Hydrographic Services and Standards Committee

New Paper-Chart and ECDIS Chart 1

HSSC-5 Shanghai

5-8 November 2013

# Background

- Need for simple, easily accessible ECDIS/ENC symbology reference for mariners

- S-52 provides an "ECDIS Chart 1," which is required to be displayable in ECDIS

  - Difficult to use

  - Does not associate ECDIS symbols with paper chart counterparts

  - Can't display Chart 1 and ENC simultaneously

# U.S. Chart No. 1, Edition 12 (15 April 2013)

- 1st chart 1 to show paper chart (INT1) symbols side-by-side with the corresponding ECDIS (S-52) symbols

- Download PDF for free at: http://www.nauticalcharts.noaa.gov/mcd/chart1/ChartNo1.pdf

- Paper copies can be ordered from one of NOAA's four publishing partners listed at: http://www.nauticalcharts.noaa.gov/mcd/chartno1.htm.
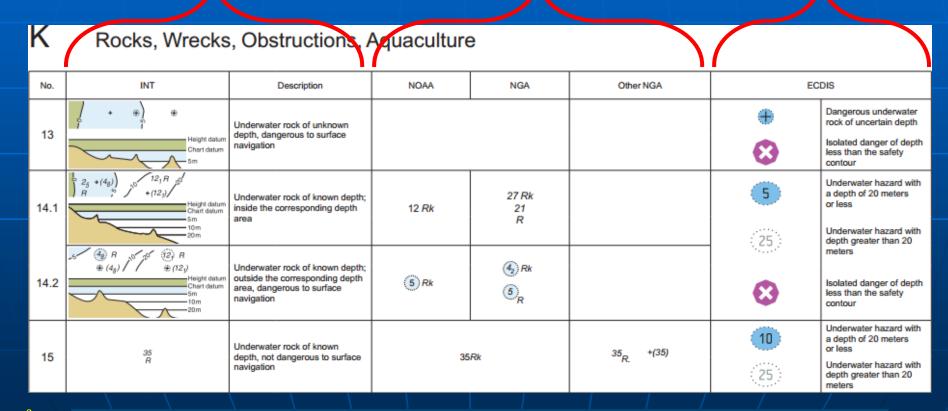
# Modified INT1 Page Format

## US

## INT1 (S-4)          National Symbols          ECDIS (S-52)



K  Rocks, Wrecks, Obstructions, Aquaculture

| No. | INT | Description | NOAA | NGA | Other NGA | ECDIS | |
|---|---|---|---|---|---|---|---|
| 13 | | Underwater rock of unknown depth, dangerous to surface navigation | | | | ⊕  ✕ | Dangerous underwater rock of uncertain depth / Isolated danger of depth less than the safety contour |
| 14.1 | | Underwater rock of known depth; inside the corresponding depth area | 12 Rk | 27 Rk 21 R | | 5  25 | Underwater hazard with a depth of 20 meters or less / Underwater hazard with depth greater than 20 meters |
| 14.2 | | Underwater rock of known depth; outside the corresponding depth area, dangerous to surface navigation | 5 Rk | 4₂ Rk 5 R | | ✕ | Isolated danger of depth less than the safety contour |
| 15 | 35 R | Underwater rock of known depth, not dangerous to surface navigation | 35Rk | | 35 R.  +(35) | 10  25 | Underwater hazard with a depth of 20 meters or less / Underwater hazard with depth greater than 20 meters |

**Many-to-many correspondence among INT1 and ECDIS symbols**
**Need to account for variation in portrayal of some objects in ECDIS, such as:**
**display of magenta "screw head" isolated danger symbol for rocks shoaler than the safety contour**

# Special ECDIS Specific Content

- ✦ Additional pages added to describe:
  - – Isolated Danger Symbol
  - – Pick Reports
  - – Day, Dusk and Night Color Palettes
  - – Conspicuous and Non-Conspicuous Features
  - – ECDIS Portrayal of Depths
  - – Routing Measures in ECDIS
  - – Simplified and Traditional "Paper Chart" Symbols

# Colour Palettes

## Day, Dusk and Night Color Palettes

ECDIS

ECDIS allows the mariner to change the color palette that is used to display an ENC. Three different color tables have been designed to provide the maximum clarity and contrast between features on the display under three different lighting conditions on the bridge, namely Day, Dusk and Night.

Each symbol is rendered in a different color appropriate for the lighting condition that the color table is meant for. This design provides maximum contrast for the display on a sunny day, as well as preserving night vision on a dimly lit bridge in the evening. This allows the mariner to look back and forth between the chart on the ECDIS display and out to sea through the bridge window without the mariner's eyes needing to readjust to a difference in light intensity.
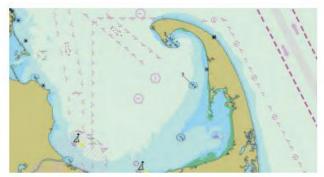
- The Day Color Table, meant to be used in bright sunlight, uses a white background for deep water and looks the most like a traditional paper chart.

- The Dusk Color Table uses a black background for deep water and colors are subdued, but slightly brighter than those used in the Night Color Table.

- The Night Color Table, meant to be used in the darkest conditions, uses a black background for deep water and muted color shades for other features.

The images on the right show each of the three color palettes.

The symbols shown in the remainder of this document use the day color palette.



DAY

DUSK

NIGHT

# Simplified and Traditional Symbols

## Simplified and Traditional "Paper Chart" Symbols

ECDIS can be set to display aids to navigation with either traditional "paper chart" or simplified symbols. The two symbol sets are shown below. Some ECDIS color fill the paper chart buoy shapes, but this is not required by IHO ECDIS portrayal specifications.

### Floating Marks

| Paper Chart | Simplified | Simplified Symbol Name |
|---|---|---|
| | | Cardinal buoy, north |
| | | Cardinal buoy, east |
| | | Cardinal buoy, south |
| | | Cardinal buoy, west |
| | | Default symbol for buoy (used when no defining attributes have been encoded in the ENC) |
| | | Isolated danger buoy |
| | | Conical lateral buoy, green |
| | | Conical lateral buoy, red |
| | | Can shape lateral buoy, green |
| | | Can shape lateral buoy, red |
| | | Installation buoy and mooring buoy |
| | | Safe water buoy |
| | | Special purpose buoy, spherical or barrel shaped, or default symbol for special purpose buoy |
| | | Special purpose TSS buoy marking the starboard side of the traffic lane |
| | | Special purpose TSS buoy marking the port side of the traffic lane |
| | | Special purpose ice buoy or spar or pillar shaped buoy |
| | | Super-buoy ODAS & LANBY |
| | | Light float |
| | | Light vessel |

### Fixed Marks

| Paper Chart | Simplified | Simplified Symbol Name |
|---|---|---|
| | | Cardinal beacon, north |
| | | Cardinal beacon, east |
| | | Cardinal beacon, south |
| | | Cardinal beacon, west |
| | | Default symbol for a beacon (used when no defining attributes have been encoded in the ENC) |
| | | Isolated danger beacon |
| | | Major lateral beacon, red |
| | | Major lateral beacon, green |
| | | Minor lateral beacon, green |
| | | Major safe water beacon |
| | | Minor safe water beacon |
| | | Major special purpose beacon |
| | | Minor special purpose beacon |

\* Paper chart symbols display various buoy or beacon shape symbols in conjunction with the topmark. Simplified portrayal only displays the topmark.

\*\* Several different paper chart symbols correspond to this simplified symbol.

### Day Marks

| Paper Chart | Simplified | Simplified Symbol Name |
|---|---|---|
| | | Square or rectangular daymark |
| | | Triangular daymark, point up |
| | | Triangular daymark, point down |
| | | Retro reflector |

# Conclusions

- The model used in US Chart No.1 can be a valuable resource for ECDIS users

- Could provide the foundation for other countries wishing to incorporate ECDIS symbology into their own chart 1 documents

- Sub-Working Group to continually improve and standardize the presentation of ECDIS symbology in INT1s and other national chart 1s could be useful

# Thanks & Sharing of Working Files

- Members of DIPWG (especially Australia) and the CSPCWG INT1 Sub-Working Group provided helpful critiques of early drafts
  - Send comments, suggestions, accolades to: **USChart1@noaa.gov**
- U.S. can provide copies of the Adobe InDesign files and graphics used to create its Chart 1
  - Send requests to: **USChart1@noaa.gov**
- Copies have already been provided to each of the three INT1 Sub-Working Group members