

***Summary of Assessments
Performed in FY 21 by SNL
QA POC for FY 20 SNL
NFCSC Milestone
Deliverables***

**Nuclear Fuel Cycle &
Supply Chain**

*Prepared for
U.S. Department of Energy
Nuclear Technology Research & Development
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Sandia National Laboratories
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Note: Authentication of the cover sheet for this assessment may be accomplished by transmittal of the signed cover sheet or acknowledging the action via Sandia email, or uploading the documentation to a controlled location on a Sandia network by the authenticator and marked accordingly.

**Summary of Assessments Performed in FY 21 by SNL QA POC for FY 20 SNL NFCSC
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1. Acronyms and Definitions

Item	Definition
ASME	The American Society of Mechanical Engineers. Publishers of the NQA-1 guidance.
DMS	Document Management System
DOE	US Department of Energy
EIMS	Enterprise Information Management Services
FCT	Fuel Cycle Technologies
FY	Fiscal Year
M#	Milestone level number
NFCSC	Nuclear Fuel Cycle and Supply Chain
NQA-1	A quality assurance standard for nuclear facilities and related activities, published by the American Society of Mechanical Engineers (ASME). The standard includes guidance for software quality assurance (SQA) within Subpart 2.7.
QA	Quality Assurance
QAPD	Quality Assurance Program Document
QA POC	Quality Assurance Point of Contact
QRL	Quality Rigor Level
PICS:NE	Performance Information Collection System – Nuclear Energy
R&A	Review and Approval
SFWD	Spent Fuel and Waste Disposition
SNL	Sandia National Laboratories
WPM	Work Package Manager
WP	Work Package

2. Executive Summary

The Sandia National Laboratories (SNL) staff is meeting the requirements of the Nuclear Fuel Cycle and Supply Chain (NFCSC) Quality Assurance Program Document (QAPD)¹. Each of the 5 NFCSC FY 20 packages for SNL were reviewed. None of the 5 packages had incorrect QRL categories.

No major corrective actions are assigned. Additional and minor PICS:NE checkbox errors may exist, but none were identified in this assessment. Training is now also geared to encourage WPMs to take credit for optional technical reviews by considering setting the QRL level to 3. This is because when the level is set to 4, the PICS:NE system does not provide fields for review information. Finally, training in the NFCSC QAPD has been delivered as always to WPMs.

3. Assessment Purpose and Scope

An internal assessment was conducted of Sandia National Laboratories FY 20 work activities, as required by the FY 2021 Level 4 Milestone # M4FT-21SN110102062, to verify compliance of work package products with the Nuclear Fuel Cycle and Supply Chain (NFCSC) Quality Assurance Program Document (QAPD) Revision 6.

4. Assessment Team

The Assessment Team consisted of:

1. Chris Camphouse, Manager and Quality Assurance Point of Contact (QA POC) Lead (8842)
2. Michael Wallace, QA POC team member (8844)

5. Assessment Results

The Assessment was conducted over the summer of 2021 at Sandia National Laboratories. This assessment was performed by reviewing program documentation and records. The assessment was conducted on all 5 of the FY 20 NFCSC Work Packages (WP's).

The assessment verified that the appropriate reviews were conducted (in accordance with the QAPD Rev. 6). As that guidance notes, the higher the QRL number, the lower the associated rigor of technical review required. The QRL level assignments were confirmed by reviewing the documentation available in the Performance Information Collection System, Nuclear Energy (PICS: NE) database, Sandia's records systems including its Technical Library, and when necessary through subsequent communications with Work Package Managers (WPMs). Notably, none of the 5 packages had incorrect QRL level category assignments.

Also, the assessment verified that the required training had been effectively implemented among all WPMs over FY20, and that documentation and records were complete, were available and easily retrievable, and that they were submitted to the laboratory's record system. Lastly, the assessment verified that QAPD, Appendix E cover sheets and PICS: NE Deliverable Forms were

¹ Nuclear Fuel Cycle and Supply Chain (NFCSC) QAPD Revision 6, 10/07/2019.

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used, that they were properly completed, and that they were included in the laboratory's record system.

The following points summarize the assessment results:

- There was 1 M2 deliverable included in the assessment for FY 20, and that was a QRL 3 product.
- There were 3 M3 deliverables included in the assessment for FY 20, and all of those were QRL 3 products.
- There was 1 M4 deliverable for FY 20 and it was categorized as QRL 4.
- No M5 deliverables were assigned for FY 20.
- All deliverables appear to have the correct QRL assignments.
- We did not observe other minor entry errors with regard to check boxes for DOE 414.1[a] categorization, Record category, and STI type.

The attached NFCSC QA Checklist in Attachment 1 provides further details.

6. Corrective Actions

No major corrective actions are assigned, but recommendations have been made to consider QRL options when a technical review is anticipated during the planning process. Additional and minor PICS:NE checkbox errors are recognized, and our annual training is geared to ensure proper check box entries as well.

7. Assessment Conclusions

All SNL NFCSC milestone activities that were closed in FY 2020 were reviewed for compliance to the NFCSC QAPD Revision 6. All packages were technically reviewed where appropriate. Future training will be emphasized to ensure proper and optimal categorizations moving forward.

8. Observations

There are no observations which merit any corrective actions. As a final note, we are upgrading our Sharepoint QA record site for purposes of efficiency and transparency relating to any future assessment. Currently the updated site captures all QA topics and milestones for FY20, including signed Appendix E forms, and training documentation and resources. The original Sharepoint site continues to archive documentation for past years.

9. ATTACHMENTS

9.1 Attachment 1 – Completed FY 21 NUCLEAR FUEL CYCLE AND SUPPLY CHAIN (NFCSC) ASSESSMENT CHECKLIST, Rev. 2

Table A-1. Assessment of NFCSC FY 20 M2 Milestone products under the NFCSC Checklist

QAPD Ref. Sect.	Quality Assurance Requirements	Sat ²	Unsat ³	N/A	Verification Conducted
REQUIREMENT: 1 - PROGRAM					
Section 1.1	Verify that your national laboratory conducting NFCSC work activities is maintaining its interface document, describing the application of their QA program (including implementing procedures), in compliance with the latest issued NFCSC QAPD revision.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Verified</i>
REQUIREMENT: 2 - TRAINING					
Section 2.0, POC Responsibilities	Verify that personnel (Work Package Managers and associated laboratory technical staff) have received the required training (which may include self-study).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>All WPMs received the QA refresher training in regard to FY20 activities.</i>
Section 3.0	REQUIREMENT: 3 - QA REQUIREMENTS FOR WORK PERFORMED BY THE NATIONAL LABORATORIES				
Section 3.1	QUALITY RIGOR LEVEL 1 REQUIREMENTS				
Section 3.1, Table 1.0	Verify activities are conducted in accordance with an established NQA-1-2000 (or later version) quality assurance program.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<i>No QRL-1 tasks exist.</i>

² Satisfactory

³ Unsatisfactory

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QAPD Ref. Sect.	Quality Assurance Requirements	Sat ²	Unsat ³	N/A	Verification Conducted
Section 3.1, Table 1.0	Verify software design, development, and testing meets the requirements of NQA-1-2000 (or later version), for Design Control, and, Test Control. In addition, a work package may specify that the activities meet the requirements of NQA-1 Subpart 2.7 Quality Assurance Requirements for Computer Software for Nuclear Facility Applications.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No QRL-1 tasks exist.
Section 3.2	QUALITY RIGOR LEVEL 2 REQUIREMENTS				
Section 3.2, Table 2.0	Verify activities are conducted in accordance with the Laboratory's DOE-approved quality assurance program.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No QRL-2 tasks exist.
Section 3.2, Table 2.0	Verify that milestones / deliverables with a Quality Rigor Level 2 received a Peer Review in accordance with NFCSC QAPD Appendix C or a procedure that meets the requirements for Peer Review as specified in Appendix C of the NFCSC QAPD	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No QRL-2 tasks exist.
Section 3.3	QUALITY RIGOR LEVEL 3 REQUIREMENTS				
Section 3.3, Table 3.0	Verify activities are conducted in accordance with the Laboratory's DOE-approved quality assurance program.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Verified.
Section 3.3, Table 3.0	Verify that milestones / deliverables with a Quality Rigor Level 3 received a technical review in accordance with NFCSC QAPD Appendix B of the NFCSC QAPD or a procedure that meets the requirements specified in Appendix B of the NFCSC QAPD.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Verified.
Section 3.4	QUALITY RIGOR LEVEL 4 REQUIREMENTS				
Section 3.4, Table 4.0	Verify that Laboratory QA requirements apply to the work activity and no additional NFCSC QA requirements (such as QRL-1/NQA-1, QRL-2 or QRL-3) are applied.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Verified.

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QAPD Ref. Sect.	Quality Assurance Requirements	Sat ²	Unsat ³	N/A	Verification Conducted
Section 3.4, Table 4.0	Verify, as applicable, that if a QRL-4 milestone / deliverable provides input to a final QRL-2 or QRL-3 milestone / deliverable, that a note was added in the “Comments” section on the Deliverable Form in PICS: NE, stating that review requirements (i.e., peer review, technical review, etc.) will be documented in the final QRL-2 or QRL-3 milestone / deliverable	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<i>The only QRL-4 product in the assessment is not a technical document and it does not feed any other reports.</i>
Section 6.0	GENERAL IMPLEMENTATION REQUIREMENTS				
Section 6.2	Verify that a QRL designation has been assigned to the milestone / deliverable that is associated with the work package.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Verified.</i>
Section 6.3	Verify that the QRL designation (associated to a particular milestone / deliverable) has been changed accordingly, if the work package has been changed.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>No work package changes have been identified and no QRLs have been changed from original levels for any of the assessed packages.</i>
Section 6.4	Verify that the QA requirements identified in a work package, including the designated Quality Rigor Level(s) are flowed down to other participants, contractors and/or subcontractors through the appropriate contractual or work control process.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>QA training is now expanded to all contributing authors and reviewers where required.</i>
Section 6.6	Verify records are controlled and maintained at your national laboratory site, using each lab’s record management system and procedures.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Verified that all deliverables are archived with the appropriate SNL record management system.</i>
Section 6.10	Verify each deliverable having a QRL-1, -2, -3 or -4 designation, includes a standardized Document Cover Sheet (Appendix E). If the PICS: NE system permits, complete information entered into the PICS: NE Deliverable Form, and listing the names of all reviewers, satisfies this requirement, including the requirement for signatures on the Document Cover Sheet (Appendix E).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Verified in PICS: NE and through emails to work package managers.</i>

Summary of Assessments Performed in FY 21 by SNL QA POC for
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QAPD Ref. Sect.	Quality Assurance Requirements	Sat ²	Unsat ³	N/A	Verification Conducted
Appendix A	If applicable, verify the NFCSC Nuclear Data activities meet the requirements established in Appendix A of the NFCSC QAPD.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<i>No Appendix A - relevant Nuclear Data activities appear to apply to the packages that were reviewed.</i>
Appendix D	If applicable, verify NEUP University assessment work completed during the year, meets the requirements of Appendix D of the NFCSC QAPD.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>University contributors are compliant because of contractual parameters, as Appendix D of the NFCSC QAPD recognizes.</i>

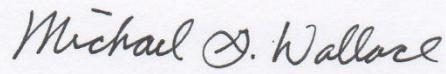
Summary of Assessments Performed in FY 21 by SNL QA POC for
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9.2 Attachment 2 – Assessment Plan

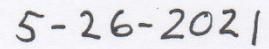
The Assessment Plan memo is included in subsequent pages.

Assessment Plan
Sandia National Laboratories
Nuclear Fuel Cycle and Supply Chain Quality Assurance
Evaluation of FY20 SNL NFCSC and SFWD Major Milestone Deliverables

Authored by Assessment Team Member (8844) Michael Wallace



Signature



Date

Approvals:

Manager (8842)

Russell Camphouse

Electronic Authentication via email (see last page)

06/02/2021



Date

Note: Authentication of the cover sheet for this assessment may be accomplished by transmittal of the signed cover sheet or acknowledging the action via Sandia email, or uploading the documentation to a controlled location on a Sandia network by the authenticator and marked accordingly.

Assessment Plan
Sandia National Laboratories
NFCSC / SFWD Quality Assurance
Evaluation of FY20 SNL Milestone Deliverables

Background

Sandia National Laboratories (SNL) Fuel Cycle Research and Development (FCRD) and Nuclear Technology Research and Development (NTRD) program activities are conducted in accordance with NFCSC / SFWD Quality Assurance Program Document (NFCSC QAPD)¹ requirements. The NFCSC QAPD interfaces with the SNL - approved Quality Assurance Program Description (SNL-QAPD)² as explained in the Sandia National Laboratories QA Program Interface Document for NFCSC / SFWD Activities³ (Interface Document, or ID).

As part of the annual work planning process, work package managers designate a Quality Rigor Level (QRL) for each work package. The QRLs (QRL 1, 2, 3, and 4), and the review requirements for each QRL are specified in the NFCSC QAPD and the Interface Document sections 8 and 9. Section 9 of the Interface Document also specifies milestone deliverable review and submittal requirements. Upon completion, and with sponsor approval, SNL NFCSC / SFWD milestone deliverables are uploaded to the Performance Information Collection System-Nuclear Energy (PICS-NE).

Any SNL deliverable intended for release beyond Sandia is submitted to Sandia's Review and Approval (R&A) process, assigned a tracking number, and on approval assigned a SAND number in the form SANDYYYY-XXXXX. Because PICS:NE is external to Sandia, all final deliverables identified there are also preserved in Sandia's R&A system, regardless of other functionality.

Purpose and Scope

This plan describes the work to develop the FY21 assessment document for the compliance of SNL's FY20 NFCSC / SFWD M2 milestone deliverables. The assessment is intended to confirm that SNL's FY20 milestone deliverables contain the appropriate authenticated review documentation (in best practices, an appropriately signed NFCSC / SFWD QAPD Appendix E included within the deliverable document, in addition to an accurately completed PICS:NE Deliverable Form). The assessment also documents and confirms that a copy has been submitted to SNL R&A. It is recognized that for a variety of reasons, including sponsor direction, not all deliverables are finalized.

Requirements

Table 1 summarizes how the assessment will initially evaluate compliance with the following QRL requirements for M2, M3, and M4 level milestone deliverables. Note that there were no QRL 1 milestones for FY20. Also note that because of some options that are available, this table is only an initial guide and the full assessment will note any deviations in the proper context.

¹ Nuclear Fuel Cycle and Supply Chain (NFCSC) Quality Assurance Program Document Revision 6, 10/07/2019.

² Sandia's Quality Assurance Program Description, SNL-QAPD-2020-05-01, Revision 5.3, effective 5/15/2020, SAND2020-5236-R.

³ Sandia National Laboratories QA Program Interface Document for NFCSC / SFWD Activities, Revision 7, 6/11/2020, SAND2016-9663 O

Requirement	QRL 2	QRL 3	QRL 4
Milestone Deliverable includes an NFCSC QAPD Appendix E Document Cover Sheet ⁴ (the sheet is preferably a part of the deliverable document but can be a separate file)	Yes	Yes	Optional
The above cover sheet indicates Peer Review ⁵	Yes	No	No
The cover sheet indicates Technical Review ⁶	No	Yes	Optional
Deliverable was submitted to SNL R&A ⁶	Yes	Yes	Yes

In addition to the guidance above, the NFCSC program has provided a 3 page checklist⁷ which will be closely followed in the Assessment.

Assessment Approach

The assigned QRL and associated milestone metadata is gathered from the Project Information Collection System for Nuclear Energy (PICS-NE). For FY20, identification of the SNL milestone deliverables and the associated QRL is largely obtained from the PICS-NE Field Report ‘Deliverable Status’. Other milestone detail (e.g., QRL) is added to the Deliverable Status information based on the deliverable Milestone ID Number and the associated information in the PICS-NE Field Report ‘Milestone Activity Detail’. For FY20 Level M2 Milestone Deliverables, STI and OSTI information may be similarly added to help understand assessment results. This information is compiled in an Excel spreadsheet, and used to record the results for the evaluation of each milestone deliverable.

Evaluation Approach

For each FY20 M2 milestone deliverable the following will be checked and recorded.

- Does the milestone deliverable include an authenticated (appropriately signed) NFCSC QAPD Appendix E sheet? Is the PICS:NE deliverable form appropriately completed.
- Was each review appropriate with respect to the assigned QRL for each milestone?
- Has the document been submitted to SNL R&A? An appropriate R&A tracking or SAND number will be recorded to confirm.

The results of this assessment will be described in two reports:

1. “Summary of Assessments Performed in FY 20 by SNL QA POC for NFCSC Activities: Evaluation of FY20 SNL NFCSC Major Milestone Deliverables”.
2. “Summary of Assessments Performed in FY 20 by SNL QA POC for SFWD Activities: Evaluation of FY20 SNL SFWD Major Milestone Deliverables”.

Plan Approval and Archive of Plan Record

The following email demonstrates Management approval of this plan.

⁴ QAPD Section 6.10 and Interface Document Section 9.4 (Alternatively, is the PICS:NE deliverable form appropriately completed.)

⁵ QAPD Section 3 and Interface Document Table 2 (Alternatively, is the PICS:NE deliverable form appropriately completed.)

⁶ Section 7.4 of the SNL-QAPD

⁷ Nuclear Fuel Cycle and Supply Chain (NFCSC) Assessment Checklist Rev 2. (12-12-2019)

From: [Camphouse, Russell Chris](#)
To: [Wallace, Michael G](#)
Subject: Approve: Plan for the FY21 Assessment of FY20 deliverables
Date: Tuesday, June 1, 2021 9:10:48 AM

Hi Mike,

I approve of the assessment plan for this year's QA assessment.

Thanks!

Chris

This plan will be processed as a record by inclusion as an attachment to the final Assessment Report.