# NEMSIS v3.5.0 Compliance Process—"Collect Data" Software

## Date

December 3, 2019 (process changes and v3.5.0 testing)
February 25, 2020 (updated web service URLs, changed test case key elements)
September 10, 2020 (added "defined lists" testing)
October 13, 2020 (additional information about "defined lists" testing)

## Compliance Testing Resources

Compliance Resources (including Pre-Testing Package):
https://nemsis.org/technical-resources/version-3/v3-compliance/

Compliant Software and Software undergoing Compliance Testing:
https://nemsis.org/technical-resources/version-3/v3-compliant-software-and-compliance-testing-status/

NEMSIS TAC Compliance Web Service for v3.5.0:
https://compliance.nemsis.org/nemsisWs.wsdl

NEMSIS TAC Compliance Testing Automation Web Service:
https://cta.nemsis.org/ComplianceTestingWs/endpoints/compliancetestingws.wsdl

NEMSIS TAC Compliance Testing Automation application:
https://cta.nemsis.org/ComplianceTestingWebapp

## Overview

Products seeking NEMSIS v3 compliance must be in final form, ready for market, installation-ready, and versioned. NEMSIS v3 compliance testing encompasses two processes called "**Collect Data**" and "**Receive and Process Data**". This guide defines the compliance testing process for "Collect Data" software: products that field-level EMS providers use to collect EMS agency demographics and patient care reports.

General Requirements for **Collect Data**:

- Data entry for the Demographic dataset and EMS dataset
- XML Schema (XSD) and Schematron validation when a record is finalized for the Demographic dataset and EMS dataset
- Send the Demographic dataset and EMS dataset via web service
- Modification of Demographics triggers a Demographic dataset submission

- Custom elements implemented in the user interface and dataset submission for the Demographic dataset and EMS dataset

As a vendor proceeds with becoming compliant, its progress and status will be updated as milestones are achieved. The status of a vendor can be found on the NEMSIS Web site in Technical Resources / V3 Compliant Software Testing Status. Milestone requirements for each status are as follows:

☐ 1. **Application Received**: The NEMSIS TAC has received an application from the vendor.

☐ 2. **Test Cases Completed:** The vendor has entered all active test cases and submitted them to the NEMSIS TAC compliance testing application. The NEMSIS TAC has verified the correctness of the test cases.

☐ 3. **Testing Web Conference Completed**: The vendor has successfully demonstrated all product functionality required in the testing web conference with the NEMSIS TAC.

# Collect Data

Products that **Collect Data** must demonstrate the implementation of all NEMSIS v3 DEMDataSet and EMSDataSet elements, implementation of custom elements, XML Schema (XSD) and Schematron data validation at record finalization, presentation of natural language expressions of validation warnings and errors to the user, and XML representation of the data. Products must also demonstrate the ability to send data via web services.

## Overview of Requirements

1. The software is able to use information from a NEMSIS v3 StateDataSet for configuration.
2. The full NEMSIS v3 Demographic standard is implemented in the user interface.
3. The full NEMSIS v3 EMS standard is implemented in the user interface.
4. The software is capable of implementing custom elements as provided in the test cases.
5. XML Schema (XSD) validation is used when a Demographic record is finalized.
6. XML Schema (XSD) validation is used when an EMS record is finalized.
7. Schematron validation is used for business rules when a Demographic record is finalized.
8. Schematron validation is used for business rules when an EMS record is finalized.
9. The software is able to validate data using multiple Schematron files (national, state, etc.).
10. Natural language expressions of validation warnings and errors are presented to the user.
11. The software is able to properly submit data using the NEMSIS v3 Web Service standard.

## Pre-Testing

Before applying for compliance, please review the pre-testing materials to ensure you are fully prepared. While the pre-testing process is "on your own," it mirrors the active testing process, and completing these steps will significantly speed up testing. The NEMSIS TAC is available to offer technical assistance to any vendor, regardless of compliance testing status.

Use the **Pre-Testing Package** (see Compliance Testing Resources, p. 1) to complete the following:

☐ 1. **Setup:** Configure the pre-testing environment in the software.

a. To help vendors set up their software with a realistic environment for compliance testing, the Pre-Testing Package contains a StateDataSet. Use the information in the StateDataSet to configure the software as if it is being set up for use in a particular state. All test cases in the Pre-Testing package have been designed to be consistent with the information in the StateDataSet.
b. Configure the software to submit data to the NEMSIS TAC Compliance Web Service (see Compliance Testing Resources, p. 1).

☐ 2. **Custom Elements**: The software must support custom elements.

a. Implement the custom elements defined in the StateDataSet in the Pre-Testing Package. (Support for custom elements will be tested in the test cases.)
b. Custom elements must be included in the XML export of the software.

☐ 3. **Schematron Rules**: The software must allow for dynamically adding Schematron rules.

a. Deploy the most current national Schematron schemas for v3.5.0 in the software.
b. Deploy the additional files from the "Schematron" directory of the Pre-Testing Package. They must be loaded dynamically and not built into the software.

☐ 4. **Defined Lists**: The software must implement the NEMSIS TAC defined lists. Defined lists can be found at nemsis.org/technical-resources/version-3/version-3-resources/.

a. Deploy the most current defined list for each element which implements them.
b. Include a mechanism to facilitate the efficient identification of the most appropriate value (hierarchical structured lists, smart lookups, etc.)
c. Additional values may appear in the lists.

☐ 5. **DEMDataSet and EMSDataSet Test Cases**: All DEMDataSet and EMSDataSet test cases should be entered into the system by the applicant.

a. Implement all DEMDataSet and EMSDataSet elements in the software user interface.
b. Enter the test cases for DEMDataSet and EMSDataSet manually as follows:
   Step 1. Use the "DEM-1_v350.html" test case to create the agency.
   Step 2. Use the five "EMS" test cases to create five PCRs within the agency.

☐ 6. **Test Case XML Files**: The software must generate NEMSIS XML data.

a. Generate XML exports of the test cases entered in the previous step.
b. Verify that the files pass XSD and Schematron validation. The software should automatically perform all XSD and Schematron validation.
c. Compare the XML files to the reference XML files in the "xml/full" folder of the Pre-Testing Package. Resolve any unexpected differences between the software-generated XML files and the Pre-Testing Package XML files.

☐ 7. **Web Service Submissions:** The software must send data via web services.

a. Verify that the software automatically submitted data to the NEMSIS TAC Compliance Web Service and retrieved submission statuses.

## Application

Submit the NEMSIS Compliance Application to begin the compliance testing process. The NEMSIS TAC will add the vendor to the V3 Compliant Software Testing Status page on the NEMSIS Web site.

## Active Testing Process

The NEMSIS TAC will provide an Active Testing Package with instructions.

The applicant must complete the following items using the Active Testing Package:

☐ 1. **Setup:** Configure the active testing environment in the software:

a. The active testing package contains a StateDataSet. Use the information in the StateDataSet to configure the software as if it is being set up for use in a particular state.
b. Configure the software to submit to the NEMSIS TAC Compliance Testing Automation Web Service.

☐ 2. **Custom Elements:**

a. Implement all custom elements defined in the StateDataSet in the Active Testing Package.

☐ 3. **Schematron Rules:**

a. Deploy the most current national Schematron schemas and the schemas from the "Schematron" directory of the Active Testing Package.

☐ 4. **Defined Lists**: The software must implement the NEMSIS TAC defined lists. Defined lists can be found at nemsis.org/technical-resources/version-3/version-3-resources/.

a. Deploy the most current defined list for each element which implements them.
b. Include a mechanism to facilitate the efficient identification of the most appropriate value (hierarchical structured lists, smart lookups, etc.)
c. Additional values may appear in the lists.

☐ 5. **DEMDataSet and EMSDataSet Test Cases:** All test cases must be entered into the system by the applicant and available to the NEMSIS TAC for review.

a. Enter the test cases for DEMDataSet and EMSDataSet manually as follows:
   Step 1. Use the "DEM-1_v350.html" test case to create the agency.
   Step 2. Use the five "EMS" test cases to create five PCRs within the agency.
b. Each test case must remain in the system for verification by the NEMSIS TAC.

☐ 6. **Web Service Submissions:**

a. Verify that the software automatically submitted data to the NEMSIS TAC Compliance Testing Automation Web Service. Note that the NEMSIS TAC Compliance Testing Automation Web Service uses the following data elements as test case keys. If the following elements do not exactly match the information provided in the Active Testing Package, the NEMSIS TAC Compliance Testing Automation Web Service will fail to identify the test case:
    i. DEMDataSet: dAgency.02 EMS Agency Number
    ii. EMSDataSet: eResponse.04 EMS Response Number

☐ 7. **Test Case Verification:**

a. Log into the NEMSIS TAC Compliance Testing Automation application.
b. Review the Validation Report for each test case submission. Verify that it passed XSD and Schematron validation.
c. Review the Comparison Report for each test case submission. Resolve any issues identified by the comparison report:
    - Empty line with gray background: The test case submission is missing data that is expected.
    - Non-empty line with gray background: The test case submission contains extra data that is not expected.
    - Line with yellow background: The test case submission contains data that differs from what is expected.
d. Contact the NEMSIS TAC if technical assistance is needed to resolve issues.

Notify the NEMSIS TAC when the above items have been completed. The following will be completed by the NEMSIS TAC:

☐ 1. **Test Case Verification:** The NEMSIS TAC will verify the test cases in the NEMSIS TAC Compliance Testing Automation application.

## Testing Web Conference

Schedule a web conference with the NEMSIS TAC compliance testing staff. The web conference may be held any time after the applicant has entered the DEMDataSet and EMSDataSet test cases. During the web conference, the NEMSIS TAC will ask the vendor to demonstrate the following:

☐ 1. **Data Entry User Interface:**

a. The NEMSIS TAC will ask the vendor to demonstrate one or more demographic data entry screens. The NEMSIS TAC will verify that the information shown matches the DEMDataSet test case from the active testing package.
b. The NEMSIS TAC will ask the vendor to show one or more EMS data entry screens for each of the five EMSDataSet test cases from the active testing package. The NEMSIS TAC will verify that the information shown matches the EMSDataSet test cases.

☐ 2. **Demographic Dataset Update:**

a. The NEMSIS TAC will instruct the vendor to change the value of a national element in demographics. The NEMSIS TAC will verify that the software automatically sends an updated DEMDataSet to the NEMSIS TAC Compliance Web Service within 24 hours. (It may take up to 24 hours after the webinar to verify this capability.)

☐ 3. **Custom Elements:**

a. The NEMSIS TAC will ask the vendor to show the DEMDataSet and EMSDataSet custom data elements in the user interface. The NEMSIS TAC will verify that the custom elements are implemented correctly.

☐ 4. **Schematron:** Each Schematron file in the Pre-Testing Package has one warning-level assertion and one error-level assertion.

a. The NEMSIS TAC will instruct the vendor to change data in the demographic record in order to trigger a Schematron error. The NEMSIS TAC will verify that the software displays the natural language error and prevents the record from being completed/finalized
b. The NEMSIS TAC will instruct the vendor to change data in the demographic record in order to trigger a Schematron warning. The NEMSIS TAC will verify that the software displays the natural language warning but allows the record to be completed/finalized).
c. The NEMSIS TAC will instruct the vendor to change data in an EMS record in order to trigger a Schematron error. The NEMSIS TAC will verify that the software displays the natural language error and prevents the record from being completed/finalized.
d. The NEMSIS TAC will instruct the vendor to change data in an EMS record in order to trigger a Schematron warning. The NEMSIS TAC will verify that the software displays the natural language warning but allows the record to be completed/finalized).

☐ 5. **Defined Lists:** The NEMSIS TAC will review the software to ensure that all items on the defined list for all elements using a defined list are implemented in the interface.

☐ 6. **Ready for Market:** The NEMSIS TAC will review the software to determine whether it is in final form, ready for market, installation-ready, and versioned.

## Certification

After the vendor has successfully passed compliance testing, the NEMSIS TAC will do the following:

☐ 1. The NEMSIS TAC will move the vendor to the "Compliant Software for EMS Agencies" list on the V3 Compliant Software Testing Status page of the NEMSIS Web site.

☐ 2. The NEMSIS TAC will send a letter to the vendor announcing the successful completion of compliance testing, along with links to compliance logos that the vendor may use to indicate that the software is certified NEMSIS compliant.

## Maintaining Compliance

Once initial NEMSIS compliance is obtained, maintenance of NEMSIS compliance status will require retesting within two years of the last successful compliance test. Prior to expiration, the vendor should repeat the compliance testing process in order to maintain compliance status. The same process is used for initial certification and recertification. The NEMSIS TAC develops new pre-testing and active testing cases annually. The vendor should complete the testing process using the test cases in effect at the time of re-certification.

In addition, a key component of NEMSIS compliance includes participation in semimonthly NEMSIS V3 implementation webinars and representation at the annual NEMSIS V3 implementation meeting, traditionally held in Park City, Utah. The NEMSIS TAC will begin tracking (and reporting) attendance at these activities beginning in 2020. All products testing for NEMSIS compliance in 2020 will be required to attend 70% of scheduled semimonthly NEMSIS V3 implementation webinars and provide at least one representative at the annual NEMSIS V3 implementation meeting to maintain compliance status. This attendance requirement will be enforced beginning in 2021. A software certifying as NEMSIS compliant will have one full year from the date of initial compliance to complete the attendance requirement.

# Appendix: Additional Resources

Vendors should use the following resources for product development prior to compliance testing, or during compliance testing if issues are identified by the NEMSIS TAC. All are found within the Technical Resources section of the NEMSIS Web site.

Data Dictionaries and XSDs

Schematron

Web Services

Resources

Additional Guides:

- Custom Elements
- Not Values
- Pertinent Negatives
- Demographic Dataset Submission
- GNIS Codes
- UUIDs
- Database Scripts

NEMSIS TAC Validator Web Service for v3.5.0:
https://validator.nemsis.org/nemsisWs.wsdl