Spallation Neutron Source Quality Assurance Plan

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Copies: This document is available on the SNS web site, http://www.sns.gov/projectinfo/projectinfo.htm. *If you are working with a copy, you should periodically verify that you have the current version.*

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Links to Content

Criteria: 1. QA Program, 2. Personnel Training and Qualification, 3. Quality Improvement, 4. Documents and Records, 5. Work Processes, 6. Design, 7. Procurement, 8. Inspection and Acceptance Testing, 9. Management Assessments, 10. Independent Assessments.

1. Purpose

The purpose of the Spallation Neutron Source (SNS) project is to provide a next-generation short-pulse spallation neutron source to meet the needs for scientific understanding and technological innovations. The project is controlled by management systems described in the SNS Project Execution Plan (PEP, ref.10). The primary objective of the SNS QA program, as mandated by the PEP, is to implement the quality assurance criteria in O 414.1A (ref. 1) in a way that achieves adequate protection of the workers, the public, and the environment, taking into account the work to be performed and the associated hazards. Further, while SNS as an accelerator facility is excluded from 10CFR830 (refs. 6 and 7) it is our intent to meet its substantive requirements.

This document is the QA plan for the SNS project. Its purpose is to give the QA requirements for the SNS and describe how the requirements will be met. It has been developed by applying the quality assurance criteria specified in references 1 and 7. It discusses how the criteria will be satisfied, using a graded approach. As required by refs. 1 and 7, this QA plan also integrates quality requirements from ORNL's integrated management system (ref. 9) and was developed using parts of an applicable consensus standard, ISO 9001 (ref. 8).

This plan is implemented by quality plans, procedures, and guides which are developed to accommodate specific quality requirements. The most significant of these is the Target Systems QA Plan (ref. 11). Additional procedures and guides are accessible through the SNS QA Web Page at http://www.sns.gov/projectinfo/qa/qa_home.htm.

2. Scope

This plan provides requirements applicable to all project participants, encompassing all activities performed by or for the SNS Project, from research and development (R&D) through facility acceptance. Additional QA plans developed by the architect-engineer/construction manager (AE/CM) and the partner laboratories will govern work in their areas of responsibility. Each partner laboratory shall work within its own QA or management plan and procedure system, which must comply with the requirements in this plan and with its own laboratory QA program. The AE/CM will implement a QA program as defined in its contract with the SNS Project Office.

3. Definitions

As used in this plan:

Acceptance Criteria Listing (ACL)—a document listing the criteria that will be checked to make an item or service acceptable.

Quality—"Fitness of an item or design for its intended use."

Quality Assurance (QA)—The set of actions taken to avoid known hazards to quality and to detect and correct poor results.

Quality-assuring actions—Planning, analyses, documentation, and other actions necessary to comply with requirements and ensure that goals are achieved.

Safety—Environment, safety, and health (ES&H), including pollution prevention and waste minimization, as defined in SNS Environmental Safety and Health Plan (ref.8).

4. Graded Approach

This is a comprehensive plan that covers a variety of systems, components, and activities. Quality assuring actions shall be applied commensurate with needs. Three grade levels (quality levels) are defined:

1. **Serious** potential impacts, requiring a **disciplined** set of actions.
2. **Moderate** potential impacts, justifying a **balanced** set of actions.
3. **Routine** potential impacts, justifying a **flexible** approach.

Tables 1 and 2 explain the process.

PLEASE NOTE: Consultation with the quality assurance representative is expected whenever grade levels are being determined, because there are many factors to consider. This discussion is only an overview of the process.

First determine the grade level in Table 1, then apply appropriate actions from Table 2.

Table 1. Determination of quality level

Risk Type	*Grade*		
	Level 1. Serious	**Level 2. Moderate**	**Level 3. Routine**
Functional	Potential for a significant adverse impact to completion of the SNS Project or to achieving key performance goals.	Potential for a moderately adverse impact to the SNS Project by affecting a WBS level 3 task or a major system or component.	Potential for negligible impact to an SNS task, system, or component.
Environment, safety, and health	Potential for (1) a death or total disability or severe adverse impact on the health or safety of a worker or the public, or (2) environmental damage that could exceed regulatory limits or involve significant cleanup costs.	Potential for injury or illness requiring hospitalization, temporary or partial disability, or moderately adverse impact on the environment or health or safety of a worker or the public.	Potential for (1) minimal impact on the health and safety of the public or a worker, such as injury or illness requiring minor supportive treatment but not requiring hospitalization, or (2) a negligible impact on the environment.
Cost	Potential for a financial loss of $500K or more.	Potential for a financial loss of $50K or more.	Potential for a financial loss less than $50K.
Compliance	Potential for noncompliance with state and federal laws and regulations or DOE requirements.	Potential for noncompliance with administrative orders or procedures established by the SNS Project Office.	Potential for minor noncompliance with established management practices.

Table 2. Actions appropriate to quality levels

	Grade[a]		
	Level 1. Disciplined	**Level 2. Balanced**	**Level 3. Flexible**
Action	Design reviews and *independent* verifications	Design reviews and verifications	Little or no design reviews, verification, or validation
	Thorough documentation	Adequate and appropriate documentation	Minimal documentation
	Established acceptance criteria listing (ACL)	Established ACL	ACL not required
	Vendor qualification and surveillance	Vendor qualification (questionnaire minimum)	Little or no vendor qualification
	Formal procedures	Procedures as needed	No formal procedures except ES&H (i.e., follow good practices)
	Complete oversight and assessment activities	Oversight covered under general management assessments	Oversight performed by line supervision
	Controlled measuring and test equipment (M&TE)	Controlled M&TE	M&TE generally not used
	Documented worker qualifications	Knowledgeable personnel employed	Knowledgeable personnel employed
	Formal inspection and testing	Tests and inspections conducted appropriately	Normal receipt inspection only (except where ES&H requires more)
	QA representative approvals are required	QA representative consultations are required	QA consultations are available

[a] To determine the grade and subsequent actions for an item or activity, first locate the appropriate risks on the matrix in Table 1. Example: Selection of any one of the four risk types in level 1 makes all the actions come from level 1..

5. DOE Quality Criteria Discussion

Criterion 1—QA Program

Organization and Functional Responsibilities

The SNS Project is a collaborative effort of six DOE laboratories, led by Oak Ridge National Laboratory (ORNL), that includes Argonne National Laboratory (ANL), Brookhaven National Laboratory (BNL), Thomas Jefferson National Accelerator Facility (JLAB), Los Alamos National Laboratory (LANL), and Lawrence Berkeley National Laboratory (LBNL). The LBNL team has completed their work. A contracted AE/CM team is responsible for the design and construction of the conventional facilities and installation of most technical system components.

Responsibility for Managing

The Associate Laboratory Director manages the project and is responsible for achieving performance goals. The SNS QA manager (QAM) is responsible for ensuring that a quality system is established, implemented, and maintained in accordance with requirements. The QAM will provide oversight and support to the partner labs to ensure a consistent quality program.

The SNS organization is composed of three divisions: the Experimental Facilities Division, Accelerator Systems Division, and Conventional Facilities Division; as well as the SNS Project Office. See the SNS Organization Chart,(Ref. 10, figure C.1).

Levels of Authority and Interface

The *Spallation Neutron Source Project Execution Plan* (ref. 10) and this QA plan define the responsibility, authority, and interrelation of personnel who manage, perform, and verify work that affects quality.

Roles and responsibilities addressed in this plan include the following.

Responsibility for performing work—All contractor staff and subcontractors are responsible for the quality of the work that they do and for using guidance and assistance that is available.

Responsibility for acceptance—The WBS manager or task leader responsible for SNS components or systems is required to determine their acceptance criteria. For quality levels 1 and 2, documentation using ACLs is required.

Responsibility for assessing work—Management at each level is responsible for evaluation through self-assessments. Independent assessments may be requested by project management.

QA Program—The SNS QAM is responsible for development, implementation, assessment, and improvement of the QA program.

Periodic reporting—The QAM is responsible for periodically reporting on the performance of the quality system to the project director for his review and as a basis for improvement of the quality system.

Readiness assessments—The project director or higher authority may call for readiness assessments as the project nears completion.

Planning and scheduling—Planning and scheduling of the project is organized around a work breakdown structure (WBS). Details of the planning and scheduling process are given in the *Project Controls Manual* (ref. 13).

Resource considerations—Managers are responsible for providing the resources needed to conduct the project successfully. Project control systems are used to aid in the dispersal of funding to the proper point at the time needed.

Managers at all the partner laboratories are expected to consider the following quality-related items as the project progresses.

- Ensuring the compatibility of the design, production process, installation, servicing, inspection and test procedures, and applicable documentation.
- Updating, as necessary, their quality control, inspection, and testing techniques, including the development of new instrumentation.
- Identifying any fabrication or installation measurement requirement involving a capability that exceeds the known state of the art in sufficient time for the needed capability to be developed.
- Providing suitable verification at appropriate stages in the realization of products.

Criterion 2—Personnel Training and Qualification

SNS managers at all locations are responsible for providing the resources to ensure that their staffs are adequately trained and qualified to perform their assigned work.

Qualified workers are required at each partner laboratory for work affecting quality level 1 systems or components. The ORNL SAP system holds training requirements and tracks the status of compliance for SNS-ORNL workers. Position descriptions that identify requirements and other routine human resources practices should be adequate documentation for most level 3 needs.

Note: ES&H training requirements are provided in ISMS programs, such as described in the *SNS Environmental Safety and Health Plan* (SNS 102030000-ES0001-R02).

Task leaders and team members are responsible for ensuring that their training and qualification requirements are fulfilled, including continuing training to maintain proficiency and qualifications.

Criterion 3—Quality Improvement

Processes to detect and prevent quality problems will be established, including equipment inspections and verifications; software code inspections, verifications, and validations; design reviews; baseline change reviews; and work planning. Item characteristics, process implementation, and other quality-related information will be reviewed and the data analyzed to identify items, services, and processes needing improvement.

Problems identified by assessment, analysis, test, inspection, and other means will be controlled and corrected using the graded approach described in this plan. Acceptance criteria listings (ACLs) and the ACL database will be the primary tools used to track conformity of SNS items.

Occurrence reporting will be as required by DOE for certain defined events or conditions.

Where appropriate, the cause(s) of the problem will be identified and corrected to prevent recurrence.

All project personnel and subcontractors are encouraged to identify problems or potential quality improvements and may do so without fear of reprisal or recrimination.

Items, services, and processes that do not conform to specified requirements shall be identified and controlled to prevent their unintended use. Inspection discrepancy reports or similar tools will be used to implement this requirement. The QAM will periodically report these non-conformances to SNS management.

Criterion 4—Documents and Records

Documents shall be prepared, reviewed, approved, issued, used, and revised to prescribe processes, specify requirements, or establish design. SNS managers will use the graded approach described in this plan to determine work in their scope that requires the preparation of controlled documents. Table 2 describes several kinds of controlled documents applicable to level I and level II items. The system to control document preparation, approval, issuance to users, and revision is described in SNS procedures on the web page *project plans and procedures*.

Required records shall be specified, prepared, reviewed, authenticated, and maintained. Guidelines have been established to aid in the selection of information and processes for storing and maintaining records for the project in accordance with DOE and National Archives and Records Administration records requirements. Project and division management, team, and task leaders are responsible for identifying the information to be preserved in accordance with the Records Inventory and Disposition Schedule (RIDS).

In addition to the technical, cost, and schedule baseline and all changes to it, the RIDS will identify types of records that must be preserved as evidence or proof that a decision was made or an action taken and the justification for the decision or action. In addition to the SNS QAM and QA representatives, the SNS records manager is available for guidance on these decisions.

Criterion 5—Work Processes

Resources—Managers and team leaders throughout the SNS Project are expected to provide the resources and support systems needed to enable their staffs to do their work using methods that promote successful completion of tasks, conformance to SNS requirements, and compliance with ES&H rules.

Graded Approach—SNS management (managers, team leaders, and task leaders) will use the graded approach described in this plan to determine the appropriate work controls based on the type of work being done. SNS QA representatives may assist in these determinations.

Safety— SNS management will ensure that management of ES&H functions and activities is an integral but visible part of the work planning and execution processes, including use of ISMS guiding principles and worker participation in work planning.

Training— SNS management will ensure that employees and subcontractors are properly trained in and are knowledgeable of the procedures, instructions, drawings, specifications, and other related administrative and technical documents that control their work. Where processes require specially qualified personnel, the performing personnel shall be appropriately trained and certified to the qualified process/procedure before performing those processes.

Work Planning—Work on the SNS Project shall be performed to established technical standards and administrative controls using approved instructions, procedures, or other appropriate means.

Acceptance Planning—Systems or components that are determined to be quality level 1 or 2 should have plans for acceptance based on the creation and completion of ACLs.

Conduct of Work—Work shall be performed safely, in a manner that ensures adequate protection for employees, the public, and the environment, and management shall be accountable for the safe performance of work. Employees and management shall exercise a degree of care commensurate with the work and the associated hazards. See ref. 12 for more details on SNS safety management systems.

Item Control and Protection—Items, including consumables, shall be identified and controlled to ensure their proper use and prevent the use of incorrect, unaccepted, or unidentified items. The project will define a system of controls to ensure that items are handled, stored, shipped, cleaned, and preserved to prevent them from deteriorating, being damaged, or becoming lost. These controls will be established according to instructions, specifications, drawings, and technical manuals for items that are sensitive, have a high cost, or have been identified as having a significant impact on the environment or schedule.

Calibration—Equipment used for process monitoring or data collection shall be calibrated and maintained. Calibration will be controlled by a system or systems making appropriate use of qualified calibration service providers, equipment calibration-status tracking database(s), and approved methods for adding equipment items to the controlled system. The QAM will oversee and support the calibration system.

Criterion 6—Design

Principles and Standards—Items and processes shall be designed using sound engineering/scientific principles and appropriate standards. Applicable requirements and design bases shall be used in the design.

Graded Approach—The SNS Project will use a system of formal controls for creating, documenting, and verifying designs. The formality of design control activities will be determined based on the scale, cost, complexity, and hazards associated with the item, using the graded approach given in this plan.

Changes—Design changes, including project change orders, field changes, and nonconforming items designated "use-as-is" or "repair," shall be controlled by measures commensurate with those applied to the original design. Temporary modifications will have a level of control similar to the design of permanent modifications if they affect a quality level 1 or 2 system.

Configuration management—Systems will be implemented to control designs and to inform facility operators of the current configuration of equipment in the facility. Configuration management and control is discussed in the *Configuration Management Plan* (ref. 14) and configuration management procedures.

Verification and Validation Verification and validation of design is established through many layers of review from inception to startup, such as the following.

- Requirements are reviewed during the project planning phase.

- Design documents are reviewed during creation by design organization internal reviews.
- Designs are further reviewed by formal multidisciplinary design review teams where warranted.
- The fabricated design is inspected and tested during fabrication and assembly.
- Commissioning tests will prove the adequacy of equipment and systems.
- A formal readiness assessment or readiness review is conducted before startup of complex systems or facilities.

Software—Design and development of computer software shall be accomplished in accordance with this plan, using a graded approach and quality representative support to determine appropriate controls based on the complexity, cost, and hazard associated with the intended use of the software.

Definitions

Design—Description that can be used to create a final end-use product, such as encoded software, machined parts, assembled structures, etc. (also called design-output or design product.)

Design inputs—Customer requirements and preferences for the features and performance of the end product and the customer's additional constraints on the design process, such as due dates, design deliverables, and codes and standards.

Design interfaces—Parts, systems, or module interfaces as well as organizational interfaces involved in coordinating the design process.

Design controls—Design control measures (such as procedures and training) provided to ensure the following:

- Selected design methods are suitable for the intended application.
- Design personnel have access to information applicable to establishing the design basis.
- Interfaces between the scopes of design are defined and coordinated to ensure compatibility.
- Design output contains sufficient detail to permit verification that it meets the design-input requirements.
- The design is documented adequately to support analysis, construction, operation, and maintenance. The design basis, as well as the detailed design outputs developed from it, will be included in the records.

Design Verification and Validation

Independence—Different degrees of independent verification are required for designs depending on their graded-approach categories. The adequacy of design inputs, processes, outputs, and changes shall be verified or validated by the following:

Level 1. Verification and validation by individuals or groups independent from those who created the design and who will not benefit from, or have the appearance that they could benefit from, any lack of objectivity.

Level 2. Verification and validation by individuals or groups other than those who created the design but who may be supervised or managed by the same person.

Level 3. Some independent verification and validation as a recommended practice.

Verification and validation work will be completed before approval and implementation of the design.

The design will be verified to an extent commensurate with its importance to safety (see Table 1), complexity of design, degree of standardization, state of the art, and similarity to proven design approaches. Acceptable verification methods include but are not limited to any one or combination of (1) design reviews, (2) alternate calculations, and (3) prototype or qualification testing and comparison of the new design with a similar proven design, if available.

Where the design method involves the use of computer software to make design calculations or dynamic models of the structure, system, or component's functionality, that software must have been demonstrated to produce validated results. The demonstration needs to be documented in a formal report of validation that is maintained in records that are accessible for inspection. However, exemptions may be made for commercially available software that is widely used and for codes with an extensive history of refinement and use by multiple institutions, if the validation is evidently unlikely to reveal a problem and is difficult and/or expensive to complete. Exemptions affecting quality level 1 or 2 systems or components should be documented.

Design validation shall be performed to ensure that the design product conforms to defined project needs and/or requirements. Design validation follows successful design verification. Designs shall be validated, preferably before procurement, manufacture, or construction, but no later than acceptance and use of the item.

Validation Criteria—The design shall

- meet the design-input requirements,
- contain or make reference to acceptance criteria, and
- identify those design characteristics that are crucial to the safe and proper functioning of the equipment or system.

Each independent inspection, test, or review will feed the evaluation process, which is a comparison of results with acceptance criteria to determine acceptance or rejection, or the need for corrective action. In some cases the outcome may be to seek adjustments to requirements.

The formality of reporting will escalate as the significance of the review or test increases. Higher levels of management must be aware of and participate in the correction of the most significant problems.

Required design analyses and calculations will be performed and documented. The resulting documentation should include the assumptions, actual calculations, design inputs, references, and units in sufficient detail such that a technically qualified person could review and understand the analyses and verify the results.

Design-output documents will be reviewed and approved before release.

Criterion 7—Procurement

Procurement controls will be implemented to ensure that purchased items and services meet project needs and comply with applicable quality requirements.

SNS personnel requesting procurement of items and services are responsible for providing technical, quality, ES&H, and other specifications that adequately describe the item or service being procured so that the supplier can understand what is desired and what will be accepted. Development of these specifications may be achieved through the involvement of QA representatives and through established review and approval systems. The following factors should be considered:

- technical performance requirements,
- appropriate standards,
- laws and regulations, and
- acceptance criteria.

Suppliers of quality level 1 or 2 items or services should be evaluated to determine their ability to provide acceptable items and services. The evaluation typically includes reviews by the QA representative. QA representative approval is mandatory for level 1, and consultation is required for level 2 procurements, as noted in the Table 2. QA representative consultation is available for level 3 procurements where needed.

Previously accepted suppliers should be appropriately monitored to ensure that they continue supplying acceptable items and services. Source surveillance is the recommended method to ensure that items are free of damage and that specified requirements were adequately met. Incoming items will be verified against previously established acceptance criteria.

Unacceptable items or services are documented. Records of supplier performance (ACLs, IDRs, and contract-required submittals) are kept for future procurement consideration.

Counterfeit/Suspect Parts—Counterfeit/suspect parts are prohibited. Inspections will be used to detect violations. When counterfeit/suspect parts are found, they will be identified, segregated, and disposed of in accordance with DOE G 440.1-6, “Implementation Guide For Use With Suspect/Counterfeit Items Requirements of DOE O 440.1, Worker Protection Management; 10 CFR 830.120; and DOE 5700.6C, Quality Assurance” (ref. 4).

Criterion 8—Inspection and Acceptance Testing

Inspection and testing of specified items, services, and processes shall be conducted using established acceptance and performance criteria.

Acceptance Criteria Listings—ACL forms, installation travelers, and the ACL database are the primary tools used to organize this activity. Forms are available online at http://www-internal.sns.gov/dcrm/procedures.htm

Graded Approach—Inspections will be conducted in accordance with the graded approach (Table 2).

Calibration—Equipment used for inspections and tests shall be calibrated and maintained. Calibration will be controlled by a system or systems making appropriate use of qualified calibration service providers, equipment calibration-status tracking database(s), and approved methods for adding equipment items to the controlled system. The QA representative will oversee and support the calibration system.

Criterion 9—Management Assessments

SNS management at all levels shall regularly evaluate achievement relative to performance requirements and shall appropriately validate or update performance requirements and expectations to ensure quality. The management assessment process shall periodically include an evaluation of the organization's products and processes to determine whether the project's missions are being fulfilled. The results of management assessments, which focus on means to improving the quality of work performed, shall be reported to the appropriate responsible line or project management level.

When performance does not meet established standards, management shall, with the assistance of others with appropriate expertise, determine the cause and initiate corrective action. QA representatives may assist, lead, or facilitate cause investigations.

For research activities, management assessments shall include the review and evaluation of research results by managers or peer groups (e.g., standing or ad hoc panels and committees) directed by management.

Criterion 10—Independent Assessments

SNS QA management will plan and conduct independent assessments to assist line managers in identifying opportunities for quality improvement and to ensure compliance with specified requirements. Independent assessments of the SNS Project can be sponsor driven or be requested by SNS management. Independent assessments typically focus on quality or ES&H management systems, self-assessment programs, or other organizational functions identified by management.

Persons conducting independent assessments shall be technically qualified and knowledgeable in the areas assessed. A qualified lead assessor (auditor) is required, and the team may include other subject-matter experts to evaluate the adequacy and effectiveness of activities if they are not responsible for the work being assessed.

Additionally, three important independent boards and committees have been chartered to advise ORNL and SNS management: the SNS Advisory Board, the Experimental Facilities Advisory Committee, and the Accelerator Systems Advisory Committee.

The SNS Advisory Board will identify and bring to the attention of the UT-Battelle Board of Governors any issues whose resolution is critical to the technical success of the project and to meeting project performance, cost and schedule goals. It receives inputs from the other two committees.

The Experimental Facilities Advisory Committee provides advice to SNS management concerning the experimental facilities, comprising the neutron source system and instrumentation.

Similarly, the Accelerator Systems Advisory Committee is charged to provide an assessment of the physics and technical progress on the accelerator.

DOE also performs external assessments that provide an objective view of performance and as a result contribute to the independent assessment process. Since such assessments are not under the control of SNS, they are not necessarily considered as being part of the independent assessment criterion. However, SNS management considers external assessment results and schedules in determining the scope of its planned management and independent assessments.

Partner Laboratories—In addition to regularly scheduled oversight assessments, independent assessments may be initiated by project management to measure specific aspects of the work being done in partnership facilities.

AE/CM—The AE/CM will receive independent assessments in accordance with the contract.

6. References for use with this plan

DOE

1. O 414.1A, "Quality Assurance" (http://www.directives.doe.gov/pdfs/doe/doetext/neword/414/o4141ac1.html)
2. DOE G 414.1-1A "Management Assessment and Independent Assessment Guide" (http://www.directives.doe.gov/pdfs/doe/doetext/neword/414/g4141-1a.html)
3. G 414.1-2, "Quality Assurance Management System Guide for use with 10 CFR 830.120 and DOE O 414.1" (http://www.directives.doe.gov/pdfs/doe/doetext/neword/414/g4141-2.html)
4. G 440.1-6 "Implementation Guide For Use With Suspect/Counterfeit Items Requirements of DOE O 440.1, Worker Protection Management; 10 CFR 830.120; and DOE 5700.6C, Quality Assurance" (http://www.directives.doe.gov/pdfs/doe/doetext/neword/440/g4401-6.html)

Code of Federal Regulations, Part 10 (10 CFR)

5. 10 CFR 835, "Occupational Radiation Protection" (http://www.access.gpo.gov/nara/cfr/waisidx_00/10cfr835_00.html)
6. 10 CFR 830, "Nuclear Safety Management" (http://www.sns.gov/projectinfo/qa/regulation10cfr830.pdf)
7. 10 CFR 830, Subpart A "Quality Assurance Requirements" (http://www.sns.gov/projectinfo/qa/regulation10cfr830.pdf)

Other Documents

8. ISO 9001:2000 “Quality Management Systems-Requirements”
9. ORNL Quality Assurance Program
   (http://sbms.ornl.gov/sbms/SBMSearch/ProgDesc/QAPD/NQAProgPD.cfm)
10. Spallation Neutron Source Project Execution Plan, (SNS 102010100PN0001R03)
    (http://www-internal.sns.gov/dcrm/plans/SNS_PEP_App_C_R03.pdf)
11. Target Systems Quality Assurance Plan
    (http://www-internal.sns.gov/dcrm/procedures/SNS-TS-P00.pdf)
12. SNS Environmental Safety and Health Plan (SNS 102030000-ES0001-R01)
    (http://www-internal.sns.gov/esh/safdoc/ES&H_Plan_Rev_1.pdf).
13. Project Controls Manual ()
14. Configuration Management Plan (SNS-102010200-PC0002-R04) http://www-internal.sns.gov/dcrm/plans/SNS-102010200-PC0002-R03.pdf.

Questions or comments about this plan should be directed to M. H. Skonicki at ORNL.
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7. Revision Table

Revision No.	Date	Page or Section	Description and Reason for Change
0	October 1999	all	Original issue, replacing QA Plan section of the SNS Project Controls Manual Chapter 8.
1	September 2000	various	Activated weblinks in the online document, incremented DOE order O 414.1 to O 414.1A (which had no effect on the plan).
2	October 2000	p2 p3 p4, Tables 1 and 2 p7 p8 p9 p13	Defined ACL, inserted (quality levels) in grading. Added Note encouraging grading consultation with QAR Removed “Level 2 moderate-environmental” option after discussion with DOE ORO project office, and emphasized consultation with the QAR three places. Replaced grade level with Quality Level in the title lines. Safety statement expanded to include ISMS guidelines and worker participation in work planning. Stop Work Authority paragraph was deleted, because the SNS Safety Plan is the more appropriate location for this discussion. The definition of statutory and regulatory requirements was deleted because it is too vague to implement for this complex project. Added this table of revisions, as a good practice.
3	April 2003	pi p1, 1. Purpose p1, 2. Scope p3, Table 1 p4, Responsibility P 5 Criterian 2 p6, Criterion 3 p6, Documents and Records p7, 6. Design p10, 7 Procurement p11, 10. Independent Assessments pp12-13, 6. References	Added a Table of Contents Updated references to parts of 10CFR830. Added a statement that ORNL SBMS and ISO 9001 were used as the appropriate standards to develop the program. Changed commissioning to facility acceptance. Under compliance, removed the word inadvertent twice, and under ESH added the word environment to the level 2 definition. Updated statement of project management duties to reflect leadership by the Associate Laboratory Director. Changed to using qualified workers instead of a system for documenting worker qualifications. Added info about SAP for ORNL SNS employees. Added statement that QAM will report non-conformances to management. Noted Table 2 identifies certain controlled documents. Removed non-functioning link to RIDS Changed *Project Controls Manual* to *Configuration Control Plan.* Listed specific types of supplier history documents. Added text describing advisory board and advisory committees as well as DOE reviews, and changed project director to management. Added references to ISO 9001, Target Systems Quality Assurance Plan and ORNL Quality Assurance Program, and other documents previously only referenced in the body of the document. Added Configuration Management Plan.