

***Summary of Assessments  
Performed in FY 20 by SNL  
QA POC for FY 19 SNL NTRD  
Milestone Deliverables***

**Nuclear Fuel Cycle &  
Supply Chain**

*Prepared for  
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Nuclear Technology Research & Development  
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Sandia xxxx*

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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.
NTRD	Nuclear Technology Research and Development
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 Nuclear Fuel Cycle and Supply Chain (NFCSC) Quality Assurance Program Document (QAPD)<sup>1</sup>. Each of the NFCSC FY 19 packages for SNL were reviewed. Minor errors were identified with regard to one package for the previous version of this report. Those are being rectified and future instances will indicate the appropriate entries.

Aside from the minor discrepancies noted, there were no quality assurance findings this fiscal year for the NFCSC program. In particular, all of the Quality Rigor Level (QRL) level assignments were confirmed to be appropriate.

## 3. Assessment Purpose and Scope

An internal assessment was conducted of Sandia National Laboratories FY 19 work activities, as required by the FY 2020 Level 4 Milestone # M4FT-20SN110102072, , to verify compliance of work package products with the Nuclear Fuel Cycle and Supply Chain (NFCSC) Quality Assurance Program Document (QAPD) Revision 6 and where relevant, Revision 5.

## 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 2020 at Sandia National Laboratories. This assessment was performed by reviewing program documentation and records. The assessment was conducted on all four of the FY 19 NFCSC (NTRD) milestone related Work Packages (WP's).

The assessment verified that WP's had appropriate QRL assignments and 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 and when necessary through communications with the associated Work Package Manager (WPM). Also, the assessment verified that any required training had been effectively implemented 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,

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<sup>1</sup> Nuclear Technology Research and Development (NTRD) Quality Assurance Program Document (QAPD), Revision 5, 1/15/2018, and Nuclear Fuel Cycle and Supply Chain (NFCSC) Revision 6, 10/07/2019. *The latest revision of that guidance is Revision 6 which was signed in late FY 19 but published in October of FY 20. As the Revision History page of that document reflects, there are no substantive changes. Because the cited revision 5 was the guiding document for FY 19 and because of the overlap, it is listed here.*

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Appendix E cover sheets and/or PICS: NE Deliverable Forms were 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 one M2 deliverable included in the assessment for FY 19, and it was a QRL 3 product
- There were three M4 deliverables for FY 19.
- Two of the M4 deliverables for FY 19 were QRL 3. The remaining M4 deliverable was the previous version of this programmatic report and accordingly it was assigned a QRL 4 review level. The single QRL 4 product did not feed into any M2 deliverables.
- Three of the four deliverables have a correctly completed PICS:NE Deliverable form.
- The remaining deliverable had some minor entry errors with regard to check boxes for DOE 414.1[a] categorization, Record category, and STI type.
- 100% (4 of 4) of the deliverables had an appropriate QRL assignment and were reviewed appropriately.
- 100% (4 of 4) have an assigned SAND number, indicating Sandia R&A review.

The details of the results are documented in the attached NFCSC QA Checklist (See Attachment 1).

## **6. Corrective Actions**

No major corrective actions are assigned, but requests have been made to adjust the minor PICS:NE checkbox errors, and subsequent annual training will be geared to ensure proper check box entries in future cases.

## **7. Assessment Conclusions**

All milestone activities that were closed in FY 2019 were reviewed for compliance to the NFCSC QAPD Revision 6. All activities were found to be compliant.

## **8. Advisory Guidance for current WPMs**

- The refresher training update in FY 20 emphasizes a goal for WPMs to complete the FCT QAPD Appendix E Document Cover sheet and include it in their milestone deliverables.
- WPMs are also advised to ensure that any product receiving a technical or peer review be assigned a QRL 3 or QRL 2 category respectively.
  - Because of the interface design, QRL 4 entries into PICS:NE will not permit the registration of any review. Therefore, if a QRL 4 product was reviewed, the authors and WPMs cannot effectively document this in the PICS:NE system.
- WPMs are also advised to ensure that any product not receiving a technical or peer review be assigned a QRL 4 category. QRL 3 and/or QRL 2 designations require a documentation of a formal review. There are no relevant QRL 1 designations at this time.

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- WPMs will receive reinforcement in future training to complete the full set of PICS:NE Deliverable Form boxes for any QRL category. In particular, the DOE 414.1[a] checkbox should be selected for almost every product other than obvious programmatic memos. Also, most documents qualify as General Records so this box should be typically selected. Finally added attention to the STI category is desired. Typically, all technical products are both formally reviewed and are STI.
- Previous assessments for this project scope have been limited to M2 deliverables. In line with expanded expectations for greater uniformity of reporting starting in FY 20, every M number category will be addressed in future internal assessments.

## **9. Observations**

Although the QAPD was revised in early FY 20, it was considered desirable to apply this update in evaluating the FY 19 relevant products. That was done and is primarily reflected by the fact that work products are no longer uploaded to the Document Management System (DMS).

**ATTACHMENT 1 – FY 19 NUCLEAR FUEL CYCLE AND SUPPLY CHAIN (NFCSC) ASSESSMENT CHECKLIST,  
REV. 2**

**Table A-1. Assessment of NTRD FY 19 M2 Milestone products under the NFCSC Checklist**

QAPD Ref. Sect.	Quality Assurance Requirements	Sat <sup>2</sup>	Unsat <sup>3</sup>	N/A	Verification Conducted
<b>REQUIREMENT: 1 - PROGRAM</b>					
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>
<b>REQUIREMENT: 2 - TRAINING</b>					
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>Verified</i>
Section 3.0	<b>REQUIREMENT: 3 - QA REQUIREMENTS FOR WORK PERFORMED BY THE NATIONAL LABORATORY</b>				
Section 3.1	<b>QUALITY RIGOR LEVEL 1 REQUIREMENTS</b>				
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>

<sup>2</sup> Satisfactory

<sup>3</sup> Unsatisfactory

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QAPD Ref. Sect.	Quality Assurance Requirements	Sat <sup>2</sup>	Unsat <sup>3</sup>	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	<b>QUALITY RIGOR LEVEL 2 REQUIREMENTS</b>				
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	<b>QUALITY RIGOR LEVEL 3 REQUIREMENTS</b>				
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 in PICS: NE and through emails to staff that properly documented technical reviews were performed on QRL-3 deliverables.
Section 3.4	<b>QUALITY RIGOR LEVEL 4 REQUIREMENTS</b>				
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 <sup>2</sup>	Unsat <sup>3</sup>	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>No QRL-4 deliverables provide direct input (to other QRL-2 or QRL-3 deliverables) that may need additional requirements to be performed at a higher rigor.</i>
Section 6.0	<b>GENERAL IMPLEMENTATION REQUIREMENTS</b>				
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 type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<i>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 type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<i>No products flow down to other participants for the packages reviewed.</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>
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 Nuclear Data activities apply to the packages that were reviewed.</i>

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QAPD Ref. Sect.	Quality Assurance Requirements	Sat <sup>2</sup>	Unsat <sup>3</sup>	N/A	Verification Conducted
Appendix D	If applicable, verify NEUP University assessment work completed during the year, meets the requirements of Appendix D of the NFCSC QAPD.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<i>No NEUP activities apply to the packages that were reviewed.</i>