

14th CHRIS Meeting, Shanghai, China, 15-17 August 2002**Digital Nautical Chart (DNC®) Report for CHRIS 2002**

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1. Digital Nautical Chart Status

NIMA (National Imagery and Mapping Agency) completed its folio of approximately 5,000 nautical charts in DIGEST C – Vector Product Format in mid-2000. This folio satisfies initial U.S. Navy operational requirements for worldwide navigation. Work continues to progress to bring the DNC database up-to-date for corrections and new editions issued since the time of digitization. The DNC database is on a schedule for all DNC to be in routine maintenance by the end of 2004. NIMA has ended all traditional hard copy compilation of nautical charts, i.e., DNC is the source for NIMA paper charts. Currently, about 1/3 of the NIMA database is in monthly updating with about 38% to be in monthly maintenance by the end of 2002. Of this, about 25% of the libraries are actually in weekly maintenance at this time.

2. DNC Updating

NIMA has successfully implemented the SAIC (Science Applications International Corporation) developed VDU (VPF Digital Updating) system for updating of DNC based on the “patch” method, i.e., a method whereby changes to the DNC database are identified and only the changes are transmitted to update the base DNC. Updates are identified to the user through inclusion of a separate update layer from which each area of change is highlighted and allows the navigator to call up the Notice-to-Mariners text associated with any change. The Notice-to-Mariners text associated with each set of updates is disseminated with the “patch” updates to DNC. Updates are currently made available on CD-ROM, through a secure web site for military users and also through the public NIMA web site. The public web site allows U.S. Coast Guard units and foreign nations using DNC to access updates without need for secure communications capability. This is possible because unless one has access to the base DNC libraries (which are restricted from general distribution) patch updates are of no use. Since the NIMA DNC database consists of some libraries which are being routinely updated by VDU and some which are not, NIMA has devised a way for the mariner to clearly know the status of any chart through a warning system which uses the IHO symbol for Unqualified data. If a DNC library has not been updated within a specified period of time, this symbol is displayed over the ECDIS display to warn the navigator that the chart is only to be used for situational awareness not primary navigation. This tool will likely be continued into the future for U.S. Coast Guard inspectors to know if a ship has up-to-date charts or not.

3. DNC Distribution

To date, the DNC has been restricted from public distribution, principally due to foreign intellectual property rights. However, U.S. waters data do not have to be restricted and NIMA is now in the process of releasing the first U.S. waters DNC data. DNC 17 (about 175 charts covering the U.S. East Coast from South Carolina to Massachusetts) is on a one-month cycle of updating and will be the first DNC data released to the public; this CD does not include any foreign data. The data is available for GIS use only, since U.S. regulations for civil electronic navigation have not yet been issued. DNC 17 is available from the NIMA public web site with the data and updates available gratis. The release of DNC 17 will eventually be followed by data from the U.S. West and Gulf Coasts. A realignment of the DNC CDs must occur to separate foreign data from the U.S. data before these data can be released. For DNC data subject to foreign copyright, release will be at the discretion of the organization with the intellectual property

rights. NIMA has been considering development of a web site index of DNC libraries to be available which identifies the office with the copyright and makes referral to that office for any release request. DNC17 and 13 have been authorized for Federal vessel navigation now that U.S. regulations have been issued to allow U.S. Federal vessels to navigate using electronic charts. This same authorization applies to foreign government vessels entering U.S. waters with DNC.

4. DNC Deployment

The updating of DNC to support the U.S. Navy deployment of two all digital carrier battle groups, one Atlantic and one Pacific, in late 2002 is on schedule. The first all digital attack submarine is to deploy in 2004. NIMA expects to meet the digital chart needs for this deployment. Resources also have been realigned within NIMA such that the charting needs for Navy to transition to digital navigation by the end of 2004 are to be met. That is, by the end of 2004, the entire DNC database is expected to be under routine maintenance with digital updating.

5. ENC/DNC

NIMA has begun looking into use of ENC as a source of data and the issues associated with translation. NIMA continues to be interested in steps towards harmonization of formats over the long-term and plans to participate in TSMAD deliberations through its DGIWG representation

6. Digital Publications

NIMA has 78 publications, all of which are in digital format. A plan has been developed to transition to all digital publications between 2003 and 2005. Hard copy versions for civil use only will be available through either the U.S. Government Printing Office or commercial providers. NIMA will make the data for publications available for gratis download from the Internet. NIMA is in the process of implementing a PDU (Publications Digital Update) using the same technology of VDU updating for DNC.

7. ECDIS-Navy (ECDIS Performance Standard Extension)

NIMA and Navy are cooperating in the development of a prototype system for implementing one of the ECDIS-N extensions of the IMO ECDIS Performance Standard. A more accurate system of visual navigation is being developed and tested which provides for visual navigation fixes to be directly integrated into the DNC display. This allows for relative navigation as a check on GPS navigation, which is dependent on datum transformation information. It also provides for the vessel navigation to be independent of GPS in the event of loss of GPS without having to revert to visual navigation with paper charts, i.e., the navigation fix is computed and automatically displayed on the screen. The first prototype will be tested in September.

8. Systems Validated as Reading DNC Correctly

Because there is a data content difference between DNC and ENC there have been some problems with system manufacturers who use implementations of the S-57 Presentation Library with DNC. It is important that the NIMA GeoSym symbols be used for display of DNC. GeoSym includes the IHO symbols, but also includes all other symbols used for NIMA products. NIMA cooperates with the U.S. Navy in testing systems for display of ECDIS-N. NIMA validates whether systems correctly display DNC data and Navy conducts the equipment testing. At this time, Offshore Systems Ltd's ECPINS, Sperry Marine's VMS and the U.S. Navy's Integrated Charting Engine (ICE) have passed the validation.
