



16th Meeting of the Hydrographic Services and Standards Committee

Paper submitted by France, Canada, Croatia, Estonia, Finland, Germany, Latvia, Norway, Poland, Sweden, Republic of Korea, United States and PRIMAR

Comments to HSSC16-05.1G “SENC distribution in an S-100 World”

Agenda Item 05.1J

HSSC-16, Tokyo, Japan, 27 – 31 May 2024



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WHAT NEED FOR SENC DISTRIBUTION IN THE S-100 WORLD?

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- More than 20 years ago, distribution issues led to considering SENC delivery as an alternative to ENC. These issues do not exist anymore.
 - initial technical justification to SENC delivery does not apply nowadays
- HSSC (HSSC15/20, former HSSC14/25 & HSSC13/27) tasked S100WG to demonstrate whether the need for SENC distribution is still justified in the S-100 world.
 - no evidence produced since HSSC13



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DIRECT DISTRIBUTION OF S-1XX PRODUCTS

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From HO, RENC
(via distributor)

To End-User





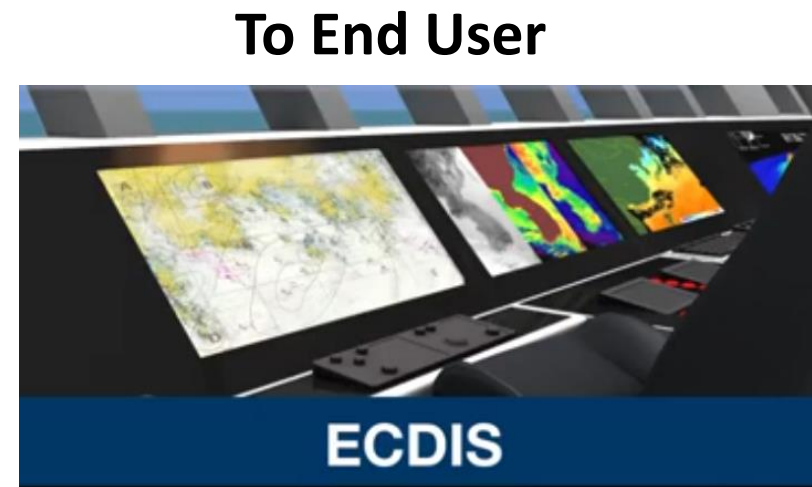
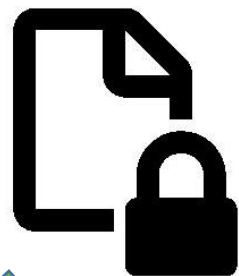
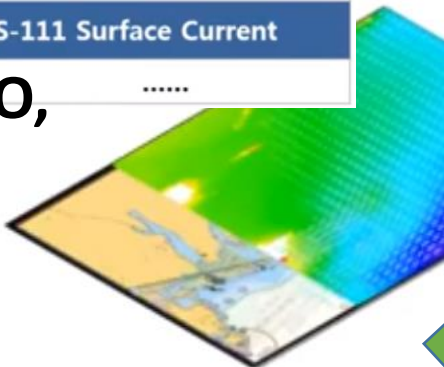
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SENC DELIVERY

International Hydrographic Organization

S-10X Products
S-101 ENC
S-102 Bathymetric Surface
S-111 Surface Current
.....

From HO,
RENC



To End User

ECDIS

SENC Delivery

S-10x product reaching the end user is **not** the original product authenticated by the producer signature

« Information from other sources »



Anything can happen





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SENC: ANYTHING CAN HAPPEN... **AND IT DOES**

- **Piracy** : if S-1xx products are unencrypted at some point during the distribution process, data may be « stolen »
- **Security** : each additionnal processing step adds a risk of data corruption, either intentionally (cyber attack, spoofing) or by accident.
- **Liability**: the product reaching the end user is not the original product authenticated by the producer signature. The producer can no more guarantee the content. This issue is at the core of legal responsibilities of the HO or the State.

Measures (QC procedures, certification process) may mitigate but will not cancel the risk

... while **S-100 Data Protection Scheme (Part 15)** is fit for purpose **exactly for that objective.**



15-3 General Description

This Part specifies a method of securing digital nautical, hydrographic and spatial related products and information. The purpose of data protection is threefold:

1. Piracy Protection: To prevent unauthorized use of data by encrypting the product information.
2. Selective Access: To restrict access to only the products that a customer has acquired a license for.
3. Authentication: To provide assurance that the products have come from approved sources.

Piracy protection and selective access are achieved by encrypting the products and providing data permits to decrypt them. Data permits have an expiration date to enable access to the products for a licensed period. Data Servers will encrypt the digital products before supplying it to the Data Client. The encrypted products are then decrypted by the end-user system (for example ECDIS/ECS) prior to being reformatted and imported into the System Internal Format (for example SENC). Authentication is provided by means of digital signatures applied to the product files.

The security scheme does not specifically address how the product information can be protected once it is within an end-user application. This is the responsibility of the Original Equipment Manufacturers (OEMs).



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TO SUMMERIZE...

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1. The digital signature certifies data integrity, non-repudiation and authentication.
2. For member states and for mariners, digital signature guarantees the authenticity and integrity of the official products that enters an ECDIS.
3. SENC distribution does not meet this essential property, which is a major cyber-security breach that should be absolutely avoided especially in a context where cyber security becomes a very challenging issue.



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ACTION REQUIRED OF HSSC

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1. Note this paper.
2. Encourage IHO member States to engage in the S-100 Part 15 implementation.
3. Close action HSSC15/20 (former HSSC14/25, HSSC13/27).
4. Consider not to launch any more action, as there is no evidence of the need for SENC distribution in the S-100 world.