UNITED STATES NAVAL ACADEMY

# DIVISION OF PROFESSIONAL DEVELOPMENT

DEPARTMENT OF SEAMANSHIP AND NAVIGATION

SECTION \_\_\_\_\_\_\_ INSTRUCTOR\_\_\_\_\_\_\_\_\_\_\_

NN210 BASIC NAVIGATION

**FINAL PROJECT: CHARLESTON HARBOR**

Materials Required: Chart #11524

US Coast Pilot Vol 4, Chapter 6

USCG Light List Vol. 3 “Atlantic and Gulf Coasts” ed. 2020

NOAA Tide prediction tables

NOAA Current prediction tables

Table 3 – Height of tide at any time

Table 3 – Speed of current at any time

NGA NM

USCG LNM

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1. **Situation**

You are the Navigator on board USS SPRUANCE (DDG-111). Your PC is moored in Charleston Harbor, SC after a period of training at sea. It’s **December 08, 2022** and your ship is transiting to San Francisco, CA for Fleet Week.

1. Ship data

Length Overall: 179ft

Draft: 8ft

Navigational Draft: 12ft

Distance Hawsepipe to pelorus: 79 ft

Height of Eye: 56 ft

Mast height: 50ft

1. Status of navigation equipment:

Based on an excellent pierside GPS fix your position is 32° 49’ 58”N 079° 053’ 32”W. FIREBOLT is moored port side to Wando River Terminal. Your team checks the starboard gyro repeater by shooting the bearing of 222°pgc to Range “A” Front Range Light. They then check the port gyro repeater and find a bearing of 083°pgc to the tank in position 32° 50’ 02”N 079° 52’ 50”W. Your Navigation RADAR ranges the southwest tip of Pier at 500yds.

1. Status of Engineering Plant

MDG1: FMC (Fully Mission Capable)

MDG2: FMC

MDE1A: FMC

MDE2A: FMC

MDE1B: FMC

MDE2B: FMC

Fuel Stat: 94%

Fresh Water: 95%

RHIB (c/s Ranger): FMC

1. Initial data

Date: 08 December 2022

Timezone: +5R

Meteorological visibility: 11 NM

1. **Mission**

**Plan to get underway at** **080830RDEC22. Answer the questions asked on the following question sheet and prepare a Navigation Brief for presentation to the class.**

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Use all NN210 lectures as references to successfully complete this project. This is a team effort project and collaboration outside your assigned team is not authorized.

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| --- | --- | --- |
|  | ***Question sheet*** |  |

1. According to the Coast Pilot, what is unique about the North jetty and why should vessels take caution? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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[4 pts]

1. What VHF channels can the Charleston Harbor Pilots be reached on?

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[4 pts]

1. What are the North Atlantic Right Whale Restrictions in the Charleston region?

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[4 pts]

1. What is the current off the entrance to Charleston Harbor?

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[4 pts]

1. What are the draft limitations within Charleston, Harbor?

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[4 pts]

1. Where is the anchorage for deep draft vessels?

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[4 pts]

1. Find the Vertical Clearance (VC) of the Ravenel Fixed Bridge at **080830RDEC22**. [Show all work].

Ravenel Fixed Bridge Charted Clearance (CC) \_\_\_\_\_\_

Charleston *Mean Tide Level* (MTL) 2.8ft

Charleston *Mean Range* (MR) 5.2ft

From *Tide Prediction Tables*

Duration of rise or fall \_\_\_\_\_\_

Time from the nearest high or low water \_\_\_\_\_\_

Range of tide \_\_\_\_\_\_

Use Table 3 – *Height of Tide at Any Time* to answer the following:

Correction to height \_\_\_\_\_\_

Height of tide \_\_\_\_\_\_

Vertical clearance (Vc) at time of transit \_\_\_\_\_\_

[20 pts]

1. Assuming 11NM meteorological visibility, find the characteristic, geographic, luminous range and computed visibility of following lights (use the USCG Lights List):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Light** | **Characteristic** | **Geographic Range** | **Luminous Range** | **Computed Visibility** |
| Cooper River Dike Light 49A |  |  |  |  |
| Battery Point Light BP |  |  |  |  |
| Cooper River Drum Island Preferred Channel Light D |  |  |  |  |
| Ashley River Light 1 |  |  |  |  |
| Cooper River Light 53 |  |  |  |  |
| Charleston Light |  |  |  |  |

[16 pts]

1. What type of structure is Mount Pleasant Range Rear Light and what is unique regarding the visibility?

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[4 pts]

1. Using the attached tide/tidal current prediction tables find the tide and velocity of tidal current for the day and time of departure (**080830RDEC22**). [Show all work for tidal current find the velocity of current]

ETD **080830RDEC22**

**Station: Charleston Harbor Entrance (between jetties)**

*From Tidal current prediction tables*

Interval between slack and ETD \_\_\_\_\_\_

Interval between slack and maximum current \_\_\_\_\_\_

Direction \_\_\_\_\_\_

Type \_\_\_\_\_\_

*From Table 3 – Speed of current at any time.*

Correcting factor \_\_\_\_\_\_

Speed of current \_\_\_\_\_\_

**Station: Charleston Harbor (off Fort Sumter)**

*From Tidal current prediction tables*

Interval between slack and ETD \_\_\_\_\_\_

Interval between slack and maximum current \_\_\_\_\_\_

Direction \_\_\_\_\_\_

Type \_\_\_\_\_\_

*From Table 3 – Speed of current at any time.*

Correcting factor \_\_\_\_\_\_

Speed of current \_\_\_\_\_\_

**Station: North Charleston**

*From Tidal current prediction tables*

Interval between slack and ETD \_\_\_\_\_\_

Interval between slack and maximum current \_\_\_\_\_\_

Direction \_\_\_\_\_\_

Type \_\_\_\_\_\_

*From Table 3 – Speed of current at any time.*

Correcting factor \_\_\_\_\_\_

Speed of current \_\_\_\_\_\_

[20 pts]

1. According to PUB151, what is the distance between Charleston, Harbor and San Francisco, CA?

Distance Charleston, SC – Panama, Panama: \_\_\_\_\_\_\_\_\_\_

Distance Panama, Panama – San Francisco, CA: \_\_\_\_\_\_\_\_\_\_

Total distance: \_\_\_\_\_\_\_\_\_\_

[6 pts]

1. Assuming you are leaving at **080830RDEC221** and have a SOA of 18 kts, at what time – DTG in Zulu time – do you expect to arrive in San Francisco?

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[6 pts]

1. What is the San Francisco **approach** chart number and what is the publishing mapping agency?

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[4 pts]