



IHO File No. S3/8151 & S3/6004

CIRCULAR LETTER 29/2019
13 June 2019

**SURVEY OF IHO MEMBER STATES
ON THE FUTURE OF THE PAPER NAUTICAL CHART**

References:

- A. Doc. HSSC11-05.4B – *Future of Paper Nautical Chart – Preliminary Report*.
- B. List of Decisions and Actions from HSSC-11.

Dear Hydrographer,

1. The IHO Nautical Cartography Working Group (NCWG) prepared a preliminary report on the "Future of the Paper Nautical Chart" (FPNC) (Reference A), which was presented to the 11th meeting of the IHO Hydrographic Services and Standards Committee (HSSC) in May 2019. Some minor edits were made to the report, based on feedback received from HSSC Members after the meeting. The preliminary report (version dated 31 May 2019) is now available at: www.iho.int > HSSC > NCWG > Miscellaneous > Future of the Paper Nautical Chart – Preliminary Report > [Link](#).

2. This preliminary report discusses several important paper chart related issues that may require the IHO, hydrographic offices, regulatory organizations, mariners and other stakeholders to consider paper charts differently and to take appropriate actions to prepare for the future of the paper chart. Some of the topics covered by the report include:

- Changes in paper chart and ENC usages and sales
- Changes in regulations for the use of paper and electronic charts
- Changes to paper chart specifications
- Changes in production practices, from a single database to produce both ENC and paper chart products
- Alternative methods of paper chart production, such as "product on demand"
- Possibilities for creating paper charts and backup charts from ENC data
- Production of International (INT) charts
- Resources allocated to the production and maintenance of paper charts
- Recommendations on the way forward.

3. Some of the discussion in the report is from the perspective of only one or just a few hydrographic offices. In order to get a more complete understanding of the state of paper nautical chart production, distribution and usage practices in the broader hydrographic community, the HSSC, at its 11th meeting approved the proposal made by the NCWG to conduct a survey of IHO member states to gather more information (Reference B, see Decision and Action HSSC11/46).

4. A questionnaire was prepared by the NCWG, keyed to issues raised in the preliminary report. The questionnaire is provided in Annex A and its online version is available at: www.iho.int > HSSC > NCWG > Miscellaneous > Future of the Paper Nautical Chart – Online Survey > [Link](#).

5. Member States are encouraged to review the preliminary report to gain some background on the questions that are presented in the survey and then complete the questionnaire. The results of the survey will be incorporated into the final FPNC report, which will be presented at the 12th meeting of HSSC in May 2020.

6. Survey Instructions: The survey is being conducted online. Please review the survey questions listed in Annex A of this Circular Letter to allow for the preparation of responses in advance and then proceed to the Online Survey ([Link](#)). Each Member State may submit only one survey response. The deadline for completing the survey is **31 August 2019**.

7. Any questions about the survey or difficulty accessing the online questionnaire should be addressed to Mr Colby Harmon, Chair of the NCWG FNPC subgroup (Colby.Harmon@noaa.gov).

8. The IHO Secretariat will appreciate participation in this important study. The information obtained from this survey will assist in the formulation of recommendations for future work to be undertaken by the NCWG and other working groups of the HSSC to support the creation, maintenance, and provision of navigational products for the modern marine environment.

On behalf of the Secretary-General

Yours sincerely,



Abri KAMPFER

Director

Annex:

A. Questionnaire on the Future of the Paper Nautical Chart (pdf format, English only).

IHO Future of the Paper Nautical Chart Survey

This survey was prepared by the International Hydrographic Organization (IHO) Nautical Cartography Working Group (NCWG) to accompany its preliminary report on the Future of the Paper Nautical Chart (FPNC).

The results of the survey will be incorporated into the final FPNC report, which will be presented by the NCWG at the twelfth meeting of the IHO Hydrographic Services and Standards Committee (HSSC), 11-15 May 2020.

Each IHO Member State may submit only one survey response.

The deadline for completing your survey is 31 August 2019.

Survey Submitter Information

Information about the submitting IHO Member State and the associated Point of Contact

1. **First name of person submitting this survey response**

2. **Last name of person submitting this survey response**

3. **E-mail of person submitting this survey response**

4. Which IHO Member State is this survey response from?*Mark only one oval.*

- Algeria
- Argentina
- Australia
- Bahrain
- Bangladesh
- Belgium
- Brazil
- Brunei Darussalam
- Bulgaria
- Cameroon
- Canada
- Chile
- China
- Colombia
- Croatia
- Cuba
- Cyprus
- Denmark
- Dominican Republic
- Ecuador
- Egypt
- Estonia
- Fiji
- Finland
- France
- Germany
- Greece
- Georgia
- Guatemala
- Iceland
- India
- Indonesia
- Iran
- Ireland
- Italy
- Jamaica
- Japan
- Korea, Democratic People's Republic of

- Korea, Republic of
- Kuwait
- Latvia
- Malaysia
- Malta
- Mauritius
- Mexico
- Monaco
- Montenegro
- Morocco
- Mozambique
- Myanmar
- Netherlands
- New Zealand
- Nigeria
- Norway
- Oman
- Pakistan
- Papua New Guinea
- Peru
- Philippines
- Poland
- Portugal
- Qatar
- Romania
- Russian Federation
- Saudi Arabia
- Seychelles
- Singapore
- Slovenia
- South Africa
- Spain
- Sri Lanka
- Suriname
- Sweden
- Thailand
- Tonga
- Trinidad and Tobago
- Tunisia
- Turkey

- Ukraine
- United Arab Emirates
- United Kingdom
- United States
- Uruguay
- Vanuatu
- Venezuela
- Viet Nam

National Regulatory Information

Information about your national maritime regulations for commercial vessels on domestic voyages. (Ref FPNC 2.2.b)

5. Primary - What type of nautical charts does your national maritime authority require commercial vessels to carry on domestic voyages? [Check one]

Mark only one oval.

- Only Paper Charts
- Only ENCs
- Either Paper Charts or ENCs
- Other: _____

6. Backup - What type of nautical charts does your national maritime authority allow commercial vessels to carry on domestic voyages as a backup for the primary chart type? [Check all that apply]

Check all that apply.

- Paper Charts
- ENCs
- RNCs
- No Backup required
- Other: _____

Backup Chart Development

Backup Charts

Information about any existing or development plans for a "fit for purpose" paper chart to be used as a backup. (Ref FPNC 2.3.a)

7. What actions or plans has your agency made to provide a simplified paper nautical chart specifically for use as a backup for electronic navigational systems (ECDIS, ECS, chart plotters, etc.)? [Check all that apply]

Check all that apply.

- We have no plans to create a simplified paper chart product other than standard nautical charts.
- We recently started considering the possibility of creating a new, simplified paper chart for backup.
- We are actively developing policies and/or specifications for a new, simplified paper chart for backup.
- We have prototyped a new, simplified paper chart for backup.
- We are producing and distributing a new, simplified paper chart for backup.
- We explored producing a simplified paper chart for backup, but have now stopped this effort.

8. Is your agency doing any other activities related to development of any product to be used as a backup for electronic navigational systems?

Chart Production System

Information about the use of a single production system for maintaining both ENC and paper chart nautical products.

9. Is your agency using, or moving toward the use of, a single production database that stores data to maintain both ENC and paper charts? (Ref FPNC 2.4.a) [Check the closest answer]

Mark only one oval.

- Our ENC and paper charts are produced from a single database.
- Our ENC and paper charts are produced from separate databases.
- Our ENC and paper charts are produced from separate databases, but we are actively migrating toward use of a single production database.
- Our ENC and paper charts are produced from separate databases, but we are considering a move toward use of a single production database.
- Other: _____

10. Is your agency using S-57 encoded data to produce S-4 based symbolization on raster chart products? (Ref FPNC 2.4.b) [Check the closest answer]

Mark only one oval.

- Yes. The symbolization of raster charts totally automated.
- Yes. The symbolization of raster charts nearly automated, but some manual "finishing" is required to completely symbolize the chart.
- No. We use S-57 encoded data to create raster charts, but raster symbolization is generated from additional (non-S-57) attribution.
- No. Our raster charts are not created from S-57 encoded data.

Distribution of Paper Nautical Charts

Paper Nautical Chart Sales

Information about sales of paper nautical charts between 2008 and 2018. This section first asks about pre-printed stocking of paper nautical charts and then about Print-on-Demand distribution methods. Please report sales numbers for each separately.

11. What methods do you use for stocking and distributing your paper nautical charts? (Ref FPNC 2.4.c) [Check all that apply]

Check all that apply.

- Large stocks of charts are printed in advance and stored for distribution.
- Single charts, or small quantities, of charts are printed or plotted as orders are received.
- Other: _____

12. The questions that follow ask that you enter paper chart sales numbers for the years 2008 through 2018, one year at a time. If you prefer, you may alternatively e-mail a spreadsheet or table to colby.harmon@noaa.gov with this information. If you prefer to e-mail your information, please indicate so below.

Mark only one oval.

- I will provide individual year sales information within this survey.
- I will e-mail this information *Skip to question 35.*
- We do not sell paper nautical charts *Skip to question 35.*
- We do not have this information *Skip to question 35.*

Provide Paper Chart Sales Data

You will first be asked to provide numbers for sales of "pre-printed" charts for years 2008-2018. You will then be asked to provide numbers for sales of "print on demand" paper charts for years 2008-2018..

Please provide the number of your agency's standard, pre-printed, paper nautical charts sold in each of the calendar years below. (Ref FPNC 25.a)

These are charts printed in large batches, usually by offset lithography, and then warehoused for subsequent distribution to customers.

13. 2008

14. 2009

15. 2010

16. **2011**

17. **2012**

18. **2013**

19. **2014**

20. **2015**

21. **2016**

22. **2017**

23. **2018**

Please provide the number of your agency's standard, Print-on-Demand, paper nautical charts sold in each of the calendar years below. (Ref FPNC 25.a)

These are charts printed one or a few at a time as they are ordered by customers.

24. **2008**

25. **2009**

26. **2010**

27. **2011**

28. 2012

29. 2013

30. 2014

31. 2015

32. 2016

33. 2017

34. 2018

Distribution of Electronic Navigational Charts (ENCs)

35. The questions that follow ask that you enter ENC sales numbers for the years 2008 through 2018, one year at a time. If you prefer, you may alternatively e-mail a spreadsheet or table to colby.harmon@noaa.gov with this information. Please indicate your preference below.

Mark only one oval.

- I will provide individual year sales information within this survey.
- I will e-mail this information *Skip to question 48.*
- We do not produce or sell ENCs *Skip to question 48.*
- We do not have this information *Skip to question 48.*

Provide ENC Sales Data

36. ENC usage can be counted in several ways. Please indicate the method that you are using to report ENC sales.

Check all that apply.

- If an ENC is sold or licensed for use in any part of a year, it is counted as 1 sale in that year.
- If an ENC is licensed for use for a portion of a year, the count for that ENC is pro-rated. For example, if a particular ENC is licensed for a ship's use for 6 months, it is counted as 0.5 sale for that year.
- Other: _____

ENC Sales

Information about sales of ENC cells between 2008 and 2018.

Please provide the number of your agency's ENCs sold in each of the calendar years below. (Ref FPNC 25.b)

37. **2008**

38. **2009**

39. **2010**

40. **2011**

41. **2012**

42. **2013**

43. **2014**

44. **2015**

45. **2016**

46. **2017**

47. **2018**

Nautical Chart Types

Information about the relationship between your paper chart products, Raster Navigational Charts (RNCs), and Electronic Navigational Charts (ENCs) (Ref FPNC 25.c)

48. Which of the following nautical chart types does your agency produce. [Check all that apply]

Check all that apply.

- Standard paper nautical charts
- Special paper charts for recreational boaters
- Raster Navigational Charts (RNC)
- Electronic Navigational Charts (ENC)
- Other: _____

49. What products or services does your agency provide specifically for recreational boaters? (Ref FPNC 25.d)

Future Products

50. How many new (first edition) paper INT charts does your agency expect to create in the next three years? (Ref FPNC 3.1.a)

51. Do you plan on a general rescheming of the layouts of your paper nautical charts in the next five years? (Ref FPNC 3.1.b)

Check all that apply.

- Yes
- No

52. If rescheming paper nautical charts is planned, please explain the rationale for rescheming (to better align with ENC coverage and scales, reduction in raster chart coverage, etc.) (Ref FPNC 3.1.b)

53. **Do you have corresponding paper nautical chart coverage for your ENC's? (Ref FPNC 3.1.c)**
[Check the closest answer]

Mark only one oval.

- Nearly every one of our ENC's have a corresponding paper chart covering the same area.
- About 75% of our ENC's have a corresponding paper chart covering the same area.
- About 50% of our ENC's have a corresponding paper chart covering the same area.
- About 25% of our ENC's have a corresponding paper chart covering the same area.
- None of our ENC's have a corresponding paper chart covering the same area.

54. **When you create new or larger scale coverage in an area, what nautical chart products do you produce? (Ref FPNC 3.1.c-d) [Check all that apply]**

Check all that apply.

- Standard paper nautical chart
- ENC
- RNC
- Raster titled data
- Vector tiled data
- Other: _____

55. **Are you using or planning to use any technology that would print paper charts directly from ENC data? (Ref FPNC 3.2.a) [Check the closest answer]**

Check all that apply.

- Yes, we are use a mostly automated process to do this.
- Yes, we are use a semi-automated process to do this.
- Yes, we are use a mostly manual process to do this.
- No, but we are exploring ways in which this might be done.
- No. We have no plans on doing this.

56. **Are you using, or planning to use, any technology that enables users to define their own paper chart extent and scale to output their own customized chart? (Ref FPNC 3.2.b) (Ref FPNC 3.2.b) [Check the closest answer]**

Check all that apply.

- Yes, we already provide this service to our customers?
- Yes, we are prototyping technology that could provide this service.
- Yes, we are considering the possibility of developing this service.
- No. We have no plans for providing this type of service.

Impact of Change

Assessment of the potential impacts of a world without paper nautical charts.

57. What is your perception of the impact of a world without paper nautical charts would have on the following five areas? That is, what degree of changes would be needed to accommodate paperless navigation or would result from paperless navigation? (Ref FPNC 4.) [Check one level for each row]

Mark only one oval per row.

	High	Med	low
International Regulation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
National Regulations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
User Requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nautical Product Production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sales Revenue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

58. What types of changes in your maritime national regulations would be required to enable the disuse of paper nautical charts? (Ref FPNC 4.1.a)

Additional Comments

59. Are there any other comments that you would like to add regarding the future of the paper nautical chart?

