

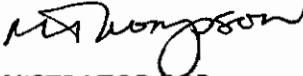


Department of Energy
National Nuclear Security Administration
Washington, DC 20585



AUG 24 2010

MEMORANDUM FOR NNSA SITE OFFICE MANAGERS
DIRECTOR, NNSA SERVICE CENTER

FROM: MICHAEL A. THOMPSON 
ASSISTANT DEPUTY ADMINISTRATOR FOR
INFRASTRUCTURE AND CONSTRUCTION
OFFICE OF DEFENSE PROGRAMS

Subject: National Nuclear Security Administration Defense Programs and
Energy Facility Contractors Group Quality Assurance Improvement
Project Task 1 (Nuclear Construction)

The National Nuclear Security Administration (NNSA) Office of Defense Programs (NA-10) and the Office of Nuclear Safety, Nuclear Operations, and Governance Reform (NA-17) has partnered with the Energy Facility Contractors Group (EFCOG) Integrated Safety Management (ISM)/Quality Assurance (QA) Group in a joint Quality Assurance Improvement Project (QAIP) to address challenges and improve performance across its operations. In order to address these challenges, a project team established Task #1 and a Focus Team to identify issues relating to the implementation of Quality Assurance Programs (QAP) for Nuclear Construction projects. This Focus Team was led by Patrick Rhoads of the Office of Construction Management Division, NA-172.2 and Kerry Grooms of BWXT Y-12. The foci of the Task #1 Nuclear Construction efforts were on the planning for and initiation of a construction QA program and on the implementation of a QA programs on actual projects. The specified goal of Task #1 was established in the QAIP:

“The end product of Focus Area #1 is a vetted, mature Criteria Review and Approach Document (CRAD) to be used in future Nuclear Construction projects’ Technical Independent Project Reviews (TIPRs) to assure that Defense Program’s expectations for nuclear construction QA are satisfied.”

The principal tasks of the Focus Team to develop the end product were reviewing the current state of implementation of QAP for nuclear projects, performing an expert elicitation process to identify known problems, performing QAP audits and surveillances to gather input, and document the lessons learned from these efforts. The end product is attached for your information and use. The CRAD will be used for future TIPRs and may be used for other QA program assessments. The salient points from the CRAD are:



- Launching a QA plan for a new project needs to be planned proactively. The planning effort demands forward-looking by the Federal Project Director to understand commercial grade dedication, vendor abilities, acquisition strategies, and selection of contractors, as examples.
- Nuclear QA-1 is the desired National Consensus Standard to apply for Nuclear Construction work.
- The federal team must develop and sustain an appropriate QA oversight capability; it is inadequate to rely solely upon contractors' QA efforts to meet QA expectations.
- QA requirements need to be flowed down to the agents who actually perform services or provide goods that become part of nuclear facilities.

If you have any questions, you can contact Mr. Samuel Johnson at (202) 586-8854.

Attachment

cc w/attachments:

D. Nichols, NA-2.1

F. Russo, NA-3.6

S. Goodrum, NA-12

P. Niedzielski-Eichner, NA-14

C. Tucker, NA-15

J. McConnell, NA-17

M. Thompson, NA-16

P. Rhoads, NA-16

M. Mistretta, NA-16

S. Johnson, NA-16

G. Udent, NA-16

T. Van Ober, NA-261

K. Grooms, EFCOG

Generic Criteria for Review of the Quality Assurance Program for Nuclear Construction for Defense Programs

By the Co-Chairs

Joint EFCOG and Defense Programs Quality Assurance Improvement Plan, Task 1

Kerry Grooms (EFCOG) and Patrick Rhoads (Defense Programs)

January 2010

These criteria were developed to augment quality assurance audits and assessments conducted in conjunction with Technical Independent Project Reviews (TIPRs) or other applicable reviews that would assess the quality assurance program associated with nuclear construction projects, especially in their planning and design stages. The criteria were devised in support of Defense Programs' efforts to improve quality assurance for nuclear construction, one of the highest priorities of the Quality Assurance Improvement Project (QAIP).¹ These criteria are the result of the joint efforts of Energy Facilities Contractors Group (EFCOG) and Defense Programs to devise a rubric for assessing the implementation of the quality assurance program for nuclear construction projects, which was one of the principal objectives assigned to Task 1 in the QAIP. There is nothing specific in the criteria that restrict their applicability just to Defense Programs projects. Furthermore, these criteria do not tie to any specific critical decision, but these criteria do focus on the planning and engineering stages of a project's life cycle. Quality assurance for the construction phase should closely follow whatever QA requirements are designated in the project ordering specifications.

There are three parts to the criteria that follow. The content for the first two parts derives from the criteria as applied by the Quality Assurance Sub-team at the Radioactive Liquid Waste Treatment Facility-Upgrade Project (RLWTF) TIPR performed November 30-December 8, 2009. At the RLWTF TIPR, the initial set of criteria was prototyped as a test case. The current presentation for Parts 1 and 2 embeds the original criteria and reflects lessons that resulted from applying the criteria at RLWTF. The content of the third part of the presentation derives from quality assurance lessons learned from recent or ongoing projects and from the survey of QA problems that was conducted by the QAIP Task 1 team. In the survey, the Task 1 team compiled inputs relating to QA for nuclear construction from an array of federal project directors, contractor project management officials, and quality assurance professionals who have been assigned to recent or ongoing nuclear projects in NNSA.

Future revisions of these criteria would be expected, based on lessons learned from applying the criteria and from lessons learned that arise in the NNSA National Security Enterprise that might arise.

¹ NNSA Defense Program and Energy Facilities Contractors Group, *Quality Assurance Improvement Project Plan*, Rev 1, Jun 26, 2009.

	Quality Assurance Criteria for Nuclear Construction
Part 1	Project Management Criteria that apply to QA
1-1	DOE O 413.3A, 5.k.(9) specifies requirements of a Project Execution Plan
1-2	DOE O 413.3A, 5.k.(10) specifies Federal Project Director responsibility and requires project QAP that address the quality requirement/elements of DOE O 414.1C and 10CFR830 Subpart A. The FPD must ensure that "appropriate aspects of Quality Assurance (are) considered during the preparation of project documents," including documents such as planning, organizational, execution and risk documents.
1-3	DOE O 413.3A, 5.m.(3) requires Integrated Project Team to ensure project interfaces are identified, defined and managed; DOE O 413.3A, 5.m.(4) identify, define and manage quality assurance requirements, DOE O 413.3A, 5.m.(7) plan and participate in project reviews, audits and appraisals.
1-4	DOE O 413.3A, Attachment, 11 requires contractor development and implementation of a QAP for scope of work requirements when contractor requirements include DOE O 414.1C and 10CFR830 Subpart A.
1-5	DOE O 414.1C and 10CFR830 Subpart A specifies QAP requirements for federal and contractors.
1-6	DOE O 414.1C and 10CFR830 Subpart A requires integration of the QAP appropriately with the safety management system.
1-7	DOE O 414.1C, 4.b.(3) and Attachment 2,3.c. specifies federal and contractor requirements for Quality Improvement.
1-8	DOE O 414.1C, 4.b.(3) and Attachment 2,4. DOE-Wide Suspect/Counterfeit Prevention Process and Attachment 3, Suspect Counterfeit Items.
Part 2	NQA-1 Criteria ASME NQA-1-2000 specifies quality assurance requirements for nuclear facility application. (A different version of NQA-1 may apply to a specific project. The 2000 Revision is used here as a template.)
2-1	ASME NQA-1-2000 Requirement 1, Organization
2-2	ASME NQA-1-2000 Requirement 2, Quality Assurance Program
2-3	ASME NQA-1-2000 Requirement 3, Design Control
2-4	ASME NQA-1-2000 Requirement 4, Procurement Document Control
2-5	ASME NQA-1-2000 Requirement 5, Instruction, Procedures and Drawings
2-6	ASME NQA-1-2000 Requirement 6, Document Control
2-7	ASME NQA-1-2000 Requirement 7, Control of Purchased Items and Services
2-8	ASME NQA-1-2000 Requirement 15, Control of Nonconforming Items
2-9	ASME NQA-1-2000 Requirement 16, Corrective Action
2-10	ASME NQA-1-2000 Requirement 17, Quality Assurance Records

2-11	ASME NQA-1-2000 Requirement 18, Audit
2-12	ASME NQA-1-2000 Subpart 2.7, Software Quality Assurance
Part 3	QA Lessons Learned from other projects (Source of lessons learned in parentheses.)
3-1	An NQA-1 program should be implemented early in the project, rather than implemented later and backfit in. (HEUMF)
3-2	The selection of contractors, such as general contractors, should be informed by the contractors' recent experience with implementing a project under an NQA-1 program, if possible. (CMRR-RLUOB)
3-3	Planning with a focus on avoiding future QA implementation problems during the execution of the project should be performed early in the project cycle. (RLWTF)
3-4	Projects should be forward-looking into planning the implementation of a commercial grade dedication program, recognizing that many items that would be required to be procured under an NQA-1 program might not be readily available on the market and recognizing that many components and services that might be procured under commercial grade dedication efforts would be procured by contractors other than the contractor who was responsible for identifying the critical attributes of the items. (RLWTF)
3-5	At the start of a project, the project team should identify what QA requirements apply and then maintain them under configuration control. If the requirements are not identified early enough, the project may need to backfit the requirements into completed work. A lack of configuration control can, and has, resulted in difficulties at project close-out, e.g., additional reviews may be required to identify the applicable requirements and activities to confirm the requirements were met. The QA plan needs to be in place, implemented through the appropriate procedures, endorsed by project management, and understood by the work force before execution of the work. In addition, if the QA requirements are not identified early and maintained appropriately, it will be difficult to flow them down to the subcontractors/ suppliers. (This lesson is closely related to 3-1) (Joint DOE-EFCOG Quality Assurance Improvement Program, QAIP)
3-6	Projects need to plan ahead on how to mitigate prospective shortages of quality QA expertise. There is a lack of expertise in the understanding, development, and implementation of nuclear QA programs. This lack of expertise extends from the federal staff down through the prime subcontractors to the lowest level of the supply chain. This is true, though to a lesser extent, within some QA organizations. The DOE oversight staff, the project/organization managers, and the subcontractor/supplier managers and staff need to thoroughly understand nuclear quality. (Joint DOE-EFCOG Quality Assurance Improvement Program, QAIP)
3-7	Due to the limited supplier base with nuclear QA programs, commercial grade dedication (CGD) is being utilized as a method to obtain items and services for use in nuclear facilities. Weaknesses have been identified not only with the subcontractor/supplier performance of CGD activities but with the prime contractors as well. These weaknesses have included identification of functional requirements, identification of critical characteristics for acceptance, identification of acceptance tests, qualification of personnel performing the tests, lot control, and documentation of CGD activities. Some of these functions, e.g., identification of functional requirements,

3-8	<p>The flow down of quality requirements to the subcontractors/suppliers must be clear and crisp. These requirements need to be based on the requirements applicable to the project and, like the project QA requirements at the prime contractor level, maintained under configuration control. A lack of configuration control can, and has, resulted in difficulties at project close-out, e.g., requiring additional reviews to identify the applicable requirements and activities to confirm the requirements were met by the subcontractors/suppliers. These requirements need to be specific to the item/activity provided (e.g., specific to the work vice sending an entire QA manual and letting subcontractor/supplier identify the applicable requirements) and implemented using a clearly understood and documented graded approach. Combined with a lack of experience/expertise in the understanding, development, and implementation of nuclear QA programs and inadequate oversight, inadequate/unclear flowdown of requirements can result in a failure of the subcontractor/supplier to meet the customer needs. Failure to meet the customer's needs typically results in cost/schedule impacts. (Joint DOE-EFCOG Quality Assurance Improvement Program, QAIP)</p>
3-9	<p>Oversight of implementation of QA program requirements needs to be well planned, based on the applicable contractual requirements, and be thorough and timely. The contracts need to ensure non-compliances will be addressed in a timely and comprehensive manner. Correction needs to be verified by the customer for significant non-compliances. This needs to be accomplished at all levels from the prime contractor down to the lowest level of the supply chain. These activities need to be documented. (Joint DOE-EFCOG Quality Assurance Improvement Program, QAIP)</p>
3-10	<p>The DOE oversight staff, the project/organization managers and staff, and the subcontractor/supplier managers and staff need to take ownership of the implementation of the QA program. The implementation of the program is the responsibility of all, not just the QA/QC organization. Personnel need to be willing, able, and encouraged by management to identify concerns. Management needs to be responsive in addressing these concerns. (Joint DOE-EFCOG Quality Assurance Improvement Program, QAIP)</p>