

# OFFICIAL NAUTICAL CHART: DEVELOPMENT OF A STANDARD

Author: Mr. Claudio A. Sobarzo  
Servicio Hidrográfico y Oceanográfico de la Armada de Chile  
[csobarzo@shoa.cl](mailto:csobarzo@shoa.cl)

## **Abstract**

The official nautical chart produced by some organization recognized by a State as an associate member of the International Hydrographic Organization (IHO) aims to provide safe navigation along national and international territorial waters. As a way to achieve this, standard nautical charts are produced in accordance to universally accepted standards.

What does nautical chart standardization mean?

It means the use of symbols, colors and abbreviations, among others, recognized and standardized by all the coastal States associated to the IHO that ensure such charts within a globally accepted framework.

To keep the standardization, the IHO has the Chart Standardization and Paper Chart Working Group (CSPCWG). This group studies, propose changes, delete or add any information or symbol which must be revised by the IHO member states ensuring widespread agreement eventually to be included in the publication M-4, “Regulations of the IHO for International Charts and Chart Specifications of the IHO”, which is the main source of how to develop an official standard chart. Publications INT1, INT2 and INT3 derive from M-4 and show clearly with a short explanation everything to produce, understand and use a nautical chart.

The Hydrographic and Oceanographic Service of the Chilean Navy (SHOA) as IHO founding member, produces its nautical charts in accordance to the above-mentioned international standards and participates actively in the working group which studies and keeps such standardization.

## **Introduction:**

The IHO defines the nautical chart as: “the process of producing a chart with a specific purpose (nautical chart) or a specially compiled data base from which the chart is derived. It is designed to comply with the navigation and maritime development requirements and to present the water depth, nature of the sea bottom, elevations, configuration and characteristics of the coast, dangers and aids to navigation, in the same way that maps provide an essential basis for planning roads, railways and general urban and rural development in the hinterland”, a chart recognized as Official when it is produced by an organization of a coastal State associated with the IHO that meets with the standardized regulations in force.

## **Some of history:**

From the most ancient times, the mankind history has clearly shown and described the need of man to explore places even further of his visual field. To obtain it, he needed to travel by land and sea. Let us not forget that the Islas Marshall area representation was one of the most interesting chart recognized as one of the oldest records; a frame of reeds tied with palm fibers and a small number of shells represented islands and other curved rods showed sea currents and wave fronts, allowing navigation along this large group of islands, perhaps the first nautical chart?

As this speech does not pretend to analyze historically the development of the nautical chart, we will advance along the time to situate us in the creation of the International Hydrographic Bureau – IHB. At the International Conference held in Washington, in 1899, the massive need for cooperation in the worldwide hydrographic field was discussed first. Then, two new conferences at Saint Petersburg in 1908 and 1912 made possible that in 1919, twenty four States in the Hydrographic Conference of London decided to create a permanent body dedicated to the hydrographic area. Consequently, in 1921, thanks to the participation of nineteen member States, the IHB started to work, which has been operating since its establishment in the Principality of Monaco, due to an invitation extended by the Prince Albert I who was a scientific seaman. Finally, in 1970, it changed its status by the International Hydrographic Organization (IHO).

### **Today:**

At present, the IHO is recognized as an intergovernmental consultative and technical organization that seeks to support safety in navigation and marine environmental protection.

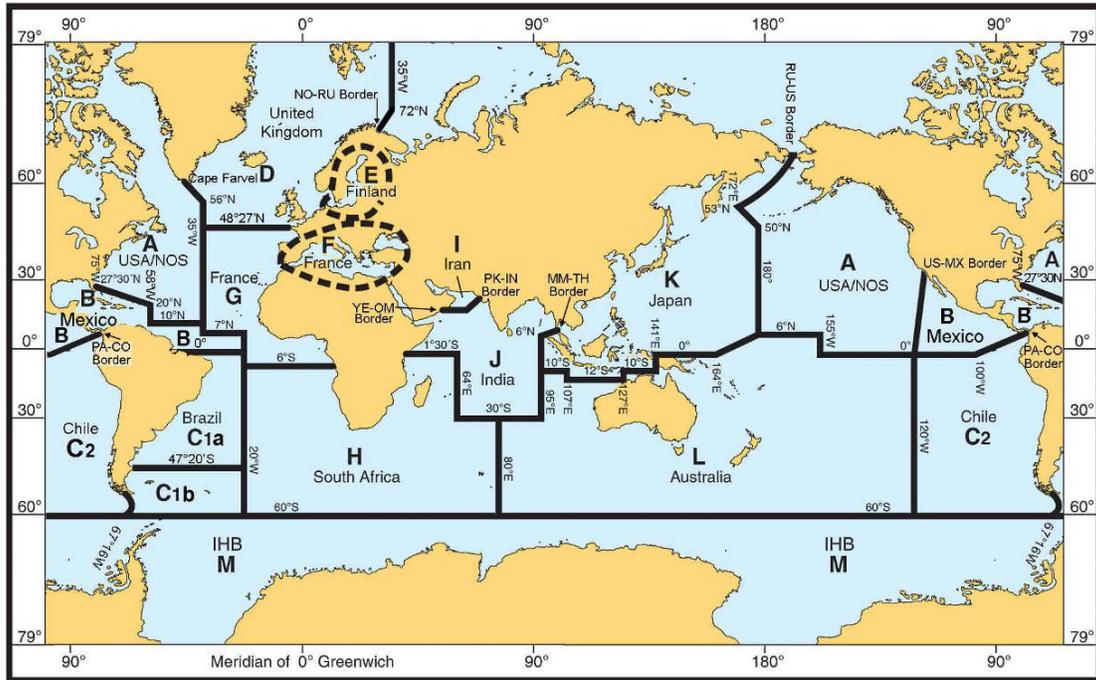
The IHO provides safe navigation and marine environment protection primarily through the standardization advice on the production of official nautical charts of a coastal State associated to the Organization. Therefore, it has been essential, since its inception, to recognize, propose and adopt symbols, colors and abbreviations for the compilation of the official nautical charts. Thus, the standardization has become the key element in safety of navigation and therefore in the marine environmental protection (figure 1), because the main users of these charts, that is, the navigators can use a graphic language that describes the navigable waters of the world to navigate and arrive at ports without risking life and any kind of loads.



'Figure 1. What is sought to avoid using with standard nautical charts'

Other important element in the standard production of official nautical charts is the global standard chart series obtained by the IHO in 1987. This concern started at the International Hydrographic Conference in 1967 and was formalized in 1971 with the world's first publication of small scale INT charts, where several coastal States participated in its edition, including Chile. These publications would not have been possible to do without the existence of a unique nautical cartographic standard; otherwise, it cannot be provided safe navigation along international waters (Figure 2).

All the above-mentioned effects occur for the joint production of nautical charts of international waters in polar areas.



'Figure 2. Global distribution of responsibility for publishing INT '

**How this standardization begins:**

One of the main IHO objectives is to achieve "the greatest possible uniformity in nautical charts and documents". Thus, it has worked hard for several decades in publishing and maintaining the publication M-4, "Regulations of the IHO for International Charts and Chart Specifications of the IHO" formerly called "Specifications of the IHO charts" (Figure 3).

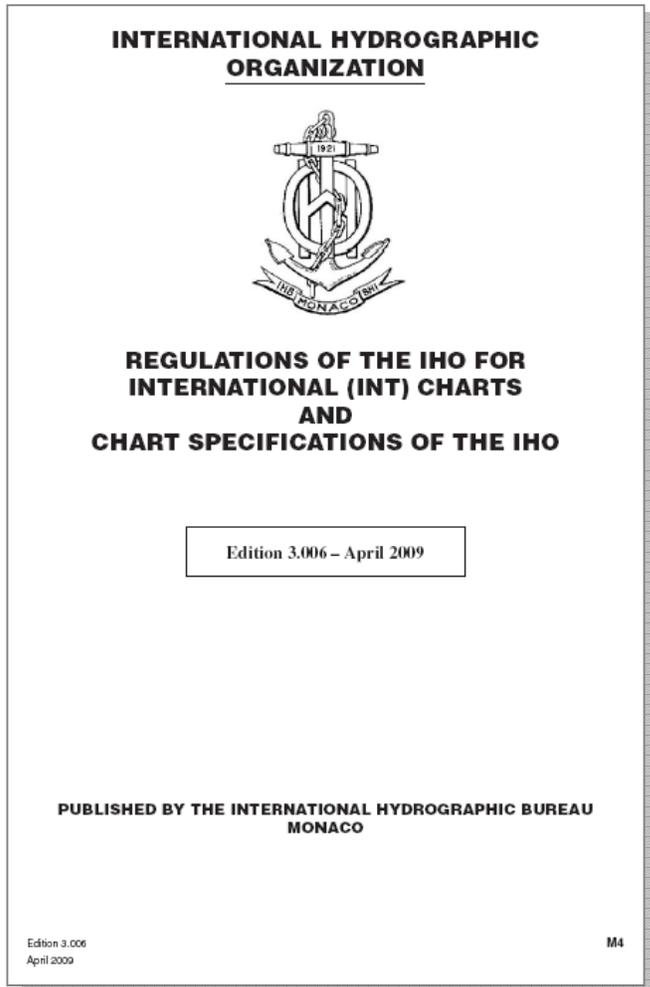


Figure 3. Title page of IHO Publication M-4.

This publication of technical specifications is under the supervision of the “Chart Standardization and Paper Chart Working Group (CSPCWG)” of the IHO, formerly called Chart Standardization Committee; a group that meets for many years the essential mission of studying, proposing changes, deleting or adding any information on colors, symbols and abbreviations used in editing the official nautical charts. This group is composed of specialists that are members from various World Hydrographic Offices, who meet periodically to review the status of the publication, to which a Member State may make comments or suggestions when appropriate. Subsequently, these are received and studied by the CSPCWG, where any technical resolution is proposed. The proposal presented through the IHB, is sent in consultation to all the countries of the IHO, which respond by accepting, rejecting or making suggestions to the respective resolution. CSPCWG analyzes the responses and provides a technical resolution that ultimately IHB makes official and sends to all the Member States for implementation.

**Other documents:**

The following documents are deriving from the Publication M-4 (Figure 4).

- INT 1 “Symbols, Abbreviations, Terms used on Charts” is a quick guide where all symbols, abbreviations and terms possible to be used on an official nautical chart are briefly described. This document is standardized in the Spanish, English and French languages and is maintained by the States of Spain, Germany and France which are responsible for updating the publication once it is affected by a technical decision from CSPCWG and validated by the IHB.
- INT 2 “Borders, Graduations, Grids and Linear Scales” contains various standard formats to be used in the edition of a nautical chart, referring to the patterns of borders, value of the graduations, geographic grid spacing and types of scales used depending on the chart publication scale. This document is edited in Spanish, English and French being the State of the Netherlands responsible for its maintenance and updating.
- INT3 “Use of Symbols and Abbreviations” shows clearly all the standard symbols, colors, explanation notes, warnings, etc. to be used in the edition of an official nautical chart. This publication is maintained and published by the United Kingdom in English language.

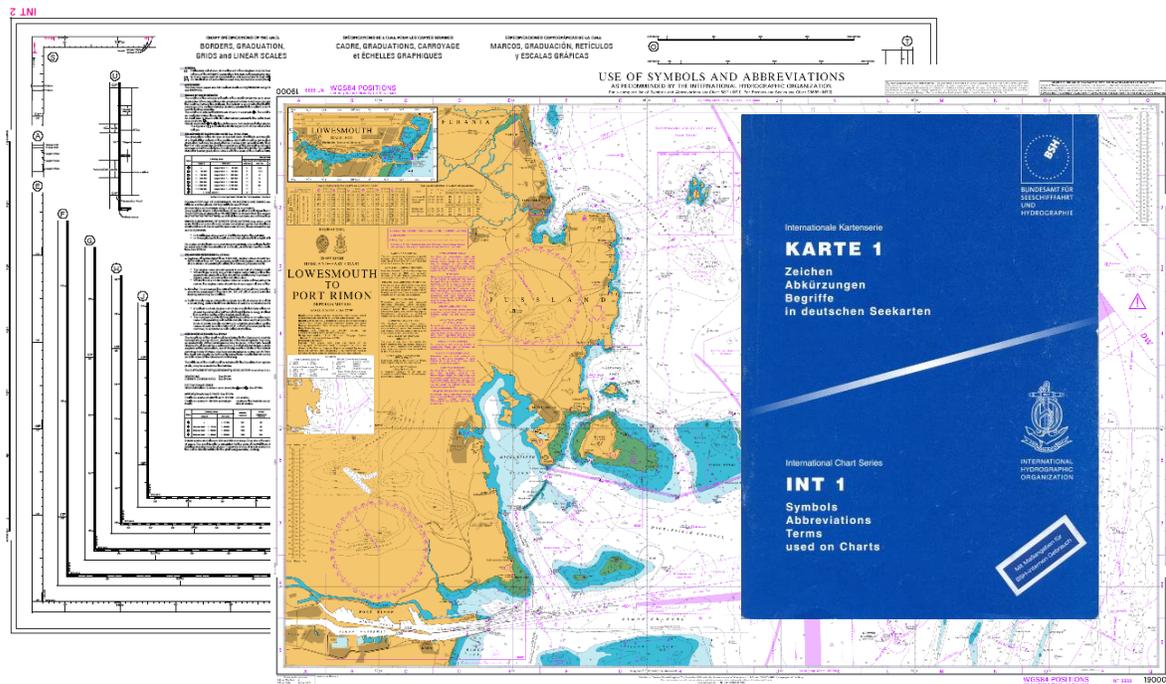


Figure 4. Publications INT1, INT2 and INT3 of the IHO.

### The Hydrographic and Oceanographic Service of the Chilean Navy – SHOA:

Since 135 years ago, SHOA has always had the responsibility for providing information to allow safe navigation along Chilean waters. This Service is also a founding member of the

IHB and has one of the largest charts folders between the IHO members States. It also actively participates in a number of groups and technical committees, such as CSPCWG, where it has since contributed to the implementation of a global nautical chart standardization, which has evolved over time for two main purposes: to protect human life at sea and marine environmental protection.

SHOA adheres strictly to the regulations proposed by the IHO, through its publication M-4, to edit the Chilean nautical charts, and meets with the INT-type publications, ensuring an internationally standard production of all its products (Figure 5).

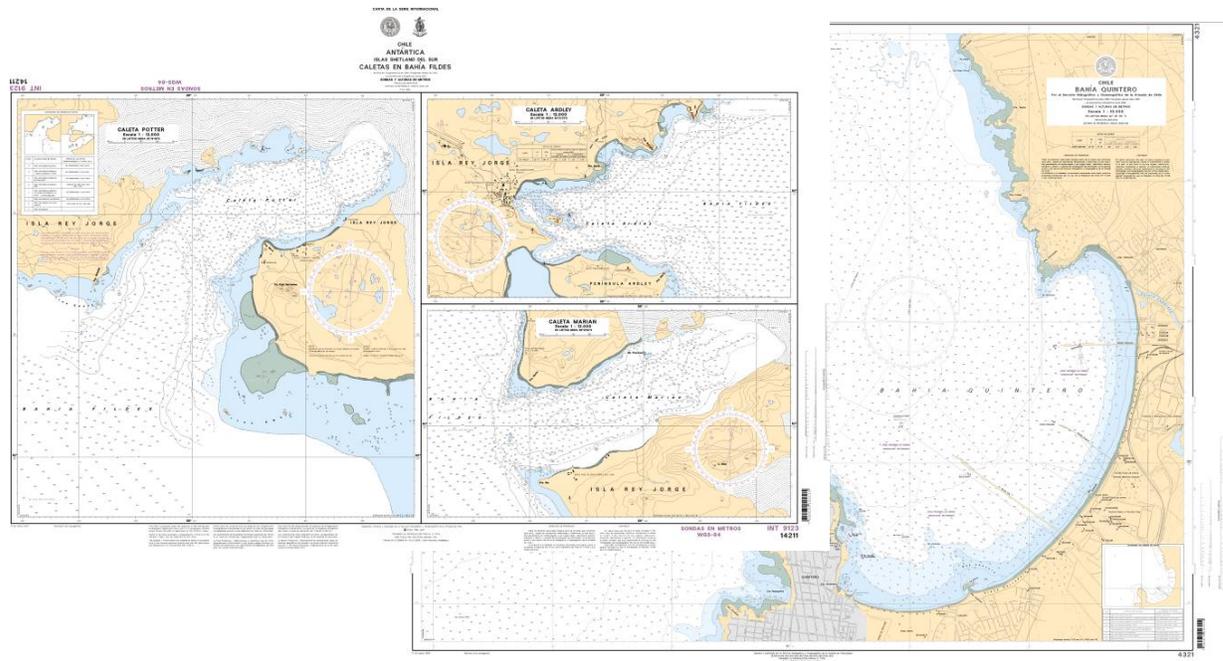


Figure 5. International and national standard nautical charts edited by SHOA.

### The Future:

This speech addressed only the issue of standardization in the development of official nautical charts on paper, but it must also be indicated that there is an existing international standard for exchanging digital information and the development of Electronic Nautical Charts – ENC: S-57 of the IHO, which is basically intended to seek the uniformity in the use and transfer of digital nautical information between all the Member States of the IHO. These ENCs that are complemented with software specially designed to be read and used in addition to the positioning given by a real-time GPS, have been made today to increase the safety of navigation in the regions that have the latest generation of nautical charts.

An issue of major importance to the IHO and thus of its Member States is to study a new legislation, the S-100 "The IHO Geospatial Standard for Hydrographic Data", which is being developed through the study and implementation of the ISO 19100 series of Geospatial Standards.

**Conclusion:**

At the end of this speech we can say that the achievement of the coastal States to standardize their production of official nautical charts, thanks to decades of work of the CSPCWG of the IHO to obtain this homogeneity of products, has not sought nothing other than providing safety of navigation along the waters of the world, which affects directly to safeguard human life at sea and protect our marine environment.

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