

**16<sup>th</sup> CHRIS MEETING**  
**28-31 May, 2003, Ottawa, Canada**

**PRINT ON DEMAND NAUTICAL CHARTS**  
*(May 2004)*

submitted by United States (NOAA)

1. Summary

<b><i>Executive summary:</i></b>	Print-on-Demand is successfully being used by USA (NOAA) and others for nautical charts. The technology would also enable one hydrographic office to print charts on behalf of any other hydrographic office. TSMAD has an approved Work Item (WI 2.9) to develop a standard for the exchange of digital repromat, the results of which could support such cooperation among hydrographic offices.
<b><i>Actions to be taken:</i></b>	CHRIS is invited to clarify the scope of TSMAD WI 2.9 to include Print-on-Demand. Member States are invited to participate on TSMAD WI 2.9 to insure that it adequately supports cooperative printing using Print-on-Demand.
<b><i>Related documents:</i></b>	CHRIS16-6.1A

2. Introduction / Scope

USA (NOAA) has released its entire suite of 1,016 nautical charts using Print-on-Demand. These charts are up-to-date with all Notice to Mariners corrections at the time they are printed. They have extra information outside the neat line of the chart targeted towards professional mariners or recreational boaters. They are available on water-resistant paper for 21.35 USD or in a laminated version for 23.85 USD.

USA's (NOAA) Print-on-Demand technology has 2 parts: a printing part, and an electronic commerce part. For printing, Hewlett Packard inkjet plotters are used. A wide variety of papers and inks are available that are suitable for nautical charts. The electronic commerce part provides an Internet-based ordering system for chart agents. The system then translates the ordered items into assembly instructions for the printing system. Charts are dynamically assembled from up-to-date digital files at print time using those assembly instructions.

The chart assembly instructions are driven by a simple database that describes how each product is made. This flexibility has allowed new products to be manufactured by adding their descriptions to the database, and using Print-on-Demand for their printing. USA (NOAA) officially released its new "PocketChart™" ([www.NauticalCharts.gov/pocketcharts/](http://www.NauticalCharts.gov/pocketcharts/)) using this method.

USA (NOAA) is printing from a central site, and also has deployed 7 remote printing sites at chart agent's stores around the nation. Three more remote printing sites will be deployed shortly.

The Print-on-Demand charts have been well received by mariners. Professional mariners understand the value of charts that are up-to-date at the time of purchase. Recreational boaters appreciate the waterproof materials. The "PocketChart™" is being received positively.

Both the printing technology and the e-commerce technology have been relatively problem free. This technology is stable, affordable, and appropriate for use by any hydrographic office.

### 3. Analysis/Discussion.

NOAA's experience indicates that Print-on-Demand is ready for widespread use. It can be used as a replacement printing process, or as a means of making an improved product. Printing can be performed at a central site, or at remote sites such as the point-of-purchase.

Print-on-Demand would permit one hydrographic office to print up-to-date charts on behalf of any other hydrographic office. It would also permit one hydrographic office to use the chart agents of another hydrographic office – agents who may be closer to the point of sale. Both opportunities would require standards for the exchange of the digital chart files and the administrative information associated with an order.

The development of standards for the exchange of digital raster reformat is an approved Work Item of TSMAD (WI 2.9). However, standards for digital reformat used in lithographic printing may not be completely suitable those for Print-on-Demand. For example, administrative information about a Print-on-Demand chart order would most likely not be in a metadata standard for lithographic reformat, which uses a different business model. It is proposed that the TSMAD Work Item take into consideration the potential desire for hydrographic offices to support each other via cooperative printing using Print-on-Demand technology.

### 4. Benefits.

Standards for the exchange of Print-on-Demand digital files would benefit hydrographic offices and mariners. Hydrographic offices could gain a network of trusted manufacturers, either other hydrographic offices or their authorized agents, to print charts close to the point-of-purchase. Distribution delays would be eliminated. Customs issues would disappear. Broader distribution of a hydrographic office's products would be possible.

Mariners would gain by having better access to a broader selection of national charts. As more hydrographic offices begin to keep their chart files up-to-date, mariners would begin getting more current information.

5. Working Groups.

The TSMAD is the appropriate working group to develop the needed standards.

6. Other relevant information.

None provided.

7. Priority.

Low

8. Target completion date.

September, 2004

9. Action Required

The CHRIS is invited amend the work program of TSMAD to include the development of standards for the exchange of digital, Print-on-Demand chart files and the administrative information associated with an order.