

20th CHRIS MEETING
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Paper for Consideration by CHRIS
Data Chain Certification Concept

Submitted by:	RTCA
Executive Summary:	The paper is intended to provide CHRIS with an overview of the concept of “Data Supply Chain Certification”, as undertaken in the processing of aeronautical data, and promotes such certification to ensure the preservation of ENC data quality, in the development of additional information layers which may need to be associated with the underlying ENC dataset.
Related Documents:	RTCA DO-200A
Related Projects:	None yet evaluated

Introduction / Background

At the TSMAD S-101 User Requirement Workshop, held at the IHB in Monaco from 4 – 6 March 2008, an issue, which is invariably present in any data supply chain, was discussed regarding the need for the complete data supply chain, and any of the chain’s individual parts, to be such that data quality is kept at the highest possible level. Any deterioration in data quality should be avoided.

One of the standards developed by RTCA is called DO-200A and is used in aviation circles for data chain certification for advanced, high precision navigational data streams. Support was forthcoming during the TSMAD workshop to look further at the data chain certification concept for marine applications.

The paper is intended to provide CHRIS with an overview of initial findings and proposes further research in this area.

Analysis/Discussion

Ensuring a world-wide consistent level of high-quality, updated official Electronic Navigational Charts (ENCs) through integrated services that support chart carriage requirements of SOLAS Chapter V, and the requirements of the IMO Performance Standards for ECDIS are enshrined in the Worldwide Electronic Navigational Chart Database (WEND) principles.

Reference to integrated services relates to a variety of end-user services where each service is selling all its ENC data, regardless of source, to the end user within a single service proposition embracing format, data protection scheme and updating mechanism, packaged in a single exchange set.

A data supply chain will generally contain several segments including situations where, for example, two chain segments exist after the data is quality controlled by the originating hydrographic office i.e. the Regional ENC Centre (RENC) segment and the Valued Added Reseller (VAR) segment. This type of data supply relies on a form of management, in the RENC chain segment, which is guaranteed by highly trusted partners like the United Kingdom Hydrographic Office (UKHO) and the Norwegian Hydrographic Service (NHS) as co-ordinators of the IC-ENC and Primar Stavangar RENCs respectively. It endeavors to ensure the quality of the data supply chain within the VAR segment by using S-63 encryption of ENC data, downstream of the RENC segment.

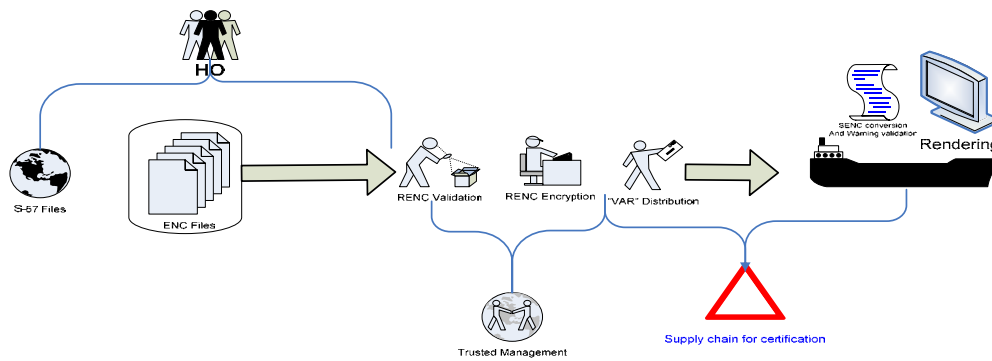


Diagram 1 (Primar Model)

Another example of a data supply chain provides the VAR with the unencrypted data for better processing and value addition. In this situation, as shown in Diagram 2, the trusted management within the RENCs is enhanced by an additional trusted chain segments at the VAR level.

While more detailed analysis of the different data supply chain models are available, the two examples given in this paper highlight potential for improvements. The experience of RTCA clearly indicated that a supply chain for safety critical information should not depend on “trust” but, rather, on “certification” to minimize the risk of data quality reduction, due to the introduction of errors based on quality lapses in the supply chain.

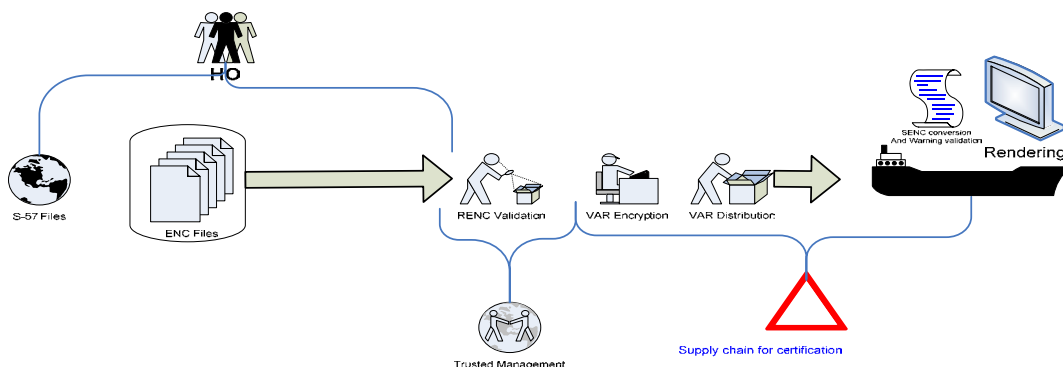


Diagram 2 (IC-ENC Model)

While ISO certification validates process quality, consistency and continuous improvements, those concepts do not address the data quality certification across processes along the supply chain.

As the S-100 series of standards evolve, the applicability of S-63 encryption comes under scrutiny. Regardless of the outcome of any discussions on this issue, the development of new standards like S-100 and subsequent standards need to take in consideration the data supply chain and the quality assurance across the complete supply chain. Further research in this area has the ability to enhance the safety aspect of the S-100 series by considering a data supply chain standard against which any chain segment could be certified.

The aviation world, represented by RTCA, can illustrate the benefit of this type of standard and collaboration with IHO could highlight the appropriateness of the concept for maritime applications. In combination with the advanced S-100 series data standards this could significantly increase the overall quality of the data supply chain, ensuring that the high quality of data produced by the Hydrographic Offices are reaching the end users, without any adverse changes in quality.

Further studies will be conducted by the RTCA Observer at IHO who will absorb any costs involved for the next level of studies. As the study is looking at the supply chain downwards from Hydrographic Offices no impact is

expected on Member States. There may be subsequent recommendations for the other segments of the marine data supply chain, but this should be addressed as they are coming up.

Conclusions

Based on everything highlighted above there is a need for ensuring the quality of the complete data supply chain of marine navigational data. Certification is much more desirable than a simple “trust” concept. In addition, such certification, once fully developed and adopted, provides Member States with a capability to approve or reject applications of partners in the supply chain, based on clear facts and fair treatment as requested by international laws.

Recommendations

Not applicable

Justification and Impacts

Justification: Data chain certification has the potential to ensure that the quality of official ENC's is not compromised when third parties seek to develop value-added functionality which requires associations with the underlying dataset(s). There is also the extra assurance for hydrographic offices who use private companies to compile ENC's on their behalf.

Impacts: In general terms, data chain certification does not interfere with any of the processes leading from survey data acquisition and processing through to the ENC compilation.

Action Required of CHRIS

The CHRIS Committee is invited to:

1. Note the efforts put forward by RTCA on the “Data Chain Certification” initiative
2. Give support for further research on this initiative and extend an invitation to interested Committee members to participate in a inter-sessional Correspondence Group
3. Permit the presenter to provide the Committee with progress reports at future meetings