



14th Meeting of the Hydrographic Services and Standards Committee

Paper submitted by France (Shom)

Reflections on the future of SENC delivery

Agenda Item 05.1E

HSSC-14, Denpasar, Bali, Indonesia - Hybrid Event, 16 – 19 May 2022



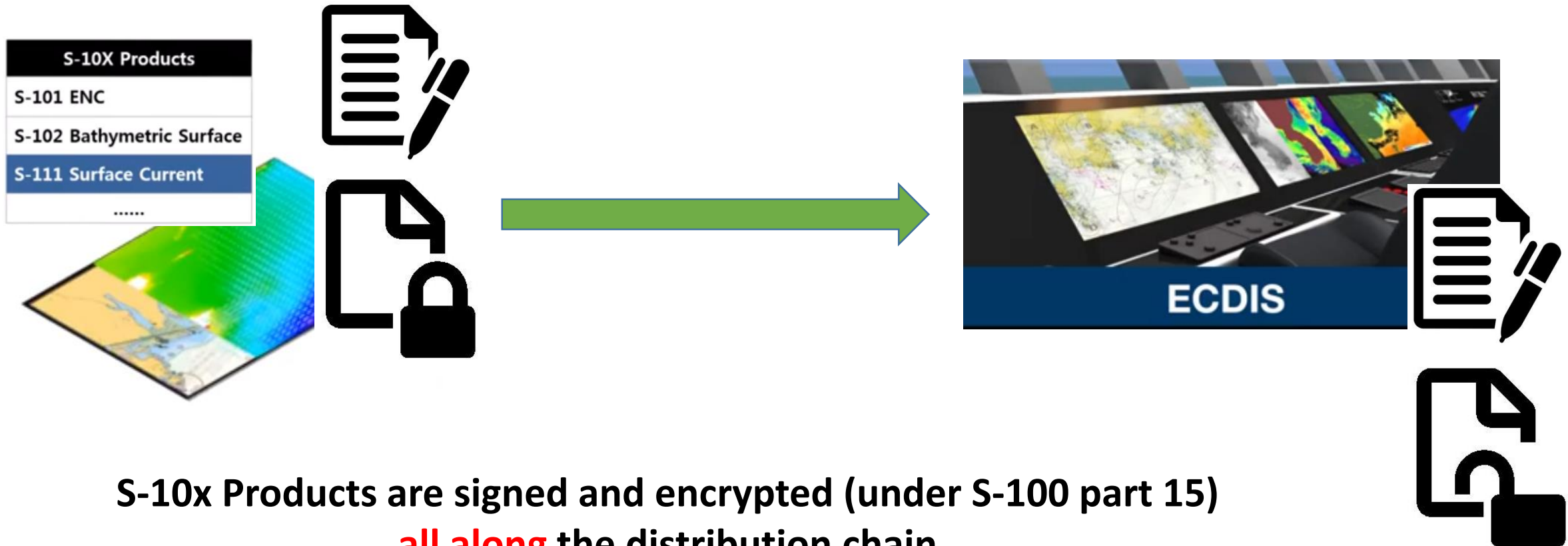
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DIRECT DISTRIBUTION OF S-10X PRODUCTS

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From HO, RENC
(via distributor)

To End-User



S-10x Products are signed and encrypted (under S-100 part 15)
all along the distribution chain



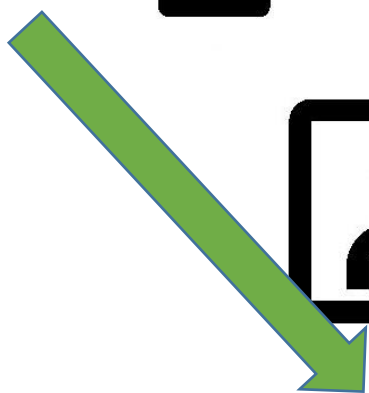
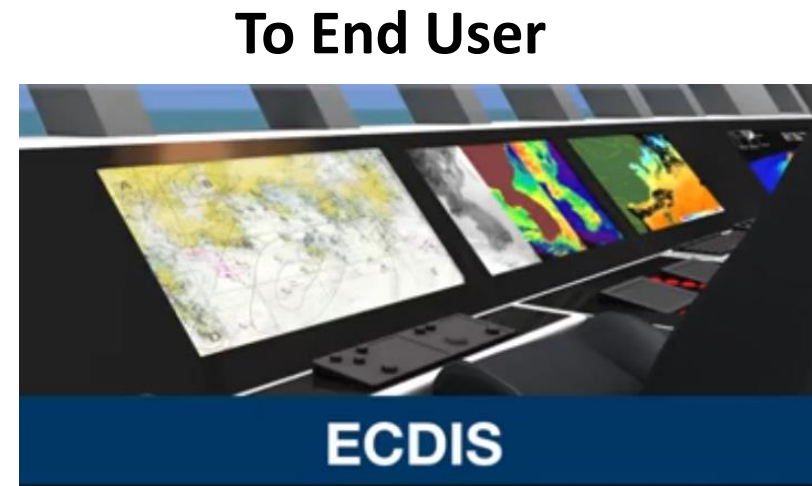
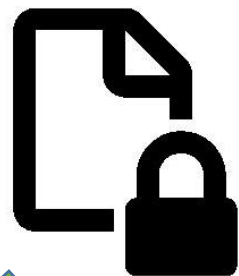
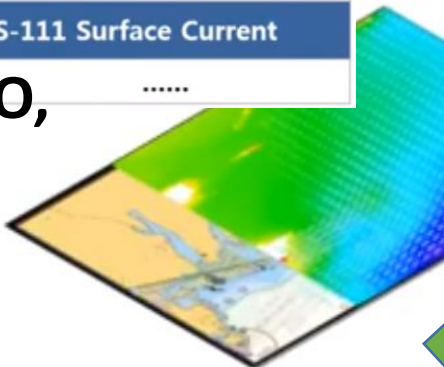
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SENC DELIVERY

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

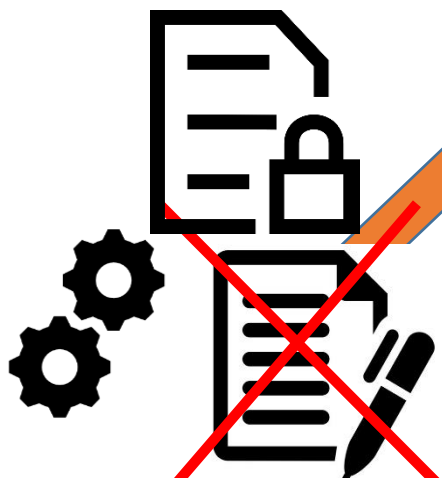
From HO,
RENC



« Information from other sources »



Anything can happen



SENC Delivery

S-10x Products reaching the end user are no longer signed by the producer



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ANYTHING CAN HAPPEN...

- **Piracy** : if S-10x products are unencrypted at one point during the distribution process, data may be « stolen » (And it happens! We have a recent case of unauthorised use of S57 ENC's...)
- **Security** : each additional processing step adds a risk of data corruption, either intentionally (cyber attack) or by accident.
- **Security and Liability**: no guarantee that the product reaching the end user has the exact same data as the product issued by the HO. This issue is at the core of legal responsibilities of the HO or the State.

Mitigation measures may be introduced (quality control procedures, certification processes). But costly and not 100% safe...

... while S-100 Data Protection Scheme (Part 15) is exactly made for that.



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S100 – PART 15 : DATA PROTECTION SCHEME

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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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WHY STILL CONSIDER THE OPTION OF SENC DELIVERY?

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- More than 20 years ago, ENC distribution was faced with some support issues, that led to considering SENC delivery :
 - Lack of consistency between some ENCs
 - Loading time in the ECDIS...
- These issues have been resolved
 - no technical justification to SENC delivery



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TO SUMMERIZE...

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1. There is no longer any technical justification to SENC delivery
2. There are cyber security and legal issues that are ideally dealt with by S-100 part 15 ensuring the same digital signature all the way from producer/RENC to end user
3. Any extra quality control procedures and/or certification processes would not only induce unnecessary costs but also blur responsibility for the product delivered to the end user.



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CONCLUSION (1/2)

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1. Safety of navigation products must be made available in the most efficient way and without any ambiguity.
2. SENC delivery is not only unnecessary, but it adds risks to an otherwise robust process. Discussions at the last 2 PRIMAR Advisory Committees show there is a general consensus on this point among PRIMAR Member states.
3. If SENC delivery of S-10x products is thought to be of any value to the end user, then it must be proven to be as safe as direct distribution.



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CONCLUSION (2/2)

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The IHO WEND-100 Principles Resolution 1/2021 states that
*“Member States should ensure the use of the IHO Data Protection Scheme (S-100 Part 15) for distribution to mariners, to **secure data integrity**, to **safeguard national copyright in data**, to **protect the mariner from falsified products**, and to **ensure traceability**.”*

SENC delivery does none of that...



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ACTIONS REQUESTED FROM HSSC

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1. Discuss these considerations
2. Take any action deemed necessary