

WATTS BAR NUCLEAR PLANT

Q-LIST

CORRECTIVE ACTION PROGRAM PLAN

REVISION 3

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Q-LIST PROGRAM PLAN
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Q-LIST
PROGRAM PLAN

1.0 INTRODUCTION

10 CFR 50, Appendix B, requires the identification of structures, systems, and components covered by the Quality Assurance (QA) program. Watts Bar Nuclear Plant (WBN) uses a Quality Assurance List (Q-List) to meet this requirement. The WBN Final Safety Analysis Report, section 17.2.1, requires that a Q-List be developed, implemented, and maintained. Originally, WBN's design and construction organizations determined component QA classification based on design drawings and Construction Specification N3G-881 which was issued by engineering. In April of 1978, TVA's nuclear power organization issued a Critical Structures, Systems, and Components (CSSC) List for use by plant personnel in implementing the Operational QA program. In order to reduce interpretation requirements, the Office of Engineering (OE) issued a Q-List in January of 1984. This listing, which is maintained to reflect current plant design, contains both QA and non-QA components and was intended to be used by design, construction, and operations. Upon issuance of the Q-List, however, operations continued to use the CSSC List concluding that it was better suited to that organization's needs. In November 1984, a special sublisting of the Q-List, the CSSC Q-List, was issued through a coordinated effort between design and operations. Attachment 1 provides a chronology of the Q-List development.

In August of 1985, a Quality Evaluation Report and Nonconformance Report (NCR) W-269-P were issued to document problems with the Q-List. Also in 1985, five Q-List related employee concerns were initiated. Attachment 2 provides a chronology of Q-List concerns and corrective actions. Q-List problems include:

1. Motors and other equipment were not uniquely identified and were not listed on the Q-List.
2. Some component identification numbers on the Q-List are not correct.
3. The Q-List contains incorrect QA classifications.
4. The Q-List does not differentiate between safety-related and special features (Limited QA) in accordance with the Nuclear Quality Assurance Manual (NQAM).

The first problem resulted from the Q-List reflecting only those identifiers specified by the designer for design purposes rather than appropriately considering any special needs for construction, modification, maintenance, and operation. The second problem resulted from errors due to an incomplete checking process. The third problem was caused by failure to develop and control the application of criteria used for classifying components listed on the Q-List. The fourth problem was actually a conservative error since the Q-List shows a "Q" for special features. The above problems did not result in an inadequate design or inadequate QA program coverage for the design of safety-related

structures, systems, and components because the Q-List was not used as design input. However, structures, systems, and components within the scope of the QA program may have been treated as non-QA during construction, modification, and maintenance activities.

The root causes of the Q-List problems are: (1) TVA's design, construction and operations organizations utilized different approaches to identifying and/or listing the plant features that require QA program application; and (2) the existing Q-List was issued to reflect the current design without adequate review or procedural guidance to ensure completeness (to support construction, modification, maintenance, and operation) and accuracy.

The 10 CFR 50.55(e) report submitted on March 3, 1986, committed TVA to use the results of a Q-List sample review to determine the scope of corrective action to be taken. This sample review, which included component identifiers, their classification, and omissions from the Q-List, found an error rate which exceeded the acceptance criteria of one percent and the decision was made to perform a complete review.

A revised final 10 CFR 50.55(e) report was submitted September 17, 1986, which provides corrective actions for the deficiencies identified in NCR W-269-P. In actuality, the review as specified in the 50.55(e) report is being implemented by the development of a new Q-list rather than revising the existing Q-list. This approach was taken to alleviate difficulties in sorting and utilizing the existing list, in interpreting the data fields and to include additional components within the scope of the Q-list. Work on this new list was initiated in mid-1986 and is approximately thirty percent complete.

One specific corrective action taken was to delete the CSSC Q-List. As a result, since January 31, 1986, the existing Q-List has been a controlled single listing which identifies the structures, systems, and components requiring QA program application.

2.0 OBJECTIVE

The objectives of the Q-List Corrective Action Program (CAP) are as follows: (1) to more clearly and consistently identify which structures, systems, and components are required to have QA or limited QA program controls applied during the performance of design, construction, modification, operation, and maintenance; and (2) to ensure that appropriate QA program controls were applied to quality-related structures, systems, and components when they were constructed, maintained, and modified.

3.0 SCOPE

The scope of the Q-List is comprised of quality-related plant civil/structures, and the mechanical and electrical systems required for unit 1 operations. Safety-related systems found in the system list in attachment 2 of the Design Baseline and Verification Program (DBVP) CAP will be uniquely identified on the Q-List. Quality-related components in other systems and certain quality-related features will not be identified uniquely on the Q-List (e.g., cable, piping, and insulation), but will be

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addressed in the Q-List general notes. These notes will clearly identify which items will have full QA or limited QA program controls applied. It is estimated that 50,000 components will be individually listed and that 300,000 additional items will be covered by notes.

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4.0 DESCRIPTION OF PROGRAM

The corrective actions to resolve NCR W-269-P and related employee concerns are defined in this section. The following corrective actions have been completed:

1. Deleted the CSSC Q-List.
2. Prepared a calculation identifying major class 1E motors.
3. Added a clarifying note to the Q-List general notes to ensure that class 1E components associated with flow control valves are consistently identified and evaluated.
4. Revised the existing Q-List to resolve specific deficiencies defined in NCR W-269-P final 50.55(e) report.
5. Prepared a matrix which indicates the source documents for all limited QA programs utilized at WBN.

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Additional actions to be accomplished are: (1) completion and issuance of a new Q-List, (2) comparison of the new Q-List to the existing Q-List to assure that construction activities performed since January 1984, when the existing Q-List was issued, had QA program controls applied when appropriate, and (3) review of maintenance and modification records to assure that "Q" features were adequately controlled.

4.1 New Q-List Development Process

The classifications included in the new Q-List will be determined by translating current information from design output documents.

The new Q-List is being developed independent of the existing Q-List to prevent recurrence of deficiencies which resulted from using inaccurate component lists and inconsistent application of classification criteria. The major elements of the development process are shown in Attachment 3 and for a typical system are:

- a. Review the system to determine quality-related aspects.
- b. Develop a list of components depicted on issued design output drawings.
- c. Determine each component's QA classification using proceduralized criteria.
- d. System based Design Change Notices (DCN) will be initiated to issue the new Q-List and to revise other appropriate design output documents.

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4.1.1 System Selection

Watts Bar civil/structures, mechanical, and electrical systems within the scope of the DBVP will be reviewed at the system level to determine which structures and systems, or portions thereof, are to be itemized and which will be covered by notes. All safety-related systems will be itemized with the exception of the reactor protection system which will be specifically covered by a note. Systems whose safety function is containment isolation will have only that portion itemized.

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4.1.2 Development of a Component Listing

The selected system will be reviewed to determine the reference design output drawings for that system. The set of reference design output drawings will be used to establish unique identifiers. Any changes to existing identifiers or the addition of new identifiers will be marked on a working copy of the reference drawings and entered in the data base. These activities will be proceduralized. These identifiers will be coordinated with the technical support and maintenance organizations and any comments will be resolved. This will ensure that identifiers listed in the Q-List are unique and that any needed breakdown for identification purposes of packaged equipment will be appropriate to support WBN organizations.

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4.1.3 Classification of System Components

The classification process will be based on the development of classification criteria for applicable QA and limited QA programs as found in the NQAP. These criteria will be issued in a project procedure which will control the classification process. The classification criteria will be applied to the component listing developed per section 4.1.2.

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4.1.4 Issuance of the New Q-List

A package will be generated for each system during the component identification process which will contain marked-up system drawings and computer printouts which identify system components. This information together with component classification package will form the basis of a system DCN Modification Package which will contain reference drawings, new Q-List, and deletion of the existing Q-list. TVA will assure through administrative controls that the Q-List will be used on a continuing basis.

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4.2 Verification of Construction

Each system's new component classification information will be compared to the existing Q-List information on a system by system basis. Differences in component classification will be identified, tracked as open items, and when appropriate, conditions adverse to quality (CAQ) will be documented. Any necessary inspection, testing, or rework will be identified and performed.

4.3 Review of Maintenance and Modification Activities

Maintenance and modification records will be reviewed against the new Q-list to identify instances of structures, systems, and components being treated incorrectly as non-QA. Each item will be identified, tracked as an open item, and when appropriate, documented with a CAQ. Any necessary inspection, testing, or rework will be identified and performed.

4.4 Recurrence Control

To prevent recurrence of problems with the Q-List, TVA will: (1) use one Q-List for design, construction, modification, maintenance and operation to identify which structures and components require QA program application; and (2) develop procedures to issue a new Q-List that is complete, accurate, and supports the needs of all WBN organizations. The Q-List will be controlled through the design change process to ensure continued completeness and accuracy.

5.0 PROGRAM INTERFACES

Coordination has been planned between the Q-List and several other Watts Bar Nuclear Plants (WBN) special programs. The Replacement Items Program uses the component identifiers and safety classifications provided by the Q-List. The Equipment Seismic Qualification Program will use the new Q-List as a means of verifying the accuracy of the seismic equipment list.

The Q-List Program will interface with the 10 CFR 50.49 Environmental Qualification (EQ) Program by indicating which components are within the scope of the EQ Program. The Vendor Information Program will use the Q-List to determine which equipment requires approved vendor information.

6.0 PROGRAM IMPLEMENTATION

Nuclear Engineering (NE) will act as the WBN lead organization in implementing the Q-List CAP. A work package engineer is responsible for coordinating activities within TVA and for interfacing with contractors as appropriate. Nuclear Power will compare the new Q-List to the review of maintenance and modification records. The procedures for the identification and classification of components and the comparison tasks will be reviewed and agreed upon by the affected WBN organizations in order to assure that coordinated methods are established for these activities. Corrective actions for the Q-List will be completed prior to fuel load.

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7.0 PROGRAM DOCUMENTATION

The Q-List CAP, as a whole, will be both documented and controlled by Watts Bar Engineering Project (WBEP) - Engineering Procedure WBEP-5.18, "Preparation and Maintenance of Watts Bar Q-List." The individual steps necessary to complete the corrective actions will be performed in accordance with applicable standards and procedures. Likewise, actions performed by operations and construction will be governed by administrative instructions and construction engineering procedures, respectively.

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Discrepancies identified during either the comparison of the new and existing Q-List or the review of maintenance and modification activities will be evaluated to determine if there is a CAQ and, if so, controlled through the CAQ process.

Q-List program completion will be documented by a Q-List CAP final report which will document program results with respect to the objectives stated in section 2.0.

8.0 CONCLUSIONS

Completing the Q-List Program will:

- (1) Implement the corrective actions for NCR W-269-P as stated in the revised final 10 CFR 50.55(e) report.
- (2) Define the scope of QA program application for design, construction, modification, operations, and maintenance activities at WBN.
- (3) Identify discrepancies in the existing Q-List and verify that quality-related features have been constructed, modified, and maintained with appropriate QA program controls applied.

Attachment 1
Q-LIST DEVELOPMENT CHRONOLOGY

- 1973 Design and construction organizations use design drawings and Construction Specification N3G-881 to determine QA levels prior to 1984.
- 1978, April Nuclear Power (NUC PR) issues CSSC List for plant use in applying operational QA program.
- 1984, Jan. Engineering Design (EN DES, not NE) issues WBN Q-List for use by all organizations, but NUC PR continues use of CSSC List.
- 1984, Nov. Office of Engineering (OE, now NE) issues special sublisting of Q-List called CSSC Q-List.
- 1985, Jan. NUC PR issues AI-7.6 providing for use of CSSC Q-List in lieu of CSSC List. Discrepancies between these two lists become evident and investigations begin (see attachment 2).
- 1985, July WBN CSSC List deleted from Nuclear Quality Assurance Manual (NQAM), Appendix A.
- 1985, Aug. TVA issues Nonconformance Report (NCR) W-269-P documenting Q-List and CSSC Q-List problems.
- 1985, Oct. TVA reports NCR W-269-P to NRC in accordance with 10 CFR 50.55(e).
- 1985, Dec. TVA interim 10 CFR 50.55(e) report issued to NRC on W-269-P.
- 1986, Jan. As partial resolution of NCR W-269-P, NUC PR revised AI-7.6 to delete CSSC Q-List, implementing entire Q-List.
- 1986, March TVA final 10 CFR 50.55(e) report issued to NRC on NCR W-269-P.
- 1986, Sept. TVA issues revised final 10 CFR 50.55(e) report to NRC on NCR W-269-P.

Attachment 2
CHRONOLOGY OF Q-LIST CONCERNS AND CORRECTIVE ACTIONS

1985, Jan. Q-List review initiated by plant QA staff to investigate alleged discrepancies.

1985, July TVA receives Employee Concern IN-85-688-003.

1985, Aug. TVA receives Employee Concern IN-85-407-001, IN-86-087-004 and IN-86-090-001.

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Quality Evaluation Report QE-85-09 issued documenting discrepancies between CSSC list and CSSC Q-List.

WB-CAR-85-45 issued to require NUC PR action on certain CSSC Q-List discrepancies.

NCR W-269-P issued to document programmatic and specific Q-List discrepancies.

1985, Sept. NCR WBN 6326 issued documenting incorrect component classifications for temperature elements on centrifugal charging pumps.

1985, Oct. NSRS Investigation Report No. I-85-422-WBN issued documenting review of employee concerns.

NCR W-269-P, R1, issued to expand detail of the identified Q-List discrepancies.

1985, Nov. TVA receives Employee Concern IN-86-095-002.

1986, Feb. WB-CAR-85-45 corrective action completed and CAR closed.

NCR WBN 6695 issued to document discrepancies between the Q-List and Construction Specification N3G-881 (NCR W-504-P issued Oct., 1986, and NCR W-504-PS issued Jan., 1987 for same discrepancies).

1986, May Problem Identification Report (PIR) WBNMEB8653 issued to document incorrect component classification information for system 47 instrumentation.

1988, Feb. Condition Adverse to Quality Report (CAQR) WBP880095 issued to document omission of various instrument panels from Q-List.

1988, Oct. Q-List Corrective Action Program Plan Revision 1 issued.

1989, Nov. Q-List Corrective Action Program Plan Revision 2 issued

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ATTACHMENT 3

Q-LIST DEVELOPMENT FLOWCHART

