

NAV 1 CERTIFICATION STANDARDS

Outcome: To safely plan and navigate a trip aboard a vessel during daytime and within sight of land, using electronic navigation.

Recommended Equipment: Nav 1 courses and examinations may be conducted and tested in a classroom, virtually, or on a vessel, and with access to an electronic navigation device required.

Prerequisite: There is no prerequisite for Nav 1 certification.

Certification Requirements: Successfully complete the following knowledge and skill requirements.

Practical Skills

1.0 Operation of Electronic Navigation Systems

- 1.1 Demonstrate the basic settings and functions of an electronic navigation device, including light settings, select and switch chart orientations (head-up, course-up, north-up), units, data boxes, chart details and notes, and alarms if appropriate.
 - 1.1.1 Customize the electronic navigation device to a vessel (e.g., vessel depth, height).
 - 1.1.2 Access course and speed from the data box.
- 1.2 Demonstrate locating your vessel on a chart and zooming in and out to view details of surrounding area.
- 1.3 Demonstrate the ability to find and communicate a latitude and longitude position from an electronic chart (degrees, minutes and decimals of minutes).
- 1.4 Measure distance and bearing to an object using the electronic chart.
- 1.5 Create and manage waypoints.
- 1.6 Demonstrate ability to access tide and current information electronically.
- 1.7 Access your latitude and longitude from a backup device.

2.0 Building a Route

- 2.1 Build and verify a multiple leg route for a cruise including intermediate waypoints as needed.
 - 2.1.1 Utilize the three Es, ETD/ETE/ETA (Estimated Time of Departure/Estimated Time Enroute/Estimated Time of Arrival) in your route building.

Knowledge

1.0 Charts: Types, Scales, Units, Datums, Symbols

- 1.1 Explain the organization of a Mercator chart, including latitude and longitude, chart scales, chart symbols (Chart No.1).
 - 1.1.1 Explain how distance and direction can be measured on the chart.
 - 1.1.2 Understand how latitude and longitude are determined and in which direction their measurements increase or decrease.
- 1.2 Describe the differences between raster and vector charts.
- 1.3 Explain how to determine what units are used on an electronic navigation device and how they are displayed.
- 1.4 Explain the reasons for using different zoom levels and the associated risks.

2.0 Auto Route

2.1 Understand the pros and cons of using auto route.

3.0 Tides and Currents

3.1 Define tides

3.1.1 Define Mean High Water (MHW) and Mean Lower Low Water (MLLW) and understand how they are used.

3.1.1.1 Describe how soundings and heights relate to MHW and MLLW chart datums.

3.1.1.2 Explain how to determine a safe passage under overhead objects (i.e., bridges, overhead cables).

3.1.1.3 Explain how to determine a safe passage over shoal water.

3.2 Define current

3.2.1 Describe different types of current (e.g., tidal, river, ocean, wind-driven).

3.2.2 Define set (direction) and drift (speed) of currents and how they may affect your course and speed over the ground.

3.2.3 Explain ebb, flood, slack, and max.

4.0 Electronic Navigation & Piloting

4.1 List the primary needs of a GPS to function, including a power source, an unobstructed electronic view of the sky, and the number of satellite signals.

4.2 Explain various ways of receiving and updating navigation information (i.e., mobile device, VHF, micro SD card) and the limitations thereof.

4.3 Describe potential location errors occurring when using mobile devices such as lack of GPS chip, location permissions not enabled for an app, or mobile cell towers giving incorrect locations.

4.4 Understand the need to determine your latitude and longitude from multiple navigation resources.

4.5 Describe the different uses of waypoints, including departure, turning, destination, and MOB.

4.6 Identify and describe the differences between course to steer (CTS), heading, and course over ground (COG).

4.7 Understand the concept of cross track error (XTE) and how to determine a new safe course.

4.8 Explain how relative bearings are taken.

4.9 Describe how to determine the relative direction between vessels/objects from their latitude and longitude positioning.

4.10 Describe how to verify a vessel's depth transducer offset.

4.11 Describe the basic principles of eyeball piloting techniques, including pilotage near a shore such as safe course, ranges (or transits), and use of the depth sounder.

4.12 Describe AIS (Automatic Identification System) and its use to identify aids to navigation.

4.13 Describe how watercolor can be used to indicate water depth and type of bottom.

4.14 Explain how you would apply a Backup Navigation plan using either an independent electronic system from the primary system, or non-electronic navigation methods.

5.0 Aids to Navigation (ATON) Systems

5.1 Understand the buoyage systems of IALA A & B, including cardinal and Intracoastal marks.

6.0 Compass

- 6.1 Describe deviation and variation, and their causes.
- 6.2 Describe compass types (fluxgate, GPS, steering, hand-bearing) and how deviation and variation may affect them.

7.0 Trip Planning

- 7.1 Understand supplemental sources of information available to plan a trip such as local knowledge contained in a cruising guide.
- 7.2 Explain the relationship between time/speed/distance.
- 7.3 Describe how to integrate basic weather information into your plan.
- 7.4 Describe the importance of navigational considerations.
 - 7.4.1 Including upwind or upcurrent arrival, anticipating leeway, fuel consumption, and when to depart from a route.
- 7.5 Describe the factors of how to select a departure and arrival time.

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