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April 24, 2003

U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001
ATTENTION: Document Control Desk

Subject: Duke Energy Corporation
Oconee Nuclear Station, Units 1, 2, and 3
Docket Nos. 50-269, 50-270, 50-287
McGuire Nuclear Station, Units 1 and 2
Docket Nos. 50-369, 50-370
Catawba Nuclear Station, Units 1 and 2
Docket Nos. 50-413, 50-414
Duke Energy Topical Report, Duke -1-A, Amendment 32
Response to Request for Additional Information Letter Dated April 4, 2003

By letter dated December 18, 2002 Duke Energy Corporation (Duke) submitted amendment number 32 to its Duke Energy Topical Report, Duke -1-A, on the Quality Assurance (QA) Program for the Oconee, McGuire, and Catawba Nuclear Stations. On April 4, 2003, the NRC requested additional information concerning the subject amendment.

Duke's response to the Request for Additional Information is provided as an enclosure to this letter.

If you have any questions, please contact M. T. Cash at 704 382-5826 or J. M. Frye at 704 382-5116 (E mail: jmfrye@duke-energy.com)

Very truly yours,

W. R. McCollum
Senior Vice President
Nuclear Support

Enclosure

A001

xc:

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W. R. McCollum, affirms that he is the person who subscribed his name to the foregoing statement, and that all the matters and facts set forth herein are true and correct to the best of his knowledge.

W. R. McCollum, Senior Vice President

Subscribed and sworn to me: April 24, 2003
Date

Notary Public

My Commission Expires: JAN 22, 2006
Date

SEAL

bxc:
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NRIA File/ELL
ONS Master File – ON03DM (File OS 801.01)
MNS Master File – MG01DM
CNS Master File – CN01DM

Duke Nuclear Assurance Program Amendment 32, submitted by letter dated December 18, 2002

Request for Additional Information (RAI)

1. Discuss examples of activities that are representative of the types of maintenance covered by "routine maintenance."

RESPONSE:

The activities representative of "routine maintenance" are those day to day plant activities that are required to maintain components and systems to specified design limits. These include preventive maintenance work orders as well as certain corrective maintenance work orders.

The technical procedures that govern these activities frequently include QC Hold/Inspection steps to inspect or verify attributes such as the ones listed below:

- Torque/tightness
- Component cleanliness
- Component wear and degradation
- Terminating electrical leads
- Installing fuses
- Reconnecting electrical plugs
- Installing circuit cards
- Replacing like for like parts (non code items)

Under the proposed inspection methodology, operational activities that are identified as "routine maintenance" would no longer be supported through the traditional QC Hold/Inspection point process. These activities would fall within the category of activities that are candidates for process monitoring.

a. Provide more clarification of the definition of "routine maintenance."

Routine Maintenance- The maintenance activities required to preserve or restore plant structures, systems, and components (SSC) to their approved original design configuration. Refer to: [4].

The following activities are **NOT** considered routine maintenance:

ASME Section XI Code activities:

-Repair or replacement activities on ISI Class A components > 1inch NPS.
-Repair or replacement activities on ISI Class B bolting >2 inch diameter.
-Repair or replacement activities on ISI Class A, B, or C Support/Restraints on piping >1inch NPS

Special Processes:

-Welding
-Heat Treating
-NDE
-Crimping/Taping/Raychem on connections >600 volts

Civil Activities:

-Concrete
-Grout
-Soils
-Coatings
-Structural Steel

Modifications:

-Minor Modification (MM)
-Nuclear Station Modification (NSM)
-Temporary Modification (TM)

b. Provide additional reference to industry guides and standards used to develop the definition and how this definition is implemented in Duke administrative and maintenance procedures.

The definition was developed by identifying the distinction between operational (routine maintenance) and construction activities (nonroutine maintenance). This distinction is recommended in ANSI N18.7-1976 (1. Scope). Many of the frequently performed instrumentation and electrical maintenance activities as well as mechanical maintenance activities are routine operational activities. The significance of this definition is that it promotes upfront planning to ensure that the QC inspection methodology is appropriate for the activity.

The definition of routine maintenance is implemented in the QA procedures that describe the process monitoring program. Refer to: [1] and [4]

The definition is implemented in the Work Process Manual for the purpose of properly determining the level of QC involvement. Implementation details that are specific to the activity or component (e.g. QA Condition, ISI Class, Tech Spec Related, etc.) are provided with the task determination details in the Work Management System. Refer to: [2] and [3]

The maintenance (MP) and instrumentation procedures (IP) do not include a definition for routine maintenance since a procedure may be used in several applications.

c. Does "routine maintenance" apply only to preventive maintenance?

No. Routine maintenance may also include corrective maintenance activities that are conducted within the original design basis.

2. List the industry standards and regulatory guides that establish the policy that Duke currently applies to establishment of hold points.

RESPONSE:

Regulatory Guide 1.30 Rev (0) (Electrical)
Incorporates ANSI N45.2.4 -1972

Regulatory Guide 1.33 Rev (2) (QA Program Requirements)
Incorporates ANSI N18.7 - 1976/ANS 3.2

Regulatory Guide 1.37 Rev (0) (Cleaning Fluid Systems)
Incorporates ANSI N45.2.1 -1973

Regulatory Guide 1.39 Rev (2) (Housekeeping)
Incorporates ANSI N45.2.3

Regulatory Guide 1.54 Rev (0) (Coatings)

Regulatory Guide 1.94 Rev (1) (Concrete and Structural Steel)
Incorporates ANSI N45.2.5 -1974

Regulatory Guide 1.116 Rev (0-R) (Mechanical)
Incorporates ANSI N45.2.8 - 1975

3. Discuss in more detail how the selection process for the proposed inspection methodology will determine 1) safety significance/ importance to safety and 2) performance-based trending.

RESPONSE:

The safety significance/ importance to safety is based on the pre-determined QA Condition and special emphasis codes that are added to the work order task. Examples of special emphasis codes are shown in the table below:

Tech Spec - (TS)	An activity or task that results in entering a Tech Spec/Station License Commitment Action Statement or directly affects a TS/SLC component.
Component Mispositioning - (CM)	An activity that carries additional risk of component mispositioning (wrong unit/wrong train errors)or inadvertent system actuation.
Multiple Groups - (MG)	An activity that requires additional oversight because of multi-group coordination, e.g., Containment/Annulus entries.
Radiological Health - (RH)	An activity that warrants increased awareness of Radiation Protection work practices.
PRA - (PR)	An activity that results in some increased level of nuclear safety risk, i.e., results in a PRA matrix entry.
Continuous Coverage - (CC)	An activity that is determined by station management to warrant continuous coverage by the execution team(s) and any support groups until work is complete. Work that is deemed (CC) requires that turnovers be conducted at the job site, breaks be minimized, handoffs between crews and other groups be well coordinated, and delays in returning the component to service be minimized. All appropriate actions shall be taken to minimize the total time that the equipment is out of service. (ref. section 601.6.5.5)
Unqualified Worker - (UW)	An activity that warrants increased supervisory oversight due to worker qualifications, e.g., contract workers, unqualified workers, procedure concerns.

Special emphasis codes will aid the QA Team Leaders in their selection of routine maintenance activities for process monitoring.

The process monitoring selection criteria also considers information from QC inspection reports, condition reports, industry operating experience reports, and specific line management requests.

4. Will the proposed inspection methodology be based on existing industry or consensus standards or regulatory guides?

RESPONSE:

The proposed inspection methodology will continue to use the existing industry standards for both construction and operational activities. The proposed change will only affect the method and frequency of *independent* inspections associated with operational activities. The maintenance procedures that govern both construction and operational activities include worker sign offs for interim examinations, checks, inspections, and verifications. The decision to independently monitor selected operational activities versus independently witnessing each predetermined inspection step is consistent with the philosophy that the individual worker and work group is the primary level for achieving and verifying quality.

Examinations, inspections, and verifications associated with construction activities will continue to use inspection hold points. These hold points are incorporated into the body of the maintenance procedures.

5. Provide a discussion of how the maintenance program will transition from the current methods for establishing hold points to the new risk-informed, performance-based methods. Include proposed text for inclusion in the Topical Report summarizing this commitment. What is the expected timeline for transition to the proposed inspection methodology?

RESPONSE:

Hold points are currently established in thousands of the maintenance procedures. The hold points were incorporated in the maintenance procedures based on the most conservative application, i.e. maintenance associated with construction activities. The QC hold points will remain in the maintenance procedures but will only apply when the work activity is considered a construction activity. The level of QC involvement with the work task will be determined when the work activity is planned. Refer to: [2]

The transition to the proposed inspection methodology is needed to reduce the maintenance group's dependence on QC for assuring quality and to challenge the QC inspection group to take an active role in monitoring plant performance issues.

Once the proposed inspection methodology has been approved, QC inspection personnel and maintenance personnel will receive formal training to implement the revised quality assurance procedures. Following training, the revised inspection program will be implemented at each site. Refer to: [5]

Proposed Training

Training Description	Delivery Method	Target Date/ Status
Quality Process Monitoring Communication Package Delivery	Reading Package	All Locations: 6/3/03
Quality Process Monitoring QC Inspector Training	Classroom	MNS- 6/11/03 ONS- 7/16/03 CNS- 8/20/03
Quality Process Monitoring Maintenance Training	Classroom	MNS- 7/07/03 ONS- 8/04/03 CNS- 9/02/03

6. Will the proposed inspection method incorporate equipment performance standards that represent a feedback loop? For example, will the methodology be based on a set of minimal performance measures in determining the transition to the new inspection framework? Conversely, is there an established threshold recognizing declining performance and a need to return to the previous methodology?

RESPONSE:

Declining equipment performance is monitored through the corrective action program.

The transition to the new inspection framework, as discussed in #4, will only impact the method and frequency of *independent* inspections and verifications. Process monitoring will allow the inspection group to increase their focus on activities that contribute to declining performance and decrease their focus on activities that are frequently performed successfully.

The planning section for process monitoring includes a Performance/Inspection History section that places emphasis on activities that have been linked to equipment failure. Refer to: [4]

7. Provide the administrative procedures that would be used to implement the new inspection methodology and the procedures that would be used to ensure that inspectors are qualified to implement and execute the new inspection methodology.

RESPONSE:

Note: Applies to questions 5 and 7

Personnel training and qualification are addressed in the QA Topical Section 17.3.1.5.

Note: Applies to Attachments

For the ease of the reviewer, the listed attachments do not contain the entire document. Only the pages that are considered relevant to these questions are included.

Attachments:

[1] NSD 601 Quality Control Inspections (Page 1-4)
[2] WPM 500 Planning (Page 17, 25-27, 39)
[3] WPM 700 Execute the Workplan (Page 5)
[4] QAM-3 Quality Process Monitoring (Page 1-13)
[5] QC Inspection Process; Quality Process Monitoring; Student Handout (Page 1-16)

[1] NSD 602 Quality Control Inspections (Page 1-4)

This Directive describes the responsibilities and processes required to implement the Duke Power Company Quality Control inspection program.

601. QUALITY CONTROL INSPECTIONS

601.1 INTRODUCTION

10CFR50, Appendix B - "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants" defines Quality Assurance as "all those planned and systematic actions necessary to provide adequate confidence that a structure, system or component will perform satisfactorily in service." Appendix B also defines principles that, when implemented as an integral part of nuclear activities, provide the necessary confidence that quality expectations have been met. It should be noted that Quality Assurance encompasses all groups who perform activities affecting the Duke Nuclear stations and goes beyond any single group or department. Quality is an interdisciplinary responsibility that is attained through individual effort, teamwork, processes, and programs implemented in accordance with these principles.

601.2 PURPOSE

The purpose of this Directive is to describe the responsibilities and processes required to implement the Duke Power Company Quality Control inspection program.

601.3 APPLICABILITY

This Directive applies to QA Condition 1 portions of the plant but may also be optionally applied to other selected items necessary for reliable operation.

601.4 REFERENCES

DUKE ENERGY CORPORATION TOPICAL REPORT QUALITY ASSURANCE PROGRAM

ANS N45.2-1971- Quality Assurance Program Requirements for Nuclear Power Plants

ANSI N18.7-1976 - Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants

ANSI N45.2.6-1978 - Qualifications of Inspection, Examination, and Testing Personnel for Nuclear Power Plants

SNT-TC-1A-1984 & 1996- Personnel Qualification and Certification in Nondestructive Testing

ANSI/SNT-CP-189- 1991- ASNT Standard for Qualification and Certification of Non-destructive Testing Personnel

NSD 208 Problem Investigation Process (PIP)

NSD 300 ASME Section XI Program

NSD 301 Nuclear Station Modifications

NSD 302 Nuclear Procurement Program

NSD 400 Nuclear Generation Welding Program

NSD 603 Special Processes

NSD 604 Stop Work

NSD 701 Records Management

NSD 702 Document Management

NSD 704 Technical Procedure Use and Adherence

ASME Section XI Functional Area Manual

Nuclear Policy Manual, Volume 1

Nuclear Inspection Program Manual

Nondestructive Examination Manual

Nuclear Coatings Manual
Nuclear Supply Chain Process Manual
Work Process Manual
PIP G-02-00051

601.5 DEFINITIONS

Inspection - A phase of quality control which by means of examination, observation or measurement determines the conformance of materials, supplies, components, parts, appurtenances, systems, processes or structures to predetermined quality requirements.

Quality Assurance Requirements - Those inspection, test, examination, certification and documentation requirements which are imposed to provide objective evidence of the conformance of an item or activity to established design, engineering, standards, and code requirements.

Quality Control (QC) - Those quality assurance actions which provide a means to control and measure the physical characteristics of an item, process or facility to established requirements.

Quality Control Inspector (Inspector) - Any individual certified to the requirements of ANSI N45.2.6, SNT-TC-1A, or ANSI/SNT-CP-189 who performs required inspections, tests or examinations.

Quality Process Monitoring (Process Monitoring) - An assessment technique which uses observation or monitoring to provide confidence that ongoing processes and activities are adequately and effectively performed.

Verification - An act of confirming, substantiating and assuring that an activity or condition has been implemented in conformance with specified requirements.

601.6 RESPONSIBILITIES

601.6.1 NUCLEAR STATION, WORK CONTROL/EXECUTION SUPPORT/QA/QC

The Nuclear Station, Work Control/Execution Support QA/QC Group is responsible for:

- Reviewing station work control procedures/documents for the application of inspection points
- Performing/Documenting inspection points
- Selecting activities that qualify for Quality Process Monitoring
- Performing/Documenting Quality Process Monitoring

601.6.2 NUCLEAR GENERAL OFFICE, NUCLEAR PERFORMANCE ASSESSMENT SECTION/QUALITY ASSURANCE SINGLE POINT OF CONTACT (SPOC)

The QA SPOC is the first point of reference for quality assurance program issues, clarifications, and interpretations.

601.6.3 NUCLEAR GENERAL OFFICE, WORK CONTROL/QA TECHNICAL SERVICES

QA Technical Services (QATS) is responsible for providing oversight and support to assure that the Duke Power Company Quality Control program and the Nondestructive (NDE) Evaluation program meet the requirements of applicable codes and standards.

601.6.4 NUCLEAR GENERAL OFFICE, WORK CONTROL /INSPECTION AND WELDING SERVICES (IWS)

The Inspection and Welding Services (IWS) team is responsible for providing qualified inspection and technical services to each of the nuclear sites and other department or groups as appropriate.

601.6.5 VENDOR/CONTRACTOR EXAMINATIONS

Eddy current examinations will be performed and documented by a vendor/contractor as determined by NGD.

601.6.6 NUCLEAR SUPPLY CHAIN

The Nuclear Supply Chain is responsible for performing and documenting receipt inspection of QA Condition materials and for documenting and performing or arranging for receipt testing. The Nuclear Supply Chain Process Manual provides instruction for receipt of QA Condition Materials.

601.6.7 NUCLEAR STATION ENGINEERING

The Nuclear Station Engineering Division is responsible for the maintenance and retention of inspection records.

601.7 ORGANIZATION

Duke's organization reflects the concept of quality assurance as an interdisciplinary function involving various functional responsibilities. The organizational structure is such that:

(1) The attainment of quality assurance program objectives is accomplished by those assigned the responsibility for performing the activity. This includes interim examinations, checks, and inspections of the work by the individual performing the work.

(2) The verification of conformance to established quality assurance program requirements is assigned to qualified personnel independent of the responsibility for performance or direct supervision of the activity. The method and extent of verification is commensurate with the activities importance to safety.

The codes and standards referenced in this directive establish an expectation that the inspection function is an independent activity carried out by qualified personnel. Duke strengthens this independence as an NRC approved requirement through the QA Topical Report. Functional independence is maintained between production personnel and inspection personnel. Functional independence includes the first line supervisor responsible for QC inspectors.

601.8 INSPECTIONS/ EXAMINATIONS/ OBSERVATIONS

Quality Control inspections, examinations, and observations are performed on selected QA Condition items to ensure the conformance of materials, parts, components, equipment, systems, processes, or structures to predetermined requirements. Inspection requirements and acceptance criteria are obtained from applicable codes, standards, and design documents. Inspection categories, the characteristics subject to inspection, inspection methods, qualifications, and certifications are described in the Nuclear Inspection Program Manual (NIPM), Nondestructive Examination Manual (NDE Manual), and the Nuclear Supply Chain Process Manual.

601.8.1 INSPECTION OF QA CONDITION WORK ACTIVITIES

ANSI N18.7 requires that modifications and nonroutine maintenance activities be inspected in a manner similar (frequency, type, and personnel performing inspections) to that associated with construction phase activities. This requirement is satisfied by applying in-line inspection points to the work controlling document.

601.8.2 PROCESS MONITORING OF ROUTINE QA CONDITION WORK ACTIVITIES

A significant portion of maintenance activities occurring during the operations phase are routine. These activities, although important, do not justify the same level of quality controls as nonroutine maintenance and modifications. Process monitoring allows QA/QC to screen and select maintenance activities for monitoring versus having to support the activity through in-line inspection points. The selection process considers factors such as safety significance, complexity, and performance history.

601.9 PROBLEM IDENTIFICATION AND CORRECTIVE ACTION

NSD 208 Problem Investigation Process (PIP) describes the formal corrective action program which facilitates the prioritization, evaluation, and correction of conditions adverse to quality, as defined by 10CFR Part 50, Appendix B.

601.10 AUTHORITY TO STOP UNSATISFACTORY WORK

NSD 604 Stop Work describes the formal process to be used by any Duke employee to stop and prevent further processing of work. This directive is to be used only when conditions exist that cause an immediate adverse affect on quality and the personnel responsible for the execution of work do not take proper corrective actions as indicated in NSD 208.

601.11 DOCUMENTATION

Inspections, examinations, and observations are documented on the work controlling document or on forms that specifically address the activity.
Documentation of inspections shall be identifiable and retrievable, and shall be retained as specified in NSD 701, "Records Management" and NSD 702, "Document Management".

[2] WPM 500 Planning (Page17, 25-27, 39)

This directive provides an overall description of the Work Order and associated Work Order Tasks under the Work Management System. It defines responsibilities for planning maintenance and modification activities and provides the necessary guidance on how this shall be accomplished.

QC REQUIRED - The task planner will enter an H, N or P to indicate the level of QC involvement. The planner shall make the determinations using the guidelines in the QC Determinations attachment. Anytime the planner is unsure if QC is needed he/she should call the station QA Technical Support group to have them make this determination.

~~QC REQUIRED - The task planner will enter a "Y" or "N" to indicate whether a QA inspection is required. The planner shall make the determinations using the guidelines in the appropriate attachment. If the task has the possibility of needing QC due to procedure sign-offs, the planner should enter a "Y". Anytime the planner is unsure if QC is needed he/she should call the QC group to have them make this determination.~~

DUKE CLASS, ISI CLASS - These determinations will be made after reviewing the appropriate flow diagrams, design drawings and documents for all QA1 valves and pipes, otherwise it may be left blank. If these avenues are not helpful, Engineering shall be contacted for the appropriate determinations. (For Modifications contact the Implementation Accountable). This field is populated by task planner, if applicable.

ANI - The task planner shall leave this blank and allow the execution procedure/directive to determine when ANI is needed.

SIZE - The size of valves and piping should be entered.

PLANT CONDITION - This field shall be determined by the appropriate scheduling function.

CLEAN ZONE - The task planner shall ensure the appropriate cleanliness level is listed per applicable directives/procedures. Note: The FME Standard shall be documented on R217 referencing, the Standard "NSD104/FME" and the Standard Description, Ref Pre-Job Briefing & FME Exec Std Pln. Additional Cleanliness/FME requirements may be specified in the work plan.

ENCLOSED/CONFINED SPACE - The task planner shall indicate with a "Y" or "N" if these are applicable after contacting Safety or after completing a field visit.

SCAFFOLD/INSULATION - Not required at this time.

REWORK - A "Y" in this space designates that the work described in this work order task is considered rework as defined in section 500.5.2.8.

CONTROL ROOM IND - A "Y" in this space designates that the equipment effects control room indication. A "N" in this space designates that the equipment does not effect control room indication. This field is initially populated by the the appropriate scheduling function and verified by the task planner as work tasks are developed. In

Attachment 1
Page 1 of 3

QC Determinations on QA Condition Work Orders

The purpose of the QC Determination Tables is to assist the planners in determining the level of QC involvement in maintenance activities. The tables indicate QC P when the activity is routine maintenance, QC H for activities other than routine maintenance, and QC N for no QC involvement. If the planner has questions or the scope is not clearly covered in these guidelines they should contact a QA representative for further guidance.

Definitions:

Quality Process Monitoring - Monitoring or direct observation by a QC inspector to verify whether an item or activity conforms to specified requirements.

QC H - Activity is associated with ASME Code requirements, special processes, modifications, construction type tasks, etc. QC Hold Points are required to be performed as applicable.

QC N - QC Hold Points are not applicable.

QC P - Activity is associated with routine maintenance. QC hold points are not applicable; however, maintenance activity is a candidate for quality process monitoring.

QC Determination Tables

NUCLEAR STATION MODIFICATIONS	QA Condition				
	1	2	3	4	5
All types of Modifications	H	H	H	H	H

Mechanical Valves:	QA Condition				
	1	2	3	4	5
Repair/Replacement - *ISI Class A >1" pipe size	H	N	N	N	N
Repair/Replacement - ISI Class B when bolting is > 2" diameter.	H	N	N	N	N
Repair/Replacement - ISI Class B or C when bolting is ≤ 2" diameter.	P	N	N	N	N
Repair/Replacement - All other Duke Classes	P	P	P	P	P
Packing	P	P	P	P	P
Hand-wheels	P	P	P	P	P
Operators: Disassemble/Reassemble	P	P	P	P	P
Repair/Replacement	P	P	P	P	P
Pumps Repair/Replacement - ISI Class A >1" pipe size	H	N	N	N	N
Repair/Replacement - ISI Class B when bolting is > 2"diameter.	H	N	N	N	N
Repair/Replacement - ISI Class B or C when bolting is ≤ 2" diameter.	P	N	N	N	N
Repair/Replacement - All other Duke Classes	P	P	P	P	P
Lubrication	P	P	P	P	P
Vibration Monitoring	P	P	P	P	P
Support / Restraints Disassemble/Reassemble	P	P	P	P	P
Repair/Replacement - ISI Class A, B, and C >1" pipe size	H	N	N	N	N
Repair/Replacement - All other Duke Classes	P	P	P	P	P
Visual and freedom of movement inspections only	P	N	N	N	N
Flange/ Manway Connections Remove and Reinstall - ISI Class A >1" pipe size	H	N	N	N	N
Remove and Reinstall - ISI Class B when bolting is > 2" diameter.	H	N	N	N	N
Remove and Reinstall - ISI Class B or C when bolting is ≤ 2" diameter.	P	N	N	N	N
Remove and Reinstall - All other Duke Classes	P	N	N	N	N
Equipment Repair/Replacement - ISI Class A >1" pipe size	H	N	N	N	N
Repair/Replacement - ISI Class B when bolting is > 2" diameter.	H	N	N	N	N
Repair/Replacement - ISI Class B or C when bolting is ≤ 2" diameter.	P	N	N	N	N
Repair/Replacement - All other Duke Classes (including motors)	P	P	P	P	P
Threaded Piping	P	N	N	N	N
Hydros -Inservice Leak Test	H	P	P	P	N
HVAC Disassemble/Reassemble	P	N	N	N	N
Remove and Reinstall	P	N	N	N	N

*Note: The ISI Class at Catawba and McGuire are determined by the Duke Class (e.g. Duke Class A- ISI Class 1; Duke Class B- ISI Class 2 and Duke Class C- ISI Class 3). The ISI Class at Oconee is determined by engineering and specified on flow diagrams.

IAE	QA Condition				
	1	2	3	4	5
Investigate/Repair/Corrective	P	P	P	P	P
Calibration Work	P	P	P	P	N
Replacement of QA Parts	P	P	P	P	P
Crimping/Taping/Raychem on wiring ≤ 600 volts	P	P	P	P	N
Crimping/Taping/Raychem on wiring > 600 volts	H	P	P	P	N
Cable Separation	P	P	P	P	N

WELDING	QA Condition				
	1	2	3	4	Non-QA
Pressure Retaining Welds	H	H	H	H	H
Piping/Components/Tubing/Base Metal Repair	H	H	H	H	H
Structural Steel/ Miscellaneous Steel	H	H	H	H	H

CIVIL	QA Condition			
	1	2	3	4
Structural Steel/Misc. Steel	H	P	P	P
Concrete Anchors	H	P	P	H
Firestops (Complete Replacement)	H	P	P	P
Firestops Repair - Oconee Only	H	P	H	P
Repairs to Concrete	H	H	H	H
Coatings - service level must be determined regardless of QA Condition.	Service Level			
	I	II	III	IV
	H	*H	H	P

* Note: Applies to coatings on containment on the annulus side at Catawba and McGuire Only.

Fac: __ Un: __ Equip: ___ __ _____ Comp: ___ __ _____ Wrk Item: ___ _____ UTC: _____ Train: ___	TASK TYPE: _____ __

Date Created: __/__/__ Page: 2

SECTION I - ORIGINATION ____ Additional Sheets

Originator: _____

Orig Section : _____
ID Tag Placed (Y/N) : _____

Critical Task (Y/N) : _____ Equipment List: _____

Problem Statement: _____

Failure Description: _____

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SECTION II - DETERMINATIONS & PROCEDURES ____ Additional Sheets

Tech Spec Item: ____ Tech Spec Expiration Date: _____ Time: _____ Tech Spec Related : ____
QA Cond : ___ _____ Confined Space : ____
Funct : ___ _____ Enclosed : ____
Retest : ___ _____ NPRDS Related : ____
ALARA : ___ _____ Rework : ____
RWP/SRWP : ___ _____ RWP/SRWP# _____ IRW: ____
Red Tag : ___ _____ From: _____ To: _____ Cleared: _____
QA Reqd : ___ _____
ANI : ___ _____ SSPS : ___ Duke Class : ____
Clean Zone : ___ _____ 7300 : ___ ISI Class : ____
EQ Item: ___ Active: ___ Size : _____
Scaffolding Req: ___ Insulation Removal Req: ___ Control Room Inst: ___ ES Related : ____
Block Tag Out: _____ PMT Block: _____ OOC : ____
Safety Stmt./ _____
Special Inst: _____

Procedures / Standards

_____ _____ _____ By _____

Planner Review And Approval _____ Date: _____

[3] WPM 700 Execute the Workplan (Page 5)

The purpose of this directive is to provide consistent guidelines for execution of work at the three Nuclear Sites. General actions required for performance of work tasks are included along with guidance relating to WMS and Work Order Task package usage. This directive only addresses work execution. It does not include Planning, Scheduling, or Work Order Task Close-out.

Technician reviews WMS R214 to determine the level of QC involvement. QC involvement with the task is indicated as follows:

- QC H - QC Hold Points are required to be performed as applicable.
- QC N - QC Hold Points are not applicable.
- QC P - QC Hold points are not applicable; however, maintenance activity is a candidate for quality process monitoring.

Technician makes appropriate contacts and interfaces with groups necessary for performing task.

Technician obtains tooling and materials necessary for performing task. Special tooling and required materials may have been identified and reserved during the Planning process. If materials or parts will be needed for the task, a paper work order package or a copy of the Materials Request should be printed if not already available.

Technician shall perform "Correct Component Verification" in accordance with NSD-700, INDEPENDENT VERIFICATION, and document Double Verification on the Work Order Task Action Taken Details. At management's discretion, double verification (second verification) for Correct Component Verification may be marked "Not Applicable" (N/A) if the task does not meet any of the following criteria:

a. Removal from and restoration to operability of all systems or components which affect the ability of a system to perform a safety related function.
b. Systems and equipment which if improperly aligned, could result in release of radioactive liquids or gases from the site.
c. Valves, breakers and other components in fire protection system major flow paths, including:
   - Fire fighting water supply and storage.
   - Halon and carbon dioxide storage systems.
   - Fire detection systems.
   - Components necessary for system to function and supply extinguishing media to the fire.
d. Other components/systems for which IV or component identification is desirable during or prior to beginning work on the component. (*This would typically include components/systems where a task may be performed in high personnel safety or error likely situations, have high unit trip potential, or have high significance for other reasons.*)

If the Correct Component Verification is included in a procedure utilized to perform the task it is appropriate to reference the procedure for the CCV documentation in the Action Taken Details by one of the examples below. The technician will have available the appropriate procedure, a printed copy of the task

[4] QAM-3 Quality Process Monitoring (Page 1-13)

The purpose of this procedure is to provide a method for QA/QC to conduct in-field process monitoring. The purpose of process monitoring is to observe activities that will assist management in evaluating the performance of maintenance activities and the effectiveness of management controls and programs.

Table of Contents

1.0 Purpose

The purpose of this procedure is to provide a method for QA/QC to conduct in-field process monitoring. The purpose of process monitoring is to observe activities that will assist management in evaluating the performance of maintenance activities and the effectiveness of management controls and programs.

2.0 Scope and Applicability

Process monitoring is used primarily to monitor routine maintenance activities.

Process monitoring of maintenance activities by QC is not intended to dilute or replace the clear responsibility of first-line supervisors for the quality of work performed under their supervision.

QC Hold or Inspection Points are the primary method of verifying the quality of modifications, non-routine maintenance, special processes, and ASME Code activities.

2.1 Document References

- 2.1.1 ANSI N18.7- 1976 Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants
- 2.1.2 Nuclear Policy Manual
- 2.1.3 Nuclear Inspection Program Manual
- 2.1.4 Work Process Manual
- 2.1.5 NSD 208 Problem Investigation Process
- 2.1.6 NSD 601 Quality Control Inspections
- 2.1.7 PIP G-99-0353, Corrective Action #5

2.2 Electronic References

- 2.2.1 Maintenance Schedule Focus
- 2.2.2 NEDL Document Viewer
- 2.2.3 Problem Investigation Process
- 2.2.4 QATS web page: http:/ngoweb/ssd/qats/index.htm
- 2.2.5 QC Performance Reporting Database
- 2.2.6 Work Management System (WMS)

3.0 Definitions

3.1 Inspection- Examination or measurement to verify whether an item or activity conforms to specified requirements.

3.2 Nuclear Station Modification- A planned change to a structure, system, or component at an operational Nuclear Station accomplished in accordance with the requirements and limitations of applicable codes, standards, specifications, licenses, and safety restrictions.

3.3 Routine Maintenance- The maintenance activities required to preserve or restore plant structures, systems, and components (SSC) to their approved original design configuration.

The following activities are **NOT** considered routine maintenance:

ASME Section XI Code activities:

-Repair or replacement activities on ISI Class A components > 1inch NPS.
-Repair or replacement activities on ISI Class B bolting >2 inch diameter.
-Repair or replacement activities on ISI Class A, B, or C Support/ Restraints on piping >1inch NPS

Special Processes:

-Welding
-Heat Treating
-NDE
-Crimping/Taping/Raychem on connections >600 volts

Civil Activities:

-Concrete
-Grout
-Soils
-Coatings
-Structural Steel

Modifications:

-Minor Modification (MM)
-Nuclear Station Modification (NSM)
-Temporary Modification (TM)

3.4 Quality Process Monitoring (Process Monitoring) – Monitoring or direct observation to verify whether an item or activity conforms to specified requirements.

3.5 Process Monitoring Report - The report made each time an inspector monitors the quality of a process or work activity. The report includes activity information, quality attainment objectives, achievement indicators, and comments relative to the monitored activity.

3.6 QC Determination Codes:

QC H - The activity is associated with ASME Code requirements, special processes, modifications, construction type tasks, etc. QC Hold and Inspection Points are required to be performed as applicable.

QC P - The activity is associated with routine maintenance. QC Hold Points for maintenance procedures are not applicable; however the maintenance activity is a candidate for process monitoring.

QC N - QC involvement is not required. QC Hold Points are not applicable.

4.0 Responsibilities

4.1 Each QA/QC Team Leader has the responsibility for implementing this procedure at their respective location.

4.2 QA/QC personnel are responsible for compiling process monitoring data into results summaries for periodic reporting to appropriate management/supervisory personnel.

5.0 Procedure

5.1 Planning and Scheduling (See Attachment 1 Flowchart)

5.1.1 Planning

The QA/QC Team Leader or designee performs a review of the maintenance schedule prior to the start of each work week. The QA/QC Team Leader selects work activities for process monitoring based upon special emphasis items such as the ones listed below:

(a) Importance to safety, quality, and plant operation

- Does the activity result in some increased level of nuclear safety risk, i.e., results in PRA matrix entry (Special Emphasis Code- PR)?
- Does the activity have the potential for introducing foreign material into open systems that can result in fuel damage, lead to a safety system malfunction, or result in a challenge to a safety system (Special Emphasis Code- FM)?

(b) Risk significance

- Is the activity defined as maintenance high risk (Special Emphasis Code- MH)?

(c) Level of complexity of the activity

- Is the activity infrequently performed or a nonroutine task that warrants increased management oversight (Special Emphasis Code- NR)?
- Does the activity warrant increased supervisory oversight due to worker qualifications, e.g., contract workers, unqualified workers; procedure concerns (Special Emphasis Code- UW)?

(d) Performance/Inspection history

- Does the activity have a history associated with quality related issues?
- Has the activity been linked to equipment failure?

If the answer to any of the questions above is yes then the activity is considered for Quality Process Monitoring.

5.1.2 Scheduling (See Attachment 2 Quality Schedule)

5.1.2.1 *Weekly,* the QA/QC Team Leader or designee completes a quality schedule. As a minimum, the schedule should include the following information:
(a) Work Order Number
(b) Task Description
(c) Team
(d) Responsible supervisor
(e) Special Emphasis Codes
(c) Inspector assigned to the work activity

5.1.2.2 The QC Supervisor assigns a QC inspector to each activity that has been selected from the maintenance schedule. Quality Process Monitoring activities related to the inspector's current discipline are the preferred method for the QC supervisor to make assignments, however this will not always be possible. QC inspection or QA Tech Support personnel are considered qualified to verify the general attributes associated with a maintenance activity.

5.1.2.3 *Daily,* the QC Supervisor or designee reviews the maintenance schedule to account for emergent work and schedule changes.

5.1.2.4 QC Supervisor pencils in changes to the quality schedule and makes assignment adjustments as necessary.

5.2 Preparation and Performance

Use the following guidelines, as appropriate:

(a) Prior to performing Quality Process Monitoring, review the electronic Work Order on WMS to develop an understanding of the scope of the work activity and the requirements and procedures applicable to the work to be observed.

(b) Quality Process Monitoring forms are included as enclosures to this procedure. The forms contain checklists of actions and attributes applicable to various activities. Choose the checklists most applicable to the work activity.

(c) When possible, contact the supervisor responsible for the work to discuss the planned scope of the observation.

(d) Commence the observation, when practical, at the pre-job briefing stage. This provides the opportunity to confirm that the personnel involved understand the work, their roles, the

risks, the interfaces, and that they have tools and supporting documents to complete the job.

(e) Inform personnel responsible for the activity that you will be observing and that notes of observations will be recorded as necessary.

(f) Upon arrival at the workplace, assess the area for the existence of any apparent hazards, such as radiation, chemicals, spills, combustibles, flammables, noise, poor lighting, tripping, hot surfaces, and general housekeeping.

(g) Allow the observed processes and activities to continue without interference unless it is apparent that immediate corrective action or preventive action is necessary.

(h) Classify the results of each monitored attribute into one of the following categories:

- Satisfactory: Activity or process observed meets established criteria in the applicable referenced procedures or work order instructions.
- Unsatisfactory: The activity or process does not meet established criteria in the applicable referenced procedures or work order instructions. Unsatisfactory issues shall be documented in accordance with NSD 208.
- Not Applicable /or Not Observed: Specific attribute was not applicable or observed during the process monitoring evolution (These attributes will not be shown on the monitoring report).

(i) At the end of the observation, briefly review the observation and issues with the personnel involved.

(j) Record observations for entry into the Performance Reporting Database. Issues should be described in sufficient detail to characterize the nature and extent of each observation.

(k) QC Supervisor/designee reviews completed Quality Process Monitoring reports.

5.3 Reporting and Communication

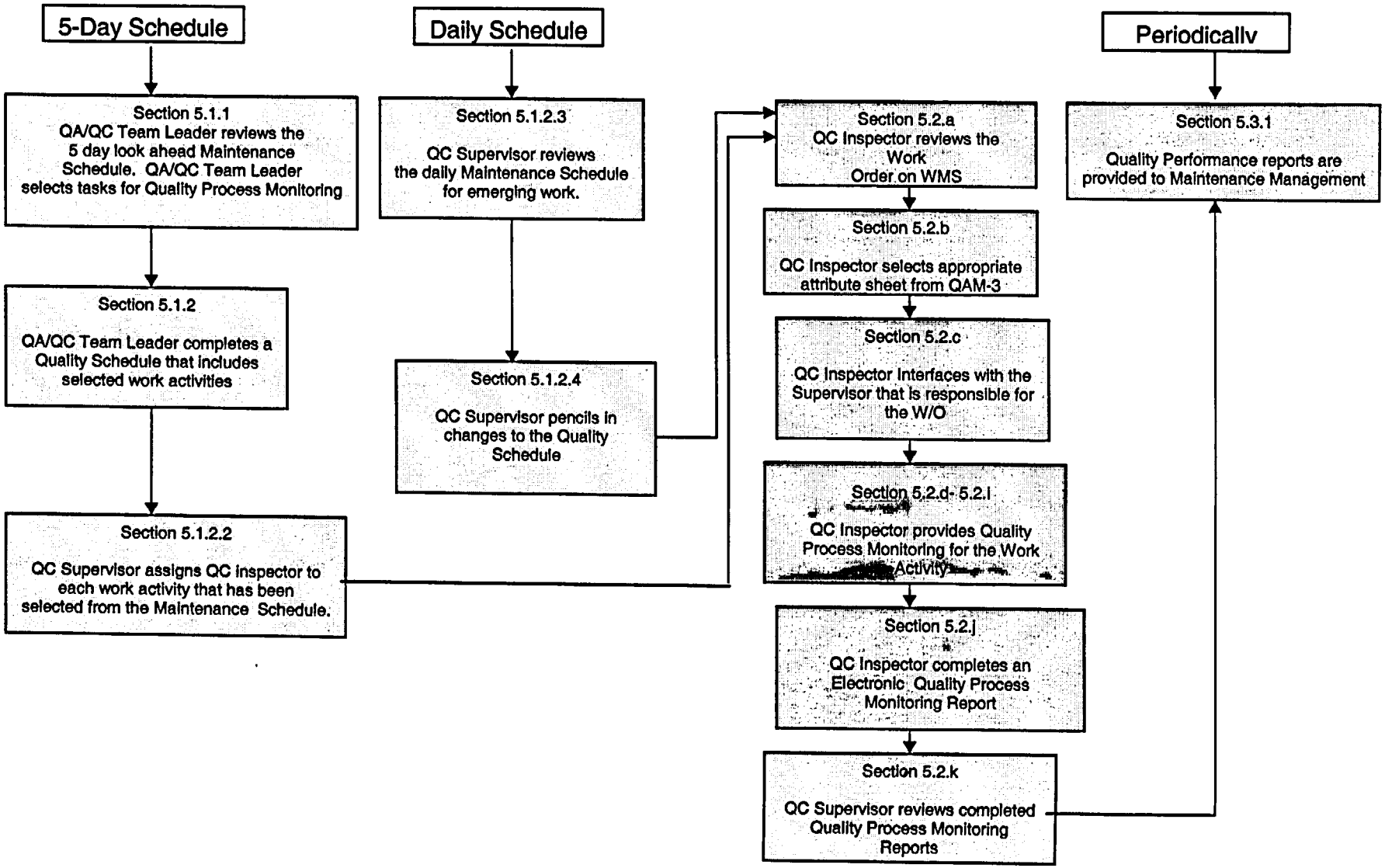
5.3.1 Quality Process Monitoring Results

Process monitoring results shall be reported to responsible maintenance management through periodic quality performance reports.

5.3.2 Content of the Quality Performance Report

The report should include the following information:

- Number of reports for a given period of time
- Number of issues identified
- Category of issues
- Success rate per category
- Overall success rate
- Graph of success rate


5-Day Schedule
Daily Schedule
Periodically
Section 5.1.1
QA/QC Team Leader reviews the 5 day look ahead Maintenance Schedule. QA/QC Team Leader selects tasks for Quality Process Monitoring
Section 5.1.2
QA/QC Team Leader completes a Quality Schedule that includes selected work activities
Section 5.1.2.2
QC Supervisor assigns QC inspector to each work activity that has been selected from the Maintenance Schedule.
Section 5.1.2.3
QC Supervisor reviews the daily Maintenance Schedule for emerging work.
Section 5.1.2.4
QC Supervisor pencils in changes to the Quality Schedule
Section 5.2.a
QC Inspector reviews the Work Order on WMS
Section 5.2.b
QC Inspector selects appropriate attribute sheet from QAM-3
Section 5.2.c
QC Inspector Interfaces with the Supervisor that is responsible for the W/O
Section 5.2.d- 5.2.i
QC Inspector provides Quality Process Monitoring for the Work Activity
Section 5.2.j
QC Inspector completes an Electronic Quality Process Monitoring Report
Section 5.2.k
QC Supervisor reviews completed Quality Process Monitoring Reports
Section 5.3.1
Quality Performance reports are provided to Maintenance Management

DRAFT

Quality Schedule
Date: 09/10/2003 Week: 40

Safety:

Weekly Topic: Back Strains

Guiding Principle: 1. Everyone is responsible for Safety

Reminder: Safety is applicable at home as well as work

Consecutive Days Since Last Recordable Injury: 399

Human Performance:

Reminder: Use component verification techniques

THIS IS AN EXAMPLE ONLY

Consecutive Days Since Last Human Performance Incident: 36

QC Determination	W/O#	Task	Team	Supv	Special Emphasis Codes	QC Insp.
QC P	98350806-14	PM 2EMXA4-3A, Breaker Functional Test	448	DWE	CE, PR, TS, MM	JHN
QC P	98351096-44	MG-52523/P2 KXA Term at 1EPFSXKXADISC	8529	TCS	FM, CM, MM	JWR
QC H	98414139-01	MGMM12472/2KCFE5770/Install New Orifice	407	JLT	CC, CE, PR, TS	DAB
QC P	98366174-04	CM Repair leak 1 NV-126	315	BLT	FM, PR, MM	DEA
QC P	98875644-02	PM VC/YC Chiller Motor	212	RBB	FM, MM	LWH
QC P	98305949-03	1EPETFELXF: Reclaim Freon	321	KCS	PR, TS, MM	TAS
QC H	98348819-12	NSM-22518/P1 CA Install Pipe Supports	6075	JLT	SA, CM, MM	WXM

Work Controls Attributes Sheet

QUALITY PROCESS MONITORING REPORT					
SCOPE	Work Order NO: Station: Component ID:				
	Task Description:				
	QA Condition: Supervisor Contacted: ☐ Yes ☐ No				
	Category : ☐ IAE ☐ MNT ☐ Not Applicable				
	Responsible Team: Date Performed: PIP's Initiated:				
	Legend: S = Satisfactory U = Unsatisfactory N/A = Not Applicable N/O = Not Observed	**S**	**U**	**N/A**	**N/O**
CONTROLS	1. General- Required authorization and reviews have been obtained prior to the start of this work activity (WPM 700).				
	2. General- Personnel selected the correct component prior to stating the work activity and the component is properly labeled (WPM 700).				
	3. General- Replacement parts or materials are properly categorized and controlled (WPM 700).				
	4. General- M&TE is calibrated and of the proper range, type, and accuracy to perform its intended function (NSD 406).				
	5. General- Plant staff uses personnel protective equipment consistent with plant safety expectations (Safe Work Practices Manual).				
	6. General- The appropriate class of system cleanliness and level of FME has been established and maintained during the observed work activity (NSD 104).				
	7. General- Plant staff is observed performing Independent Verification (e.g., IV, DV, SV) in accordance with NSD 700.				
	8. General- Personnel have identified deficiencies to plant structures, systems, or components and initiated a PIP or work request (NSD 208).				
	9. General- Approved documents used (NSD 704).				
	10. General- Management expectations are met for technical procedure use and adherence (NSD 704).				
	11. General- Task Completion Details entered on WMS Panel 121 (WPM 700).				
RESULTS	Issue Code(s):				
	Comments: QC Inspector: _____ Date: _____ Reviewed By: _____ Date: _____				

Mechanical Attributes Sheet
Reference: QAF-18

QUALITY PROCESS MONITORING REPORT					
SCOPE	Work Order NO:	Station:	Component ID:		
	QA Condition:	Supervisor Contacted: ☐ Yes ☐ No			
	Responsible Team:	Reference Procedure:			
	Date Performed:	PIP's Initiated:			
	Task Description:				

	Legend: S = Satisfactory U = Unsatisfactory N/A = Not Applicable N/O = Not Observed	S	U	N/A	N/O
ATTRIBUTES	G01. General- Required authorization and reviews have been obtained prior to the start of this work activity (WPM 700).				
	G02. General- Personnel selected the correct component prior to starting the work activity and the component is properly labeled (WPM 700).				
	G03. General- Approved Documents used (NSD 704)				
	G04. General- Replacement parts or materials are properly categorized and controlled				
	G05. General- Housekeeping (NSD 104)				
	G06. General- M&TE				
	G07. General- Torque				
	G08. General- Proper Tool Selection				
	M01. Mechanical- Gasket Seating Surfaces				
	M02. Mechanical- Disc and Seat Surface				
	M03. Mechanical- Body/Bonnet Internal Surface				
	M04. Mechanical- Stem (No deformities)				
	M05. Mechanical- Correct Bolting Material				
	M06. Mechanical- Internal Cleanliness				
	M07. Mechanical- Directional Flow				
	M08. Mechanical- Flange Alignment				
	M09. Mechanical- Minimum Thread Engagement				
	M10. Mechanical- Exposed Portion of Fasteners				
	M11. Mechanical- Couplings, Shaft, and Shaft Sleeves				
	M12. Mechanical- Impeller/Piston Assembly				
	M13. Mechanical- Casing/Head Internal Surface				
	M14. Mechanical- Bearings/Journals				
	M15. Mechanical- Mechanical Seals				
	M16. Mechanical- Dimensions/Tolerances/Measurements/Final Alignments				
	M17. Mechanical- Work is performed in accordance with governing station documents				
	M18. Mechanical/Electrical- Tubing connections are correct/ tight				
	M19. Mechanical/Electrical - NPT Threaded Connections clean and tight				

RESULTS	
	Issue Code(s):
	Comments:
	QC Inspector: _____ Date: _____
	Reviewed By: _____ Date: _____

Electrical Attributes Sheet
Reference: QAE-1, QAE-2, and QAE-3

QUALITY PROCESS MONITORING REPORT					
SCOPE	Work Order NO:	Station:	Component ID:		
	QA Condition:	Supervisor Contacted: ☐ Yes ☐ No			
	Responsible Team:	Reference Procedure:			
	Date Performed:	PIP's Initiated:			
	Task Description:				
	Legend: S = Satisfactory U = Unsatisfactory N/A = Not Applicable N/O = Not Observed	S	U	N/A	N/O
ATTRIBUTES	1. General- Required authorization and reviews have been obtained prior to the start of this work activity (WPM 700).				
	2. General- Personnel selected the correct component prior to stating the work activity (WPM 700).				
	3. General- Approved Documents Used (NSD 704)				
	4. General- Replacement parts or materials are properly categorized and controlled				
	5. General- Housekeeping (NSD 104)				
	6. General- Approved Materials Used				
	7. General- Identification and Labeling				
	8. General- Proper Tool Selection				
	9. General- M&TE				
	10. General- Torque				
	11. Electrical- Environmental Qualifications				
	12. Electrical- No unauthorized devices on hangers (NSD 104)				
	13. Electrical- Crimping				
	14. Electrical- Separation				
	15. Electrical- Lifting/Landing Leads				
	16. Electrical- Part/Item Physical Condition				
	17. Electrical- Hardware (None Missing)				
	18. Electrical- Work is performed in accordance with governing station documents				
	19. Electrical/Mechanical- Tubing connections are correct/ tight				
	20. Electrical/Mechanical- NPT Threaded Connections clean and tight				
RESULTS	Issue Code(s):				
	Comments::				

QC Inspector: _____ Date: _____

Reviewed By: _____ Date: _____

QA/QC Issue Codes

1. **No Issues** - Quality expectations are met

2. **Process Controls/Documentation** - Deficiency or discrepancy involving controlled documents and/ or required documentation.

2a. Insufficient details in the work order/supporting documents.
2b. Drawing, Spec., VN, MM, contains incorrect data.
2c. Required documentation is incorrect or missing
2o. Other

3. **Work Execution** - Preventable job delays and rework caused by work that is not performed in accordance with established expectations.

3a. Incorrect procedure used.
3b. Failure to follow procedures/directives/policies.
3c. Assembly/fabrication does not conform to specifications
3d. Improper tool selection
3e. Inadequate general housekeeping
3o. Other

4. **Materiel/Equipment Condition** - Condition of the item does not meet established standards.

4a. Item does not conform to design/spec.
4b. Item is physically damaged or defective.
4c. Required markings/labels are illegible or missing.
4d. Physical dimensions out of tolerance
4e. Component failed required test
4o. Other

The following **EXAMPLE** is the recommended format for identifying a QC issue in the PIP database:

Method Used To Discover Problem:

Quality Process Monitoring

Brief Problem Description

Work Execution – Preventable job delay

Detailed Problem Description

Torque wrench was selected for the work activity that was not within the range required by the procedure (QC Issue Code 3d). Last updated by: AD Ramsey 8/30/02

Immediate Corrective Action:

Technician returned to tool issue and checked out the correct torque wrench. This PIP is for tracking purposes only. No further corrective action is required.

[5] QC Inspection Process; Quality Process Monitoring; Student Handout (Page 1-16)

This lesson provides training for maintenance personnel on the revisions to the QC Inspection Process and its transition to an Observation Process as developed by the QC Optimization Team.

QC INSPECTION PROCESS
QUALITY PROCESS MONITORING

STUDENT HANDOUT

DRAFT

OVERVIEW:

This lesson provides training for maintenance personnel on the revisions to the QC Inspection Process and its transition to an Observation Process as developed by the QC Optimization Team.

REFERENCES:

1. WPM 500, Planning
2. WPM 700, Execute the Workplan
3. NSD 704, Technical Procedure Use and Adherence
4. NSD 601, Quality Control Inspections
5. QAM-3, Quality Process Monitoring
6. PIP C-98-04578 – 1998 JUMA Report
7. PIP G-99-00353 - 1999 JUMA Report

OUTLINE:

1.0 INTRODUCTION

- 1.1 Lesson Purpose
- 1.2 Project History

2.0 PRESENTATION

- 2.1 Quality
- 2.2 Definitions
- 2.3 Process Monitoring
- 2.4 Process Changes
- 2.5 Responsibilities
- 2.6 Benefits

3.0 SUMMARY

- 3.1 Review Objectives
- 3.2 Perform Evaluation Of Lesson Materials Using Beyond Question

4.0 ATTACHMENTS

- 4.1 Information only examples from Draft QAM-3 Quality Process Monitoring Reports

OBJECTIVES

Terminal Objective

Slide #3

During the course of this training, students will develop and demonstrate an understanding of the changes and impacts to maintenance due to the implementation of the QC Inspection Process. This training will be evaluated using Beyond Question technology tools or equivalent.

Enabling Objectives

Slide #4

1. Identify who is responsible for achieving quality.
2. Identify the proper definition for the following terms:
   - Quality Process Monitoring
   - QC "P"
   - QC "H"
   - QC "N"
   - QC Hold Point
   - QC Inspection Point
   - Routine Maintenance

Slide #5

3. Given a scenario, identify when to contact QC.

Slide #6

4. Given a scenario, identify when a PIP will be generated.
5. Discuss the impact of revisions to NSD 704, Technical Procedure Use and Adherence.

1.0 INTRODUCTION

1.1 Purpose

Slide #7

The purpose of this lesson is to train personnel responsible for maintenance activities on the QC "Process Monitoring" Inspection Process to support implementation at each of Duke's nuclear sites.

This lesson provides a review of the development of the revised QC Inspection Process, the changes that are being implemented at each of Duke Power's nuclear sites and their impact on maintenance practices.

1.2 History

Slide #8

Three years ago an assessment of the Quality Control Program identified that the Nuclear Inspection Manual appeared to be written on a construction based focus where all phases of work are inspected and ensures that quality is built into the work. This approach is not wrong it's just not consistent with industry maintenance philosophy that - places quality accountability with the workers. Maintenance personnel interviewed as part of the same assessment felt it was not necessary to have a QC Inspector on many of the repetitive routine jobs.

These and other initiatives led to the development of the Quality Improvement Project which was tasked to design a process for QA/QC to monitor maintenance work process effectiveness and assure compliance with the QA Program.

Slide #9

Their project objectives were to:

Detail the method of planning and executing the process

Identify the interfaces and stakeholders

Identify the documents and procedures that will be impacted

Identify change management issues

Implement the process

2.0 PRESENTATION

2.1 Quality

Slide #10

Quality is conformance to mutually agreed-upon rules, regulations, specifications, and standards.

OBJ #1

The attainment of quality rests with those assigned the responsibility of performing the activity. The verification of quality is assigned to qualified personnel independent of the responsibility for performance or direct supervision of the activity.

There are four levels of defense of quality.

Slide #11

OBJ #1

Level 1: Individuals - Individuals are responsible for achieving quality. Only at the first level is the quality of all work assured, collectively by individuals.

Level 2: Management and Supervisory Personnel - Consists of all levels of management and supervisory personnel, and assesses the first level of defense.

Level 3: Independent Internal Oversight - Consists of the oversight provided by QA/QC, Safety Reviews, and Regulatory Audits. Assesses the effectiveness of self-assessment efforts.

Level 4: Independent External Oversight - Consists of external oversight such as NRC and INPO. Provides assessment of the first three levels.

Slide #12

Factors that influence quality may manifest themselves at any stage of a work activity. It is everyone's responsibility to promptly identify quality issues so that they can be corrected. Think of the "Defense of Quality" like the defense on a football team. Their objective is to stop the offense (quality issues) as close to the line as possible.

Defensive Line - The first line of defense. This is the INDIVIDUAL WORKER that has been assigned to perform "hands on" work. Only on the first line is 100% quality coverage possible.

Linebackers - The second line of defense. These are the SUPERVISORS and MANAGERS that support the line. Their job is to coach, call the plays, and tackle any issue that gets by the first line. They assess the first line of defense.

Cornerbacks - The third line of defense. This position is filled by QA/QC, SRG, and NAID. This is typically a "coverage assignment" that is focused on higher risk, nuclear safety related activities. They assess the effectiveness of self assessment efforts.

Safeties - The fourth line of defense. This position is filled by INPO and NRC. They assess the first three levels of defense and confirm that our defensive plan is working.

The major significance of issues identified by QA/QC is that they represent missed opportunities for the issues to have been identified by the first or second levels of defense of quality.

2.2 Definitions

Slide #13

OBJ #2

Slide #14

Quality Process Monitoring – (Process Monitoring) In general is an assessment technique which uses observation or monitoring to provide confidence that ongoing processes and activities are adequately and effectively performed. Specifically, (NSD 704 & WPM 500) monitoring or direct observation by a QC Inspector to verify whether an item or activity conforms to specified requirements.

Slide #15

QC "P" – A code entered onto appropriate WMS panels for QC determinations. The activity is associated with routine maintenance. QC Hold Points, Inspection Points and Sign-offs for maintenance procedures are not applicable; however the maintenance activity is a candidate for quality process monitoring.

Slide #16

QC "H" - A code entered onto appropriate WMS panels for QC determinations. The activity is associated with ASME Code requirements, special processes, modifications, construction type tasks, etc. QC Hold and Inspection Points are required to be performed as applicable. The same as current QC "Y".

Slide #17

QC "N" – A code entered onto appropriate WMS panels for QC determinations. QC Hold Points, Inspection Points and Sign-offs are not applicable. The same as current QC "N".

Slide #18

QC Hold Point - A QC inspection requirement for an item or trait which must be inspected and signed off before work can proceed unless documented approval for the work to continue beyond the designated Hold Point is obtained from a Qualified QA Reviewer or a QC Inspection supervisor.

Slide #19

QC Inspection Point – A QC inspection requirement for an item or trait which may be performed at any time during the work process with concurrence from the QC inspector and the craftsman responsible for the work.

Slide #20

QC Sign-offs (non-designated) – QC Sign-offs which are not designated as Hold Points or Inspection Points shall be treated as Hold Points with the following exception; If verbal approval is obtained from a Qualified QA Reviewer or QA/QC Inspection personnel, work may continue beyond the inspection sign-off.

Slide #21

Routine Maintenance - The maintenance activities required to preserve or restore plant systems, structures, and components to their approved original design configuration. The following activities are NOT considered routine maintenance: (QAM-3)

ASME Section XI Code activities:

Repair or replacement activities on:

-ISI Class A > 1 inch NPS

-ISI Class B bolting >2 inch diameter

-ISI Class A, B, or C Support / Restraints on piping > 1 inch NPS

Special Processes:

-Welding -NDE

-Heat Treating -Crimping/Taping/Raychem > 600 volts

Civil Activities:

-Concrete -Coatings

-Grout -Structural Steel

-Soils

Modifications:

-Minor Modifications (MM)

-Nuclear Station Modifications (NSM)

-Temporary Modifications (TM)

2.3 Process Monitoring

Slide #22

Based on information gathered from industry benchmarking, the most efficient inspection programs use a combination of in-line inspection points and **process monitoring** techniques. In-line inspection points are used for non-routine activities and **process monitoring** is the preferred method for routine maintenance activities. These methods are used by the South Texas Project and the New York Power Authority.

Process monitoring is an assessment technique which uses observation or monitoring to provide confidence that ongoing processes and activities are adequately and effectively performed.

Slide #23

The objective of **process monitoring** is to observe and provide feedback on activities that will assist management in evaluating the effectiveness of management controls and programs. **Process monitoring** provides the inspection program with a method of evaluating activities that may be observed versus the application of inspection hold points. The selection process for routine maintenance activities is based on safety significance, task complexity, and performance history.

ANSI N18.7 requires that modifications and nonroutine maintenance activities be inspected in a manner similar to that associated with construction phase activities. This requirement is satisfied by applying in-line inspection points to the work controlling documents.

Slide #24

The processes being implemented at our nuclear sites will be composed of both types of quality controls. Our modifications and nonroutine maintenance activities will continue to have proceduralized Hold Points and Inspection Points. Our routine maintenance activities will use process monitoring. This will bring several benefits to Maintenance and QA/QC.

2.4 Process Changes

Slide #25

These process changes will be worked into the current maintenance processes. This will start with the QA/QC Team Leader reviewing the Look-Ahead Maintenance Schedule and selecting tasks for Quality Process Monitoring. The QA/QC Team Leader will create a schedule for QC that includes the selected work activities. The QC Supervisor assigns inspectors to the work activities for Quality Process Monitoring. The QC Supervisor will review the daily Maintenance schedules to identify emergent work for Process Monitoring and make the appropriate changes to the QC schedule.

Slide #26

The QC Inspector reviews the assigned tasks on WMS and interfaces with the appropriate Maintenance or NMS Supervisor responsible for the work. The QC Inspector provides Quality Process Monitoring for the work activity and documents it on appropriate reports. There is no official start or stop requirement for the Process Monitoring. At the end of the observation the inspector should review the observation and issues with the people involved.

OBJ #4

Slide #27

PIP will be used to document Process Monitoring for trending purposes. Activities that do not meet established criteria will be documented in a PIP for tracking even if the the unacceptable condition is corrected. The use of PIP will allow monitoring and identification of trends for future Process Monitoring direction.

Periodically Quality Performance reports will be provided to Maintenance Management from the Process Monitoring report data.

OBJ #3

Maintenance Supervisors will not be required to contact QC for inspections on tasks coded "N" or "P". As described above, QC will be responsible for contacting the Maintenance team for the activities they are assigned for Process Monitoring. Maintenance Supervisors will continue to be responsible for contacting QC for inspections on tasks coded "H".

Slide #28

Another way to illustrate this is - if the team has a work order task with a code of "P" the team is not expected to contact QC prior to performing the task. QC Hold Points and other signature points no longer apply. If QC wants to monitor the performance of the task they (QC) are responsible for contacting the team.

A contact has to be made with QC for work order tasks with a code of "H" and all QC Hold points and other signature and inspection points apply.

The work and processes will be monitored to the extent necessary. The selection process for maintenance activities where process monitoring will be applied is based on factors such as:

Slide #29

Level of complexity for the activity

Importance to safety, quality, and plant operation

Safety significance (Maintenance Rule/Probable Risk Assessment criteria)

Unacceptable quality trends

Inspection and performance history

System/Responsible Engineer or Management request

Industry information/OE Information Notices

2.5 Responsibilities

Slide #30

QA/QC Execution Support – Work Control (NSD 601.6.1)

The Nuclear Station, Work Control/Execution Support QA/QC Group is responsible for:

- Reviewing station work control procedures and documents for the application of inspection points
- Performing and Documenting inspection points
- Selecting activities that qualify for Quality Process Monitoring
- Performing and Documenting Quality Process Monitoring

Planning

Slide #31

Central Field and MOD Planners are responsible for determining and documenting the appropriate QC determination when planning work order tasks. The task planner will enter an H, N or P as the "QC Required" determination to indicate the level of QC involvement. The planner shall make the determinations using the guidelines in the QC Determinations attachment. Anytime the planner is unsure if QC is needed he/she should call the station QA Technical Support group to have them make this determination. (WPM 500.5.5.4 - R214 Determinations)

Job Scope Changes will be addressed by the Central or Field Planner responsible for the task. The same requirements for QC determinations apply.

Maintenance and NMS (WPM 700)

Slide #32

Technician reviews WMS R214 to determine the level of QC involvement. QC involvement with the task is indicated as follows:

- QC H - QC Hold Points, QC Inspection Points and QC Sign-offs are required to be performed as applicable.
- QC N - QC Hold Points, QC Inspection Points and QC Sign-offs are not applicable.
- QC P - QC Hold Points, QC Inspection Points and QC Sign-offs are not applicable; however, maintenance activity is a candidate for quality process monitoring.

Slide #33

If QC inspections were performed on Work Order Task that was originally planned as QC H, Work Supervisor or designee will enter "Y" on panel R122 for QC REQUIRED: PERFORMED field.

If no QC inspections were performed on Work Order Task that was originally planned as QC H, Work Supervisor or designee will enter "N" on panel R122 for QC REQUIRED: PERFORMED field.

If the Work Order Task was originally planned as QC P or N, Work Supervisor or designee will enter "N" on panel R122 for QC REQUIRED: PERFORMED field.

OBJ #5

NSD 704, Technical Procedure Use and Adherence is being revised to support the implementation of this process and prevent the revision of all Maintenance QA procedures. Its changes direct:

Slide #34

> When QC Hold Points and/or QC Inspection Points apply to the work activity, as indicated on the work order by a QC "H", the performer is responsible for taking the same action as required by a QC "Yes" in today's process.
>
> When QC Hold Points and/or QC Inspection Points do not apply to the work activity, as indicated on the work order by a QC "N" or QC "P", the performer is responsible for indicating that QA inspection is not applicable. Per NSD 704 rev 10 the steps may be marked N/A.

2.6 Benefits

Slide #35

What is the value of this process?

Process monitoring provides a balanced approach to the various self assessment options that are available.

Independent oversight is recognized as a valuable component of an existing self-assessment process as a method to help management identify opportunities for improvement. Independent oversight assesses the effectiveness of maintenance self-assessment efforts.

Process monitoring will benefit both Maintenance and QC. It is flexible, adaptable and easy to use. Process monitoring can be used to provide oversight at critical points in a work activity without having to halt work to await inspection clearance. Other benefits of process monitoring are as follows:

Slide #36

- Real time observations performed
- Provides a more comprehensive look at routine maintenance activities
- Immediate periodic feedback to craft and supervisory personnel
- Ability to select the processes that should be observed versus those activities that are chosen via hold points
- More effective use of QC on a daily basis
- Stabilizes the workload
- Monitoring is non-discipline specific
- Can be used to focus inspections on declining performance areas

- Reduction of Call-outs on routine maintenance activities

A significant portion of work activities occurring during maintenance can be classified as routine. Process monitoring will allow the QA/QC Team Leaders to select activities for monitoring based on risk, versus supporting the activity using traditional inspection points. Work activities that qualify as routine maintenance will be selected from the work schedule. The work and processes will be monitored to the extent necessary. This allows selective inspections and process observations to drive out problems.

Slide #37

2.7 Implementation

This process is being implemented at Catawba September 1, 2003; McGuire August 1, 2003; and Oconee July 1, 2003.

Some additional steps to be taken are:

Address ASME Section XI Repairs and Replacements

Cross Certification of QC Inspectors

Existing and Model Work Order Backfit

Outage Planning Impacts

Slide #38

3.0 SUMMARY

3.1 Review Objectives

3.2 Perform Evaluation of Lesson Materials

4.0 Attachments

4.1 Information only examples from Draft QAM-3 Quality Process Monitoring Reports

Quality Schedule
Date: 09/10/2003 Week: 40

Safety:

Weekly Topic: Back Strains

Guiding Principle: 1. Everyone is responsible for Safety

Reminder: Safety is applicable at home as well as work

Consecutive Days Since Last Recordable Injury: 399

Human Performance:

Reminder: Use component verification techniques

Consecutive Days Since Last Human Performance Incident: 36

QC Determination	W/O#	Task	Team	Supv	Special Emphasis Codes	QC Insp.
QC P	98350806-14	PM 2EMXA4-3A, Breaker Functional Test	448	DWE	CE, PR, TS, MM	JHN
QC P	98351096-44	MG-52523/P2 KXA Term at 1EPFSXKXADISC	8529	TCS	FM, CM, MM	JWR
QC H	98414139-01	MGMM12472/2KCFE5770/Install New Orifice	407	JLT	CC, CE, PR, TS	DAB
QC P	98366174-04	CM Repair leak 1 NV-126	315	BLT	FM, PR, MM	DEA
QC P	98875644-02	PM VC/YC Chiller Motor	212	RBB	FM, MM	LWH
QC P	98305949-03	1EPETFELXF: Reclaim Freon	321	KCS	PR, TS, MM	TAS
QC H	98348819-12	NSM-22518/P1 CA Install Pipe Supports	6075	JLT	SA, CM, MM	WXM

Attachment 4.1

Work Controls Attributes Sheet

QUALITY PROCESS MONITORING REPORT					
SCOPE	Work Order NO: Station: Component ID:				
	Task Description:				
	QA Condition: Supervisor Contacted: ☐ Yes ☐ No				
	Category : ☐ IAE ☐ MNT ☐ Not Applicable				
	Responsible Team: Date Performed: PIP's Initiated:				
	Legend: S = Satisfactory U = Unsatisfactory N/A = Not Applicable N/O = Not Observed	**S**	**U**	**N/A**	**N/O**
CONTROLS	1. General- Required authorization and reviews have been obtained prior to the start of this work activity (WPM 700).				
	2. General- Personnel selected the correct component prior to starting the work activity and the component is properly labeled (WPM 700).				
	3. General- Replacement parts or materials are properly categorized and controlled (WPM 700).				
	4. General- M&TE is calibrated and of the proper range, type, and accuracy to perform its intended function (NSD 406).				
	5. General- Plant staff uses personnel protective equipment consistent with plant safety expectations (Safe Work Practices Manual).				
	6. General- The appropriate class of system cleanliness and level of FME has been established and maintained during the observed work activity (NSD 104).				
	7. General- Plant staff is observed performing Independent Verification (e.g., IV, DV, SV) in accordance with NSD 700.				
	8. General- Personnel have identified deficiencies to plant structures, systems, or components and initiated a PIP or work request (NSD 208).				
	9. General- Approved documents used (NSD 704).				
	10. General- Management expectations are met for technical procedure use and adherence (NSD 704).				
	11. General- Task Completion Details entered on WMS Panel 121 (WPM 700).				
RESULTS	Issue Code(s):				
	Comments: QC Inspector: _____ Date: _____ Reviewed By: _____ Date: _____				

Attachment 4.1

Mechanical Attributes Sheet
Reference: QAF-18

QUALITY PROCESS MONITORING REPORT					
SCOPE	Work Order NO:	Station:	Component ID:		
	QA Condition:	Supervisor Contacted: ☐ Yes ☐ No			
	Responsible Team:	Reference Procedure:			
	Date Performed:	PIP's Initiated:			
	Task Description:				
	Legend: S = Satisfactory U = Unsatisfactory N/A = Not Applicable N/O = Not Observed	S	U	N/A	N/O
ATTRIBUTES	1. General- Required authorization and reviews have been obtained prior to the start of this work activity (WPM 700).				
	2. General- Personnel selected the correct component prior to starting the work activity and the component is properly labeled (WPM 700).				
	3. General- Approved Documents used (NSD 704).				
	4. General- Replacement parts or materials are properly categorized and controlled				
	5. General- Housekeeping (NSD 104)				
	6. General- MT&E				
	7. General- Torque				
	8. General- Proper Tool Selection				
	9. Mechanical- Gasket Seating Surfaces				
	10. Mechanical- Disc and Seat Surface				
	11. Mechanical- Body/Bonnet Internal Surface				
	12. Mechanical- Stem (No deformities)				
	13. Mechanical- Correct Bolting Material				
	14. Mechanical- Internal Cleanliness				
	15. Mechanical- Directional Flow				
	16. Mechanical- Flange Alignment				
	17. Mechanical- Minimum Thread Engagement				
	18. Mechanical- Exposed Portion of Fasteners				
	19. Mechanical- Shaft and Shaft Sleeves				
	20. Mechanical- Impeller/Piston Assembly				
	21. Mechanical- Casing/Head Internal Surface				
	22. Mechanical- Bearings/Journals				
	23. Mechanical- Mechanical Seals				
	24. Mechanical- Dimensions/Tolerances/Measurements				
	25. Mechanical- Work is performed in accordance with governing station documents				
	26. Mechanical/Electrical- Tubing connections are correct/ tight				
	27. Mechanical/Electrical - NPT Threaded Connections clean and tight				
RESULTS	Issue Code(s):				
	Comments: QC Inspector: _____ Date: _____ Reviewed By: _____ Date: _____				

Attachment 4.1

Electrical Attributes Sheet
Reference: QAE-1, QAE-2, and QAE-3

QUALITY PROCESS MONITORING REPORT					
SCOPE	Work Order NO: Station: Component ID:				
	QA Condition: Supervisor Contacted: ☐ Yes ☐ No				
	Responsible Team: Reference Procedure:				
	Date Performed: PIP's Initiated:				
	Task Description:				
	Legend: S = Satisfactory U = Unsatisfactory N/A = Not Applicable N/O = Not Observed	S	U	N/A	N/O
ATTRIBUTES	1. General- Required authorization and reviews have been obtained prior to the start of this work activity (WPM 700).				
	2. General- Personnel selected the correct component prior to starting the work activity (WPM 700).				
	3. General- Approved Documents Used (NSD 704)				
	4. General- Replacement parts or materials are properly categorized and controlled				
	5. General- Housekeeping (NSD 104)				
	6. General- Approved Materials Used				
	7. General- Identification and Labeling				
	8. General- Proper Tool Selection				
	9. General- MT&E				
	10. General- Torque				
	11. Electrical- Environmental Qualifications				
	12. Electrical- No unauthorized devices on hangers (NSD 104)				
	13. Electrical- Crimping				
	14. Electrical- Separation				
	15. Electrical- Lifting/Landing Leads				
	16. Electrical- Part/Item Physical Condition				
	17. Electrical- Hardware (None Missing)				
	18. Electrical- Work is performed in accordance with governing station documents				
	19. Electrical/Mechanical- Tubing connections are correct/ tight				
	20. Electrical/Mechanical- NPT Threaded Connections clean and tight				
RESULTS	Issue Code(s):				
	Comments::				
	QC Inspector: _____ Date: _____				
	Reviewed By: _____ Date: _____				