# 7Cs Analyzer - Modules

7Cs Analyzer is an application used for validating S-57 and S-100 datasets, based on the relevant product specifications and standards. This software's modular structure enables the user to customize it very flexibly, to suit a very wide range of use-cases.

## 7Cs Analyzer Base Module

The Base Module includes the core S-57 validation functionality (for ENC, IENC, bENC). The User Guide of the 7Cs Analyzer includes a complete list of product specifications and related standards. These are used to validate IHO S-57 Electronic Navigation Charts (S-57 ENC), Inland Electronic Navigation Charts (S-57 Inland ENC), and bathymetric Electronic Navigation Charts (bENCs and bIENCs).

## SDMS Module

The SDMS Module can be used to connect 7Cs Analyzer to the new S-100 Data Management System (SDMS).

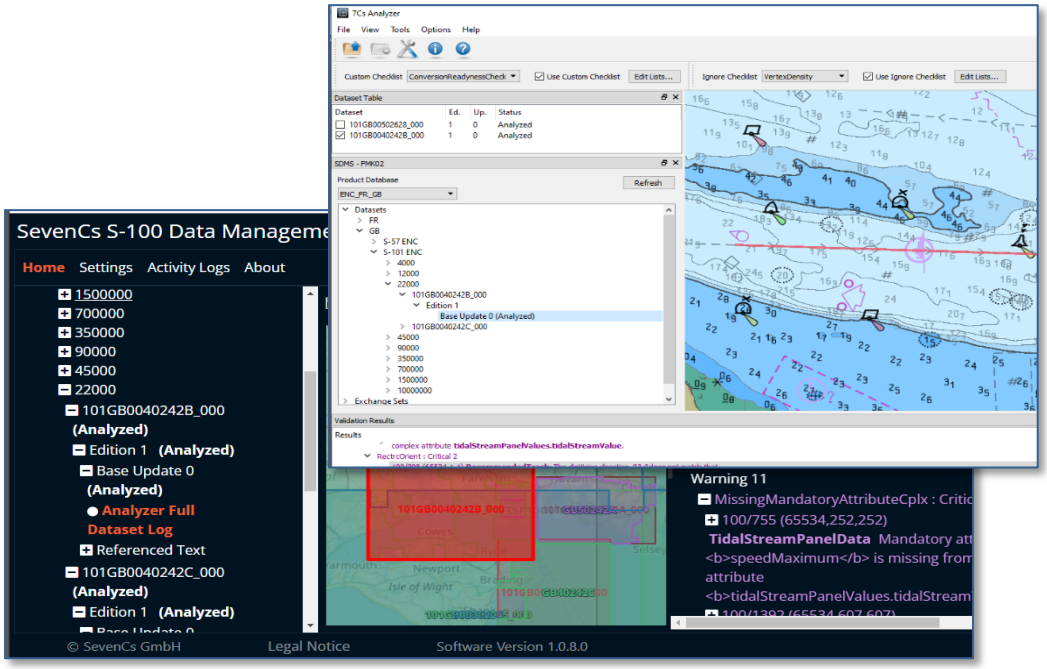


*Figure 1, SDMS adds comprehensive workflow management to 7Cs Analyzer validation*

This new option adds comprehensive workflow management to the 7Cs Analyzer validation process. SDMS comes as a separate installation and is licensed independently from 7Cs Analyzer.

## 7Cs Analyzer Chart Display Module

Traditionally, datasets validated with 7Cs Analyzer would be displayed in ENC Designer. The new Chart Display Module comes as an optional component; this is useful for those customers that do not use ENC Designer for review of the validation results. The interactive chart display supports the display of S-57 datasets based on the ENC, IENC and bENC product specifications, according to the S-52 standard.

Users that have activated '7Cs Analyzer S-101 Validation Module' and/or the '7Cs Analyzer Navy Module' can display those products as well.

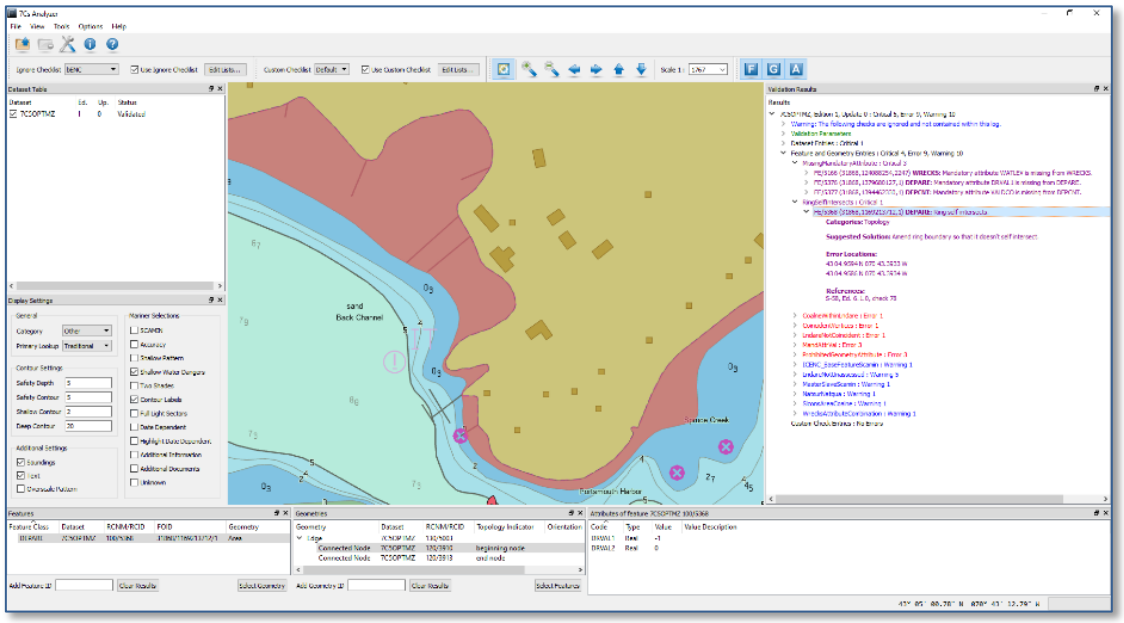

*Figure 2, 7Cs Analyzer Chart Display with Feature Highlight*



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In Combi Mode and in Geometry Display Mode, users can highlight those spatial objects that have been referenced in particular error messages.

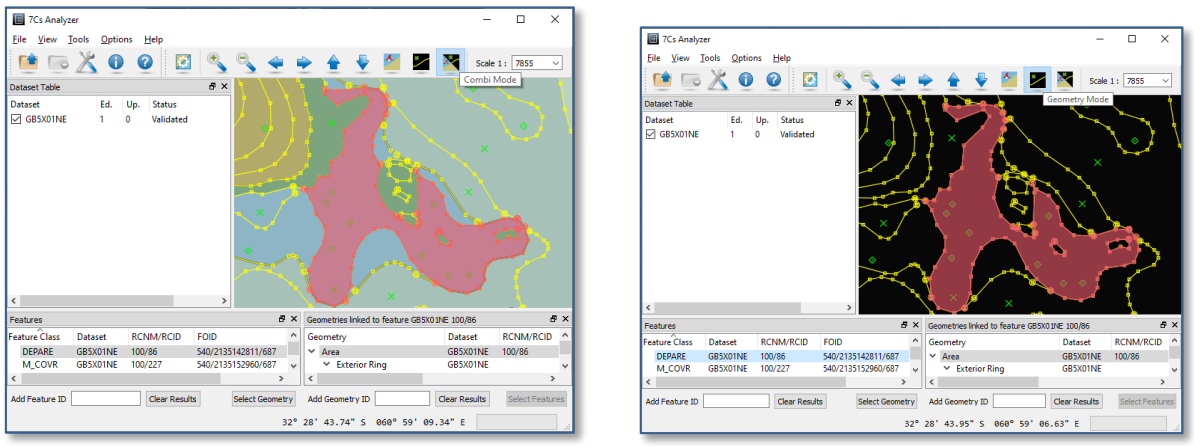


*Figure 3, Combi Mode with geometry shine-through (left) and Geometry Mode (right)*

## 7Cs Analyzer S-101 Validation Module

IHO S-101 Electronic Navigation Charts (S-101 ENC) are validated according to:

1. IHO S-100 – Universal Hydrographic Data Model, Ed. 5.0.0

2. IHO S-101 Electronic Navigation Chart Product Specification, Ed. 1.1.0

3. IHO S-101 ENC Validation Checks, Ed. 1.1.0

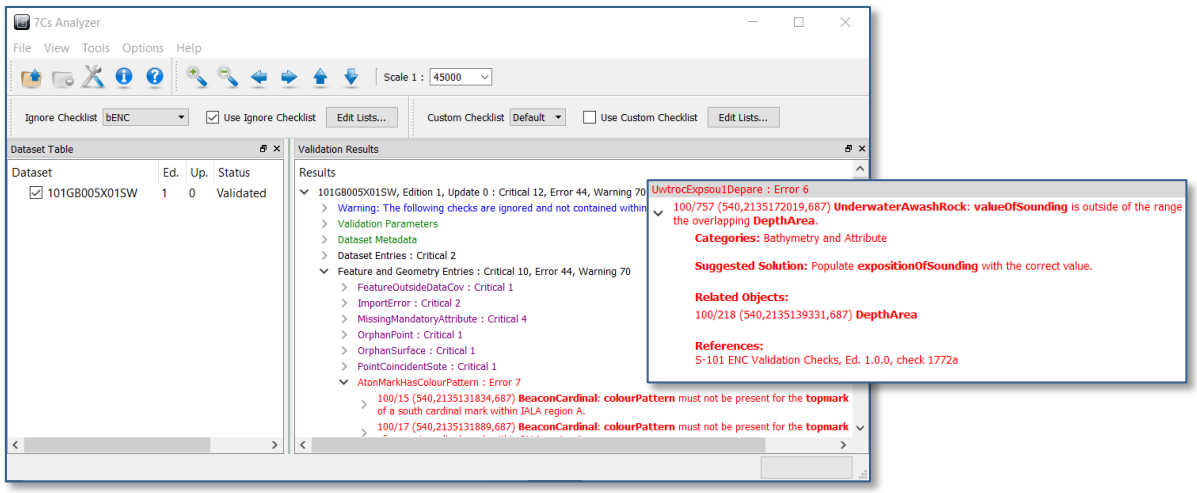


*Figure 4, Result of S-101 validation*



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The Display Module must have been licensed in addition to the S-101 Module to be able to display S-101 ENCs.

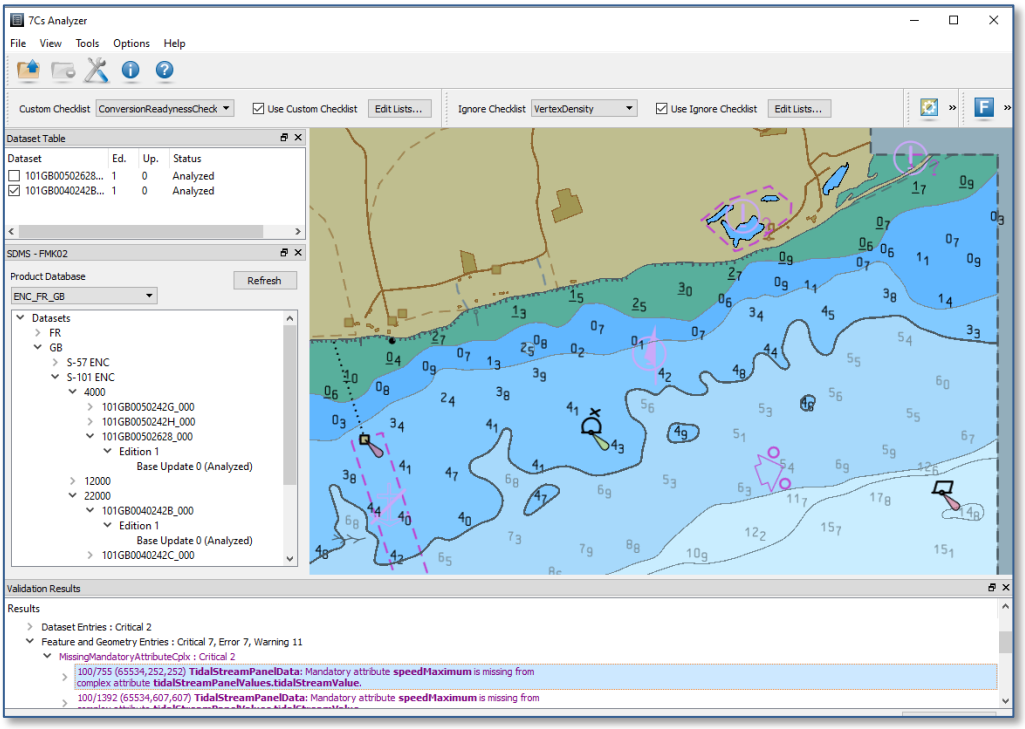


*Figure 5, Display of S-101 data*



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## 7Cs Analyzer Navy Module

Additional Military Layer (AML) charts are validated according to:

1. NATO AML product specifications, Versions 2.x and 3.0
2. NATO AML Co-production Programme Recommended AML Verification Checks, Ver. 2.0 (draft - 20190805_NACPP Recommended AML Verification Checks_ v2.0_draft.doc)

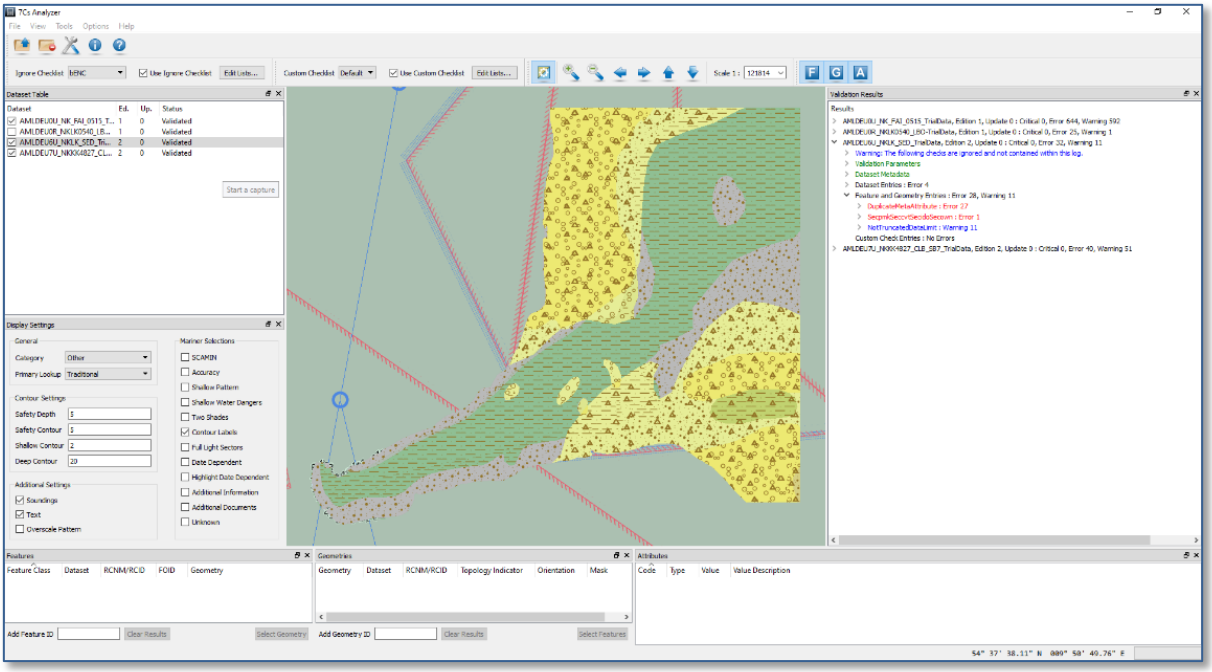

*Figure 6, Display and validation of AML data.*



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## 7Cs Analyzer HVC Module

S-57 validation software has traditionally focused on the validation of individual cells in isolation. 7Cs Analyzer provides an optional module for validation of Horizontal and Vertical Consistency (HVC). That module is based upon S-57 Use of the Object Catalogue, 2.1.8: Seamless ENC coverage. This includes:

- validation of adjacent datasets (horizontal consistency)
- validation of overlapping datasets (vertical consistency)

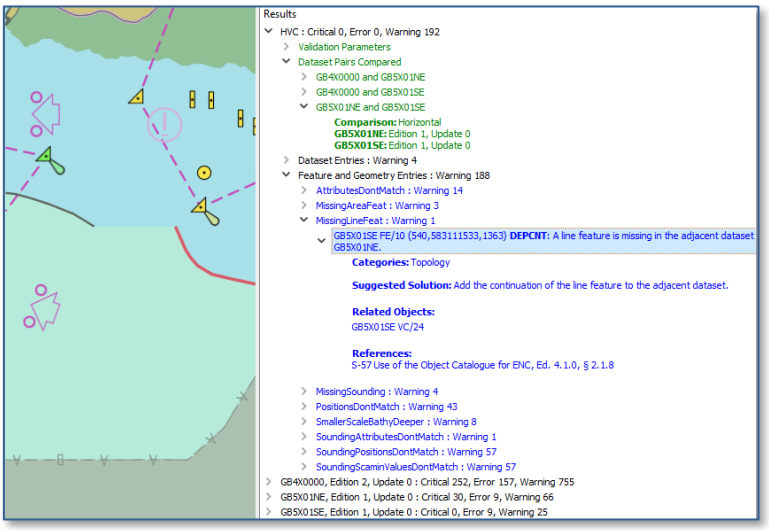


*Figure 7, Horizontal and vertical consistency checks*



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## 7Cs Analyzer ESRI© Shape Export Module

The validation logs of all datasets can be saved in ESRI shapefile format.

Shapefile validation logs can be loaded into third-party production or viewing software, such as the software provided by ESRI and CARIS. Shapefiles are imported into these systems as layers.

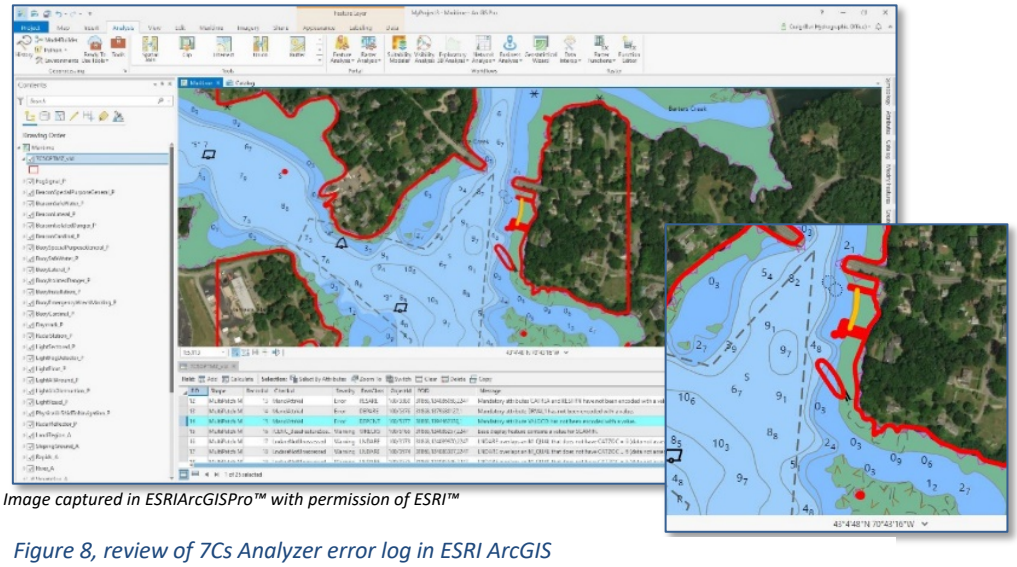

*Image captured in ESRIArcGISPro™ with permission of ESRI™*

*Figure 8, review of 7Cs Analyzer error log in ESRI ArcGIS*

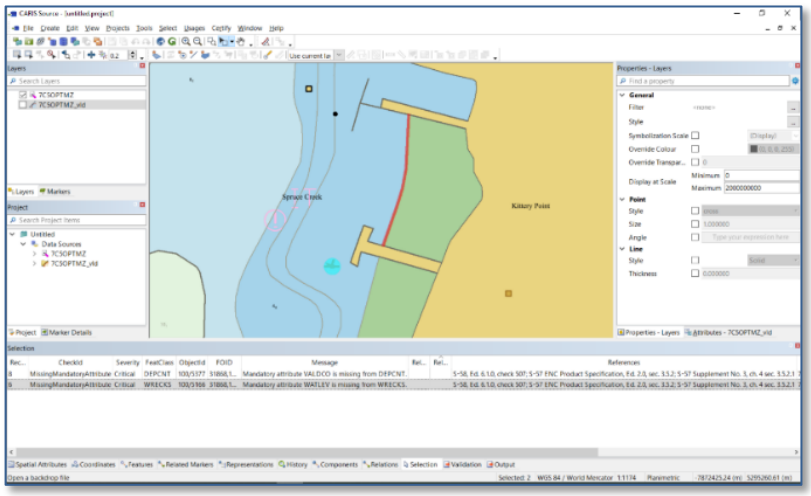

*Figure 9, review of 7Cs Analyzer error log in Caris HPD*

*Image captured in CARIS HPD™ with permission of Teledyne CARIS™*



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## 7Cs Analyzer Service API

To improve automation of the validation process, customers can integrate the 7Cs Analyzer validation engine into their existing S-57 / S-10x processing workflows, by means of the new 7Cs Analyzer Service API.

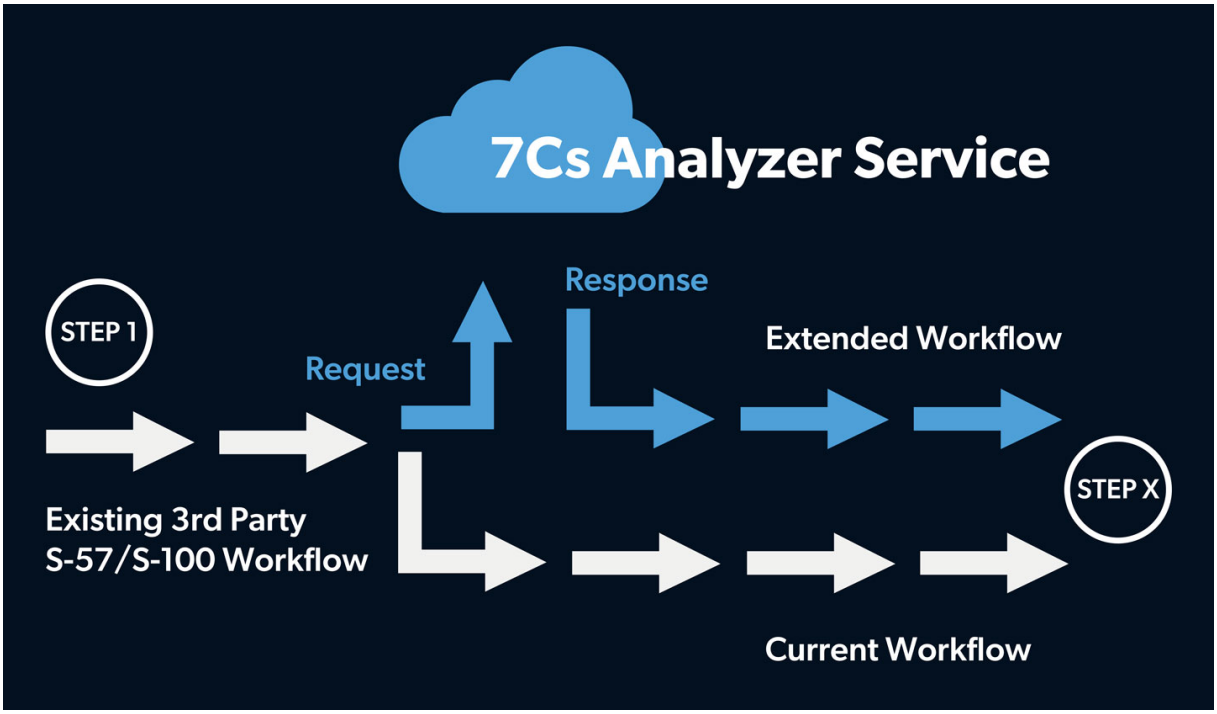


*Figure 10, integration of 7Cs Analyzer Service API into an existing workflow*

The 7Cs Analyzer Service API comes as separate installation and is licensed separately from 7Cs Analyzer.



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