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Quality Assurance Program Plan for Building 324

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U.S. Department of Energy Contract DE-AC06-96RL13200

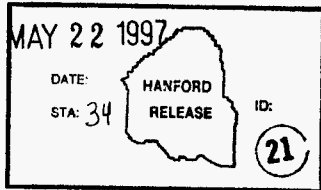
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Abstract: This QAPP implements the Quality Assurance Program Plan for Building 324.

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1.0 INTRODUCTION

This Quality Assurance Program Plan (QAPP) provides an overview of the quality assurance program for Building 324. This plan supersedes the PNNL Nuclear Facilities Quality Management System Description, PNL-NF-QMSD, Revision 2, dated March 1996.

The program applies to the facility safety structures, systems, and components and to activities that could affect safety structures, systems, and components. Adherence to the quality assurance program ensures the following.

- U.S. Department of Energy missions and objectives are effectively accomplished.
- Products and services are safe, reliable, and meet or exceed the requirements and expectations of the user.
- Hazards to the public, to Hanford Site and facility workers, and to the environment are minimized.

The format of this Quality Assurance Program Plan is structured to parallel that of 10 CFR 830.120, "Quality Assurance Requirements."

2.0 REQUIREMENTS

10 CFR 830.120 is the source document for the quality assurance program. WHC-SP-1131, *Westinghouse Hanford Company Quality Assurance Program and Implementation Plan*, details the quality assurance program and the measures to achieve 10 CFR 830.120 compliance. WHC-SP-1131 has been adopted by Fluor Danial Hanford and its major subcontractors and is approved by the U.S. Department of Energy. Appendix A contains details of facility specific unique features and implementation deficiencies that are part of the implementation plan.

3.0 MANAGEMENT

3.1 Program

A written quality program, comprised of a hierarchy of documents, has been established and is being maintained. The policy on quality reflects management commitment to the establishment of an effective quality program. The policy describes the quality management systems required to

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ensure the safe and effective accomplishment of the objectives and missions at the U.S. Department of Energy nuclear facilities (HNF-CM-1). Application of the quality assurance program is based on the graded approach, consistent with the complexity of the item and consequences of failure.

Figure 1 displays the hierarchy of quality assurance requirements. HNF-CM-4-2, *Quality Assurance Manual*, is the first-level implementing manual in the hierarchy and is the link to the facility-level manuals. The facility manuals, in turn, provide facility-specific requirements for work performance instructions.

The Quality Assurance Center of Expertise group is responsible for ensuring that requirements of the implementation manuals are met. This group coordinates the quality assurance program. The Center of Expertise group is comprised of plant, project, and facility representatives who function as interpretive experts of the plants, projects, and facilities they represent.

3.2 Personnel Training and Qualification

The Personnel Training and Qualification program has been established to ensure that personnel are trained and qualified to perform assigned tasks. The training and qualification program provides for the development of personnel proficiency commensurate with the scope, complexity, and nature of an assigned activity. Management is responsible for developing generic staff position requirements based on the level of education and experience necessary for proficient performance of tasks related to a given staff position.

Facility managers and suppliers that provide personnel to support facility operations are responsible for ensuring that staff members are sufficiently trained to perform assigned tasks in a manner that minimizes (1) risk to the worker performing the task, coworkers, and the public; (2) negative impacts to the environment; and (3) risk of damage to the facility and facility equipment.

3.3 Quality Improvement

The objective of quality improvement is to prevent problems and to continuously improve the quality of items and work processes. The basis to quality improvement is that (1) work activities can be planned, performed, assessed, and improved and (2) lessons learned from this

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process can be used when planning subsequent activities. The focus of the quality improvement process is to reduce the variability of work processes that influence the quality of the product.

Under the corrective action program, organizations have the authority to identify quality problems and to initiate, recommend, or provide solutions through designated channels. Management systems (e.g., root cause analysis, lessons learned) are used to plan, implement, and evaluate improvements.

Items, services, and processes that do not meet established quality requirements are identified, controlled, and corrected as soon as practical in accordance with established priorities. Controls placed on nonconforming items prevent inadvertent installation or use through identification, documentation, evaluation, segregation (when applicable), and disposition of the items. Processes and services that do not conform to specified requirements are controlled so that the output of the process or service is not inadvertently used. Corrective actions are designed to be commensurate with the significance of the nonconforming condition. Conditions that pose significant risk are evaluated to determine the root cause of the condition and to determine actions that will preclude recurrence.

3.4 Documents and Records

The Documents and Records program establishes requirements for control of the preparation, review, approval, issuance, use and revision to documents that establish policies, prescribe work, specify requirements, or establish design to assure that correct documents are employed. Controlled documents and revisions to those documents are reviewed for adequacy, completeness, and correctness before approval. After approval, controlled documents are issued to specified users.

Records that furnish documentary evidence of quality are prepared, maintained, and stored in accordance with approved procedures and instructions. Records must be legible, identifiable, accurate, complete, protected, and retrievable. DOE 1324.2A, *Records Disposition*, sets forth mandatory use of the general records schedules published by the National Archives and Records Administration. These schedules define the retention periods of different document types.

4.0 PERFORMANCE

4.1 Work Processes

Work associated with nuclear safety functions is planned, authorized, and performed in accordance with approved technical standards, instructions, procedures, and other control documentation commensurate with the complexity and risk posed by the work to be performed.

The Calibration program governs the process that ensures quality of the calibration and maintenance of process monitoring equipment. Equipment found to be out-of-calibration is tagged and not used until recalibrated. Items inspected or data taken with equipment found to be out-of-calibration are considered to be indeterminate. A review or reinspection is performed to determine the appropriate status.

Handling, storage, shipping, cleaning, and preservation of items are controlled to prevent damage, loss, or deterioration. Marking and labeling of items are maintained throughout packaging, shipping, handling, and storage. Special protective measures are specified and provided when required to maintain acceptable quality.

4.2 Design

Codes, standards, and practices utilized for the assurance of quality, are identified and incorporated into the design of new or replacement items through system design requirements documentation. Design documentation incorporates the applicable requirement and design basis of the codes, standards, and practices in effect on the date of design approval. Exceptions to preserve maintainability or interchangeability are handled on a case-by-case basis and documented in the design description.

Whenever possible, materials, components, and processes already in use and proven in similar applications are used. The design is approved for technical adequacy only when sufficient design data have been furnished to ensure that the design meets the specified requirements. Applicable data and documentation are used whenever necessary to validate changes and to establish requirements for design verification.

Engineering documents (e.g., drawings, specifications, design analyses, system descriptions, engineering studies, technical reports) are verified in accordance with approved procedures and instructions. The procedures identify the positions responsible for verification and require that

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design errors are identified and corrected. Documents cannot be released without verification. Verification of design documents is accomplished by individual or interdisciplinary design reviews, alternate calculations to verify the correctness of the original design calculations, or qualification testing to demonstrate adequacy of performance under conditions that simulate the most adverse design conditions. The extent of verification is based on the complexity, risk, and uniqueness of the design. The verification is accomplished by individual(s), other than the originator, who has adequate qualifications to have originated the work. The verification may be conducted by the originator's supervisor, if the originator's supervisor is the only technically qualified individual available.

Design changes, including field changes, are subject to design control measures commensurate to those applied to the original design. Verification and review of design changes are performed to the same level as that of the original design. As-built changes are documented and verified through field walk-downs before being incorporated into the original design documents.

4.3 Procurement

Procurement procedures ensure that regulatory requirements, design and site investigation bases, and other necessary quality requirements are included or referenced in the documents used for procurement of material, equipment, and services. Procurement documents covered in this section include purchase orders, purchase requisitions, external work orders, and store orders.

Procedures are in place for preparation, revision, review, approval, issue, control, and retention of procurement documents. These procedures identify the requirements to be met by each supplier's quality assurance system and the instructions for submitting documents for information or approval. The procedures also specify the right of access to supplier facilities for source inspection and audits, including requirements for advance notification of inspection or tests to be witnessed.

Measures are established to ensure that purchased material, equipment, and services conform to the procurement documents. Established measures include provisions for source evaluation and selection, objective evidence of inspection at the contractor or subcontractor source, examination of products upon delivery, and audits. Documentary evidence that materials and equipment conform to code, regulation, or contract procurement requirements is made available before installation or before use.

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The requirement for a documented quality assurance program is specified in applicable procurement documents and is invoked on the basis of the safety function of the items or services being procured. The extent of the documented supplier quality assurance program, when required, depends upon the type and use of the item or service being procured.

Supplier capability to provide items or services is evaluated before selection and periodically during supplier performance in accordance with HNF-CM-4-2. The evaluation and selection of procurement sources is based on specified criteria. The evaluation includes one or more of the following:

- Evaluation of each supplier's quality history of providing an identical or similar product that performs satisfactorily in actual use
- Review of each supplier's current quality assurance records supported by documented qualitative and quantitative information that can be objectively evaluated
- Direct evaluation of each supplier's facilities, personnel, and quality assurance program implementation to determine the technical and quality capability of that supplier.

Methods established for the acceptance of an item or service furnished by suppliers are described in HNF-CM-4-2. Methods used to accept an item or service from suppliers consist of one or more of the following:

- Supplier certification and release (Certificate of Conformance)
- Source verification or inspection
- Receiving inspection
- Acceptance testing
- Post-installation testing.

4.4 Inspection and Acceptance Testing

Inspection and acceptance testing is performed in accordance with the guidance provided in HNF-CM-4-2. Inspection, surveillance, and testing of items and activities that have the potential to affect quality during procurement, construction, repair, modification, maintenance, and installation are subject to these tests. Suppliers and contractors are expected to inspect and test

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their own work. Surveillances are performed to ensure that these inspections and tests are adequately and competently performed.

Hold points (e.g., items or activities of which inspection is mandatory), checklists, and other inspection planning documents are established and implemented to ensure required inspections are performed.

Inspection and acceptance criteria are derived from engineering design documents, supplier information, construction procedures, and maintenance procedures. Inspection procedures and instructions identify the following:

- References to applicable documents such as drawings, specifications, and procedures
- Type of inspection to be performed
- Characteristics to be inspected
- Individuals or groups responsible for performing the inspection
- Acceptance criteria (explicit or by reference) obtained from specifications, drawings, supplier instructions, and standards
- Description of the inspection method and equipment to be used, or referenced to an appropriate procedure
- Frequency of inspection or sampling plan.

Measuring and test equipment used for acceptance of items is verified to be of the proper type, range, and accuracy. Where possible, instruments have calibration certifications traceable to nationally-recognized standards. Instruments are calibrated at specified intervals, before and after use, or just prior to use, as determined by required accuracy, intended use, frequency of use, stability characteristics, and other conditions affecting performance. Instruments are labeled, tagged, or otherwise controlled to indicate calibration status and to ensure traceability to calibration test data. Instruments found out-of-calibration or out-of-tolerance are tagged or segregated and not used until they are successfully recalibrated. The acceptability of items or processes measured, inspected, or tested with out-of-tolerance instruments are evaluated and measurements and tests are repeated as required.

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Inspectors conduct site inspections as required by inspection documents. Inspectors have no other competing duties while performing inspections and are independent of the personnel performing the work being inspected.

5.0 ASSESSMENT

5.1 Management Assessments

Management assessments are conducted by or at the request of an organization manager to identify problems that are hindering the accomplishment of management objectives. The responsibility for establishing a management assessment program is assigned to the facility manager. When problems are discovered, the method of identification and correction shall be established by the facility manager.

A management assessment for the 324 Building will be performed in June 1997.

5.2 Independent Assessments

The independent assessment program (1) provides for the measurement of item and service quality, requirements compliance, and work performance, and (2) promotes improvement. The type of independent assessment performed and the frequency with which an assessment is performed are based on the status, complexity, and importance of the activity or process being assessed, and the past performance of the activity or process being assessed. Independent assessments are conducted by technically qualified experts in the activity or process being assessed. These assessors are part of the Facility Evaluation Board and are not associated with the activity or process being assessed. An independent assessment identifies the following:

- Work performance and process effectiveness
- Identification of abnormal performance and potential performance problems
- Identification of improvement opportunities
- Documentation of assessment findings.

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Independent assessment findings are presented to the organization responsible for performance of the subject activities or processes. The findings of the assessments are then used to formulate corrective actions to promote improvements.

An independent assesment will be scheduled for October 1997.

6.0 REFERENCES

10 CFR 830.120, 1996, "Quality Assurance Requirements," *Code of Federal Regulations*.

DOE 1324.2A, 1995, *Records Disposition*, U.S. Department of Energy, Washington, D.C.

HNF-CM-1, 1996, *Company Policies and Charters*, Fluor Daniel Hanford Company, Richland, Washington.

HNF-CM-4-2, 1996, *Quality Assurance Manual*, Fluor Daniel Hanford Company, Richland, Washington.

WHC-SP-1131, 1995, *Westinghouse Hanford Company Quality Assurance Program and Implementation Plan*, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

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Figure 1. Hierarchy of Quality Assurance Requirements

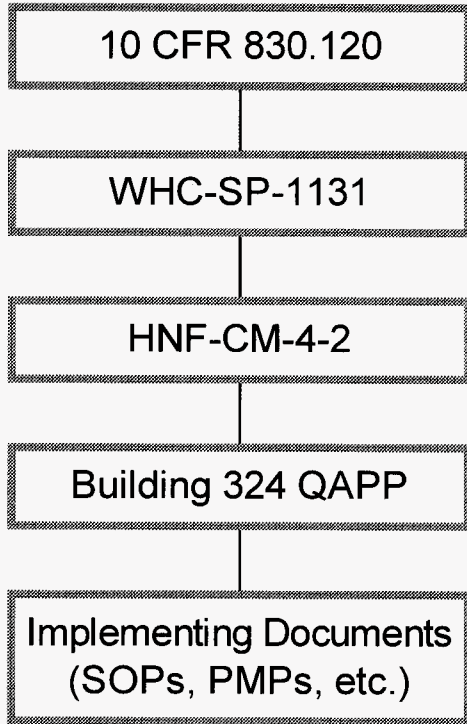


Table 1. Quality Assurance Program Index

(Sheet 1 of 2)

10CFR 830.120/ SP-1131 QA CRITERIA SECTIONS	QA POLICY AND IMPLEMENTING DOCUMENTS HNF-CM-4-2 Manual	OTHER IMPLEMENTING DOCUMENTS	
		SITE WIDE (PROCEDURES) HNF-	FACILITY SPECIFIC Building 324 (See Note 1)
(1) MANAGEMENT			
(1)(i) Program	QR 1.0, QR 2.0 QI 2.1, QI 2.2, QI 2.8	CM-1, CM-1-3 CM-1-5, CM-3-5 CM-4-46, CM-6-1 CM-6-2, CM-7-5	TBD-SPJ-001
(1)(ii) Personnel Training and Qualification	QR 2.0, QI 2.6 QR 9.0, QR 10.0	CM-2-15, CM-4-5 CM-4-39, CM-7-5 WHC-IP-1184	TBD-SPJ-001
(1)(iii) Quality Improvement	QR 15.0, QI 15.1 QI 15.2, QI 15.6 QR 16.0, QI 16.1	CM-1-3, CM-1-4 CM-1-5, CM-6-1 CM-6-2, CM-7-5 CM-1	TBD-SPJ-001
(1)(iv) Documents and Records	QR 6.0, QR 17.0 QI 17.1, QI 17.2 QR 19.0	CM-1-3, CM-2-15 CM-3-4, CM-3-5 CM-3-8, CM-3-10 CM-4-5, CM-6-1 CM-6-2, CM-7-5 CM-8-7	TBD-SPJ-001

Table 1. Quality Assurance Program Index
(sheet 2 of 2)

10CFR 830.120/ SP-1131 QA CRITERIA SECTIONS	QA POLICY AND IMPLEMENTING DOCUMENTS HNF-CM-4-2 Manual	OTHER IMPLEMENTING DOCUMENTS	
		SITE WIDE (PROCEDURES) HNF-	FACILITY SPECIFIC Building 324
(2) PERFORMANCE			
(2)(i) Work Processes	QR 5.0, QR 8.0 QR 9.0, QI 9.1 QI 9.2, QR 11.0 QR 12.0, QI 12.2 QI 12.3, QI 12.4 QI 12.5, QI 12.6 QI 12.7, QR 13.0 QI 13.3, QI 13.4 QR 14.0, QI 14.1 QR 19.0	CM-1-3, CM-1-5, CM-1-8 CM-1-10, CM-2-1 CM-2-2, CM-2-3 CM-2-4, CM-2-14 CM-3-5, CM-4-5 CM-4-38, CM-4-39 CM-4-41, CM-5-4 CM-5-16, CM-6-1 CM-6-2, CM-6-10 CM-7-7, CM-8-7 DOE-RL-92-36,HSRCM-1	TBD-SPJ-001
(2)(ii) Design	QR 3.0, QR 5.0 QR 19.0	CM-1-3, CM-1-8 CM-3-5, CM-3-10 CM-4-5, CM-4-46 CM-6-1, CM-6-2	TBD-SPJ-001
(2)(iii) Procurement	QR 4.0, QI 4.1 QR 7.0, QI 7.1 QI 7.2, QI 7.3 QI 7.6, QR 15.0, QR 15.6	CM-1-3, CM-2-1 CM-2-2, CM-2-3 CM-3-5, CM-4-5 CM-6-1, CM-6-2	TBD-SPJ-001
(2)(iv) Inspection and Acceptance Testing	QI 7.4, QR 10.0, QI 10.2 QR 11.0, QR 12.0 QI 12.2, QI 12.3 QI 12.4, QI 12.5 QI 12.6, QI 12.7 QR 14.0, QR 19.0	CM-1-3, CM-1-4 CM-1-5, CM-1-8, CM-3-5 CM-4-5, CM-4-41 CM-5-4, CM-6-1 CM-6-2	TBD-SPJ-001
(3) ASSESSMENT			
(3)(i) Management Assessment	QR 16.0, QI 16.1	CM-1-3, CM-1-4 CM-1-5, CM-4-5 CM-7-5, CM-1	TBD-SPJ-001
(3)(ii) Independent Assessment	QR 18.0, QI 18.1	CM-1-3, CM-1-4 CM-4-5, CM-4-6 CM-6-1, CM-6-2 CM-7-5	TBD-SPJ-001

Note 1: TBDs will be replaced with applicable sections from the Building Administration Manual.

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APPENDIX A
UNIQUE REQUIREMENTS AND IMPLEMENTATION DEFICIENCIES

UNIQUE REQUIREMENTS

The unique Codes and Standards that are applicable to the Building 324 Facility are as follows: None identified.

IMPLEMENTATION DEFICIENCIES

The Building 324 Facility compliance assessment did not reveal areas requiring attention.