First Officially Approved Electronic Chart System

Italy is the first nation officially to adopt ECS systems - other than ECDIS - as equivalent standard to paper charts. The approved ECS systems, as defined by issued standard, are devoted to Italian pleasure boats and fishing vessels not SOLAS compliant. Since 10th July 2002 there has existed a new â€˜standardâ€™ in electronic cartography. The Italian Ministry of Transport infrastructure (in charge of safety of navigation) has approved the technical specification for â€˜ECS Systems and ECS Databaseâ€™ that can be used on Italian pleasure and fishing boats not SOLAS compliant as a substitute for the traditional paper chart.

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Background
The need to create a new standard for electronic charts and related display system arose a couple of years ago when the above ministry issued Decree number 274, in which it was stated that "â€¦for pleasure and fishing boats not SOLAS compliant it was possible to substitute the traditional paper nautical charts with electronics systems compliant to standards to be written in accordance to the real needs and the characteristics of this kind of vesselâ€¦"
From that date onwards, the two Italian technical bodies involved (the Hydro-graphic Office and Coast Guard) working together with two companies, C-Map and Navionics, to draft the standard that was officially approved last July. One of the most important and relevant issues is that compliance with this standard will have to be self-certified by the producer and the Italian Hydrographic Office will act as â€˜supervisorâ€™ of such a declaration, responsible for making appropriate and random checks on the products of private firms.

Introduction
The specifications have been written according the needs of pleasure and fishing boats having the same safety requirements but in need of less complementary information than are SOLAS vessels.
The standard foresees three classes of ECS systems, as follows:

- Class 1 for pleasure yachts and fishing vessels more than 24 mt. LOA
- Class 2 for pleasure yachts and fishing vessels less than 24 mt. LOA
- Class 3 to be used as back up system only 1

The three classes mentioned above have some differences related to the hardware characteristics of â€˜plottersâ€™ and to the capacity of the managing and visualisation software.

Document Overview
The title of the official document issued by the Italian Hydrographic Office is Il 3165 sistemi elettronici di ausilio alla navigazione - ECS approvati e relativa cartografia digitale -ecs database. It is structured in order to allow very simple interpretation, looking very exhaustive to a potential private producer interested in the business of approved ECS system production. It is composed of more then thirty pages arranged under fourteen chapters and one annex as follows: Introduction, Definition, General requirement, Information representation, ECS database supply and updating, Alarm and warnings, Representation of additional information, Colour and symbols, Screen requirements, Operational settings, Calculation and accuracy, ECS Database, Connection with other electronic devices, List of tests for hardware (annex).

Relevant Existing Standards
The Italian standard has been written taking into account a lot of other existing standards. A brief list of them is as follows:

- IEC 60945: Maritime navigation and radio communication equipment and systems - General Requirements Method of testing and required test results. For hardware tests
- IHO SP S-52: Appendix 2. For colours and symbol be used in colour visualisation
- IEC 61174: For colour and symbol to be used to display navigation element and parameters
- IEC 61162-1 (RTE e WPL): For the input of data from a course planning device or navigation
- ISO 9000: For the quality assurance process that must be held by the ECS database producer
- IHO M4: To be used as source for ECS database test

Document Contents Analysis
a) Cartographic Database
The cartographic database adopted by the Italian standard, defined as â€˜ECS Databaseâ€™, provides for vector electronic cartography,

with the information and characteristics that are compliant to the content of The Final Draft International Standard (FDIS) version of ISO 10379, already described in this magazine few months ago2.
The official source (Official Nautical Charts and documents) can be integrated by the private producer of an ECS Database with other data and information coming from other sources, but this second type of information must be kept separate from others. All characteristics of contents, compilation criteria and updating procedures are well and very clearly described. In order to define different kinds of navigation for which a specific ECS database can
be used, the following table of correspondence has been introduced in the standard:

b)Managing and Visualisation Software
Regarding this aspect the technical specifications are very detailed and offer a lot of constraints to the producer, starting from the definition of the â€˜standard displayâ€™4 and of the maximum numbers of commands to visualise it derived from any other visualisation, to the minimum set of â€˜operating statusâ€™ (navigation, planning, and non operational status) with related detailed instructions and definition.

c) Hardware Characteristics
The possibility of substituting the official paper chart with both a complete â€˜approved systemsâ€™ and a suitable back-up system makes hardware characteristics another very important issue. The list of hardware characteristics is very detailed, and from my point of view the more interesting are:

- Hardware Tests. The hardware must be able to pass the tests specified in the annex to the document, according to procedures and results required by publication: IEC 60945, Maritime navigation and radio communication equipment and systems - General Requirements - Method of testing and required test results
- Power Source Failure. For both ECS class one and two, if the power failure is less than 45 seconds the ECS must be provided with auto restart facility and must be able (after a restart) to show the same configuration of information existing on the screen before the power failure
- Colours and Symbols. For class one, ECS colours and symbols must be in accordance with colour and symbols recommended by IHO for ECDIS systems (Appendix two at IHO SP S-52). For class two ECS it is possible to use colours and symbols in accordance with official paper chart sources. If colours and symbols do not comply with ECDIS or official paper chart symbols, a legend of colours and symbols must be provided. For class three ECS it is possible to use a monochromatic display, but all the information must be shown in order to be clearly understood in all light situations

What Happens in Other Countries?
From next summer (according to some unofficial information collected from private firms interested in approved ECS systems production) the first Approved ECS systems should be ready and available for the Italian market, the only country that Ã up until today - has officially adopted this kind of ECS systems.
But some things may happen within very short time.
An important change to the US Hydrographic Services Improvement Act of 1998 was made in early January 2003 when the President of the United States signed the Re-Authorization Act, making it law (Public Law 107-372). The revised Act requires that the Hydrographer of the United States (Coast Survey) establish a Quality Assurance standard whereby privately-made hydrographic products may be certified by the Hydrographer as meeting his requirements. The earlier version of the law only authorised the Hydrographer to perform this function; this revision makes it mandatory.

1. *In order to comply with Italian law, the yacht and fishing boat wanting to substitute paper charts with ECS systems must carry on board two approved ECS systems (one as back up); or one ECS system - of class 1 or 2 according to LOA - and a set of official paper charts.*
2. *The Final Draft International Standard (FDIS) version of ISO 10379, the ECS database standard, was transmitted to the Secretariat of Technical Committee 8, Special Committee 6 in Tokyo for distribution to voting countries. This version of the standard was produced at a meeting of the Working Group in Genoa, Italy last December with the participation of representatives of eight countries. Changes were made with the agreement of those present, improving the procedures for testing for compliance and recognising the growing trend towards using HO-produced ENCs as the source of privately-made databases. Once this round of voting is completed, publication of the standard is scheduled for August 2003.*
3. *An ECS Database that does not have requirement of safety to be used for navigation in restricted waters, port and coastal navigation in association with a GPS system.*
4. *The â€˜Standard Displayâ€™ is defined as the minimum content of an ECS Database and of its navigation element (own ship, track and planned course) that must be shown on the screen according to a specific situation.*

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https://www.hydro-international.com/content/article/first-officially-approved-electronic-chart-system