HSSC7-07.7B INF7

Paper for Consideration by HSSC

Ensuring Compatibility with ISO Standards

Submitted by:	Canada
Executive Summary:	The IHO S-100 standards and implicitly all of the Other IHO S-100 series standards based on S-100 are dependent upon the ISO TC211 suite of standards. The IHO standards need to be stable because they become the basis for IMO and other regulations and with respect to Marine Limits and Boundaries they may become part of international treaties. Stability is a very important aspect of S-100. However, the ISO TC211 standards continue to evolve and new versions are published. These new versions are not directly compatible with the previous versions since some classes are changed or moved between standards. ISO currently is withdrawing the previous version of their standards. This can mean that the IHO standards are referencing deprecated ISO standards. This needs to be addressed both in IHO and in ISO.
Related Documents:	S-100, and all of the S-100 suite of standards, ISO TC211 suite of standards
Related Projects:	S-100, S-102, S-111, S-121, and any IHO standards that directly references an ISO standard.

Introduction / Background

The safety of navigation provides a strong requirement for stable and well tested standards. In 1996 IHO released S-57 edition 3.0 which was frozen for 4 years. In 2000 S-57 edition 3.1 was released and frozen "forever". In January 2007 Supplement 1 was added to S-57 and a second supplement in 2009 building upon but not changing the frozen standard. S-57 was frozen because ECDIS equipment once installed would likely last for many years until a ship was refitted, and there was little likelihood of updating the software on such systems. Also ECDIS systems require extensive compliance testing and revised software would require retesting. Navigational safety is too important to have the electronic navigational systems fail because of the continuous updating, "improvements" and bug fixing that goes on in the realm of many commercial software systems.

The problem is that one cannot easily freeze a standard because technology is evolving at an ever increasing rate in the electronics, communications and computing world. If the IHO standardized equipment became an island separated from all other electronic systems then it would be a special case development and would become extremely expensive.

IHO chose a strategy to develop the next generation of electronic navigational standards using a two level approach. It established the S-100 "Universal Hydrographic Model" standard based on the International Organization for Standardization (ISO) suite of standards, and then developed the eNavigation standard S-101 for an Electronic Nautical Chart (ENC) as a Product Specification based on the S-100 standard. This would allow the S-100 standard to evolve, in a carefully managed manner, while allowing the ENC product specification to be fixed for a significant period of time. Testing would be to the S-101 ENC product specification. Eventually, many years in the future a new version of the ENC product specification could be issued as long as backward compatibility was maintained.

The reason for building on the ISO suite of standards is that these standards are widely implemented in the geographic information commercial domain, and therefore support software systems, databases and other

components would be more easily available. The only compliance testing would be to the stable product specification and the ECDIS equipment that uses the data.

A critical element of this strategy is the stability of the ISO suite of standards. However, the driving factors in ISO are not the same as those in IHO, and less attention has been taken to backward compatibility and stability. The current ISO policy is to revise standards every 5 years and make changes as necessary to ensure that they meet the needs of the ISO member nations. This has meant, for the geographical information area, keeping up with technological developments more than ensuring stability.

Currently ISO is undertaking a round of revisions of its base standards and some of the changes will make things difficult for IHO. To compound the problem ISO withdraws its previous versions of standards. It is still possible to purchase these older versions from ISO directly, but the availability of these older standards is a special case. In general only the most recent versions are sold.

This is important because S-100 references some of the older ISO standards. For example, the metadata used in S-100 derives from the ISO 19115:2003 Metadata standard. ISO published a revision of this standard ISO 19115-1:2014 Metadata – Fundamentals in 2014. The new standard includes many changes and moved some metadata classes to a separate standard ISO 19157:2013 Data Quality, The new data quality standard replaces previous data quality standards such as ISO 2013:2002 Quality principles, ISO 19114:2003 Quality evaluation procedures and ISO 19138:2006 Data Quality measures. Since the data classes often change names when they are moved or revised it is sometimes difficult to trace what has changed.

Sometimes there are even problems within ISO. The ISO 19115-2:2009 Metadata extensions for imagery references the older ISO 19115:2003 Metadata. The ISO 19130-1 Sensor and data models for imagery and gridded data (that includes bathymetric sensors) and is currently under revision references the newer ISO 19115-1:2014 Metadata standard and older ISO 19115-2:2009 Metadata extensions for imagery which indirectly references the original ISO 19115:2003 standard. That is, in some cases ISO ends up referencing both the new and old version of standards at the same time.

Metadata is important, but the larger problem occurs with even more fundamental standards such as ISO 19123:2005 Spatial Schema which currently being revised, and where all classes are being renamed and revised. In this case ISO is providing a crosswalk as part of the standard so that one can trace back to the previous version.

There are solutions to carefully manage this evolution, but insufficient effort is being expended in ISO and IHO to ensure compatibility.

Maintaining compatibility

ISO has addressed the need for stability and compatibility in other technological domains in the past. For example it maintains a strong level of interoperability between different versions of telecommunications standards. This is done jointly with the UN International Telecommunications Union. The requirement in telecommunications is clear. The requirement in geographic information needs to be made clearer.

IHO is a liaison member of ISO, and is a parallel international organization. IHO has a voice in ISO both at the ISO TC 211 Geographic Information committee level and at the ISO Central Secretariat level. IHO needs to voice its requirement to ISO.

What needs to be done is that **all of the ISO TC211 standards that are changed need to maintain a crosswalk so that references to the previous standards can be understood in terms of the new standards. It is desirable that ISO maintain these crosswalks as annexes to the revised standards so that they are available for purchase as part of the copies of the new standards. The references made to the ISO standards by external standards such as IHO S-100 should remain valid even if the ISO standards are revised.**

If ISO is not able to develop these crosswalks then IHO would have to develop such crosswalks for the ISO classes it uses.

Summary

This document presented the need for stability in the IHO S-100 suite of standards and showed how the current developments in ISO TC211 may impinge this stability. An approach is described to carefully managing the evolution of these standards.

Recommendation

It is recommended that the HSSC request the IHO liaison representative to ISO (Mr A Pharaoh of IHB) raise this issue at the upcoming ISO TC211 meetings being held in Sydney Australia, 7 to 11 December 2015. (The liaison report to ISO might use material from this paper).

Action Required of HSSC

The HSSC should request the IHB to raise this issue with ISO TC211.