



9th Meeting of the Nautical Cartography Working Group (NCWG)

ENC Derived Paper Chart Guidelines **NCWG9-05.9A**



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BACKGROUND

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- October 2022, IHO Council 6 Action C6/17, endorsed the offer of the US (supported by AU, DE, DK, KR, and NZ) to:
 1. Document use cases and develop associated guidelines
 2. Identify challenges with S-4...
...to **achieve automated production of derived paper charts from ENC content databases**
 3. Submit them to the HSSC/NCWG for their consideration





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USE CASES

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1. Backup Safety of Navigation (SoN) product for ECDIS-mandated vessels

- Reduced geographic coverage (i.e., sea buoy to sea buoy)
- Reduced number of scales
- Fixed product extents to support updating and navigational consistency/safety
- Some divergence from S-4 requirements
- SOLAS update process required

2. Primary SoN product for non-ECDIS-mandated vessels

- Supporting all scales and geographic coverage for SoN
- Fixed product extents to support updating and navigational consistency/safety
- Limited divergence from S-4 requirements
- Regulated updated processes required

3. Non-SoN planning products

- No requirement to meet S-4
- Must be marked, such as, "Not for Navigation"





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CHALLENGES TO MEET S-4 AND CONSIDERATIONS

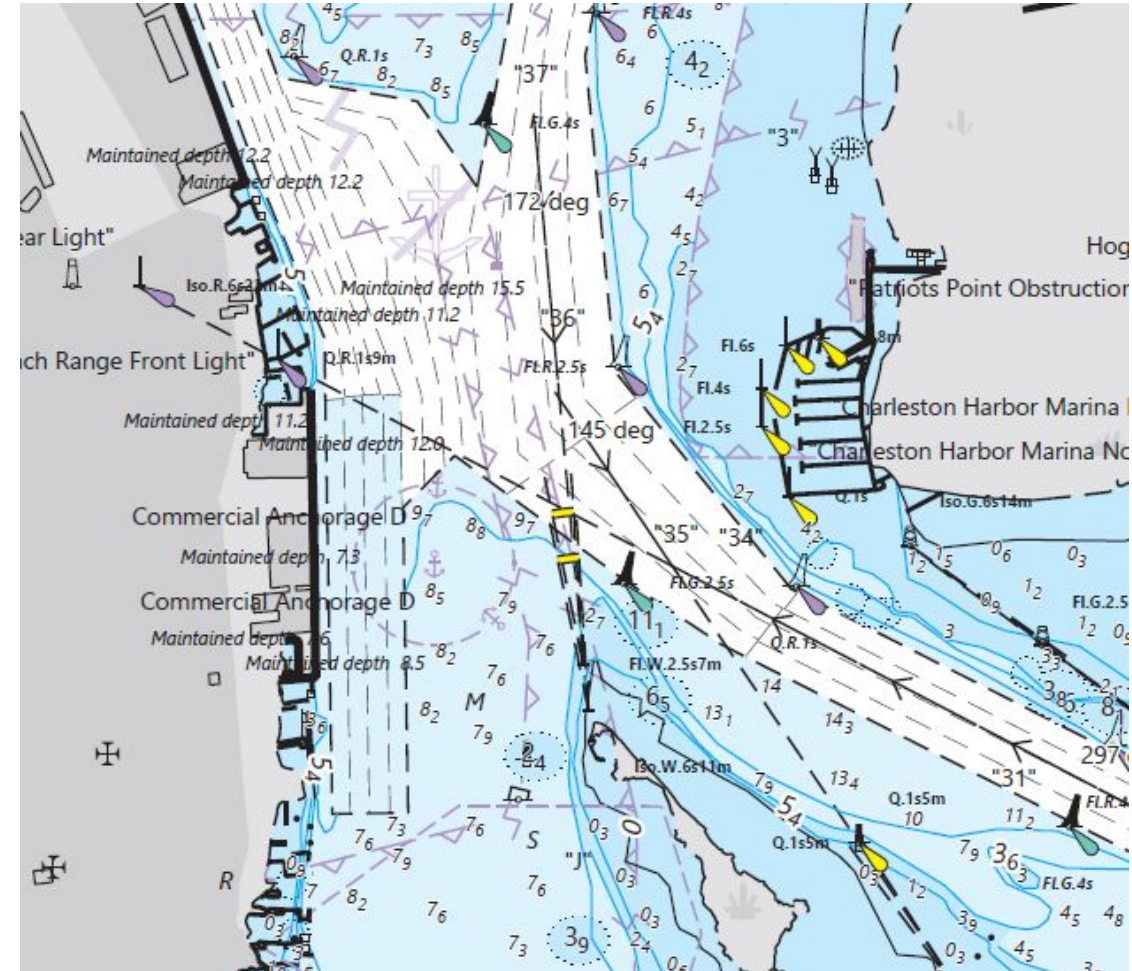
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- Static Cartographic Representation

- ENC data on a paper chart
 - Edge matching
 - Over collection
 - Clutter

- Labeling Features

- Size, placement, and importance considerations
- Overprinting





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CHALLENGES cont.

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- Notes and Cautions
 - Placement
 - Is the feature on the chart?
 - “See Note”
- Updating and Correcting Charts
 - Automated vs manual
 - New editions?

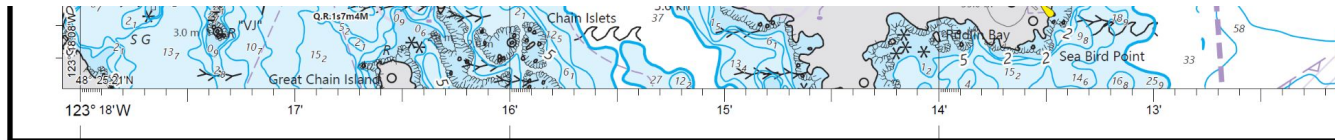




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GUIDELINES

WGS 84



Generation Date: 21 December 2022

N3A800

IN PRINT

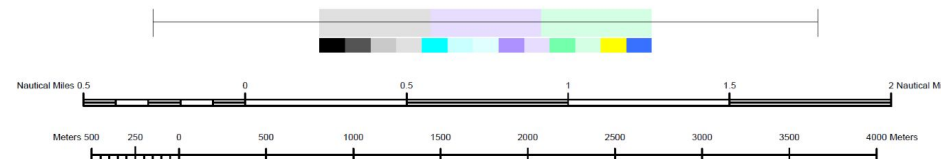


NSN 7642017030205

NGA Ref No: CPENEN3A800

UNITS IN METERS

To ensure this chart was printed at the proper scale, alignment, and color: (1) the line below should be straight and measure six inches (152.4 millimeters), (2) the line should strikethrough three equally-sized boxes of distinct color containing the word "OVERPRINT", and (3) a separate group of 13 equally-sized boxes of distinct color should be aligned and completely visible under red light. If any part of the three checks listed above fail to be confirmed, this copy is not certified safe for navigation.



- Scale
 - Should match ENC cell
- Print Media Requirements
 - Should remain the same as current paper nautical charts
- Chart Elements
 - Graticules & Compass Roses
- Chart Marginalia
 - Title, authority, number, scale, datum, generation date
- Notes and Cautions
 - On chart or separate pages

AUTOMATION CAVEAT

This chart has been automatically rendered from Electronic Navigational Charts (ENCs) that are produced by the [hydrographic authority] and/or received from [hydrographic authority's] trusted-partners. While significant technological development efforts have been made in this automation process, cartographic anomalies could nonetheless exist. Mariners using this chart must understand this is a static reproduction of the ENC and has not been individually quality checked or adjusted for optimal navigation usage in the area covered by this chart. Navigational users are reminded of the affirmative duty of the prudent mariner to "use all available means to assure safe navigation of their vessels" and to not rely solely on any single aid to navigation.

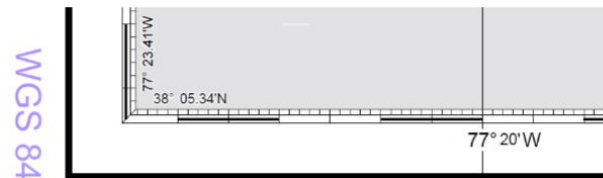


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GUIDELINES cont.

International Hydrographic Organization

- Charted Information
 - Aids to Navigation
 - Depts and Units
 - Blue Tint
 - Symbology
 - Heights
 - Labelling of Characteristics
- Updating
 - Notifying Users of Changes
 - Providing Critical Updates



Generation Date: 26 July 2023

PWA804

CORRECTED

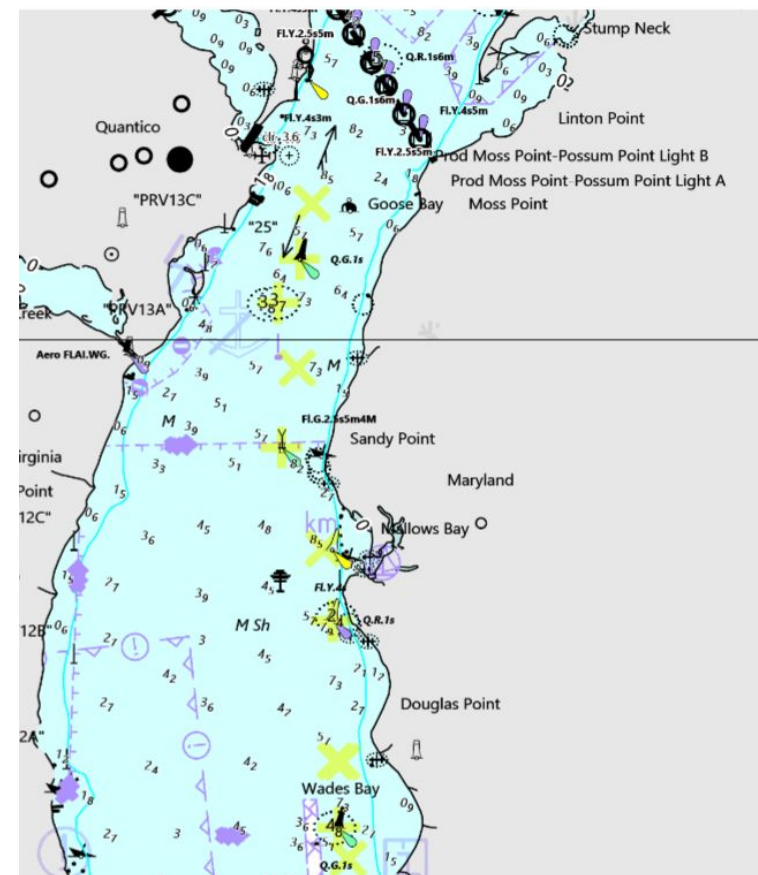


NSN 7642017068695

NGA Ref No. CPENAPWA804

CORRECTIONS LEGEND

	Add point		Add area
	Change point		Change area
	Delete point		Delete area
	Add line		
	Change line		
	Delete line		





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RECOMMENDATIONS

- 1) NCWG should consider this paper and any necessary changes to its content

JUSTIFICATION AND IMPACTS

- 1) More hydrographic offices are moving towards using ENC data to create paper nautical charts
- 2) A standard needs to be set regarding what should be shown on charts and how they are produced



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ACTION REQUIRED

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The NCWG is invited to:

- Discuss this paper and its recommendations
- Address any comments regarding ENC-derived paper nautical charts
- Consider adopting these guidelines as a working group document
- Submit this paper to HSSC for its consideration