



# **Hydrographic Surveys Working Group (HSWG) 5**

Manual on Hydrography Project Team

Plenary Update

02<sup>nd</sup> Oct 2023



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# MHPT UPDATE

International  
Hydrographic  
Organization

- MHPT Objectives
- General update from MHPT
- Workplan
- Review of C-13 Questionnaire
- Outline for MHPT Breakout session



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# MHPT OBJECTIVES

International  
Hydrographic  
Organization

- Review and update the existing content, structure, presentation format, and dissemination of C-13;
- Preparing and proposing revisions and amendments to reflect changes of C-13 in the demands of the review and update;
- Support HSWG in all relevant aspects of C-13.



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# GENERAL UPDATE

International  
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Organization

- Extended the C-13 Questionnaire Availability to allow more responses
  - Closed on 30 June with only 99 responses
- Since HSWG 4 Project Team has been meeting Inter-sessionally to review the individual Chapters of C-13 using feedback from questionnaire as well as S5B and team knowledge and expertise
  - *Findings later in the session*
- Contacted the Tides and Water Levels Working Group for assistance/contributions to Chapter 5 – Water Levels and Flow
  - *Confirmed willing to assist*





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# REVIEW OF C-13 QUESTIONNAIRE

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- Questionnaire extended by 4 months
  - 2<sup>nd</sup> extension following request from IBSC to allow training organisations to comment
  - 99 total responses (only 10 additional responses)



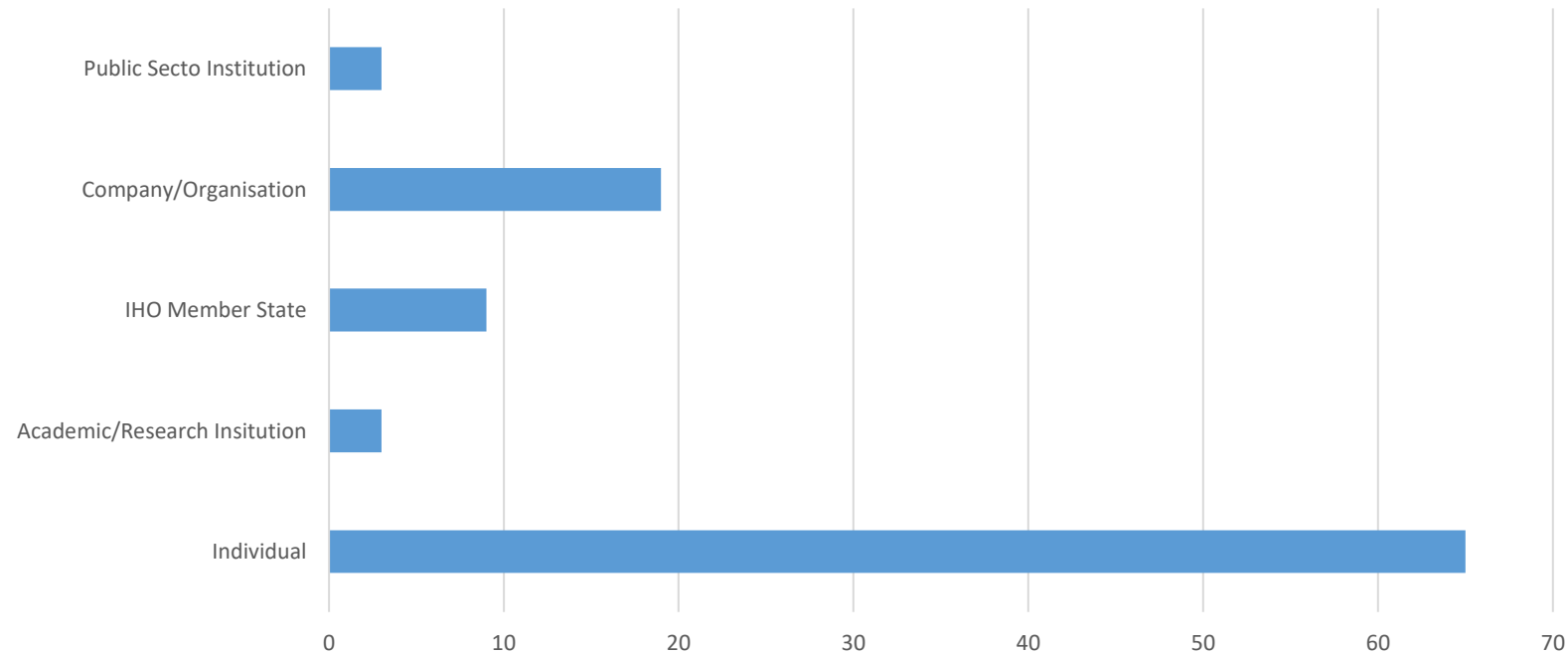
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# REVIEW OF C-13 QUESTIONNAIRE

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1. Are you responding as an individual or representing the wider views of a company, organization or IHO Member State?

Responses by Organisation



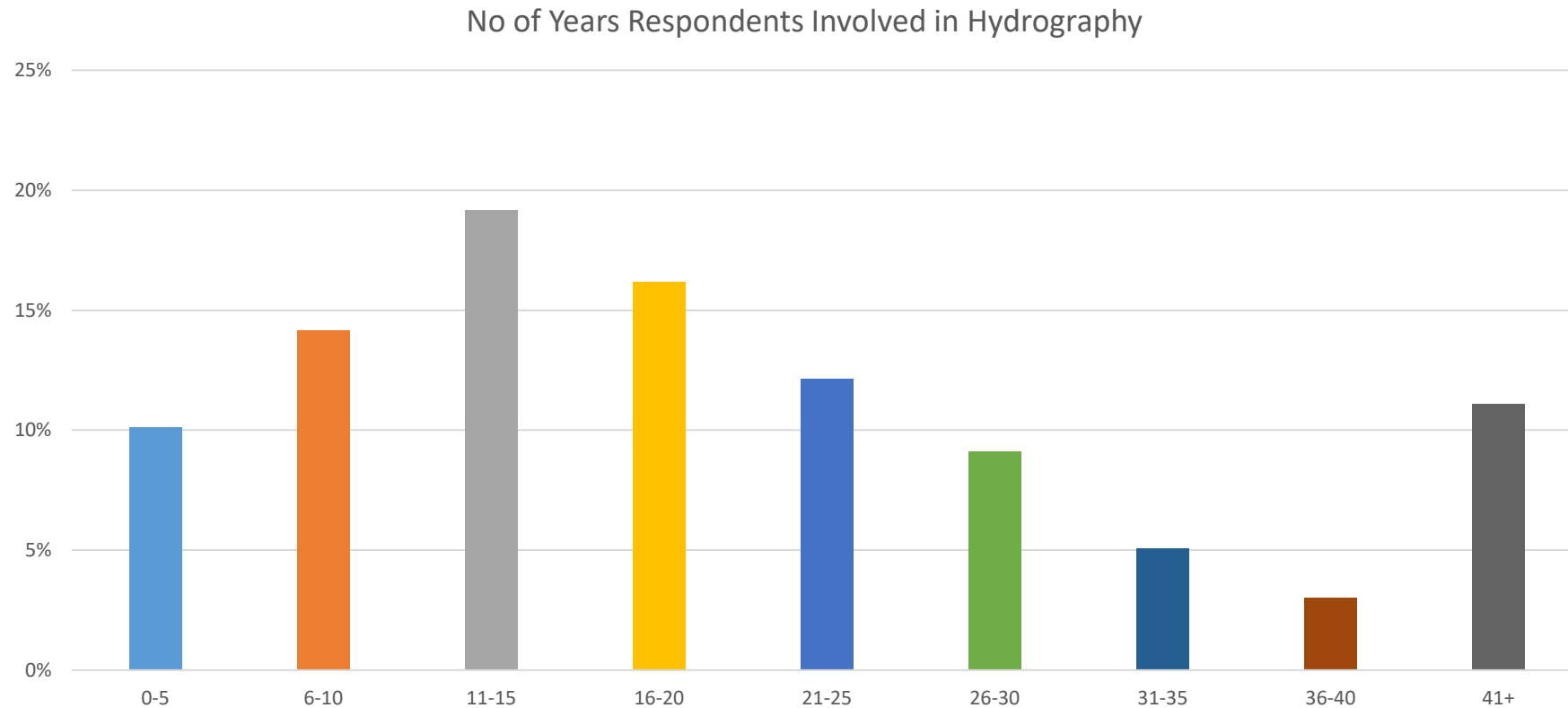


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# REVIEW OF C-13 QUESTIONNAIRE

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2. To the nearest whole year, how long have you been involved in hydrography, or an allied industry or profession?







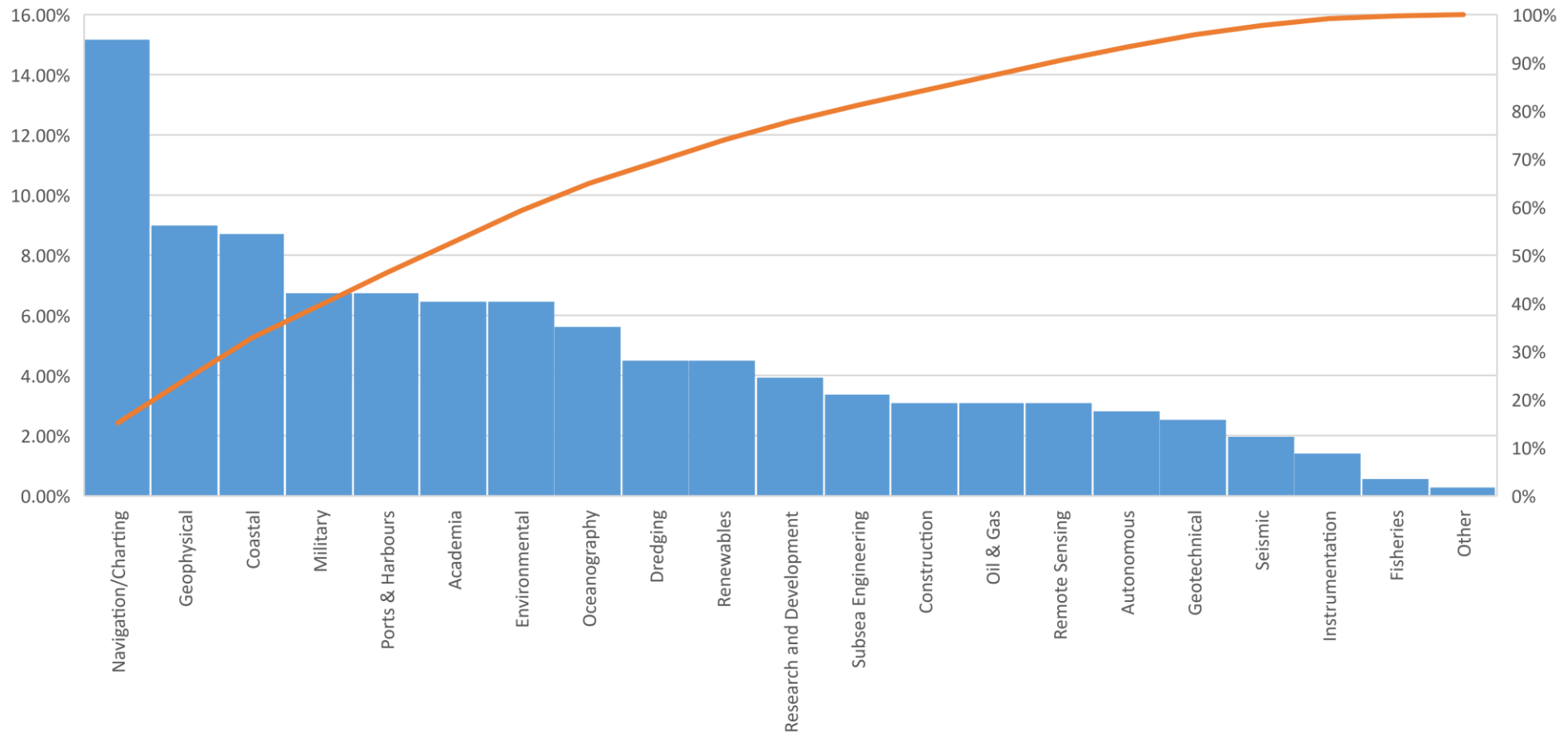
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# REVIEW OF C-13 QUESTIONNAIRE

International Hydrographic Organization

## 3. In which industry sectors(s) are you currently working? (Select up to 4)

Sectors and Proportion of Respondents





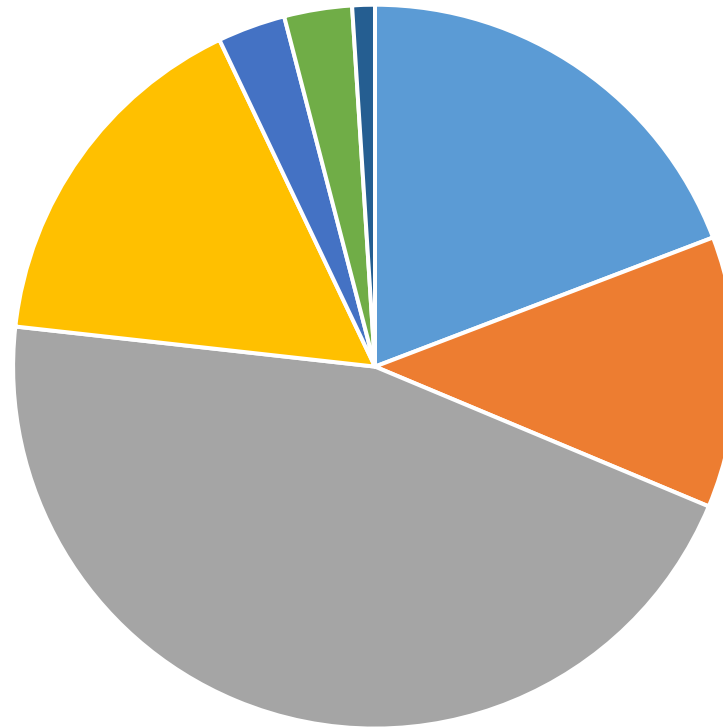
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# REVIEW OF C-13 QUESTIONNAIRE

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## 4. Which best represents your current role?

Respondents by Area of Responsibility



■ Education ■ Senior Management ■ Data Collection ■ Data Processing/Analysis ■ Procurement ■ Consultant ■ Student

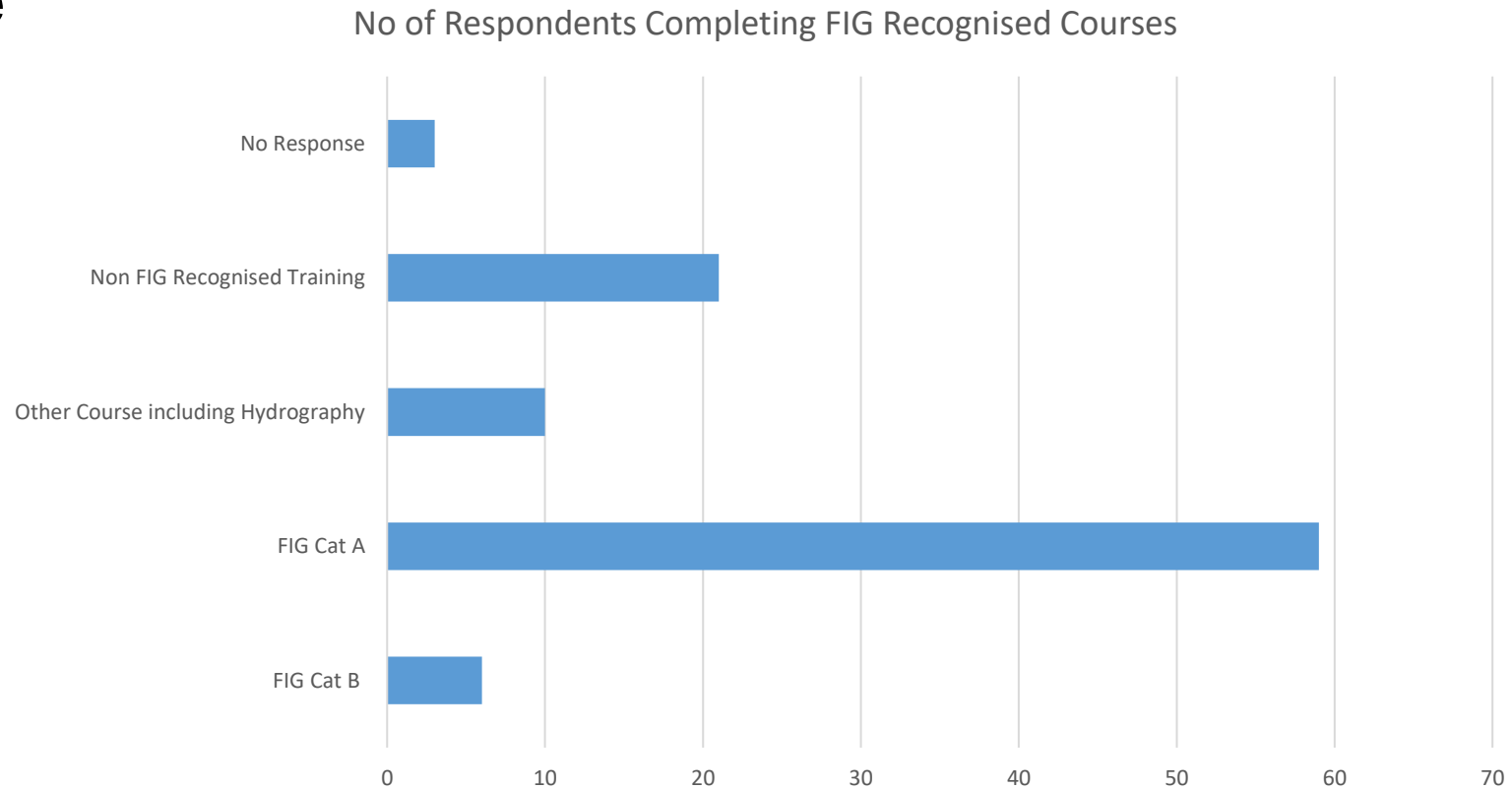


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# REVIEW OF C-13 QUESTIONNAIRE

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6. Have you attended a programme which has been recognised as meeting the requirements of the FIG/IHO/ICA S-5/S 8 Standards of Competence



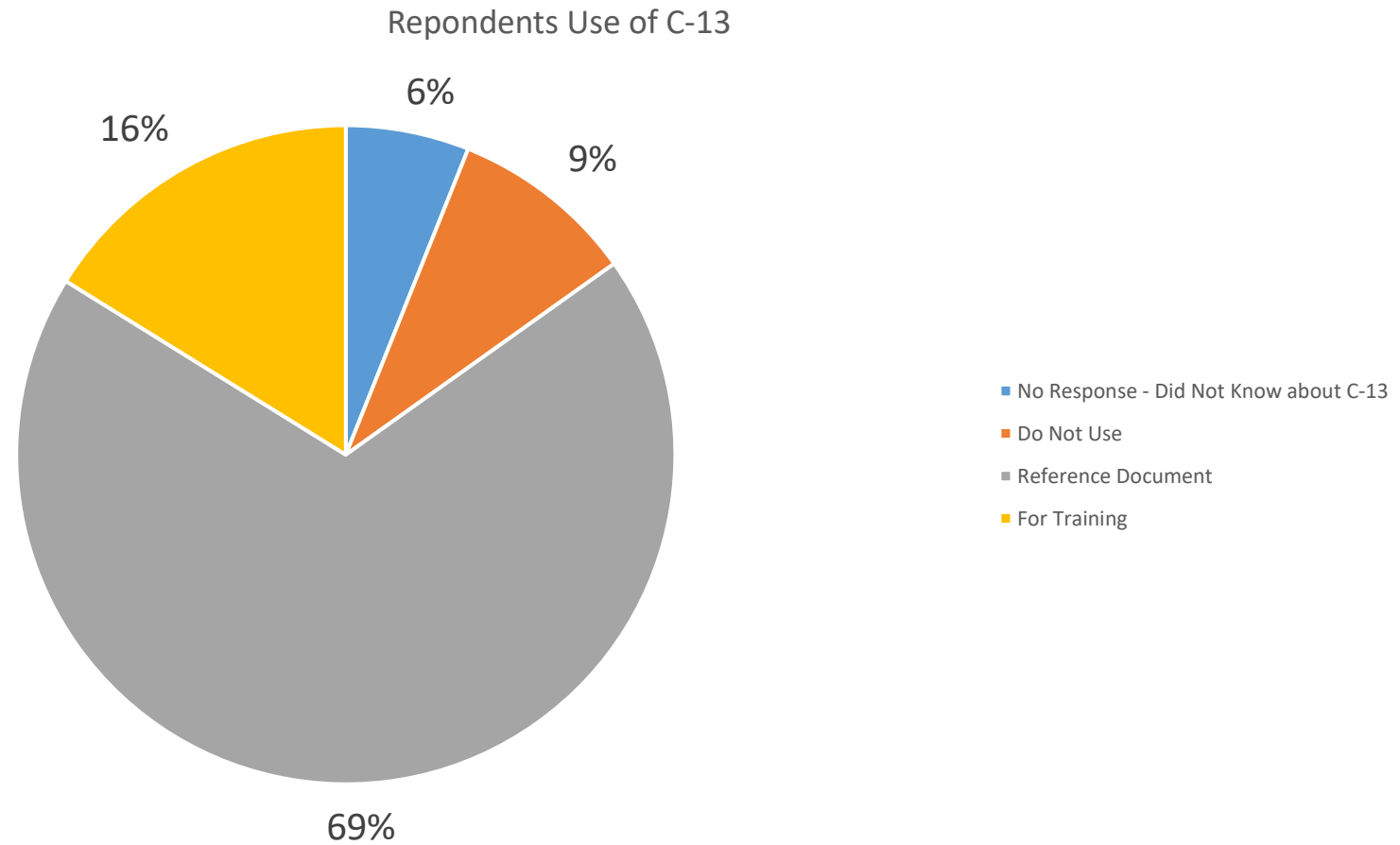


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# REVIEW OF C-13 QUESTIONNAIRE

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## 9. How do you use the document?





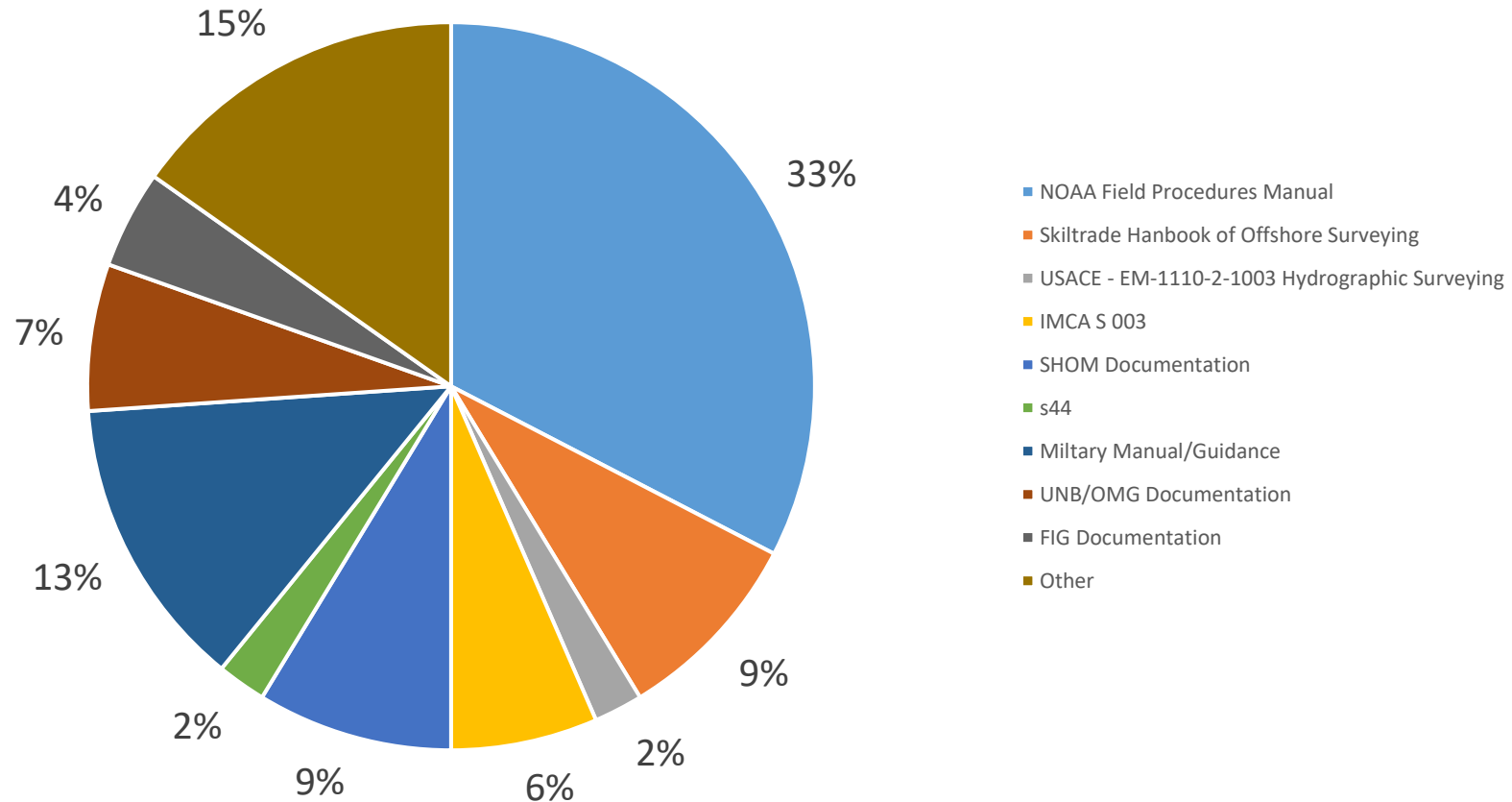
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# REVIEW OF C-13 QUESTIONNAIRE

International  
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## 10. Do you use another similar manual, but not from IHO?

Documentation other Than C-13 Used





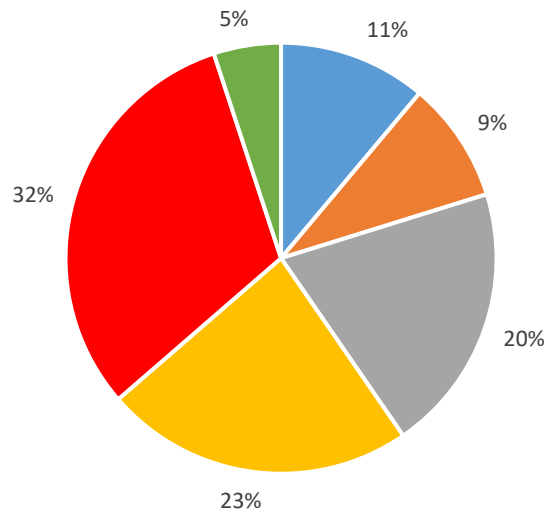
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# REVIEW OF C-13 QUESTIONNAIRE

International Hydrographic Organization

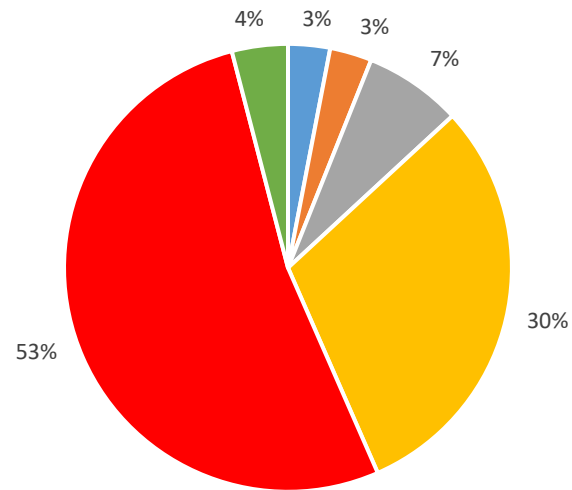
## 12. How would you use a revised Manual?

How likely would you be to use a Future Manual Operationally



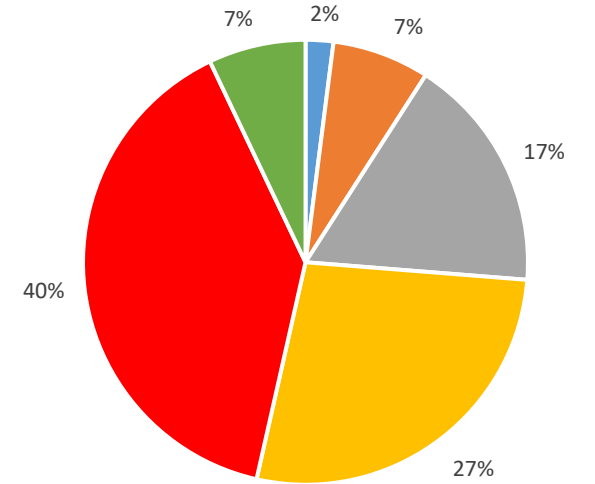
1 - Not Really 2 - A Little 3 - Yes  
4 - Quite Often 5 - A Lot No Response

How likely would you be to use a Future Manual as a Reference



1 - Not Really 2 - A Little 3 - Yes  
4 - Quite Often 5 - A Lot No Response

How Likely would you be to use a future manual for Teaching and Learning



1 - Not Really 2 - A Little 3 - Yes 4 - Quite Often 5 - A Lot No Response



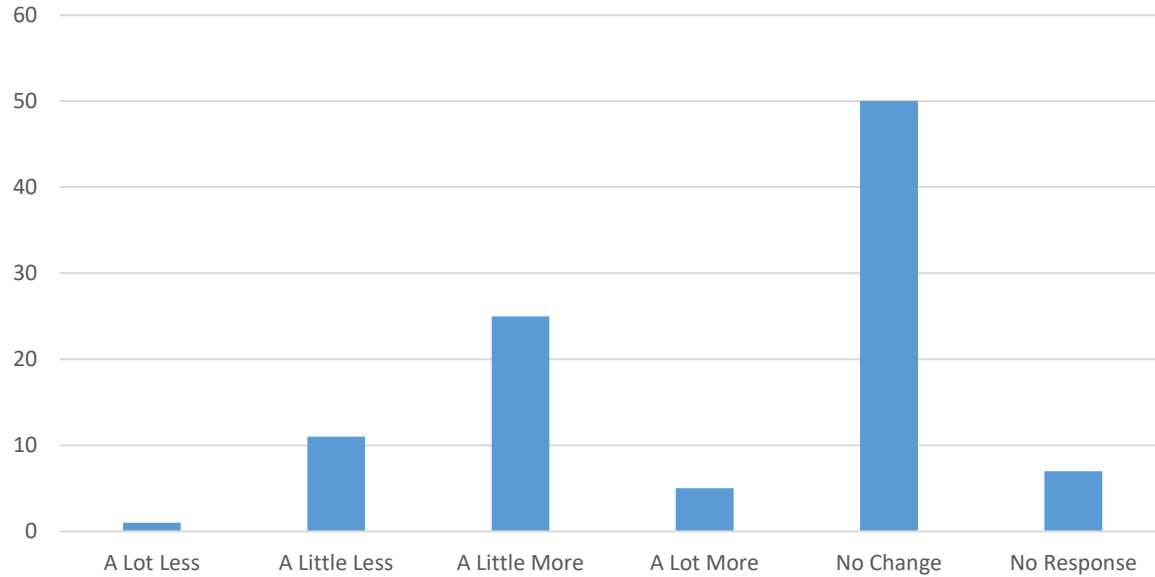
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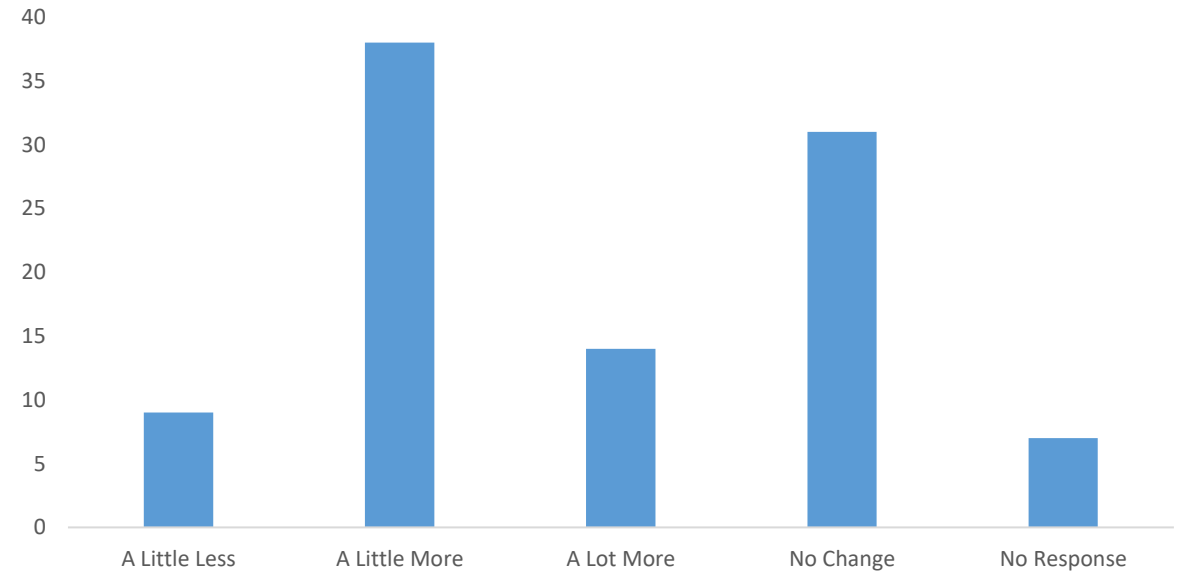
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## 13. What type of content should be further developed in this update

Content Development - General Description



Content Development - Theory





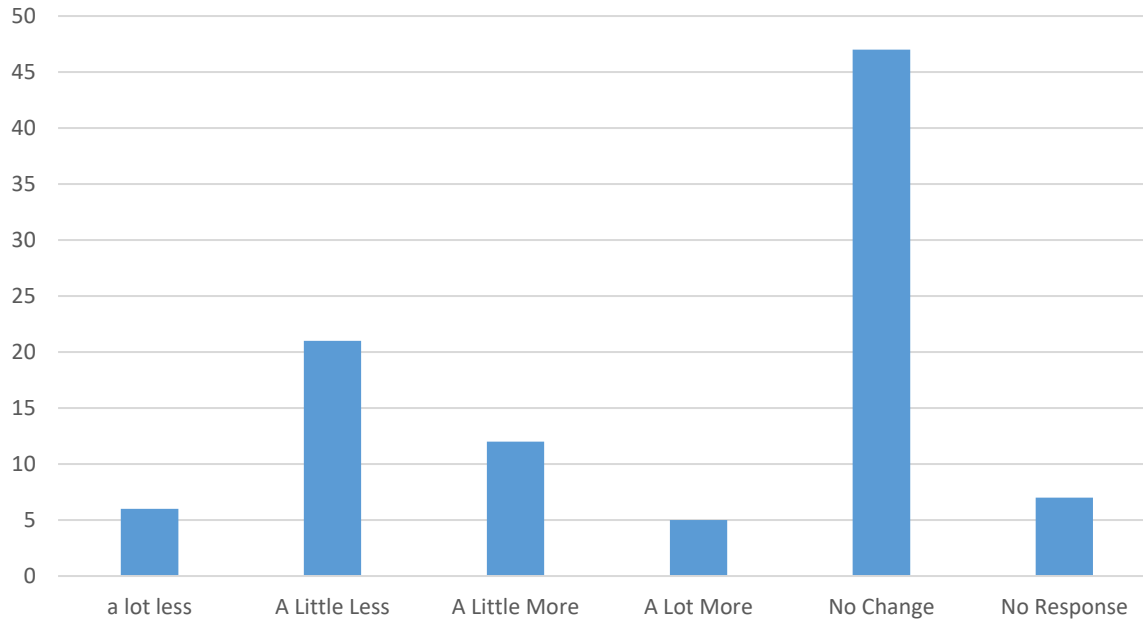
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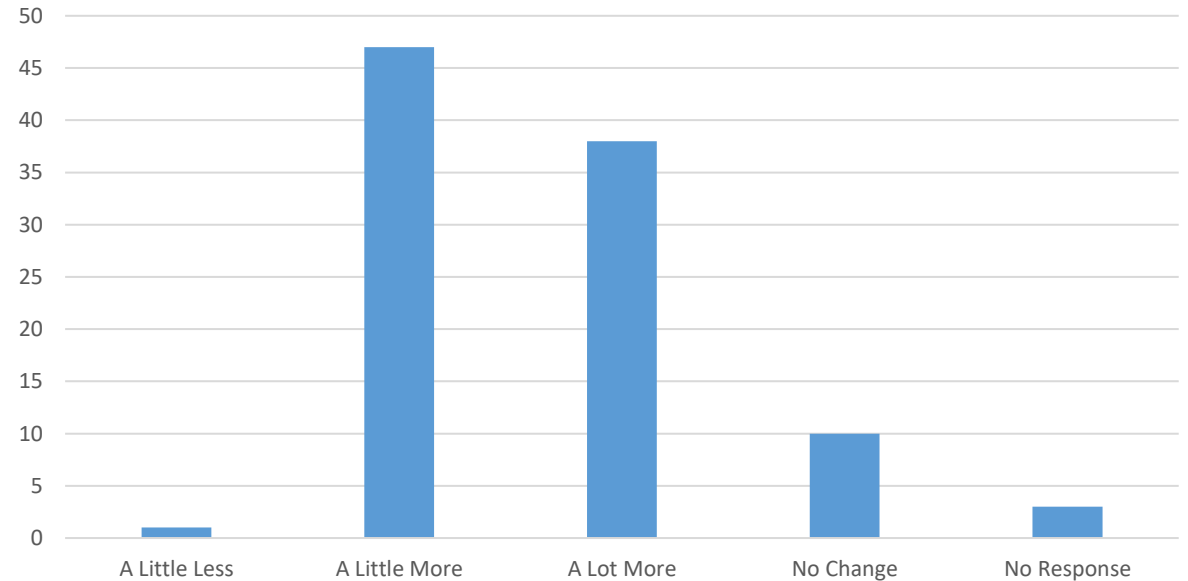
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## 13. What type of content should be further developed in this update

Content Development - Historical Concepts



Content Development - Operational Planning and Survey





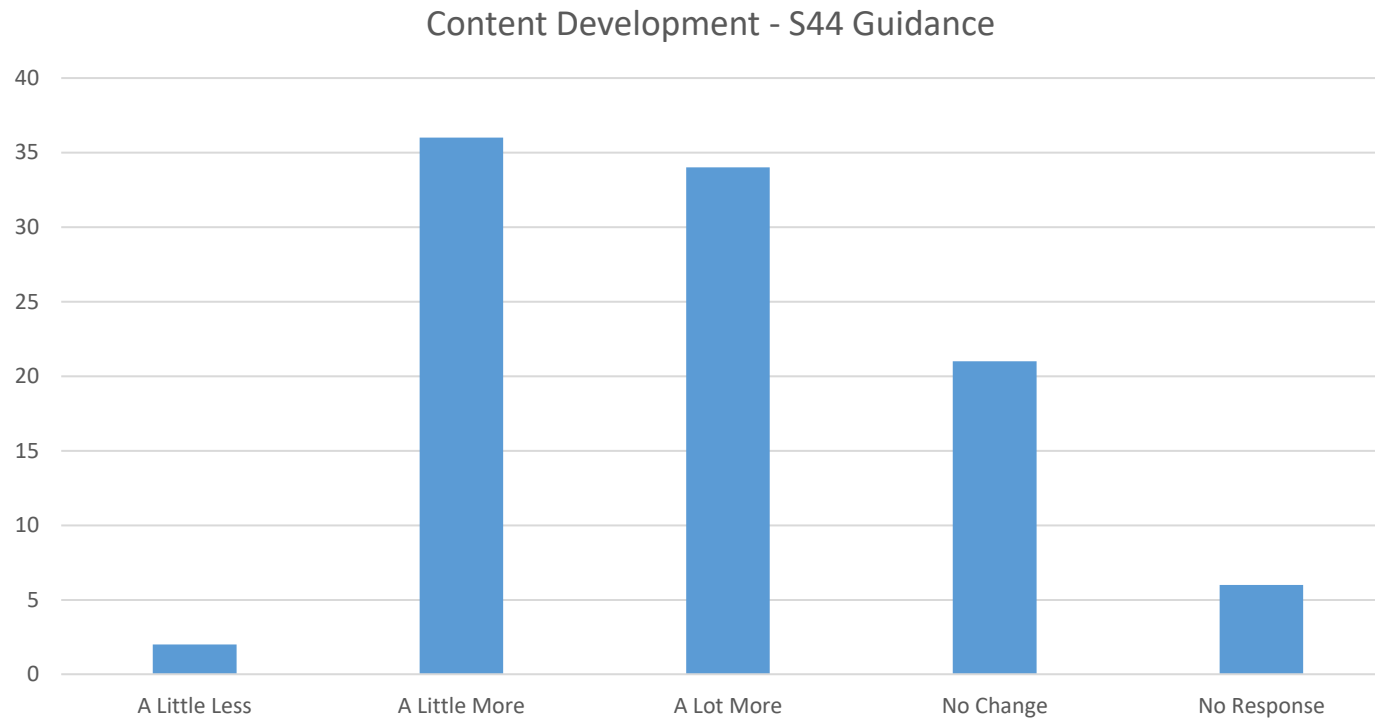


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# REVIEW OF C-13 QUESTIONNAIRE

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## 13. What type of content should be further developed in this update





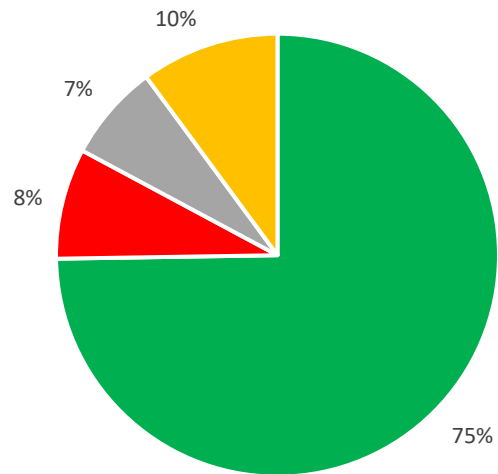
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# REVIEW OF C-13 QUESTIONNAIRE

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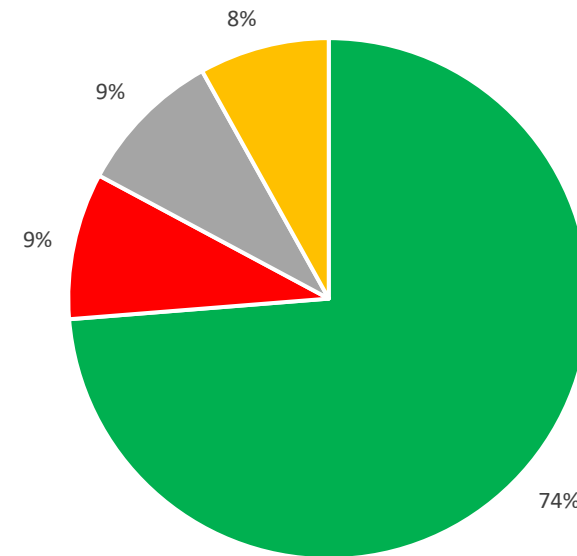
## 14. Chapter Usage

Which Part of C-13 do you find useful - Chapter 1 - Principles of Hydrographic Surveying



■ Yes ■ No ■ I Don't Know ■ No Response

Which Part of C-13 do you find useful - Chapter 2 - Positioning



■ Yes ■ No ■ I Don't Know ■ No Response



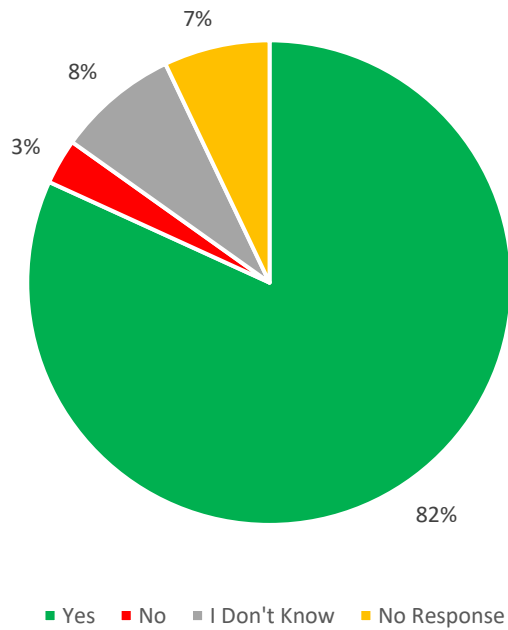
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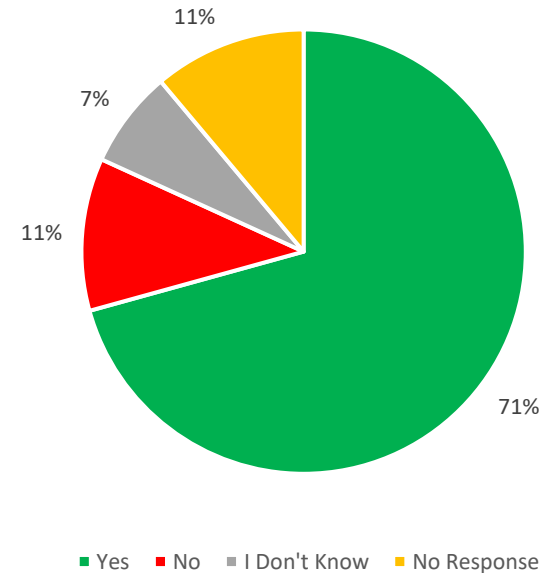
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## 14. Chapter Usage

What Part of C-13 do you find Useful - Chapter 3 - Depth Determination



What Part of C-13 do you find Useful - Chapter 4 - Seafloor Classification and Determination





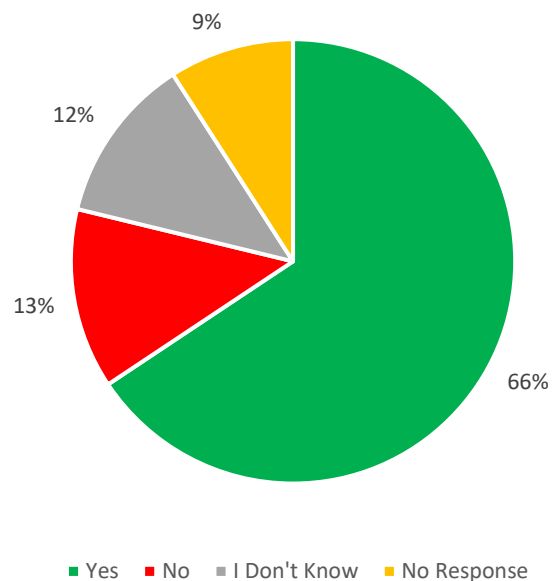
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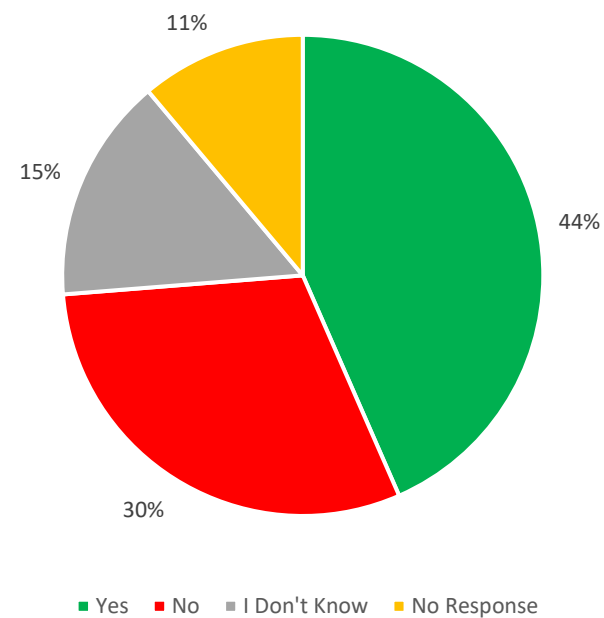
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## 14. Chapter Usage

Which Part of C-13 do you find most useful? Chapter 5 – Water Levels and Flow



Which Part of C-13 do you find most useful Chapter 6 – Topographic Surveying





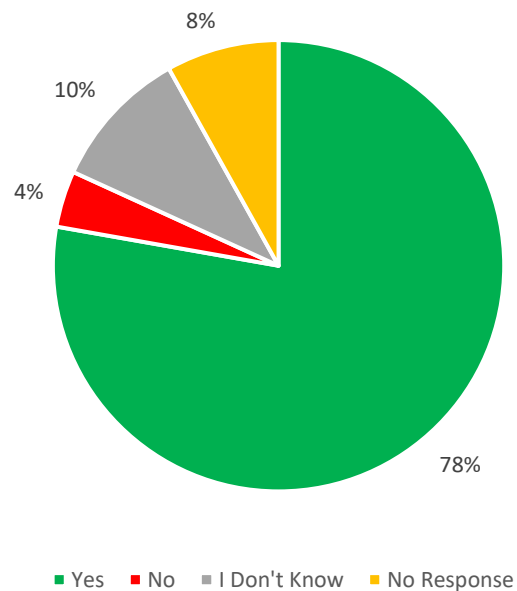
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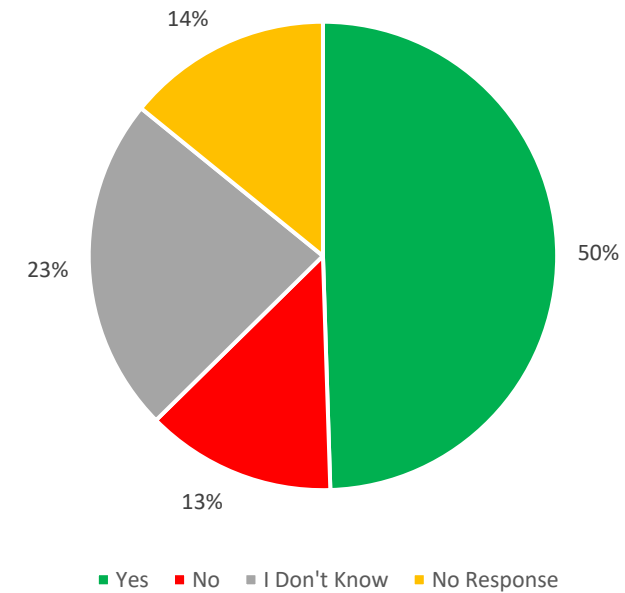
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## 14. Chapter Usage

Which Part of C-13 do you find most useful Chapter 7 – Hydrographic Practise



Which Parts of C-13 do you find most useful - Appendices





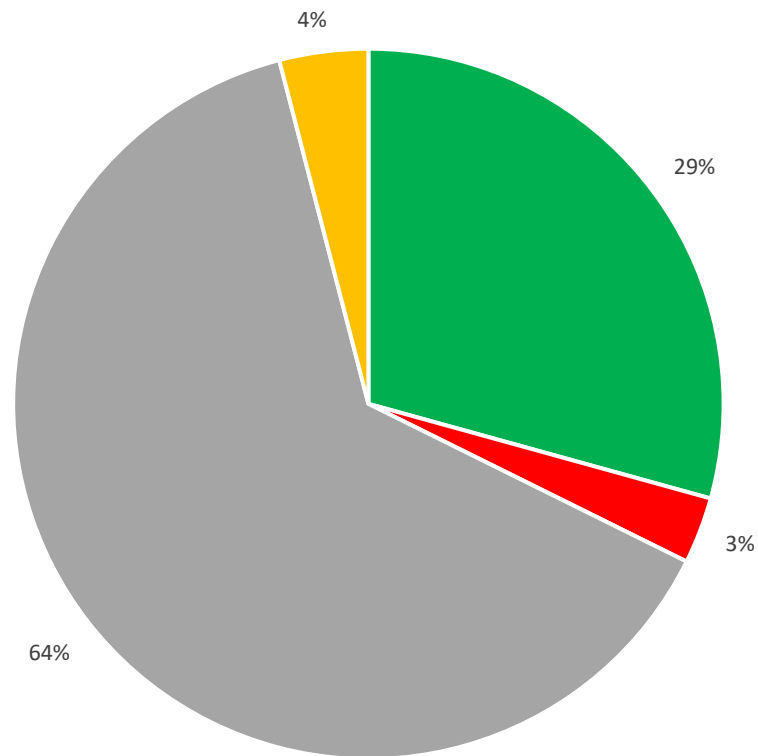
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# REVIEW OF C-13 QUESTIONNAIRE

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## 17. How should a future C-13 be presented

Would you prefer using a future version of C-13 in an online reference format instead of a printable version (pdf)?



■ Yes ■ No ■ Both ■ No Response



# REVIEW OF C-13 QUESTIONNAIRE

## 15. Areas for Update

1	More current methodologies to be included in every chapter which doesn't coincide with market demand Need to update contents to be compliant with the digital era, the use of GIS, web mapping, cloud data server, big data .... Need to update with new sensors and platform: airborne photogrammetry , airborne drone, LiDAR, new satellite imagery, new MBES with different geometry and multi frequency backscatter
2	More contents on data processing, especially MBES and backscatter processing, sound speed correction, machine learning processing New content on satellite derived bathymetry, crowdsource bathymetry Additional content on hydrographic data transformation to jointly use topographic and bathymetric data (vertical datum transformation) New content on the S-100 standard
3	More information on multispectral photogrammetry, usv, remote sensing
4	Surveying to ellipsoid and shifting to chart/navigation reference frame; needs more on backscatter and water column; uncertainty of depth determination
5	At least, more focus on multibeam capabilities to detect, S-44 ed6 (including current annexes), data management...
6	Ch5 More on Ellipsoidally referenced surveys. Ch3 Updating MBES detection techniques e.g multi detect, water column. Add some info on satellite derived bathymetry. Ch4 Backscatter section could be updated with best practices from the GeoHab Backscatter Working Group. Ch3/Ch6 Update depth detection/coastal mapping to include more on topo/bathy lidar Ch7 metadata standards might be valuable to address briefly
7	It would require a detailed analysis to give specific info about dated/obsolete information found in the Manual On Hydrography. In general terms the focus on dredging/reclamation projects is missing. Safety of navigation is in the Benelux much less important than survey projects involving dredging/reclamation/wind farm projects and pipe laying projects.
8	Expanding the TPU (H) & (V) knowledgebase by deep diving into the contributing factors, how to implement within processing systems eg. understanding if they need to be entered 1.96 or 2.45, and more on tide/ellipsoidal reductions and checks/validation methods.
9	Ensure a consistent level with up to date information for a consistent use. Currently the manual is a mix of too theoretical, or is date and useful information for practical use and not enough theory as a reference.
10	Vessel Static Offsets and how to establish local reference frame, Backscatter, Uncertainty, Basics on S-100 framework or links to "S-100 101" type training documents/websites, Autonomous systems and best practices with planning/acquisition/processing and operations (i.e. tips on launch and recovery)
11	Miss Geophysical and UXO surveying. Also construction survey can be interesting (pipe laying, roV surveys, breakwater construction). Also new technics like lidar, uav and usv GNSS - PPP ; autonomous vehicles
12	boresight calibration water column bathy lidar



# REVIEW OF C-13 QUESTIONNAIRE

## 15. Areas for Update

13	New technologies should be included in all relevant chapters ( particularly concerning robotic survey technology)
14	Lacking more details on the collection and use of multibeam sonar backscatter data. This should be included in Ch 1, 3 and 4.
15	2 - include PPP/PPK 4 - Update S-44 references 6 - include PPP/PPK 7 - include PPP/PPK, LiDAR, SDB all chapters should be more "user-friendly", providing more images/tables/charts, etc.
16	Include S-44 6th Edition content on Chapter 1, 4, and 6 ; Include S-100 Standard content on Chapter 1 and 4; and Include content about autonomous survey vessels on Chapter 7.
17	Global positioning uncertainties have improved since 2011. This detail should be included in the update. One example is the use of virtual stations during post processed precise point kinematic solutions during a hydrographic survey operation.
18	Update to assure new, modern technologies are fully covered.
19	New measurement system and relative use and setting
20	In chapter 2, Positioning I miss information about PPK, pos processing positioning.
21	Chapter 4 : practical and operational directives Chapter 6: more information about acquisition devices (laser scanner, profiler, etc)
22	All chapters, new technics
23	Update on modern technology available.
24	CH 1. IHO Standard need to reflect new orders, and explain how the customization is limited. eg Exclusive order being used in the middle of the North Sea might not be appropriate. CH 3. Patch Test - update to include Dual Head MBES systems. Ch 4. Wreck detection using Water Column to be included. CH 5. Updated section required on GNSS tides and datum reduction methods which are most commonly used. CH 5. Vessel based GNSS tide verifications / comparisons. CH 7. Sounding Density with regard to object detection - examples from hydrographic organisations (UKHO, NOAA, SMA etc). Ch 7. Object detection with regard to MBES footprint and water depth / system angles. How does depth limit what an MBES can be used to detect. CH 7. TPU, update sections with regard horizontal and vertical uncertainty, taking into account new MBES and positioning systems. Example - what is achievable in certain locations eg, ports or middle of north sea.





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# REVIEW OF C-13 QUESTIONNAIRE

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## 16. Areas for Removal

Old practices should be removed or merged into a dedicated chapter to not be mixed with the rest of content.

1 Chapter 1 could be merged with chapter 4 and 7 (see S5B table of content -> hydrographic practices).

2 Ch7.4 Media Requirement is outdated

It would require a detailed analysis to give specific info about dated/obsolete information found in the Manual On Hydrography. In general terms the focus on dredging/reclamation projects is missing. Safety of navigation is in the Benelux much less important than survey projects involving dredging/reclamation/wind farm projects and pipe laying projects.

3 multi-channel echosounder ?

4 older triangulation methods ?

There are many outdated positioning systems and techniques that are not used anymore and are only interesting as a historical perspective (range poles, LORAN, 5 etc.)

6 Think its important that even dated survey methods are left in there. This information is still relevant as a lot of data on nautical charts comes from these older methods.

Some of the traditional land surveying methods can be left out.

Topographic surveying may be removed from C-13 (the subject of hydrographic surveying is large enough)

7

Reduce the scope of historical positioning methods and place more emphasis on GNSS (Chapter 2). Remove Cartography (Chapter 2). Acoustic fundamentals should be removed and references to other text books given (Chapter 3). Seafloor classifications schemes are probably outdated by today's standards (Chapter 4).

9 The structure of the C-13 document is excellent in its current state.

10 All the historical approaches to be removed and obsolete techniques and mathematical calculations are to be removed just to make it a handy and latest manual

11 All chapters could be simplified with respect to theory and background and focus more on the operational aspects.



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# • OUTLINE FOR MHPT BREAKOUT SESSION

- Outline for MHPT Breakout session
  - Breakout Session 1
    - Review of Previous Meetings and Outcomes
    - Recording Changes and Additions
  - Breakout Session 2
    - Review of Findings Chapter 1-4
  - Breakout Session 3
    - Review of Findings Chapters 5-7
    - Next Steps
  - Breakout Session 4
    - Workplan Update
    - Inter-Sessional Activities Development



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Any Questions