UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report Nos.: 50-369/85-05 and 50-370/85-05

Licensee: Duke Power Company
422 South Church Street
Charlotte, NC 28242

Docket Nos.: 50-369 and 50-370 License Nos.: NPF-9 and NPF-17

Facility Name: McGuire 1 and 2

Inspection Conducted: February 11-15, 1985

Inspectors: N. Economos for J. L. Coley — 3-8-85 Date Signed

J. L. Coley — 3-8-85 Date Signed

Approved by: J. J. Blake, Section Chief — 3/8/85 Date Signed
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope: This routine, unannounced inspection entailed 89 inspector-hours on site in the areas of inservice inspection - independent measurements, review of ultrasonic examination procedures, and evaluation and review of records.

Results: One violation was found - violation 370/85-05-02, Failure to Remove Combustible Agents from Control Access Area - paragraph 5.

REPORT DETAILS

1. Persons Contacted

   Licensee Employees

   *M. D. McIntosh, Station Manager
   *T. L. McConnell, Superintendent of Technical Services
   *D. J. Rains, Superintendent of Maintenance
   R. P. Ruth, Project Senior QA Engineer
   *A. F. Batts, QA Technical Support Supervisor
   *N. McCraw, Compliance Engineer
   *T. M. Hilderbrand, ISI Specialist

   Other Organization

   Babcock and Wilcox, Special Products and Integrated Field Services (SPIF)
   R. Patterson, ISI Coordinator

   NRC Resident Inspectors

   *W. T. Orders, Senior Resident Inspector
   *R. Pierson, Resident Inspector

   *Attended exit interview

2. Exit Interview

   The inspection scope and findings were summarized on February 15, 1985, with those persons indicated in paragraph 1 above. The inspectors described the area inspected and discussed in detail the findings listed below. No dissenting comments were received from the licensee.

   Inspector Followup Item (IFI), 369, 370/85-05-01, Transducer Selection to Accommodate Size and Joint Configuration, paragraph 5.

   Violation 370/85-05-02, Failure to Remove Combustible Agents from Control Access Area, paragraph 5.

   IFI 369, 370/85-05-03, Demonstrate Capability of Transducer to Detect a Notch Reflector in Centrifugally Cast Stainless Steel, paragraph 7.

   The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

3. Licensee Action on Previous Enforcement Matters

   Not inspected.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Independent Measurements, Ultrasonic Examination (U/T) of Pipe Welds, Unit 2 (92706)

This work effort was performed in order to evaluate, by independent measurement, the adequacy of the inservice inspection (ISI) ultrasonic examinations of welds performed by the licensee during this refueling outage. Paragraph 50.55a(g) of 10 CFR Part 50, requires that the ISI of the McGuire Nuclear Station be performed in accordance with the 1980 edition of ASME Section XI, including all addenda through Winter 1980 (hereafter referred to as Section XI), to the extent practicable within the limitations of design, geometry and materials of construction of the component.

Following the requirements, of approved and qualified U/T procedure ISI-120, Revision 24, the NRC inspectors independently reexamined the following welds:

Weld Identification	Pipe Size	Components Welded	Drawing
NI2FW29-1/C5-21-382	12" schedule 100	Pipe to Pipe	MCFI-2NI29, Rev. 13
NI2FW29-6/C5-21-383	12" schedule 100	Pipe to Elbow	MCFI-2NI29, Rev. 13
NI2FW29-12/C5-21-384	12" schedule 100	Pipe to Elbow	MCFI-2NI29, Rev. 13
NI2FW29-18/C5-21-385	8" schedule 100	Pipe to Elbow	MCFI-2NI29, Rev. 13
NI2F-461/C5-21-357	8" schedule 160	Reducer (8"x6") to pipe	MCFI-2NI15, Rev. 15
NI2F-464/C5-21-358	8" schedule 160	Reducer (8"x6") to pipe	MCFI-2NI15, Rev. 15
NI2F-465/C5-21-359	6" schedule 160	Pipe to 90° elbow	MCFI-2NI15, Rev. 15
NI2F-467/C5-21-360	6" schedule 160	Pipe to 90° elbow	MCFI-2NI15, Rev. 15

The examination showed that a number of these welds exhibited recordable indications which were interpreted as root condition and/or geometry. These findings compared favorably with those identified by the licensee during preservice and the current ISI examination. No rejectable indications were identified.

Within these areas, the inspector made the following observations:

1. In most instances Babcock and Wilcox (B&W), the agent performing the U/T for the licensee, uses a 1/2-inch diameter transducer to examine welds in the thickness and size range of the aforementioned welds. The inspectors noted that this size transducer worked satisfactorily on welds without geometric restrictions, e.g., pipe to pipe welds of similar size and shape. However, in such cases where elbows and reducers were involved, the 1/2-inch transducer precluded the full examination of certain joint configurations including the inside radius of 90° elbows and the larger diameter side transitions on the 8" x 6" reducers. Also, the inspectors found that nonuniform surface conditions resulting from hand preparing of ISI welds resulted in poor transducer contact and momentary loss of signal. In the case of welds with the aforementioned geometric restriction, the examination records showed that the welds had received only partial examination and the area where examination could not be performed was noted.

   The inspectors took exception to this inspection approach and took the position that a partial examination of this type joint due to geometric restrictions/configuration was not acceptable because the full circumference of the welds could have been U/T examined with a smaller diameter transducer. Technical aspects and details of the examination were discussed with the licensee's representative and B&W's ISI coordinator who agreed to look further into this matter and take appropriate steps towards improving the examination coverage of these weld types. Inspector followup item 369, 370/85-05-01, "Transducer Selection to Accommodate Size and Joint Configuration", was identified until this matter is appropriately resolved.

2. During the U/T examination of welds inside the auxiliary building, the inspectors observed two cans of liquid penetrant materials and a brush applicator resting on structural steel near the ceiling of that area. Discussion with cognizant licensee personnel disclosed that Duke Power Company (DPC) technicians were in that area earlier to perform the surface examination and/or preparation for U/T on the above welds and failed to remove these items upon their departure. This practice is contrary to Station Directive 3.11, Revision 9, which requires the removal of such combustible agents and other unnecessary material from control access areas upon completion of the task being performed. This failure to follow procedural requirements is in violation of 10 CFR 50, Appendix B, Criterion V as implemented by Topical Report DUKE-1-A, Section 17.2.5. This violation was identified as violation 370/85-05-02, Failure to Remove Combustible Agents from Control Access Area.

6. Inservice Inspection, Data Review and Evaluation, Unit 2 (73755)

Records of completed U/T examinations were selected and reviewed to ascertain whether: the method(s), technique and extent of the examination complied with the ISI plan and appliable procedures; findings were properly recorded and evaluated by qualified personnel; programmatic deviations were recorded as required; personnel, instruments, calibration blocks and NDE materials (couplants) were designated and qualifications/certifications were on file. The applicable code for this activity was identified in paragraph 1 above. Records selected for this review were as follows:

Identification No.	Components Welded
C5-21-382	Pipe to pipe
C5-21-383	Pipe to 90° elbow
C5-21-384	Pipe to 90° elbow
C5-21-385	Pipe to 90° elbow
C5-21-357	Reducer (8"x6") to pipe
C5-21-358	Reducer (8"x6") to pipe
C5-21-359	Pipe to 90° elbow

Within the areas inspected, no violations or deviations were identified.

7. Inservice Inspection - Procedure Review, Unit 2 (73052)

a. The above procedures were reviewed in the following areas: a procedure approval, requirements for qualification of NDE personnel, and compilation of required records.

Procedure No.	Title	Revision
ISI-125	Ultrasonic Examination for Intergranular stress corrosion cracking in Stainless Steel or nickel-based alloy piping	4
ISI-120	Ultrasonic Examination of Piping Welds Joining Similar and Dissimilar Materials	24

b. Technical content relative to: type of apparatus, extent of coverage including beam angles and scanning techniques, calibration requirements, search units, DAC curves, transfer requirements, reference level for monitoring discontinuities, method of demonstrating penetration, levels for evaluating and recording indications, and acceptance standards.

The inspectors discussed the subject matter with the DPC representative and the B&W ISI coordinator in order to better understand the technique and equipment/instruments to be used for the U/T examination of the reactor coolant pressure boundary (RCPB) pipe welds and adjacent centrifugally cast stainless steel (CCSS) material. Moreover, the inspectors requested that B&W demonstrate the capability of their U/T equipment to discern a notch reflector when calibrated on the Code-required side drilled holes of their reactor coolant CCSS calibration block. B&W stated, however, that the transducer they used to penetrate CCSS would not produce a signal from a notch calibration reflector.

The 1977 edition of the ASME Section XI Code and all subsequent editions of the Code have required that only the bottom third of the weld be examined on similar and dissimilar metal welds in piping four inches in diameter and larger. This means that the Code examination is primarily performed for the detection of cracks propagating from the pipe/weld internal surface. Until recently, transducers that would penetrate CCSS utilized refracted longitudinal waves mounted such that they would detect the calibration side drilled holes; however, they would not detect perpendicular type reflectors such as notches or cracks. However, transducers have now been developed that will calibrate on a notch while at the side drilled hole calibration sensitivity. As a result of this improvement in ultrasonic technology, detection of cracks is now possible in CCSS.

The licensee was notified that equipment presently available at the McGuire site that will not detect cracks is not within the scope of the licensee's commitment to perform examinations in CCSS on a "best attempt basis." Inspector followup item 369, 370/85-05-03, "Demonstrate Capability of Transducer to Detect a Notch Reflector in CCSS Material", was identified until a demonstration can be performed during a further inspection.