2 August 2002

Caribbean and Gulf of Mexico
Electronic Chart Implementation Project

Project Description

The Caribbean - Gulf of Mexico Hydrographic Commission, Electronic Chart Working Group (CGMHC – EC WG) is conducting a project with the goal of implementing electronic charting in the region.

Project Goals

1. **Facilitate the production and use of official electronic chart data (both ENC and RNC).**

For many Hydrographic Offices the first step is to improve the quality paper nautical charts necessary to ensure safe navigation in key ports and shipping routes. The next step involves the production of Raster Navigational Chart (RNC) and Electronic Navigational Chart (ENC) data for use with shipborne Electronic Chart Display and Information Systems (ECDIS) and Electronic Chart Systems (ECS)

2. **Increase awareness of the benefits to using official electronic chart data.**

In addition to improving the safety of marine navigation and efficiency of maritime commerce, electronic chart data can be used in conjunction with coastal zone management and marine environmental protection.

3. **Establish an electronic chart data distribution network among regional HOs.**

This network will include the creation of a database and distribution infrastructure necessary for the dissemination of electronic chart data and updates throughout the region.

Challenges/Opportunities

In order to increase production and use of nautical charting products/services, three basic issues must be addressed:

1) National Hydrographic Offices need assistance in conducting hydrographic surveys.
2) The hydrographic survey data must be processed into a database that can be used to produce both paper charts and electronic chart data (raster and vector).
3) A regional chart distribution and service infrastructure must be established in order to fulfill the requirements of maritime and inter-modal transportation within the region.

This process of "capacity building" also involves acquiring the necessary computer hardware equipment and software tools, as well as dedicated human resources and professional training. In order to accomplish these tasks, short- and long-term funding (initial investment and sustainable income) is required.

It is intended that the CGMHC – EC WG Electronic Chart Implementation Project contribute towards achieving other regional goals and objectives. As identified by Mexico, there are several initiatives in which hydrography and electronic charting can play a significant role. For instance, the *Plan Puebla – Panama* Project is a regional plan supported by seven Central American nations. The Project objective is to increase human and ecological richness of the Meso-American region by enhancing sustainable development while maintaining cultural

diversity. Increased production of nautical charting products and services are considered necessary in order to facilitate efficient, cost-effective transportation of people and merchandise. This project is also linked with the Central American Commission for Maritime Transportation (*COCATRAM*) Project. *COCATRAM* has the objective to increase intermodal transportation throughout the entire Central American region. Another project, *Escalera Nautica* intends to develop a nautical chart infrastructure that is targeted for the tourist and yachting market in four Pacific Coast and Gulf of California states of Mexico. This project involves both hydrographic surveying and the production of large-scale electronic chart products in over 100 ports and recreational regions. It also includes the establishment of an intermodal transportation infrastructure (e.g., roads, airports, shipping terminals, and marina facilities.

Approach

Prior to recommending a means and process to increase the production and use of nautical charting products and services, a series of assessments will be performed.

Hydrographic Surveys
An inventory and assessment of the current availability of existing surveys as well as what is required to produce nautical charting products.

Nautical Chart Coverage
An inventory and assessment of what currently exists, and what is needed for the three basic types of nautical charting products:

Paper Nautical Chart
Raster Navigational Chart (RNC)
Electronic Navigational Chart (ENC)

Shipping Routes
Major shipping routes and ports will be identified and prioritized based on the type and number of vessels, number of transits, types of cargo, and amount tonnage being shipped.

Key Ports
In addition to major shipping routes/ports, other routes/ports that are or expect to be involved in regional trade/commerce will be identified. A particular focus will be related to the tourism/ recreational industry since this is an important part of the regional economy.

Electronic Chart Data Distribution/Service Center
Various options for establishing a Regional Nautical Chart Center will be considered. In particular, the establishment of a Regional ENC Center (RENC) based on the IHO Worldwide Electronic Navigational Chart Database (WEND) will be investigated. The goal is to establish an infrastructure that is suitable for the Caribbean – Gulf of Mexico region.

Short-term Development Assistance
Recognizing the limited financial resources available to some of the CGM region's HOs, there is a need to look at the means/process required to obtain short-term financial assistance from international funding organizations (e.g., World Bank, Inter-American Development Bank, Global Environmental Facility, etc.). The Project also includes the development of a business model for cooperation between regional HOs.

This information will be provided at the next meeting, November 4-5, 2002 and used to make decisions on the next steps for this project.

Benefits

The overall benefits include maintaining safety-of-life at-sea, improving efficiency of maritime transportation, and ensuring marine environmental protection. In particular, four economic areas that should benefit from increased production and use of nautical charting products/services include:

1. Commercial shipping (e.g., container, tanker, and bulk carriers)
2. Tourism (i.e., cruise ships)
3. Regional commerce (e.g., coastal and inter-region vessels)
4. Recreational (sailing and powerboats)

For nations in the Caribbean – Gulf of Mexico region, regional benefits of the Electronic Chart Implementation Product include:

1. Short-term financial assistance from international funding organizations for the initial production of hydrographic data and establishment of required nautical charting services.
2. Long-term commitment by governments to maintain necessary hydrographic services based on proven benefits (e.g., sustained economic growth) resulting from safe, more efficient, and environmentally conscious maritime transportation.

Potential benefits to Project Participants may include:

National HOs
- Training and guidance on the interpretation and implementation of IHO standards.
- Technical advice and assistance on ENC production.
- A series of regional workshops dealing with electronic chart production, maintenance and distribution.

Shipping Companies
- Availability of official raster and vector electronic chart data conforming to IHO standards that can used in conjunction with onboard ECDIS or ECS equipment.
- Availability of ENC or System ENC (SENC) data for port areas and approaches, and RNC data for transits between ports throughout the region.

Electronic Chart Equipment Manufacturers
- Increased production and availability of official RNC and ENC data for use onboard vessels operating in the region. This includes vessels currently equipped with ECDIS or ECS, as well as vessels planning to install this type of equipment.

Electronic Chart Data Producers/Distributors
- Opportunity to provide contract services to regional Hydrographic Offices in hydrographic surveying, database management, and nautical chart production (paper, RNC, and ENC)
- Commercial involvement, needed to establish a regional electronic chart delivery/service infrastructure.

Other Benefits to all Project Participants Include:

1. Network of data exchange and arrangements to carry out quality assurance prior to release for commercial use.
2. Delivery mechanism for the supply and updating of ENC and raster data.
3. Guidelines for ENC production and quality assurance, and a syllabus for training of mariners in the use of ECDIS.
4. A Project Web page for keeping participants informed project status/progress
5. The provision of value-added RNCs and ENCs that provide supplemental information on Environmentally Sensitive Sea Areas (ESSAs) and Particularly Sensitive Sea Areas (PSSAs).

Background

In December 1996, the Maritime and Port Authority of Singapore (MPA), and the United Kingdom Hydrographic Office (UKHO) initiated the Singapore-Hong Kong Admiralty Raster and ENC Demonstration (SHARED) Project in an effort to overcome the lack of worldwide coverage of official Electronic Navigational Chart (ENC) data. The goal of the Project was to demonstrate the use of ENCs and Raster Navigational Charts (RNCs) with ECDIS-equipped vessels operating on major shipping routes between Southampton and Hong Kong via Singapore. The main objective was to assess the safety, effectiveness and usefulness of integrated ENCs and RNCs with ECDIS for safe navigation. Additional objectives included a demonstration of the practical exchange of electronic hydrographic data between national Hydrographic Offices (HOs). The first SHARED demonstration took place in March 1997. At the April 2000 meeting of the Caribbean Sea-Gulf of Mexico Hydrographic Commission (CGMHC) in Kingston, Jamaica, it was agreed that it would be useful if the SHARED Project were extended into the Caribbean – Gulf of Mexico region.

During 2001, a Project Plan and Terms of Reference were developed, as well as an attempt to identify participants. However, it was recommended at the April 2002 meeting of the CGMHC – Electronic Chart Working Group that the Project should concentrate on the production of ENCs, and to support the regional distribution and use of electronic chart-related navigational information. As a result, the name of the project was changed from "Extension of the SHARED Demonstration Project" to "Caribbean and Gulf of Mexico Electronic Chart Implementation Project."

In addition to reducing the incidence of vessel groundings and ensuring safety-of-life at sea, electronic charting can decrease the occurrence of marine environmental pollution resulting from the spillage of petroleum products and other types of hazardous cargos. For instance, the grounding of the EXXON Valdez in Prince William Sound, Alaska in 1989 resulted in significant environmental degradation and a $3.5 billion effort to clean up the oil spill. If this tank vessel had an electronic chart system installed, the incident could have been prevented. Given the importance of the coastal marine environment in the Caribbean Sea – Gulf of Mexico, and the large number of tank vessels transiting through the region, it is important that electronic chart data and systems be used to the greatest extent possible. One major oil spill could result in a significant impact on the region's economy, marine environment, and the livelihood of its citizens.