Paper for Consideration by S-100 Working Group 2

Proposed Test Cases for the S-100 Initial Data Conversion Tool

Submitted by:	NATO Geospatial Maritime Working Group
Executive Summary:	This paper proposes a set of test cases to support the testing of the Initial Data Conversion tool which forms a component of the S-100 Testbed.
Related Documents:	S-100 Test Framework
	ISO 15288
Related Projects:	S-100

Introduction / Background

At S-100 Working Group 1 an update was provided on the S-100 Testbed, this noted that no test cases are to be defined for the Initial Data Conversion Tool (known as the S-100 Converter) which forms a key component of the S-100 "System". Observing that the NATO Geospatial Maritime Working Group (GMWG) intends to utilize the S-100 Testbed in order to test S-100 based product specifications; GMWG took an action to propose test cases for the S-100 Converter for consideration by S-100 WG 2. This paper provides this proposal and includes an initial draft set of test cases at annex A.

Analysis/Discussion

The S-100 Test Framework was developed in order to provide a robust framework for the testing and development of S-100. It was intended to follow the Systems Engineering approach laid out in ISO 15288 in order to test each component of the wider system and thus ensure that lessons identified during the introduction and implementation of S-57 would be learned.

Section 8 of the S-100 Test Framework defines the Initial Data Conversion Tool also referred to as Phase 2. This defines the inputs and outputs of this components and its high level function. A number of requirements are defined, how the conversion is conducted is not defined therefore a logical approach is to test the output S-101 dataset as a means to validate this component. S-101 will in the future include a set of validation checks which build on the existing S-58 ENC Validation Checks, however as yet these checks are not available.

In the absence of these validation checks a set of test cases can be defined which seek to verify the output dataset against the various specifications. These test cases may be conducted manually through visual inspection or programmatically.

Conclusions

This paper proposes that in order to ensure that the S-100 Test Framework is robust the S-100 Converter should have a set of test cases against which its outputs can be verified. These test cases are provided for review and comment by the S-100 WG.

Recommendations

This paper recommends that a set of test cases should be developed and agreed to ensure that the S-100 Converter can be tested. Although S-101 Validation Checks will in future provide a more complete and robust means to test this component an interim set of test cases should be put in place.

Justification and Impacts

This approach will ensure that the S-100 Testbed provides a robust framework for testing. A lack of testing could mean that invalid S-100 test datasets are produced and therefore further testing may be jeopardised.

Action Required of S-100WG

The S-100WG is invited to:

    a.   endorse that a set of test cases for the S-100 Converter should be included within the S-100 Test Framework.

    b.   agree to review the proposed test cases for the S-100 Converter and seek to develop these into an agreed set of test cases.

Annex A – Draft Test Cases for S-100 Converter

Version 0.1

Instructions

This document described the method and test cases to be used in order to test the S-100 Converter. This testing utilizes the following inputs;

A - An S-57 ENC base cell which reflects the S-57 ENC Product Specification and passes the current S-58 validation checks for Critical errors shall be used to conduct this testing and this shall be known as the input dataset. (Note: updates not in scope at this stage)

B – Configuration file – this file may define specific metadata values such as minimum and maximum display scale. Additional metadata values allowable in S-101 but not present in an S-57 ENC may also be included.

The S-100 Converter application shall be opened and the input dataset selected. The conversion shall then be executed. It is important to ensure that the version of the S-101 Feature Catalogue used by the converter is known.

Output

C – An S-101 dataset as an ISO 8211 file.

D – Conversion log file as a text file.

The output dataset and log file shall then be examined by performing the following tests;

Test Reference	1	
Test Description		
Conceptual Consistency – Conformance to Feature Catalogue		
Test Instruction		
1.1 Confirm that the output dataset only contains features and information types defined in the specified Feature Catalogue. 1.2 Confirm that the output dataset only contains attributes and attribute values defined in the specified Feature Catalogue. 1.3 Confirm that attributes and relationships (associations, aggregations etc) only exist in the output dataset as defined in the specified Feature Catalogue.		

Test Reference	2	
Test Description		
Content Consistency – Conformance to Feature Catalogue		
Test Instruction		

2.1 Confirm by comparison of the input dataset and output dataset that all content has been converted and where required content has been transformed as defined in the specifications.

2.2 Confirm by inspection of the Conversion log file that only features and attributes not permitted in S-101 have been omitted.

2.3 Confirm by inspection that no additional features or attributes other than those specified in the specifications have been included in the output dataset.

Test Reference	3	
Test Description		
Format Consistency – Conformance to the IS0 8211 encapsulation		
Test Instruction		

3.1 confirm that the output of the converter is a valid ISO 8211 file which reflects S-100 Part 10a and S-101 Annex B

Test Reference	4	
Test Description		
Geometric Consistency		
Test Instruction		

4.1 Confirm by comparison that no changes to geometry have been made to the output dataset.