time h.m.	*Height* ft
0012	11.3
1251	11.0

Low Water	
Time h.m.	*Height* ft
0638	–2.0
1853	–0.8

The duration of fall is $6^h\ 38^m - 00^h\ 12^m = 6^h\ 26^m$.

The time after high water for which the height is required is $3^h\ 00^m - 00^h\ 12^m = 2^h\ 48^m$.

The range of tide is 11.3 – (–2.0) = 13.3 feet.

Entering table 3 at the duration of fall of $6^h\ 20^m$, which is the nearest value to $6^h\ 26^m$, the nearest value on the horizontal line to $2^h\ 48^m$ is $2^h\ 45^m$ after high water. Follow down this column to its intersection with a range of 13.5 feet which is the nearest tabular value to 13.3 feet, one obtains 5.3 which, being calculated from high water, must be subtracted from it. The approximate height at $03^h\ 00^m$ is, therefore, 11.3 – 5.3 = 6.0 feet or 183 centimeters.

When the duration of rise or fall is greater than $10^h\ 40^m$, enter the table with one-half the given duration and with one-half the time from the nearest high or low water; but if the duration of rise or fall is less than 4 hours, enter the table with double the given duration and with double the time from the nearest high or low water.

TABLE 3. —HEIGHT OF TIDE AT ANY TIME.

Similarly, when the range of tide is greater than 20 feet, enter the table with one-half the given range. The tabular correction should then be doubled before applying it to the given high or low water height. If the range of tide is greater than 40 feet, take one-third of the range and multiply the tabular correction by 3.

If the height at any time is desired for a place listed in table 2 predictions of the high and low waters for the day in question should be obtained by the use of the difference given for the place in that table. Having obtained these predictions, the height for any intermediate time is obtained in the same manner as illustrated in the foregoing example.

GRAPHIC METHOD

If the height of the tide is required for a number of times on a certain day the full tide curve for the day may be obtained by the *one-quarter, one-tenth rule*. The procedure is as follows:

1. On cross-section paper plot the high and low water points in the order of their occurrence for the day, measuring time horizontally and height vertically. These are the basic points for the curve.
2. Draw light straight lines connecting the points representing successive high and low waters.
3. Divide each of these straight lines into four equal parts. The halfway point of each line gives another point for the curve.
4. At the quarter point adjacent to high water draw a vertical line above the point and at the quarter point adjacent to low water draw a vertical line below the point, making the length of these lines equal to one-tenth of the range between the high and low waters used. The points marking the ends of these vertical lines give two additional intermediate points for the curve.
5. Draw a smooth curve through the points of high and low waters and the intermediate points, making the curve well rounded near high and low waters. This curve will approximate the actual tide curve and heights for any time of the day may be readily scaled from it.

Caution.—Both methods presented are based on the assumption that the rise and fall conform to simple cosine curves. Therefore, the heights obtained will be approximate. The roughness of approximation will vary as the tide curve differs from a cosine curve.

An example of the use of the graphical method is illustrated below. Using the same predicted tides as in example 2, the approximate height at $3^h\ 00^m$ could be determined as shown below.

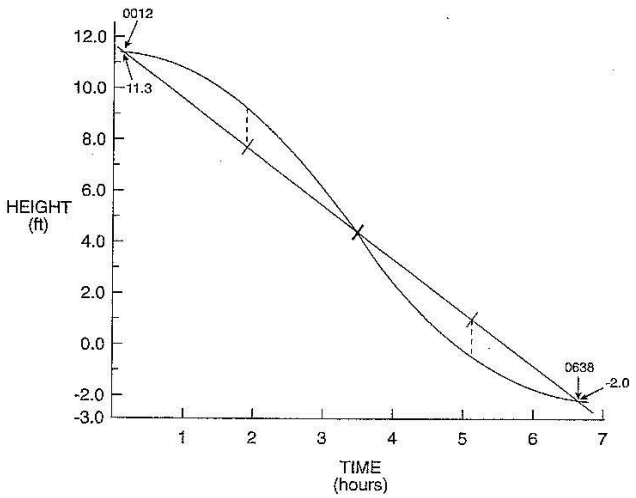

TABLE 3. —HEIGHT OF TIDE AT ANY TIME

Duration of rise or fall, see footnote	Time from the nearest high water or low water														
h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.
4 10	0 08	0 16	0 24	0 32	0 40	0 48	0 56	1 04	1 12	1 20	1 28	1 36	1 44	1 52	2 00
4 20	0 09	0 17	0 26	0 35	0 43	0 52	1 01	1 09	1 18	1 27	1 35	1 44	1 53	2 01	2 10
4 40	0 09	0 19	0 28	0 37	0 47	0 56	1 05	1 15	1 24	1 33	1 43	1 52	2 01	2 11	2 20
5 00	0 10	0 20	0 30	0 40	0 50	1 00	1 10	1 20	1 30	1 40	1 50	2 00	2 10	2 20	2 30
5 20	0 11	0 21	0 32	0 43	0 53	1 04	1 15	1 25	1 36	1 47	1 57	2 08	2 19	2 29	2 40
5 40	0 11	0 23	0 34	0 45	0 57	1 08	1 19	1 31	1 42	1 53	2 05	2 16	2 27	2 39	2 50
6 00	0 12	0 24	0 36	0 48	1 00	1 12	1 24	1 36	1 48	2 00	2 12	2 24	2 36	2 48	3 00
6 20	0 13	0 25	0 38	0 51	1 03	1 16	1 29	1 41	1 54	2 07	2 19	2 32	2 45	2 57	3 10
6 40	0 13	0 27	0 40	0 53	1 07	1 20	1 33	1 47	2 00	2 13	2 27	2 40	2 53	3 07	3 20
7 00	0 14	0 28	0 42	0 56	1 10	1 24	1 38	1 52	2 06	2 20	2 34	2 48	3 02	3 16	3 30
7 20	0 15	0 29	0 44	0 59	1 13	1 28	1 43	1 57	2 12	2 27	2 41	2 56	3 11	3 25	3 40
7 40	0 15	0 31	0 46	1 01	1 17	1 32	1 47	2 03	2 18	2 33	2 49	3 04	3 19	3 35	3 50
8 00	0 16	0 32	0 48	1 04	1 20	1 36	1 52	2 08	2 24	2 40	2 56	3 12	3 28	3 44	4 00
8 20	0 17	0 33	0 50	1 07	1 23	1 40	1 57	2 13	2 30	2 47	3 03	3 20	3 37	3 53	4 10
8 40	0 17	0 35	0 52	1 09	1 27	1 44	2 01	2 19	2 36	2 53	3 11	3 28	3 45	4 03	4 20
9 00	0 18	0 36	0 54	1 12	1 30	1 48	2 06	2 24	2 42	3 00	3 18	3 36	3 54	4 12	4 30
9 20	0 19	0 37	0 56	1 15	1 33	1 52	2 11	2 29	2 48	3 07	3 25	3 44	4 03	4 21	4 40
9 40	0 19	0 39	0 58	1 17	1 37	1 56	2 15	2 35	2 54	3 13	3 33	3 52	4 11	4 31	4 50
10 00	0 20	0 40	1 00	1 20	1 40	2 00	2 20	2 40	3 00	3 20	3 40	4 00	4 20	4 40	5 00
10 20	0 21	0 41	1 02	1 23	1 43	2 04	2 25	2 45	3 06	3 27	3 47	4 08	4 29	4 49	5 10
10 40	0 21	0 43	1 04	1 25	1 47	2 08	2 29	2 51	3 12	3 33	3 55	4 16	4 37	4 59	5 20

Range of tide, see footnote	Correction to height														
Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.
0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
1.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5
1.5	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.8
2.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
2.5	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.2
3.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.2	1.3	1.5
3.5	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.6	0.7	0.9	1.0	1.2	1.4	1.6	1.8
4.0	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.7	0.8	1.0	1.2	1.4	1.6	1.8	2.0
4.5	0.0	0.0	0.1	0.2	0.3	0.4	0.6	0.7	0.9	1.1	1.3	1.6	1.8	2.0	2.2
5.0	0.0	0.1	0.1	0.2	0.3	0.5	0.6	0.8	1.0	1.2	1.5	1.7	2.0	2.2	2.5
5.5	0.0	0.1	0.1	0.2	0.4	0.5	0.7	0.9	1.1	1.4	1.6	1.9	2.2	2.5	2.8
6.0	0.0	0.1	0.1	0.3	0.4	0.6	0.8	1.0	1.2	1.5	1.8	2.1	2.4	2.7	3.0
6.5	0.0	0.1	0.2	0.3	0.4	0.6	0.8	1.1	1.3	1.6	1.9	2.2	2.6	2.9	3.2
7.0	0.0	0.1	0.2	0.3	0.5	0.7	0.9	1.2	1.4	1.8	2.1	2.4	2.8	3.1	3.5
7.5	0.0	0.1	0.2	0.3	0.5	0.7	1.0	1.2	1.5	1.9	2.2	2.6	3.0	3.4	3.8
8.0	0.0	0.1	0.2	0.3	0.5	0.8	1.0	1.3	1.6	2.0	2.4	2.8	3.2	3.6	4.0
8.5	0.0	0.1	0.2	0.4	0.6	0.8	1.1	1.4	1.8	2.1	2.5	2.9	3.4	3.8	4.2
9.0	0.0	0.1	0.2	0.4	0.6	0.9	1.2	1.5	1.9	2.2	2.7	3.1	3.6	4.0	4.5
9.5	0.0	0.1	0.2	0.4	0.6	0.9	1.2	1.6	2.0	2.4	2.8	3.3	3.8	4.3	4.8
10.0	0.0	0.1	0.2	0.4	0.7	1.0	1.3	1.7	2.1	2.5	3.0	3.5	4.0	4.5	5.0
10.5	0.0	0.1	0.3	0.5	0.7	1.0	1.3	1.7	2.2	2.6	3.1	3.6	4.2	4.7	5.2
11.0	0.0	0.1	0.3	0.5	0.7	1.1	1.4	1.7	2.3	2.8	3.3	3.8	4.4	4.9	5.5
11.5	0.0	0.1	0.3	0.5	0.8	1.1	1.5	1.8	2.3	2.9	3.4	4.0	4.6	5.1	5.8
12.0	0.0	0.1	0.3	0.5	0.8	1.1	1.5	1.9	2.5	3.0	3.6	4.1	4.8	5.4	6.0
12.5	0.0	0.1	0.3	0.5	0.8	1.2	2.6	1.9	2.6	3.1	3.7	4.3	5.0	5.6	6.2
13.0	0.0	0.1	0.3	0.6	0.9	1.2	1.7	2.2	2.7	3.2	3.9	4.5	5.1	5.8	6.5
13.5	0.0	0.1	0.3	0.6	0.9	1.3	1.7	2.2	2.8	3.4	4.0	4.7	5.3	6.0	6.8
14.0	0.0	0.2	0.3	0.6	0.9	1.3	1.8	2.3	2.9	3.5	4.2	4.8	5.5	6.3	7.0
14.5	0.0	0.2	0.4	0.6	1.0	1.4	1.9	2.4	3.0	3.6	4.3	5.0	5.7	6.5	7.2
15.0	0.0	0.2	0.4	0.6	1.0	1.4	1.9	2.5	3.1	3.8	4.4	5.2	5.9	6.7	7.5
15.5	0.0	0.2	0.4	0.7	1.0	1.5	2.0	2.6	3.2	3.9	4.6	5.4	6.1	6.9	7.8
16.0	0.0	0.2	0.4	0.7	1.1	1.5	2.1	2.6	3.3	4.0	4.7	5.5	6.3	7.2	8.0
16.5	0.0	0.2	0.4	0.7	1.1	1.6	2.1	2.7	3.4	4.1	4.9	5.7	6.5	7.4	8.2
17.0	0.0	0.2	0.4	0.7	1.1	1.6	2.2	2.8	3.5	4.2	5.0	5.9	6.7	7.6	8.5
17.5	0.0	0.2	0.4	0.8	1.2	1.7	2.2	2.9	3.6	4.4	5.2	6.0	6.9	7.8	8.8
18.0	0.0	0.2	0.4	0.8	1.2	1.7	2.3	3.0	3.7	4.5	5.3	6.2	7.1	8.1	9.0
18.5	0.1	0.2	0.5	0.8	1.2	1.8	2.4	3.1	3.8	4.6	5.5	6.4	7.3	8.3	9.2
19.0	0.1	0.2	0.5	0.8	1.3	1.8	2.4	3.1	3.9	4.8	5.6	6.6	7.5	8.5	9.5
19.5	0.1	0.2	0.5	0.8	1.3	1.9	2.5	3.2	4.0	4.9	5.8	6.7	7.7	8.7	9.8
20.0	0.1	0.2	0.5	0.9	1.3	1.9	2.6	3.3	4.1	5.0	5.9	6.9	7.9	9.0	10.0

Obtain from the predictions the high water and low water, one of which is before and the other after the time for which the height is required. The difference between the times of occurrence of these tides is the duration of rise or fall, and the difference between their heights is the range of tide for the above table. Find the difference between the nearest high or low water and the time for which the height is required.

Enter the table with the duration of rise or fall, printed in heavy-faced type, which most nearly agrees with the actual value, and on that horizontal line find the time from the nearest high or low water which agrees most nearly with the corresponding actual difference. The correction sought is in the column directly below, on the line with the range of tide.

When the nearest tide is high water, subtract the correction.

When the nearest tide is low, add the correction.

TABLE 3.—SPEED OF CURRENT AT ANY TIME

EXPLANATION

Though the predictions in this publication give only the slacks and maximum currents, the speed of the current at any intermediate time can be obtained approximately by the use of this table. Directions for its use are given below the table.

Before using the table for a place listed in Table 2, the predictions for the day in question should be first obtained by means of the differences and ratios given in Table 2.

The examples below follow the numbered steps in the directions.

Example 1.—Find the speed of the current in The Race at 6:00 on a day when the predictions which immediately precede and follow 6:00 are as follows:

(1)

Slack Water Time	Maximum (Flood) Time	Speed
4:18	7:36	3.2 knots

Directions under the table indicate Table A is to be used for this station.

(2) Interval between slack and maximum flood is 7:36 – 4:18 = 3^h18^m. Column heading nearest to 3^h18^m is 3^h20^m.

(3) Interval between slack and time desired is 6:00 – 4:18 = 1^h42^m. Line labeled 1^h40^m is nearest to 1^h42^m.

(4) Factor in column 3^h20^m and on line 1^h40^m is 0.7. The above flood speed of 3.2 knots multiplied by 0.7 gives a flood speed of 2.24 knots (or 2.2 knots, since one decimal is sufficient) for the time desired.

Example 2.—Find the speed of the current in the Harlem River at Broadway Bridge at 16:30 on a day when the predictions (obtained using the difference and ratio in table 2) which immediately precede and follow 16:30 are as follows:

(1)

Maximum (Ebb) Time	Speed	Slack Water Time
13:49	2.5 knots	17:25

Directions under the table indicate Table B is to be used, since this station in Table 2 is referred to Hell Gate.

(2) Interval between slack and maximum ebb is 17:25 – 13:49 = 3^h36^m. Hence, use column headed 3^h40^m.

(3) Interval between slack and time desired is 17:25 – 16:30 = 0^h55^m. Hence, use line labeled 1^h00^m.

(4) Factor in column 3^h40^m and on line 1^h00^m is 0.5. The above ebb speed of 2.5 knots multiplied by 0.5 gives an ebb speed of 1.2 knots for the desired time.

When the interval between slack and maximum current is greater than 5^h40^m, enter the table with one-half the interval between slack and maximum current and one-half the interval between slack and the desired time and use the factor thus found.

TABLE 3.—SPEED OF CURRENT AT ANY TIME

TABLE A

Interval between slack and desired time	Interval between slack and maximum current													
	h. m. 1 20	h. m. 1 40	h. m. 2 00	h. m. 2 20	h. m. 2 40	h. m. 3 00	h.m. 3 20	h.m. 3 40	h.m. 4 00	h.m. 4 20	h.m. 4 40	h.m. 5 00	h.m. 5 20	h.m. 5 40
h. m.	knots	knots	knots	knots	knots	knots	knots	knots	knots	knots	knots	knots	knots	knots
0 20	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0 40	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
1 00	0.9	0.8	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3
1 20	1.0	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4
1 40	----	1.0	1.0	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.4
2 00	----	----	1.0	1.0	0.9	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.5
2 20	----	----	----	1.0	1.0	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6
2 40	----	----	----	----	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.7	0.7	0.7
3 00	----	----	----	----	----	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.8	0.7
3 20	----	----	----	----	----	----	1.0	1.0	1.0	0.9	0.9	0.9	0.8	0.8
3 40	----	----	----	----	----	----	----	1.0	1.0	1.0	0.9	0.9	0.9	0.9
4 00	----	----	----	----	----	----	----	----	1.0	1.0	1.0	1.0	0.9	0.9
4 20	----	----	----	----	----	----	----	----	----	1.0	1.0	1.0	1.0	0.9
4 40	----	----	----	----	----	----	----	----	----	----	1.0	1.0	1.0	1.0
5 00	----	----	----	----	----	----	----	----	----	----	----	1.0	1.0	1.0
5 20	----	----	----	----	----	----	----	----	----	----	----	----	1.0	1.0
5 40	----	----	----	----	----	----	----	----	----	----	----	----	----	1.0

TABLE B

Interval between slack and desired time	Interval between slack and maximum current													
	h. m. 1 20	h. m. 1 40	h. m. 2 00	h. m. 2 20	h. m. 2 40	h. m. 3 00	h. m. 3 20	h. m. 3 40	h. m. 4 00	h. m. 4 20	h. m. 4 40	h. m. 5 00	h. m. 5 20	h. m. 5 40
h. m.	knots	knots	knots	knots	knots	knots	knots	knots	knots	knots	knots	knots	knots	knots
0 20	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
0 40	0.8	0.7	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3
1 00	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4
1 20	1.0	1.0	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5
1 40	----	1.0	1.0	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6
2 00	----	----	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.6
2 20	----	----	----	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.8	0.7	0.7	0.7
2 40	----	----	----	----	1.0	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.8	0.7
3 00	----	----	----	----	----	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.8	0.8
3 20	----	----	----	----	----	----	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9
3 40	----	----	----	----	----	----	----	1.0	1.0	1.0	1.0	0.9	0.9	0.9
4 00	----	----	----	----	----	----	----	----	1.0	1.0	1.0	1.0	0.9	0.9
4 20	----	----	----	----	----	----	----	----	----	1.0	1.0	1.0	1.0	0.9
4 40	----	----	----	----	----	----	----	----	----	----	1.0	1.0	1.0	1.0
5 00	----	----	----	----	----	----	----	----	----	----	----	1.0	1.0	1.0
5 20	----	----	----	----	----	----	----	----	----	----	----	----	1.0	1.0
5 40	----	----	----	----	----	----	----	----	----	----	----	----	----	1.0

Use Table A for all places except those listed below for Table B.
Use Table B for Cape Code Canal, Hell Gate, Chesapeake and Delaware Canal, and all stations in table 2 which are referred to them.

1. From predictions find the time of slack water and the time and velocity of maximum current (flood or ebb), one of which is immediately before and the other after the time for which the velocity is desired.
2. Find the interval of time between the above slack and maximum current, and enter the top of Table A or B with the interval which most nearly agrees with this value.
3. Find the interval of time between the above slack and the time desired, and enter the side of Table A or B with the interval which most nearly agrees with this value.
4. Find, in the Table, the factor corresponding to the above two intervals, and multiply the maximum velocity by this factor. The result will be the approximate velocity at the time desired.

TABLE 4.—DURATION OF SLACK

The predicted times of slack water given in this publication indicate the instant of zero speed, which is only momentary. There is a period on each side of the slack water, however, during which the current is so weak that for practical purposes it may be considered negligible.

The following tables give, for various maximum currents, the approximate period of time during which weak currents not exceeding 0.1 to 0.5 knot will be encountered. This duration includes the last of the flood or ebb and the beginning of the following ebb or flood, that is, half of the duration will be before and half after the time of slack water.

Table A should be used for all places except those listed below for table B.

Table B should be used for Cape Cod Canal, Hell Gate, Chesapeake and Delaware Canal, and all stations in Table 2 which are referred to them.

Duration of weak current near time of slack water

TABLE A

Maximum current	*Period with a speed not more than -*				
	0.1 knot	*0.2 knot*	*0.3 knot*	*0.4 knot*	*0.5 knot*
Knots	*Minutes*	*Minutes*	*Minutes*	*Minutes*	*Minutes*
1.0	23	46	70	94	120
1.5	15	31	46	62	78
2.0	11	23	35	46	58
3.0	8	15	23	31	38
4.0	6	11	17	23	29
5.0	5	9	14	18	23
6.0	4	8	11	15	19
7.0	3	7	10	13	16
8.0	3	6	9	11	14
9.0	3	5	8	10	13
10.0	2	5	7	9	11

TABLE B

Maximum current	*Period with a speed not more than -*				
	0.1 knot	*0.2 knot*	*0.3 knot*	*0.4 knot*	*0.5 knot*
Knots	*Minutes*	*Minutes*	*Minutes*	*Minutes*	*Minutes*
1.0	13	28	46	66	89
1.5	8	18	28	39	52
2.0	6	13	20	28	36
3.0	4	8	13	18	22
4.0	3	6	9	13	17
5.0	3	5	8	10	13
6.0	2	4	6	8	11
7.0	2	4	5	7	9
8.0	2	3	5	6	8

When there is a difference between the speeds of the maximum flood and ebb preceding and following the slack for which the duration is desired, it will be sufficiently accurate for practical purposes to find a separate duration for each maximum speed and take the average of the two as the duration of the weak current.