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U. S. Nuclear Regulatory Commission
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Subject: McGuire Nuclear Station Unit 2
Docket No. 50-370
Relief Request 01-009

Reference: Letter from Mr. H.B. Barron of Duke Energy Corporation to Nuclear Regulatory Commission, "Relief Request 01-001", dated April 11, 2001

Pursuant to 10CFR50.55a(g)(5)(iii), Duke Energy Corporation (Duke) requests relief from certain ASME Section XI requirements as described in the attached Relief Request 01-009. This relief request addresses cases of limited examination coverage from inspections performed during end of fuel cycle (EOC) 13 for Unit 2. This request is applicable to the Second 10-year Interval Inservice Inspection Program Plan. The 1989 Edition of the ASME Section XI Code contains the applicable requirements.

This transmittal supercedes a previous submittal, addressing the same subject matter, from Duke Energy Corporation to the NRC, dated April 11, 2001. Additional information is included in the attached relief request to address concerns raised by the NRC staff during a telephone conference call on October 18, 2001. Duke requests that Relief Request 01-001 be withdrawn from consideration.

Questions on this matter should be directed to Norman T. Simms, McGuire Licensing and Compliance, at (704) 875-4685.

Sincerely,

H. B. Barron

Attachment

A047

cc: Mr. L. A Reyes
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bxc w/ att: Master File # 1.3.2.13
RCG Files
NRIA File/ELL

ATTACHMENT

RELIEF REQUEST 01-009

Duke Energy Corporation

McGuire Nuclear Station - Unit 2

SECOND 10-YEAR INTERVAL REQUEST FOR RELIEF NO. 01-009

Duke Energy Corporation has determined that conformance with certain ASME Section XI Code requirements is impractical. Therefore, pursuant to 10CFR50.55a (g) (5) (iii), Duke Energy requests relief from applicable portions of the code.

Included in the request are seven welds: four Examination Category B-J welds, one Examination Category C-B weld and two Examination Category C-F-1 welds.

The McGuire Unit-2 Inservice Inspection Plan was written to the requirements of the 1989 Edition of ASME Section XI, no addenda.

The items in this Request for Relief were performed during EOC-13, the last outage in the second period of the second ten-year interval.

Code Case N-460 applies to the examinations performed during this outage.

I. System / Components(s) for Which Relief is Requested:

Examination Category B-J:
Piping Circumferential Weld for the Reactor Coolant system.

ID Numbers	Item Numbers	End of Cycle
2NC2FW53-25	B09.011.032	13

II. Code Requirement:

ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition Table IWB-2500, lists the following requirements for the Examination Category as shown below:

Examination Category B-J: Figure IWB-2500-8 (c), Examination Volume C-D-E-F.

III. Code Requirement from Which Relief Is Requested:

Examination Category B-J:
Relief is requested from the requirement to examine 100% of volume C-D-E-F.

IV. Basis for Relief:

Examination Category B-J:

During the ultrasonic examination of this weld, greater than 90% of the required examination volume as allowed by Code Case N-460 could not be achieved. As shown in Attachment 1, (Pages 1-4) the examination coverage was limited to 60.30% of the required examination volume. This is an austenitic stainless steel elbow-to-flange weld where access is limited to the pipe side of the weld only. The percentage of coverage reported represents the aggregate coverage obtained from one scan parallel to the pipe axis and two scans, 180° apart in the circumferential direction. The weld design prevented any axial scan from the flange side. In order to achieve more coverage the weld would have to be re-designed to allow scanning from both sides.

Duke Energy Corporation does not claim credit for coverage of the far side of austenitic welds. The characteristics of austenitic weld metal attenuate and distort the sound beam when shear waves pass through the weld. Refracted longitudinal waves provide better penetration. Duke Energy Corporation uses a combination of shear waves and longitudinal waves to examine single sided austenitic welds.

The procedures, personnel and equipment have been qualified through the Performance Demonstration Initiative (PDI). However, although longitudinal wave search units were used in the qualification and cracks were detected through the weld metal, PDI does not provide a qualification for single sided examinations of austenitic welds.

V. Alternate Examinations or Testing:

No additional examinations are planned during the current interval for this weld. Because of the flange configuration, Radiography would not provide any additional coverage.

Duke Energy Corporation will use the most effective ultrasonic techniques available to obtain maximum coverage for future examinations of this weld.

VI. Justification for the Granting of Relief:

Examination Category B-J:

Although the examination volume as defined in ASME Section XI 1989 Edition with no addenda, Figure IWB-2500-8 (c) could not be covered, the amount of coverage obtained for this examination provides an acceptable level of quality and integrity. This weld was examined using procedures, personnel and equipment qualified through the Performance Demonstration Initiative (PDI). In addition, this weld was examined during installation using volumetric and surface NDE methods.

This weld is located within the reactor coolant loop. This weld is not exposed to significant neutron fluence and not prone to negative material property changes (i.e. embrittlement) associated with neutron bombardment. This weld was rigorously inspected by radiography and dye penetrant examination during construction and verified to be free from unacceptable fabrication defects. If a leak were to occur at the weld in question, the reactor coolant leakage calculation which is normally performed daily (and required by Technical Specifications to be performed every 72 hours) would provide an early indication of leakage. The unidentified leakage specification in Technical Specification 3.4.13.1 is 1 gpm. Several other indicators such as containment radiation monitors EMF-38, 39, and 40, the containment floor and equipment sump levels, containment humidity instruments and the ventilation unit condensate drain tank level would provide early indication of weld leakage for prompt Operations and Engineering evaluation.

VII. Implementation Schedule:

Duke Energy Corporation will continue to use ultrasonic examination procedures to obtain maximum coverage to the extent practical of the item number referenced in Section I of this Request for Relief. No additional ultrasonic examination is planned during the current interval for this weld.

VIII. References:

Attachment 1. Information for Examination Category B-J affected welds: Pages 1-4 cover this weld.

B09.011.032

I. System / Components(s) for Which Relief is Requested:

Examination Category B-J:
Piping Circumferential Weld for the Reactor Coolant system.

ID Numbers	Item Numbers	End of Cycle
2NC2FW53-37	B09.011.039	13

II. Code Requirement:

ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition Table IWB-2500, lists the following requirements for the Examination Category as shown below:

Examination Category B-J: Figure IWB-2500-8 (c), Examination Volume C-D-E-F.

III. Code Requirement from Which Relief Is Requested:

Examination Category B-J:
Relief is requested from the requirement to examine 100% of volume C-D-E-F.

IV. Basis for Relief:

Examination Category B-J:

During the ultrasonic examination of this weld, greater than 90% of the required examination volume as allowed by Code Case N-460 could not be achieved. As shown in Attachment 1, (Pages 5-8) the examination coverage was limited to 60.30% of the required examination volume. This is an austenitic stainless steel elbow-to-flange weld where access is limited to the pipe side of the weld only. The percentage of coverage reported represents the aggregate coverage obtained from one scan parallel to the pipe axis and two scans, 180° apart in the circumferential direction. The weld design prevented any axial scan from the flange side. In order to achieve more coverage the weld would have to be re-designed to allow scanning from both sides.

Duke Energy Corporation does not claim credit for coverage of the far side of austenitic welds. The characteristics of austenitic weld metal attenuate and distort the sound beam when shear waves pass through the weld. Refracted longitudinal waves provide better penetration. Duke Energy Corporation uses a combination of shear waves and longitudinal waves to examine single sided austenitic welds.

The procedures, personnel and equipment have been qualified through the Performance Demonstration Initiative (PDI). However, although longitudinal wave search units were used in the qualification and cracks were detected through the weld metal, PDI does not provide a qualification for single sided examinations of austenitic welds.

V. Alternate Examinations or Testing:

No additional examinations are planned during the current interval for this weld. Because of the flange configuration, Radiography would not provide any additional coverage.

Duke Energy Corporation will use the most effective ultrasonic techniques available to obtain maximum coverage for future examinations of this weld.

VI. Justification for the Granting of Relief:

Examination Category B-J:

Although the examination volume as defined in ASME Section XI 1989 Edition with no addenda, Figure IWB-2500-8 (c) could not be covered, the amount of coverage obtained for this examination provides an acceptable level of quality and integrity. This weld was examined using procedures, personnel and equipment qualified through the Performance Demonstration Initiative (PDI). In addition, this weld was examined during installation using volumetric and surface NDE methods.

This weld is located within the reactor coolant loop. This weld is not exposed to significant neutron fluence and is not prone to negative material property changes (i.e. embrittlement) associated with neutron bombardment. This weld was rigorously inspected by radiography and dye penetrant examinations during

construction and verified to be free from unacceptable fabrication defects. If a leak were to occur at the weld in question, the reactor coolant leakage calculation which is normally performed daily (and required by Technical Specifications to be performed every 72 hours) would provide an early indication of leakage. The unidentified leakage specification in Technical Specification 3.4.13.1 is 1 gpm. Several other indicators such as containment radiation monitors EMF-38, 39, and 40, the containment floor and equipment sump levels, containment humidity instruments and the ventilation unit condensate drain tank level would provide early indication of weld leakage for prompt Operations and Engineering evaluation.

VII. Implementation Schedule:

Duke Energy Corporation will continue to use ultrasonic examination procedures to obtain maximum coverage to the extent practical of the item number referenced in Section I of this Request for Relief. No additional ultrasonic examination is planned during the current interval for this weld.

VIII. References:

Attachment 1. Information for Examination Category B-J affected welds: Pages 5-8 cover this weld.

I. System / Components(s) for Which Relief is Requested:

Examination Category B-J:
Piping Circumferential Weld for the Safety Injection system.

ID Numbers	Item Numbers	End of Cycle
2NI2F471	B09.011.162	13

II. Code Requirement:

ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition Table IWB-2500, lists the following requirements for each Examination Category as shown below:

Examination Category B-J: Figure IWB-2500-8 (c), Examination Volume C-D-E-F.

III. Code Requirement from Which Relief Is Requested:

Examination Category B-J:
Relief is requested from the requirement to examine 100% of volume C-D-E-F.

IV. Basis for Relief:

Examination Category B-J:

During the ultrasonic examination of this weld, greater than 90% of the required examination volume as allowed by Code Case N-460 could not be achieved. As shown in Attachment 1, (Pages 9-12) the examination coverage was limited to 59.70% of the required examination volume. This is an austenitic stainless steel elbow-to-valve weld where access is limited to the elbow side of the weld only. The percentage of coverage reported represents the aggregate coverage obtained from one scan parallel to the pipe axis and two scans, 180° apart in the circumferential direction. The weld design prevented any axial scan from the valve side. In order to achieve more coverage the weld would have to be re-designed to allow scanning from both sides.

Duke Energy Corporation does not claim credit for coverage of the far side of austenitic welds. The characteristics of austenitic weld metal attenuate and distort the sound beam when shear waves pass through the weld. Refracted longitudinal waves provide better penetration. Duke Energy Corporation uses a combination of shear waves and longitudinal waves to examine single sided austenitic welds.

The procedures, personnel and equipment have been qualified through the Performance Demonstration Initiative (PDI). However, although longitudinal wave search units were used in the qualification and cracks were detected through the weld metal, PDI does not provide a qualification for single sided examinations of austenitic welds.

V. Alternate Examinations or Testing:

No additional examinations are planned during the current interval for this weld. Because of the valve configuration, Radiography would not provide any additional coverage.

Duke Energy Corporation will use the most effective ultrasonic techniques available to obtain maximum coverage for future examinations of this weld.

VI. Justification for the Granting of Relief:

Examination Category B-J:

Although the examination volume as defined in ASME Section XI 1989 Edition with no addenda, Figure IWB-2500-8 (c) could not be covered, the amount of coverage obtained for this examination provides an acceptable level of quality and integrity. This weld was examined using procedures, personnel and equipment qualified through the Performance Demonstration Initiative (PDI). In addition, this weld was examined during installation using volumetric and surface NDE methods.

This weld is located within the Emergency Core Cooling System Cold Leg Injection lines. This weld is not exposed to significant neutron fluence and is not prone to embrittlement associated with neutron

bombardment. This weld was rigorously inspected by radiography and dye penetrant examinations during construction and verified to be free from unacceptable fabrication defects. If a leak were to occur at the weld in question, the reactor coolant leakage calculation which is normally performed daily (and required by Technical Specifications to be performed every 72 hours) would provide an early indication of leakage. The unidentified leakage specification in Technical Specification 3.4.13.1 is 1 gpm. Several other indicators such as containment radiation monitors EMF-38, 39, and 40, the containment floor and equipment sump levels, containment humidity instruments and the ventilation unit condensate drain tank level would provide early indication of weld leakage for prompt Operations and Engineering evaluation.

Check valves located downstream could however provide isolation from the reactor coolant system. In that case leakage from these welds would be indicated by outleakage from the associated Cold Leg Accumulator tanks. Level in these tanks is continuously monitored and alarmed in the control room and is maintained within limits established in Technical Specification 3.5.1.2. The fill frequency for these tanks is also trended by the Safety Injection System Engineer who would notice an increase in makeup to the tank should leakage occur from this weld. Also containment floor and equipment sump level would provide early indication of weld leakage for prompt Operations and Engineering evaluation.

VII. Implementation Schedule:

Duke Energy Corporation will continue to use ultrasonic examination procedures to obtain maximum coverage to the extent practical of the item number referenced in Section I of this Request for Relief. No additional ultrasonic examination is planned during the current interval for this weld.

VIII. References:

Attachment 1. Information for Examination Category B-J affected welds: Pages 9-12 cover this weld.

I. System / Components(s) for Which Relief is Requested:

Examination Category B-J:
Piping Circumferential Weld for the Safety Injection system.

ID Numbers	Item Numbers	End of Cycle
2NI2F494	B09.011.165	13

II. Code Requirement:

ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition Table IWB-2500, lists the following requirements for the Examination Category as shown below:

Examination Category B-J: Figure IWB-2500-8 (c), Examination Volume C-D-E-F.

III. Code Requirement from Which Relief Is Requested:

Examination Category B-J:
Relief is requested from the requirement to examine 100% of volume C-D-E-F.

IV. Basis for Relief:

Examination Category B-J:

During the ultrasonic examination of this weld, greater than 90% of the required examination volume as allowed by Code Case N-460 could not be achieved. As shown in Attachment 1, Pages 13-16, the examination coverage was limited to 59.61% of the required examination volume. This is an austenitic stainless steel elbow-to-valve weld where access is limited to the elbow side of the weld only. The percentage of coverage reported represents the aggregate coverage obtained from one scan parallel to the pipe axis and two scans, 180° apart in the circumferential direction. The weld design prevented any axial scan from the valve side. In order to achieve more coverage the weld would have to be re-designed to allow scanning from both sides.

Duke Energy Corporation does not claim credit for coverage of the far side of austenitic welds. The characteristics of austenitic weld metal attenuate and distort the sound beam when shear waves pass through the weld. Refracted longitudinal waves provide better penetration. Duke Energy Corporation uses a combination of shear waves and longitudinal waves to examine single sided austenitic welds.

The procedures, personnel and equipment have been qualified through the Performance Demonstration Initiative (PDI). However, although longitudinal wave search units were used in the qualification and cracks were detected through the weld metal, PDI does not provide a qualification for single sided examinations of austenitic welds.

V. Alternate Examinations or Testing:

No additional examinations are planned during the current interval for this weld. Because of the valve configuration, Radiography would not provide any additional coverage.

Duke Energy Corporation will use the most effective ultrasonic techniques available to obtain maximum coverage for future examinations of this weld.

VI. Justification for the Granting of Relief:

Examination Category B-J:

Although the examination volume as defined in ASME Section XI 1989 Edition with no addenda, Figure IWB-2500-8 (c) could not be covered, the amount of coverage obtained for this examination provides an acceptable level of quality and integrity. This weld was examined using procedures, personnel and equipment qualified through the Performance Demonstration Initiative (PDI). In addition, this weld was examined during installation using volumetric and surface NDE methods.

The weld is located within the Emergency Core Cooling System Cold Leg Injection lines. This weld is not exposed to significant neutron fluence and is not

prone to embrittlement associated with neutron bombardment. This weld was rigorously inspected by radiography and dye penetrant examinations during construction and verified to be free from unacceptable fabrication defects. If a leak were to occur at the weld in question, the reactor coolant leakage calculation which is normally performed daily (and required by Technical Specifications to be performed every 72 hours) would provide an early indication of leakage. The unidentified leakage specification in Technical Specification 3.4.13.1 is 1 gpm. Several other indicators such as containment radiation monitors EMF-38, 39, and 40, the containment floor and equipment sump levels, containment humidity instruments and the ventilation unit condensate drain tank level would provide early indication of weld leakage for prompt Operations and Engineering evaluation.

Check valves located downstream could however provide isolation from the reactor coolant system. In that case leakage from these welds would be indicated by outleakage from the associated Cold Leg Accumulator tanks. Level in these tanks is continuously monitored and alarmed in the control room and is maintained within limits established in Technical Specification 3.5.1.2. The fill frequency for these tanks is also trended by the Safety Injection System Engineer who would notice an increase in makeup to the tank should leakage occur from this weld. Also containment floor and equipment sump level would provide early indication of weld leakage for prompt Operations and Engineering evaluation.

VII. Implementation Schedule:

Duke Energy Corporation will continue to use ultrasonic examination procedures to obtain maximum coverage to the extent practical of the item number referenced in Section I of this Request for Relief. No additional ultrasonic examination is planned during the current interval for this weld.

VIII. References:

Attachment 1. Information for Examination Category B-J affected welds: Pages 13-16 cover this weld.

B09.011.165

I. System / Components(s) for Which Relief is Requested:

Examination Category C-B:
Nozzle-to-Shell (or Head) Weld for Steam Generator 2C Auxilliary Feedwater System (CA).

ID Numbers	Item Numbers	End of Cycle
2SGC-W259	C02.021.007	13

II. Code Requirement:

ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition Table IWC-2500, lists the following requirements for each Examination Category as shown below:

Examination Category C-B: Figure IWC-2500-4 (a), Examination Volume C-D-E-F.

ASME Section V, Article 4, Paragraph T-424.1 states: "The volume shall be examined by moving the search unit over the examination surface so as to scan the entire examination volume."

III. Code Requirement from Which Relief Is Requested:

Examination Category C-B:
Relief is requested from the requirement to examine 100% of volume C-D-E-F.

IV. Basis for Relief:

Examination Category C-B:

During the ultrasonic examination of this weld, greater than 90% of the required examination volume as allowed by Code Case N-460 could not be obtained. As shown in Attachment 2, the examination coverage was limited to 74.40% of the required examination volume. This is a ferritic nozzle to shell weld where access is limited to the vessel shell side only. The percentage of coverage reported represents the aggregate coverage obtained from one scan perpendicular to the weld axis and two scans, 180° apart parallel to the weld. The weld design prevented any axial scan from the nozzle side. In order to

achieve more coverage the weld would have to be re-designed to allow scanning from both sides.

V. Alternate Examinations or Testing:

No additional examinations are planned during the current interval for this weld. Radiography is not an acceptable alternative because of access restrictions for source and film placement.

Duke Energy Corporation will use the most effective ultrasonic techniques available to obtain maximum coverage for future examinations of this weld.

VI. Justification for the Granting of Relief:

Examination Category C-B:

Although the examination volume as defined in ASME Section XI 1989 Edition with no addenda, Figure IWC-2500-4 (a) could not be covered to the extent required, the amount of coverage obtained for this examination provides an acceptable level of quality and integrity. This weld was examined using procedures, personnel and equipment qualified for the ultrasonic examination of ferritic pressure vessel welds through the Performance Demonstration Initiative (PDI). The qualifications were conducted on samples with access to both sides of the weld. Therefore, Duke Energy Corporation does not claim credit for the full volume when a single sided examination is performed.

If a leak were to occur at the weld in question [Steam Generator (CA) Nozzle], there are methods by which the leak could be identified for prompt Engineering evaluation. A leak at a CA nozzle would result in the following:

a) Increased containment humidity. This parameter is indicated in the control room and is monitored periodically by Operations and also the Containment Ventilation System Engineer.

b) Increased S/G enclosure temperature. This parameter is continuously monitored by the Operations via an OAC alarm, and is periodically monitored by the System Engineer.

c) Increased input into the Ventilation Unit Condensate Drain Tank (VUCDT). This parameter is monitored continuously by Operations via an OAC alarm and also periodically by the Liquid Radwaste System Engineer and Reactor Coolant System Engineer.

Note: The above parameters would be used to identify a leak in the steam generator enclosure, but could not specifically identify the CA nozzle as the source of leakage. A containment entry would be required to identify the exact source of the leakage.

Also, a containment walkdown is performed when the unit reaches Mode 3 (full temperature / pressure) during the unit shutdown for each refueling outage. This walkdown should identify any leak at the weld in question.

Concerning the consequences of a leak at the CA nozzle (affects on CA system operation): Any leakage would result in a portion of the CA flow bypassing the steam generator, and therefore being unavailable to maintain steam generator levels. Very small leaks (< 1 gpm) would have no discernible effect on CA system operation. Leaks that approach 5 gpm would need to be evaluated for system operability effects. McGuire has specific Safety Analyses for accidents where minor and major main feedwater system pipe breaks are postulated. These Safety Analyses demonstrate compliance with requirements of 10CFR100. Replacement or re-design of any of these Class 1 or Class 2 nozzles is not a viable alternative. Duke Energy believes the amount of coverage obtained for these examinations provides reasonable assurance of the continued structural integrity of the subject welds.

Also, the CA nozzles are equipped with thermal sleeves to limit thermal shock due to auxiliary feedwater injections. McGuire operates the CA nozzles consistent with the stress and fatigue qualifications provided by the Manufacturer (BWI).

VII. Implementation Schedule:

Duke Energy Corporation will continue to use ultrasonic examination procedures to obtain maximum coverage to the extent practical of the item number referenced in Section I of this Request for Relief.

No additional ultrasonic examinations are planned during the current interval for this weld.

VIII. References:

Attachment 2. Information for Examination Category C-B affected welds: Pages 1-9 cover this weld.

C02.021.007

I. System / Components(s) for Which Relief is Requested:

Examination Category C-F-1:
Piping Circumferential Weld for Safety Injection System.

ID Numbers	Item Numbers	End Of Cycle
2NI2F493	C05.011.129	13

II. Code Requirement:

ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition Table IWC-2500, lists the following requirements for the Examination Category as shown below:

Examination Category C-F-1: ASME Section XI, Figure IWC-2500-7 (a), Examination Volume C-D-E-F.

III. Code Requirement from Which Relief Is Requested:

Examination Category C-F-1:
Relief is requested from the requirement to examine 100% of Volume C-D-E-F.

IV. Basis for Relief:

Examination Category C-F-1:

During the ultrasonic examination of this weld, greater than 90% of the required examination volume as allowed by Code Case N-460 could not be obtained. As shown in Attachment 3, Pages 1-4 the examination coverage was limited to 59.86% of the required examination volume. This is a stainless steel pipe-to-valve weld where access is limited to the pipe side only. The percentage of coverage reported represents the aggregate coverage obtained from one scan perpendicular to the weld axis and two scans, 180° apart parallel to the weld. The weld design prevented any axial scan from the valve side. In order to achieve more coverage the weld would have to be re-designed to allow scanning from both sides.

Duke Energy Corporation does not claim credit for coverage of the far side of austenitic welds. The characteristics of austenitic weld metal attenuate and distort the sound beam when shear waves pass through the weld. Refracted longitudinal waves provide better penetration. Duke Energy Corporation uses a combination of shear waves and longitudinal waves to examine single sided austenitic welds.

The procedures, personnel and equipment have been qualified through the Performance Demonstration Initiative (PDI). However, although longitudinal wave search units were used in the qualification and cracks were detected through the weld metal, PDI does not provide a qualification for single sided examinations of austenitic welds.

V. Alternate Examinations or Testing:

No additional examinations are planned during the current interval for this weld. Because of the valve configuration, Radiography would not provide any additional coverage.

Duke Energy Corporation will use the most effective ultrasonic techniques available to obtain maximum coverage for future examinations of this weld.

VI. Justification for the Granting of Relief:

Examination Category C-F-1:

Although the examination volume as defined in ASME Section XI 1989 Edition with no addenda, Figure IWB-2500-7 (a) could not be covered, the amount of coverage obtained for this examination provides an acceptable level of quality and integrity. This weld was examined using procedures, personnel and equipment qualified through the Performance Demonstration Initiative (PDI). In addition, this weld was examined during installation using volumetric and surface NDE methods.

This weld is located on the "D" Cold Leg ECCS line. This weld is not exposed to significant neutron fluence and is not prone to embrittlement associated with neutron bombardment. This weld was rigorously inspected by radiography and dye penetrant

examinations during construction and verified to be free from unacceptable fabrication defects. Because there are two check valves between this weld and the reactor coolant loop, it is not likely that leakage through this weld would be exhibited as described previously for the Category B-J piping. Likewise, a single check valve may also prevent outleakage from the "D" Cold Leg Accumulator (as described previously for Items B09.011.162 and B09.011.165 welds) from indicating weld leakage. Leakage from this weld would likely be indicated by the containment floor and equipment sump level which is alarmed in the control room. The inputs to this sump are also trended by the WL Liquid Radwaste system engineer and an upward trend or significant influent increase would prompt Operations and Engineering evaluation.

VII. Implementation Schedule:

Duke Energy Corporation will continue to use ultrasonic examination procedures to obtain maximum coverage to the extent practical of the item number referenced in Section I of this Request for Relief. No additional ultrasonic examination is planned during the current interval for this weld.

VIII. References:

Attachment 3. Information for Examination Category C-F-1 affected welds: Pages 1-4 cover this weld.

C05.011.129

I. System / Components(s) for Which Relief is Requested:

Examination Category C-F-1:
Piping Circumferential Weld for Chemical and Volume Control System.

ID Numbers	Item Numbers	End Of Cycle
2RCPA-TE	C05.021.081	13

II. Code Requirement:

ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition Table IWC-2500, lists the following requirements for the Examination Category as shown below:

Examination Category C-F-1: ASME Section XI, Figure IWC-2500-7 (a), Examination Volume C-D-E-F.

III. Code Requirement from Which Relief Is Requested:

Examination Category C-F-1:

Relief is requested from the requirement to examine 100% of Volume C-D-E-F.

IV. Basis for Relief:

Examination Category C-F-1:

During the ultrasonic examination of this weld, greater than 90% of the required examination volume could not be obtained. As shown in Attachment 3 (Pages 5-10), the examination coverage was limited to 58.17% of the required examination volume. This is a stainless steel flange-to-tee weld where access is limited to the flange side only. The percentage of coverage reported represents the aggregate coverage obtained from one scan perpendicular to the weld axis and two scans, 180° apart parallel to the weld. The weld design prevented any axial scan from the tee side. In order to achieve more coverage the weld would have to be re-designed to allow scanning from both sides.

Duke Energy Corporation does not claim credit for coverage of the far side of austenitic welds. The characteristics of austenitic weld metal attenuate and distort the sound beam when shear waves pass through the weld. Refracted longitudinal waves provide better penetration. Duke Energy Corporation uses a combination of shear waves and longitudinal waves to examine single sided austenitic welds.

The procedures, personnel and equipment have been qualified through the Performance Demonstration Initiative (PDI). However, although longitudinal wave search units were used in the qualification and cracks were detected through the weld metal, PDI does not provide a qualification for single sided examinations of austenitic welds.

V. Alternate Examinations or Testing:

No additional examinations are planned during the current interval for this weld. Because of the valve configuration, Radiography would not provide any additional coverage.

Duke Energy Corporation will use the most effective ultrasonic techniques available to obtain maximum coverage for future examinations of this weld.

VI. Justification for the Granting of Relief:

Examination Category C-F-1:

Although the examination volume as defined in ASME Section XI 1989 Edition with no addenda, Figure IWC-2500-7 (a) could not be covered, the amount of coverage obtained for this examination provides an acceptable level of quality and integrity. This weld was examined using procedures, personnel and equipment qualified through the Performance Demonstration Initiative (PDI). In addition, this weld was examined during installation using volumetric and surface NDE methods.

This weld is located on a portion of the Chemical and Volume Control system which is not credited nor is it required for accident mitigation. A leak from this weld would not be considered an accident initiator.

This weld is located on the Discharge Accumulator for the Reciprocating Charging Pump. Although this pump is not normally in operation, it is operated on a quarterly frequency at which time an operator is dispatched to observe the pump and would likely notice any leakage from the weld. Since the pressure during the quarterly pump run is ten times more than the residual heat removal discharge pressure (accident condition), a leak in the weld is more likely to occur during pump operation. At other times, leakage from this weld would be noticed during operator rounds which are conducted in the pump room once each shift. Unidentified reactor coolant leakage methods would also readily detect leakage from this piping. A leak from this weld could easily be isolated leaving the Emergency Core Cooling System 100% functional.

VII. Implementation Schedule:

Duke Energy Corporation will continue to use ultrasonic examination procedures to obtain maximum coverage to the extent practical of the item number referenced in Section I of this Request for Relief. No additional ultrasonic examination is planned during the current interval for this weld.

VIII. References:

Attachment 3. Information for Examination Category C-F-1 affected welds: Pages 5-10 cover this weld.

C05.021.081

The following individuals were involved in the development of this request for relief. Edward Hyland, Bob Kirk, Bryan Meyer, Grant Cutri(McGuire Primary Systems Engineering) and Hoang V. Dinh (McGuire Civil Engineering) provided input to the engineering justification (Section VI) for granting relief. Jim McArdle (NDE Level III) provided Sections II, III, IV and V. Gary Underwood (McGuire ISI Plan Manager) compiled and completed the request.

Sponsored By: Gary Underwood Date 12-06-01

Approved By: R. Kevin Rhyne Date 12/6/01

McGuire Unit #2
EOC13

Item # B09.011.032

Weld # 2NC2FW 53-25

No Data Recorded. Reference Calibration Sheet #'s

000 20 48

000 20 50

REQUEST FOR RELIEF 01-009
ATTACHMENT 1
PAGES 1 - 4

DUKE POWER COMPANY
ISI LIMITATION REPORT

FORM NDE-UT-4
Revision 1

Component/Weld ID: 2NC2FW53-25 Item No: B09.011.032

Remarks: DUE TO FLANGE CONFIGURATION

☒ NO SCAN ☐ LIMITED SCAN	SURFACE ☒ 1 ☐ 2	BEAM DIRECTION ☐ 1 ☐ 2 ☐ cw ☐ ccw	DUE TO FLANGE CONFIGURATION
FROM L N/A to L N/A		INCHES FROM WO .6" to BEYOND	
ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other ____		FROM 0 DEG to 360 DEG	
☐ NO SCAN ☐ LIMITED SCAN	SURFACE ☐ 1 ☐ 2	BEAM DIRECTION ☐ 1 ☐ 2 ☐ cw ☐ ccw	
FROM L ____ to L ____		INCHES FROM WO ____ to ____	
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other ____		FROM ____ DEG to ____ DEG	
☐ NO SCAN ☐ LIMITED SCAN	SURFACE ☐ 1 ☐ 2	BEAM DIRECTION ☐ 1 ☐ 2 ☐ cw ☐ ccw	
FROM L ____ to L ____		INCHES FROM WO ____ to ____	
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other ____		FROM ____ DEG to ____ DEG	
☐ NO SCAN ☐ LIMITED SCAN	SURFACE ☐ 1 ☐ 2	BEAM DIRECTION ☐ 1 ☐ 2 ☐ cw ☐ ccw	
FROM L ____ to L ____		INCHES FROM WO ____ to ____	
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other ____		FROM ____ DEG to ____	

Prepared By: [signature] Level: II Date: 9-20-00 **Sketch(s) attached** ☒ yes ☐ no Sheet 2 of 4

Reviewed By: Guy G Bibb Date: 9-25-00 Authorized Inspector: [signature] Date: 9-26-00

R GH 10/3/00

DUKE POWER COMPANY

Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

Examination Volume/Area Defined

☒ Base Metal ☒ Weld ☐ Near Surface ☐ Bolting ☐ Inner Radius

Area Calculation	Volume Calculation
.24 X 1.3 = .312 SQ. IN.	.312 X 21.0 = 6.6 CU. IN

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	45	CW	.312	21	6.6	6.6	100.00
2	45	CCW	.312	21	6.6	6.6	100.00
3	60	S2	.127	21	2.7	6.6	40.91
4	60	S1	0	0	0	6.6	0.00
		SHEAR WAVE	AGGREGATE	COVERAGE			60.30
L-WAVE							0.00
4	60L	S1	.185	21	3.9	6.6	59.09

59.1% OF 25% (SCAN 4) = 14.8%

Item No: B09.011.032

Prepared By: James H. Bess Level: II Date: 9-20-00

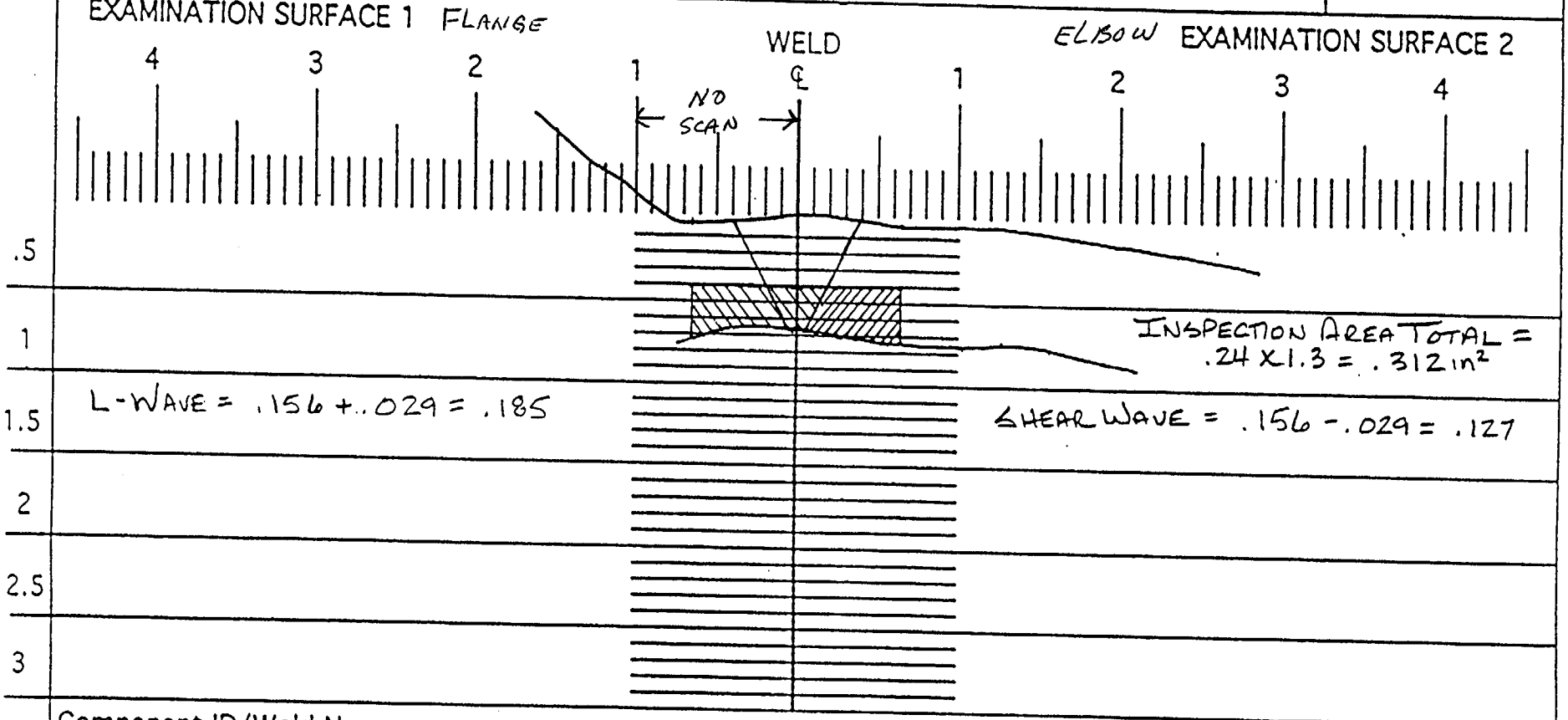
Reviewed By: Guy L. Bibb Level: III Date: 9-25-00

DUKE POWER COMPANY

UT PROFILE/PLOT SHEET

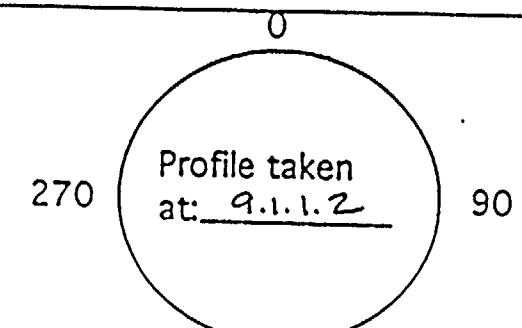
NDE-UT-5

Revision 1



Component ID/Weld No. 2NC2FW53-25

: Remarks:



Item No: B09.011.032

Examiner: James A Beson	Level: II	Date: 9-20-00
Reviewed By: Larry S. Bibb	Level: III	Date: 9.25.00
Authorized Inspector: [illegible]		Date: 9-26-00

Sheet 4 of 4

R. Gil 10/3/00

McGuire Unit #2
EOC13

Item # B09.011.039

Weld # 2NC 2FW 53-37

No Data Recorded. Reference Calibration Sheet #'s

000 2048

000 2050

10/4/01

DUKE POWER COMPANY
ISI LIMITATION REPORT

FORM NDE-UT-4
Revision 1

Component/Weld ID: 2NC2FW53-37 | Item No: B09.011.039 | Remarks:

☒ NO SCAN
☐ LIMITED SCAN
SURFACE: ☒ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☒ 2 ☐ cw ☐ ccw
FROM L N/A to L N/A
INCHES FROM WO .6" to BEYOND
ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other _____
FROM 0 DEG to 360 DEG
Remarks: DUE TO FLANGE CONFIGURATION

☐ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L _____ to L _____
INCHES FROM WO _____ to _____
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____
FROM _____ DEG to _____ DEG

☐ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L _____ to L _____
INCHES FROM WO _____ to _____
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____
FROM _____ DEG to _____ DEG

☐ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L _____ to L _____
INCHES FROM WO _____ to _____
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____
FROM _____ DEG to _____

Prepared By: James H. Bacon Level: II Date: 9-20-00 | Sketch(s) attached ☒ yes ☐ no | Sheet 2 of 4

Reviewed By: Tracy L Bibb Date: 9-25-00 | Authorized Inspector: [signature] Date: 9-26-00

10-4-00

DUKE POWER COMPANY

Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

Page 7

Examination Volume/Area Defined

☒ Base Metal ☒ Weld ☐ Near Surface ☐ Bolting ☐ Inner Radius

Area Calculation	Volume Calculation
.24 X 1.3 = .312 SQ. IN.	.312 X 21.0 = 6.6 CU. IN

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	45	CW	.312	21	6.6	6.6	100.00
2	45	CCW	.312	21	6.6	6.6	100.00
3	60	S2	.127	21	2.7	6.6	40.91
4	60	S1	0	0	0	6.6	0.00
		SHEAR WAVE	AGGREGATE	COVERAGE			60.30
L-WAVE	60L	S1	.185	21	3.9	6.6	59.09

59.1% OF 25% (SCAN 4) = 14.8%

R1

Item No: B09.011.039

Prepared By: Jerrod H. Bass Level: II Date: 9-20-00

Reviewed By: Guy L. Bibb Level: III Date: 9-25-00

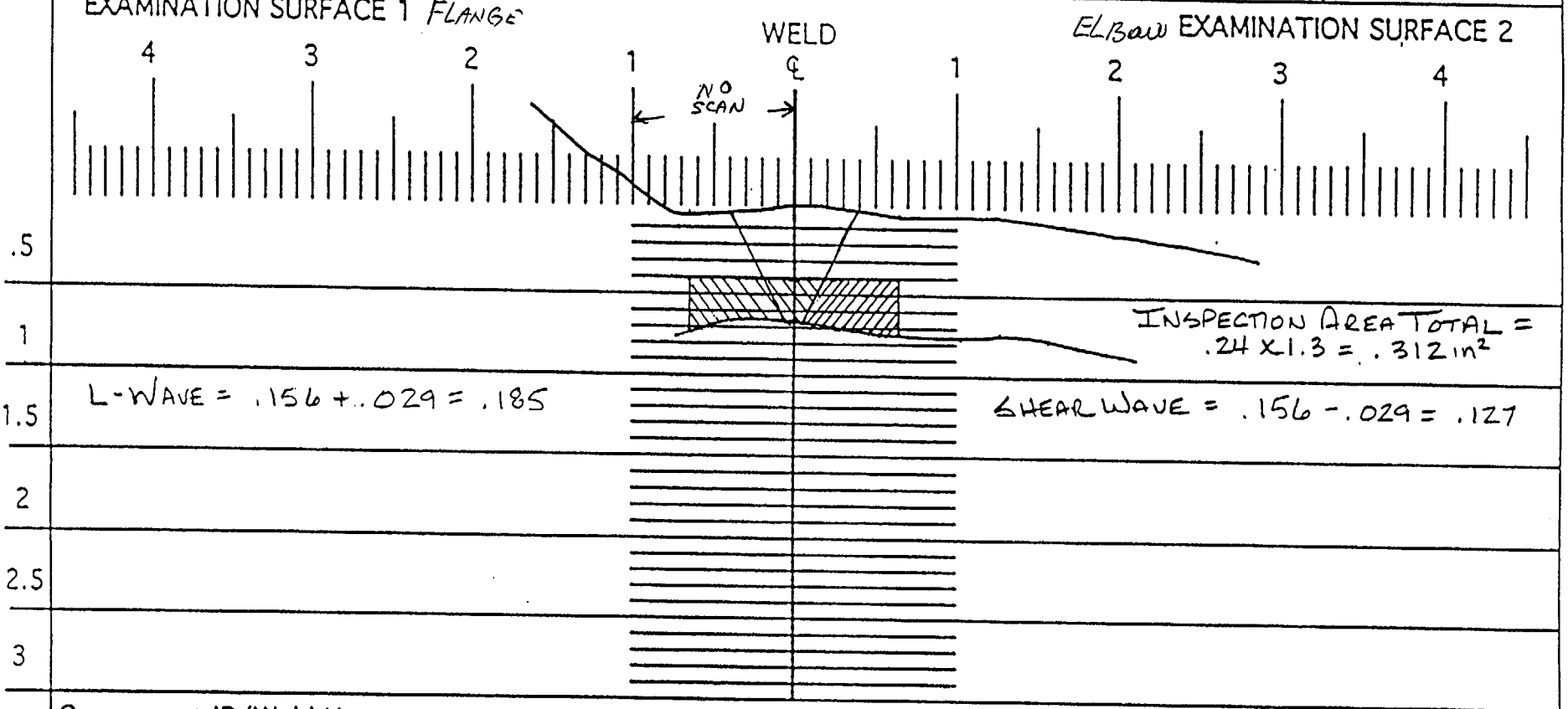
R2 10/4/

DUKE POWER COMPANY

UT PROFILE/PLOT SHEET

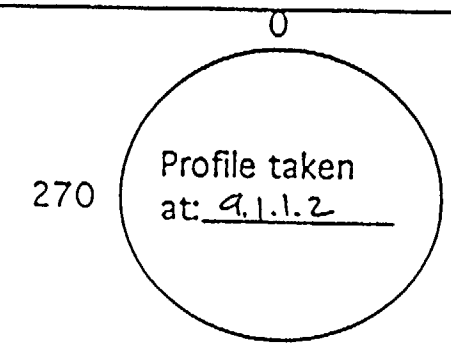
NDE-UT-5

Revision 1



Component ID/Weld No. 2NC2FW53-37

: Remarks:



Item No: B09.011.039

Examiner: James H Bess	Level: II	Date: 9-20-00
Reviewed By: Terry L. Bell	Level: III	Date: 9-25-00
Authorized Inspector:		Date: 9-26-00

Sheet 4 of 4

R Gri 10/4/00

McGuire Unit #2
EOC13

Item # B09.011.162

Weld # 2N12F 471

No Data Recorded. Reference Calibration Sheet #'s

0002029

000 2030

R
GU
10/4/00

DUKE POWER COMPANY
ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2NI2F471 | Item No: B09.011.162 | Remarks:

☒ NO SCAN ☐ LIMITED SCAN FROM L N/A to L N/A ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other ____	SURFACE ☐ 1 ☒ 2	BEAM DIRECTION ☒ 1 ☐ 2 ☐ cw ☐ ccw INCHES FROM WO .5" to BEYOND FROM 0 DEG to 360 DEG	DUE TO VALVE CONFIGURATION
☐ NO SCAN ☐ LIMITED SCAN FROM L ____ to L ____ ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other ____	SURFACE ☐ 1 ☐ 2	BEAM DIRECTION ☐ 1 ☐ 2 ☐ cw ☐ ccw INCHES FROM WO ____ to ____ FROM ____ DEG to ____ DEG	
☐ NO SCAN ☐ LIMITED SCAN FROM L ____ to L ____ ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other ____	SURFACE ☐ 1 ☐ 2	BEAM DIRECTION ☐ 1 ☐ 2 ☐ cw ☐ ccw INCHES FROM WO ____ to ____ FROM ____ DEG to ____ DEG	
☐ NO SCAN ☐ LIMITED SCAN FROM L ____ to L ____ ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other ____	SURFACE ☐ 1 ☐ 2	BEAM DIRECTION ☐ 1 ☐ 2 ☐ cw ☐ ccw INCHES FROM WO ____ to ____ FROM ____ DEG to ____	

Prepared By: *Larry Mauldin* Level: III Date: 9-12-00 | **Sketch(s) attached** ☒ yes ☐ no | Sheet 2 of 4

Reviewed By: *Guy S. Bibb* Date: III 9-15-00 | Authorized Inspector: *[signature]* Date: 9-16-00

R GW 10/4/00

Page 11

DUKE POWER COMPANY Limited Examination Coverage Worksheet	NDE-91-1 Revision 0

Examination Volume/Area Defined

☒ Base Metal ☒ Weld ☐ Near Surface ☐ Bolting ☐ Inner Radius

Area Calculation	Volume Calculation
.26" X 1.1" = .286 SQ. IN.	.286 SQ. IN. X 21" = 6.006 = 6.01 CU. IN.

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60S	2	.111	21	2.331	6.01	38.79
2	60S	1	0	21	0	6.01	0.00
3	45	CW	.286	21	6.01	6.01	100.00
4	45	CCW	.286	21	6.01	6.01	100.00
	SHEAR	WAVE	AGGREGATE	COVERAGE	14.351	24.04	59.70
1	60L	2	.175	21	3.675	6.01	61.15

61.15% OF 25% (SCAN 1) =
LONG WAVE COVERAGE = 15.29% OF TOTAL WELD.

R GJ 10/4/00

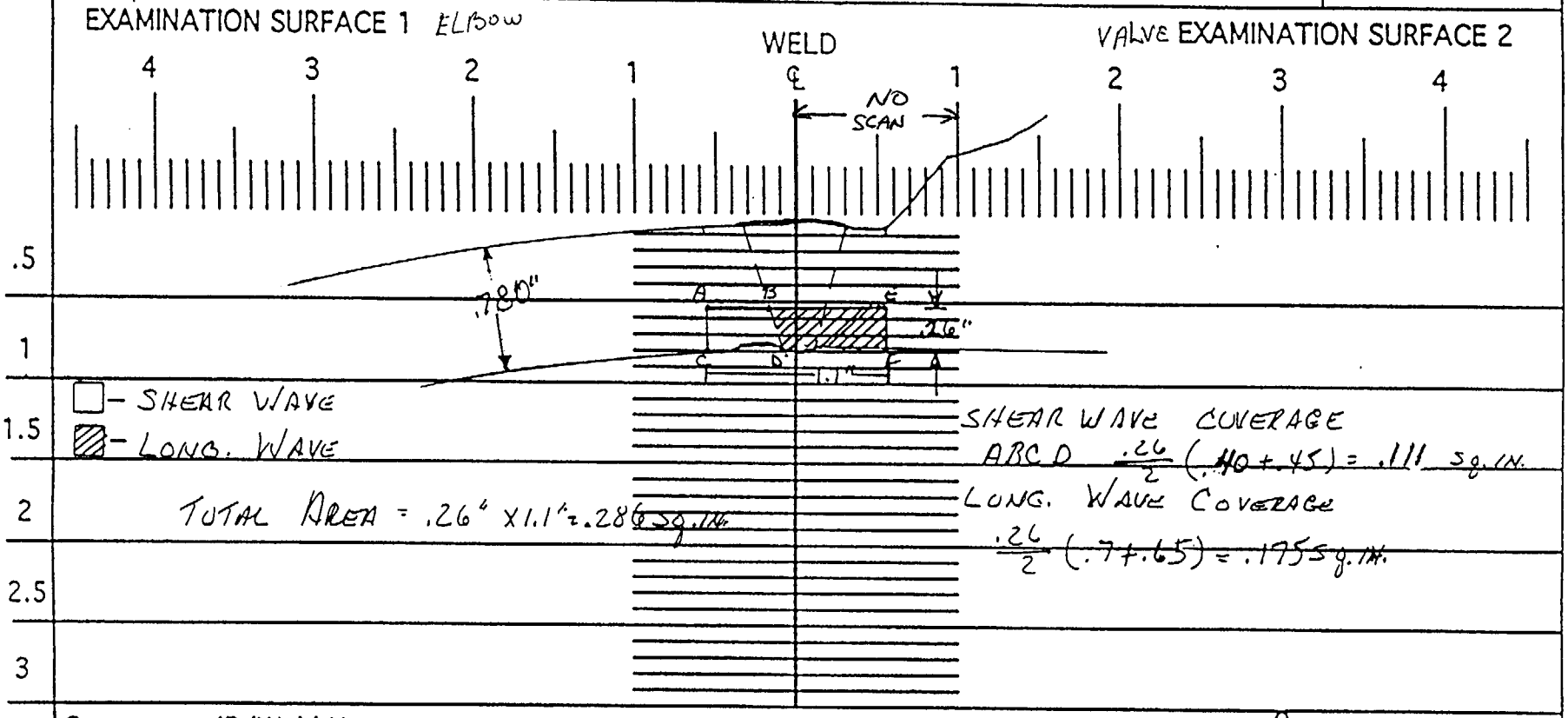
Item No: B09.011.162			
Prepared By: Larry Maulden	Level: III	Date: 9-12-00
Reviewed By: Guy L. Bibb	Level: III	Date: 9-15-00

DUKE POWER COMPANY

UT PROFILE/PLOT SHEET

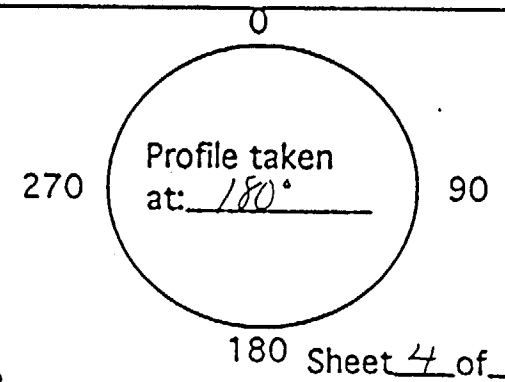
NDE-UT-5

Revision 1



Component ID/Weld No. 2NI2F471

: Remarks:



Item No: B09.011.162

Examiner:	Larry Moulden	Level: III	Date: 9-12-00
Reviewed By:	Guy D. Bibb	Level: III	Date: 9-15-00
Authorized Inspector:	[signature]		Date: 9-16-00

Sheet 4 of 4

R Gm 10/6/00

McGuire Unit #2
EOC13

Item # B09.011.165

Weld # 2N12F494

No Data Recorded. Reference Calibration Sheet #'s

000 20 27

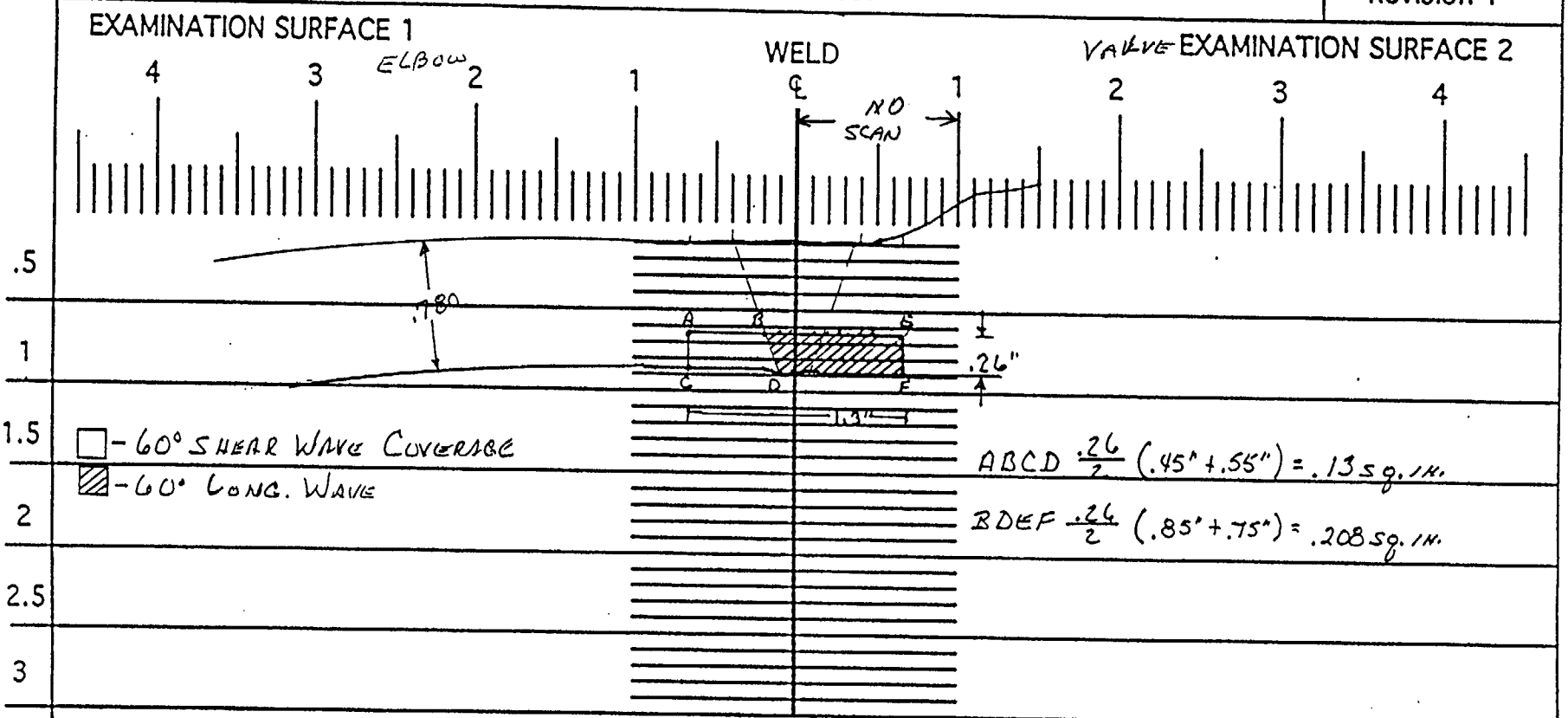
000 20 28

DUKE POWER COMPANY

UT PROFILE/PLOT SHEET

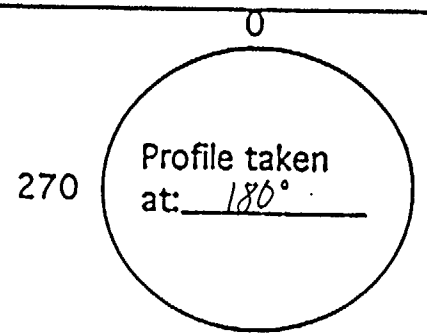
NDE-UT-5

Revision 1



Component ID/Weld No. 2NI2F494

: Remarks:



Item No: B09.011.165

Examiner: Larry Thaulder	Level: III	Date: 9-12-00
Reviewed By: Roy L. Bibb	Level: III	Date: 9-15-00
Authorized Inspector:		Date: 9-16-00

Sheet 2 of 4

RJ 10/4/00

DUKE POWER COMPANY
Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

Examination Volume/Area Defined

☒ Base Metal ☒ Weld ☐ Near Surface ☐ Bolting ☐ Inner Radius

Area Calculation	Volume Calculation
.26 " X 1.3" = .338 SQ. IN.	.338 SQ. IN. X 21" = 7.098 = 7.1 CU. IN.

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60	2	.13	21	2.73	7.1	38.45
2	60	1	0	21	0	7.1	0.00
3	45	CW	.338	21	7.1	7.1	100.00
4	45	CCW	.338	21	7.1	7.1	100.00
	SHEAR	WAVE	AGGREGATE	COVERAGE	16.93	28.4	59.61
1	60L	2	.208	21	4.368	7.1	61.52

LONG WAVE 61.5% OF 25% (SCAN 1) =
15.25% OF TOTAL WELD

Item No: B09.011.165

Prepared By: Larry Maddox Level: III Date: 9-12-00

Reviewed By: Larry G. Bibb Level: III Date: 9-15-00

DUKE POWER COMPANY
ISI LIMITATION REPORT

FORM NDE-UT-4
Revision 1

Component/Weld ID: 2NI2F494 | Item No: B09.011.165 | Remarks:

☒ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☒ 2
BEAM DIRECTION: ☒ 1 ☐ 2 ☐ cw ☐ ccw
FROM L N/A to L N/A
INCHES FROM WO .5" to BEYOND
ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other _____
FROM 0 DEG to 360 DEG
Remarks: DUE TO VALVE CONFIGURATION

☐ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L _____ to L _____
INCHES FROM WO _____ to _____
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____
FROM _____ DEG to _____ DEG

☐ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L _____ to L _____
INCHES FROM WO _____ to _____
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____
FROM _____ DEG to _____ DEG

☐ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L _____ to L _____
INCHES FROM WO _____ to _____
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____
FROM _____ DEG to _____

Prepared By: Larry Maulden Level: III Date: 9-12-00 | Sketch(s) attached ☒ yes ☐ no | Sheet 4 of 4

Reviewed By: Guy S. Bibb Date: 9-15-00 | Authorized Inspector: [signature] Date: 9-16-00

5/14/01

Form NDE-620
Revision 0

DUKE POWER COMPANY

ULTRASONIC DATA SHEET FOR PLANAR REFLECTORS IN FERRITIC PRESSURE VESSELS

Station: MCGUIRE	Unit: 2	Component/Weld ID: 2SGC-W259	Date: 9/23/00
Weld Length (in.): 66"	Surface Condition: GROUND	L0 9.2.3	Exam Start: 0940 / Exam Finish: 1010

Procedure No: NDE-620
Revision: 8
FC N/A

Scans
70° 67.7 dB Zone I 60° 75.2 dB Zone II
60° 75.2 dB Zone III Axial
60° 75.2 dB Zone III Circ.

Configuration
S2 S1
NOZZLE TO SHELL
Scan Surface: OD

Surface Temp. 109 °F
Pyrometer s/n: MCWDE213
Cal. Due Date: 11/18/00

Calibration Sheet No:
0002054
0002055
0002056

Indication #	∠	MP_{max}	% FSH	L_{max}	W_{max}	SU LOCATION	BEAM DIRECTION	SCAN ⊥ ∥	REMARKS
NRI	70°								ZONE 1
NRI	60°								ZONE 2 & 3

> 90% Coverage obtained: yes ☐ no ☑ (see NDE-UT-4) Limitation report is required

Examiner: M E Hansen Level: II Date: 9/23/00 Examiner: _____ Level: ___ Date: ___

Item No: C02.021.007

Reviewed by: Larry A. Bibb Level: III Date: 9-25-00 Authorized Inspector: _____ Date: 9-26-00

R 0 10/9/00

REQUEST FOR RELIEF 01-009
ATTACHMENT 2
PAGES 1-9

DUKE POWER COMPANY
ISI LIMITATION REPORT

FORM NDE-UT-4
Revision 1

Component/Weld ID: 2SGC-W259 Item No: C02.021.007

Remarks:

NOZZLE CONFIGURATION

☒ NO SCAN
☐ LIMITED SCAN

SURFACE: ☐ 1 ☒ 2

BEAM DIRECTION: ☒ 1 ☒ 2 ☐ cw ☒ ccw

FROM L ________ to L ______ INCHES FROM WO CL + 2" to BEYOND

ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other 70 FROM 0 DEG to 360 DEG

☐ NO SCAN
☐ LIMITED SCAN

SURFACE: ☐ 1 ☐ 2

BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L ________ to L ______ INCHES FROM WO ________ to ________

ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other ______ FROM ____ DEG to ____ DEG

☐ NO SCAN
☐ LIMITED SCAN

SURFACE: ☐ 1 ☐ 2

BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L ________ to L ______ INCHES FROM WO ________ to ________

ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other ______ FROM ____ DEG to ____ DEG

☐ NO SCAN
☐ LIMITED SCAN

SURFACE: ☐ 1 ☐ 2

BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L ________ to L ______ INCHES FROM WO ________ to ________

ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other ______ FROM ____ DEG to ____

Prepared By: [signature] Level: II Date: 9/23/00 **Sketch(s) attached** ☒ yes ☐ no Sheet 2 of 9

Reviewed By: [signature] Date: 9-25-00 Authorized Inspector: [signature] Date: 9-26-00

R GH 10/9/00

Page 2

DUKE POWER COMPANY

Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

Examination Volume/Area Defined

☐ Base Metal ☐ Weld ☒ Near Surface ☐ Bolting ☐ Inner Radius

Area Calculation	Volume Calculation
ZONE I SEE DRWG. 6.3 SQ. IN.	6.3 SQ. IN X 69 IN. = 434.7 CU. IN.

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	70	S2	6.2	69	427.8	434.7	98.41
2	70	S1	3.2	69	220.8	434.7	50.79
3	70	CW	5.5	69	379.5	434.7	87.30
4	70	CCW	5.5	69	379.5	434.7	87.30
					1407.6	1738.8	80.95

Item No: C02.021.007

Prepared By: [signature] Level: II Date: 9/25/00

Reviewed By: Suzy G. Bibb Level: III Date: 9-25-00

Page 4

DUKE POWER COMPANY

Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

Examination Volume/Area Defined

☒ Base Metal ☒ Weld ☐ Near Surface ☐ Bolting ☐ Inner Radius

Area Calculation	Volume Calculation
ZONES II & III SEE DRWG. 17.5 SQ. IN.	17.5 SQ. IN. X 69 IN. = 1207.5 CU. IN.

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60	S2	17.5	69	1207.5	1205.7	100.15
2	60	S1	1.5	69	103.5	1207.5	8.57
3	60	CW	14.2	69	979.8	1207.5	81.14
4	60	CCW	14.2	69	979.8	1207.5	81.14
					3270.6	4830	67.71

Item No: C02.021.007

Prepared By: [signature] Level: II Date: 9/23/00

Reviewed By: Guy L. Bibb Level: III Date: 9-25-00

DUKE POWER COMPANY Limited Examination Coverage Worksheet	NDE-91-1 Revision 0

Examination Volume/Area Defined

☐ Base Metal ☐ Weld ☐ Near Surface ☐ Bolting ☐ Inner Radius

Area Calculation	Volume Calculation

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage

60 COVERAGE 67.7%
70 COVERAGE 81 %
AGGREGATE COVERAGE 74.4%

			Item No:	C02.021.007
Prepared By:		Level: II	Date:	9/23/00
Reviewed By:	Guy L. Bibb	Level: III	Date:	9-25-00

AUX. FEED WATER NOZZLE

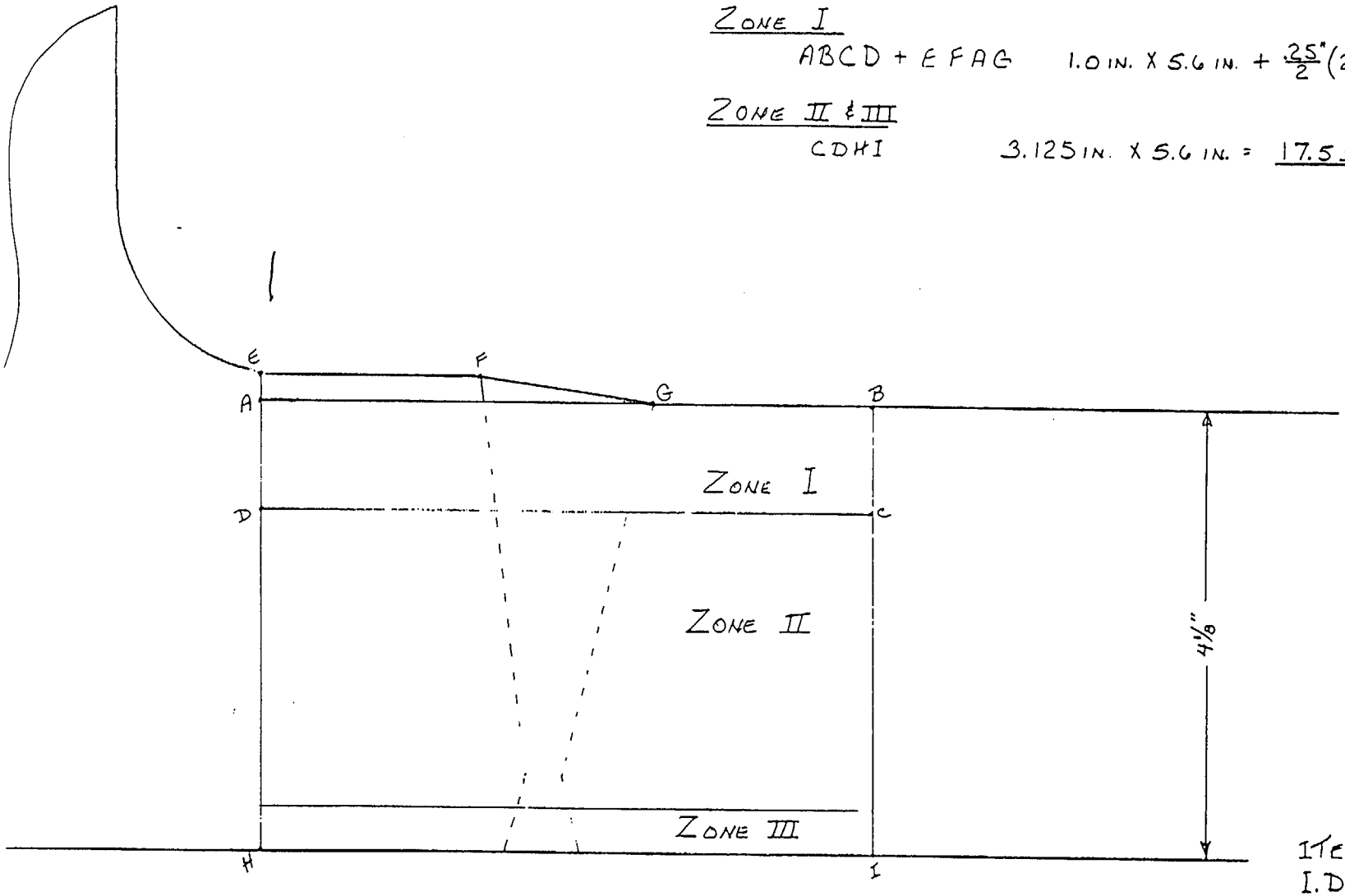
EXAM AREAS:

ZONE I

ABCD + EFAG 1.0 IN. X 5.6 IN. + $\frac{.25"}{2}$(2.0"+3.6) = 6.3 SQ. IN.

ZONE II & III

CDHI 3.125 IN. X 5.6 IN. = 17.5 SQ. IN.



ITEM # C02.021.007
I.D. # 2SGC-W259
BY:
DATE: 9/23/00

PG. 6 of 9

10/9/00

AUX. FEED WATER NOZ E

70° COVERAGE AREA (ZONE I)

S1 to S2 ABC (AREA of LOSS) $\frac{.7" \times .25"}{2} = .0875$

(TOTAL AREA) 6.3 sq.IN. - (LOSS) .0875 sq.IN. = 6.2125 =

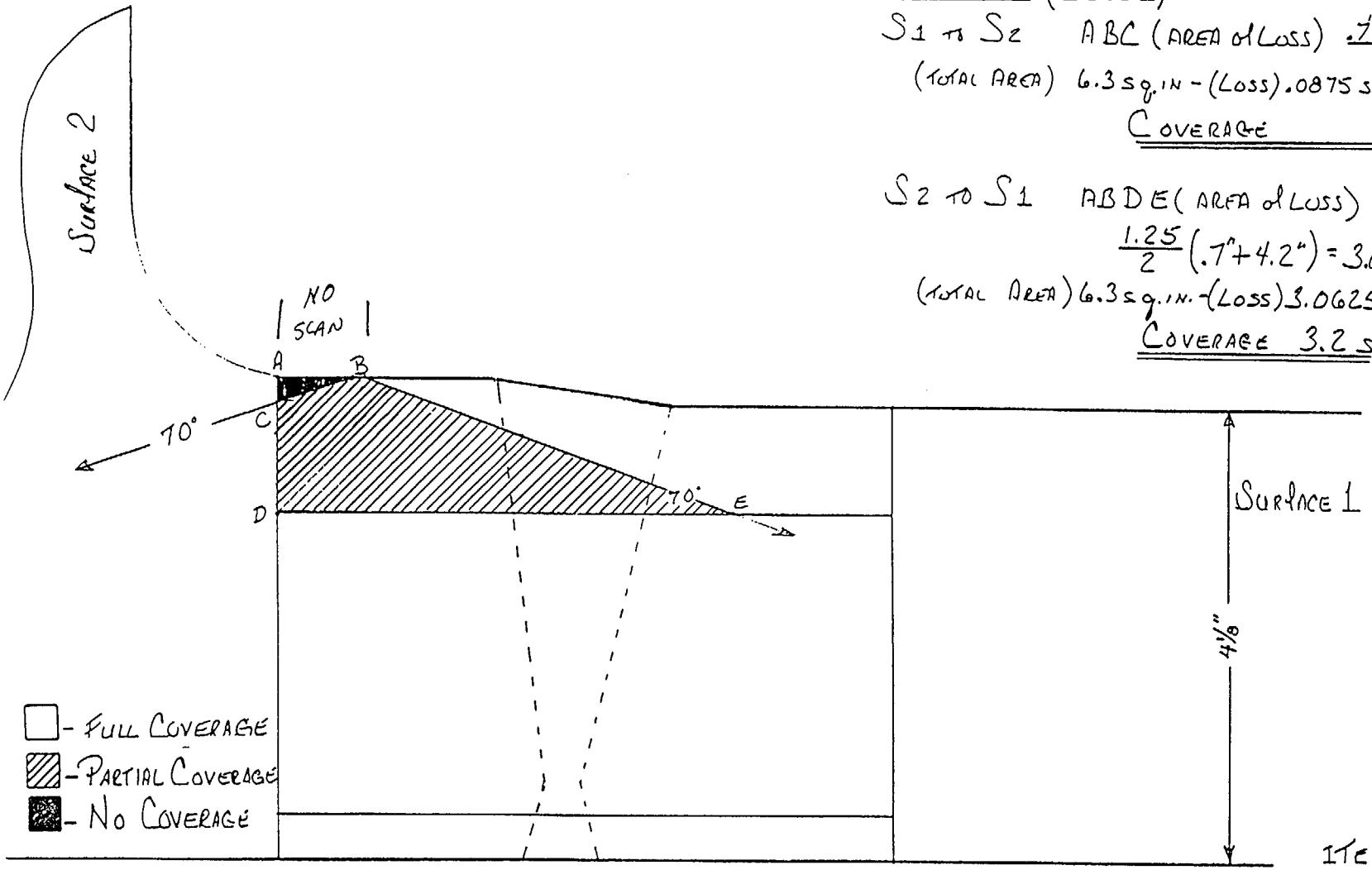
COVERAGE 6.2 sq.IN.

S2 to S1 ABDE (AREA of LOSS)

$\frac{1.25}{2}(.7" + 4.2") = 3.0625$

(TOTAL AREA) 6.3 sq.IN. - (LOSS) 3.0625 = 3.2375

COVERAGE 3.2 sq.IN.



ITEM # C02.021.007

I.D.# 256C-W259

BY:

DATE: 9/23/00

PG. 2 of 9

R 9-28-00

R GH 10/9/00

AUX. FEED WATER NOZ E

70° COVERAGE (ZONE I - CIRC SCAN)

ABCD (AREA of LOSS) .65" X 1.25" = .8125

(TOTAL AREA) 6.3 sq in. - (LOSS) .8125 sq in. = 5.4875

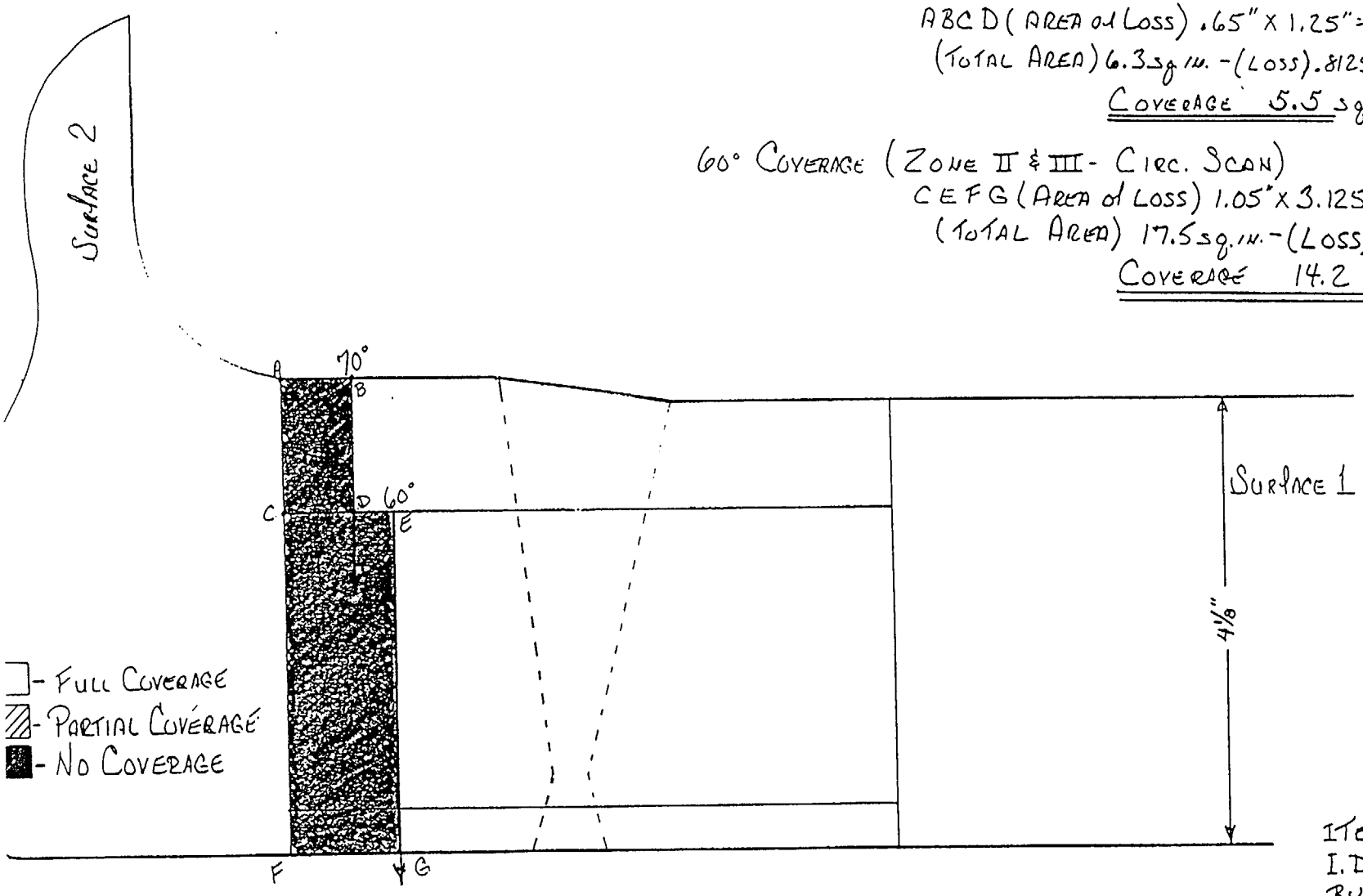
COVERAGE 5.5 sq. IN.

60° COVERAGE (ZONE II & III - CIRC. SCAN)

CEFG (AREA of LOSS) 1.05" X 3.125" = 3.28125

(TOTAL AREA) 17.5 sq. in. - (LOSS) 3.28125 sq. in. =

COVERAGE 14.2 sq. IN.



ITEM # C02.021.007

I.D.* 256C-W259

BY:

DATE: 9/23/00

PG. 8 of 9

R 9/28/00 R 10/9/00

AUX. FEED WATER NOZ E

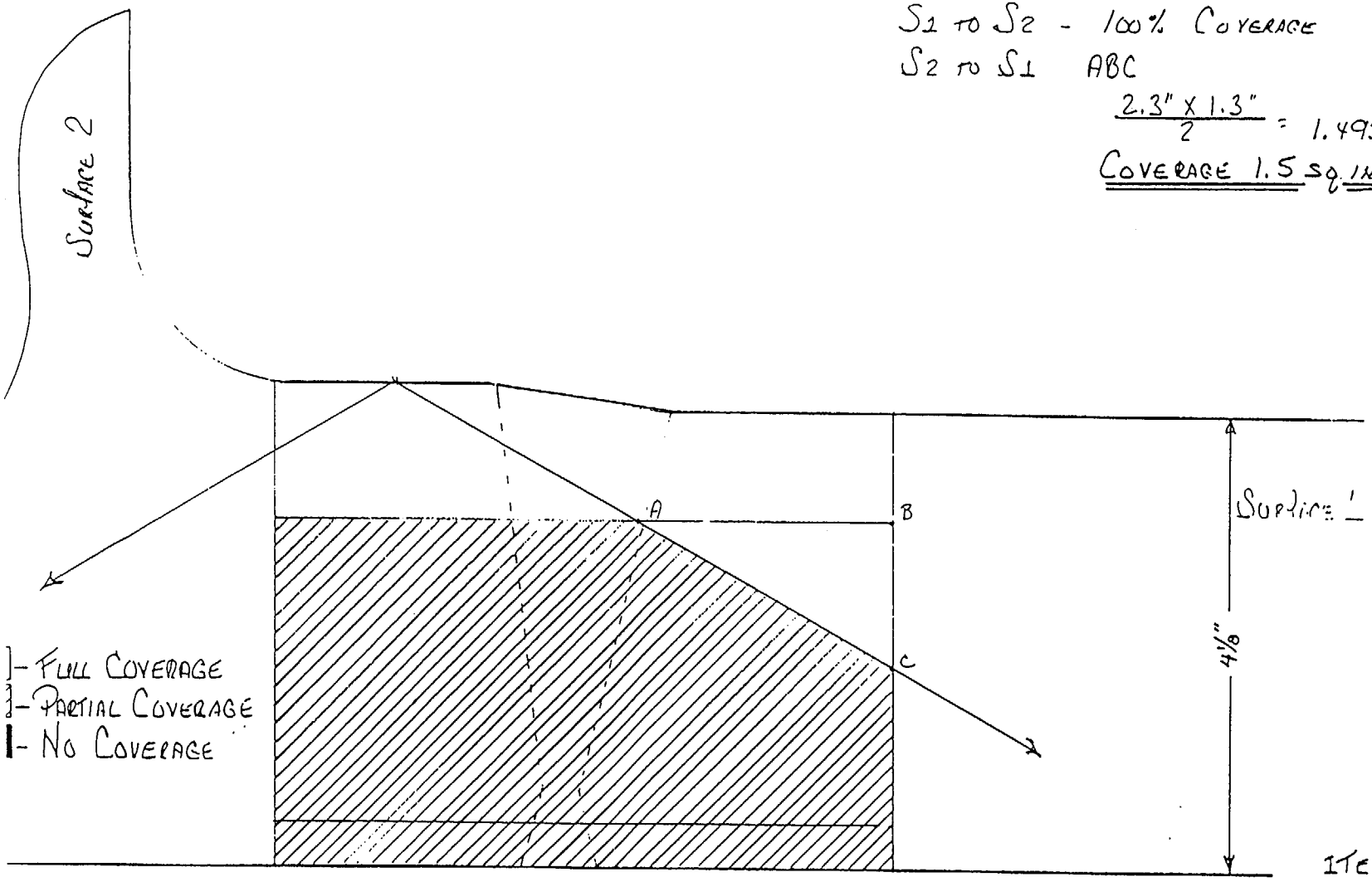
60° COVERAGE AREA

S1 TO S2 - 100% COVERAGE

S2 TO S1 ABC

$\frac{2.3" \times 1.3"}{2} = 1.495$ SQ. IN.

COVERAGE 1.5 SQ. IN



ITEM # C02.021.007

I.D. # 2516C-4259

BY:

DATE: 9/23/00

PG. 9 of 9

9/26-00 9/29/00

McGuire Unit #2
EOC13

Item # C05.011.129

Weld # 2N12F493

No Data Recorded. Reference Calibration Sheet #'s

0002028

0002027

REQUEST FOR RELIEF 01-009
ATTACHMENT 3
pages 1 - 4

R. GH 10/11

DUKE POWER COMPANY
ISI LIMITATION REPORT

FORM NDE-UT-4
Revision 1

Component/Weld ID: 2NI2F493 | Item No: C05.011.129 | Remarks:

Scan		Remarks
☒ NO SCAN ☐ LIMITED SCAN FROM L N/A to L N/A ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other ____	SURFACE: ☒ 1 ☐ 2 BEAM DIRECTION: ☐ 1 ⊡ 2 ☐ cw ☐ ccw INCHES FROM WO .5" to BEYOND FROM 0 DEG to 360 DEG	DUE TO VALVE CONFIGURATION
☐ NO SCAN ☐ LIMITED SCAN FROM L ____ to L ____ ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other ____	SURFACE: ☐ 1 ☐ 2 BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw INCHES FROM WO ____ to ____ FROM ____ DEG to ____ DEG	
☐ NO SCAN ☐ LIMITED SCAN FROM L ____ to L ____ ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other ____	SURFACE: ☐ 1 ☐ 2 BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw INCHES FROM WO ____ to ____ FROM ____ DEG to ____ DEG	
☐ NO SCAN ☐ LIMITED SCAN FROM L ____ to L ____ ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other ____	SURFACE: ☐ 1 ☐ 2 BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw INCHES FROM WO ____ to ____ FROM ____ DEG to ____	

Prepared By: [signature] Level: III Date: 9-12-00 | Sketch(s) attached ☒ yes ☐ no | Sheet 2 of 4

Reviewed By: [signature] Date: 9-15-00 | Authorized Inspector: [signature] Date: 9-16-00

R
GH
10/10/00

Page 2

DUKE POWER COMPANY
Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

page 3

Examination Volume/Area Defined

☒ Base Metal ☒ Weld ☐ Near Surface ☐ Bolting ☐ Inner Radius

Area Calculation	Volume Calculation
* SEE DRAWING .266 SQ. IN.	.266 SQ. IN. X 21 IN. = 5.586 CU. IN. = 5.59 CU. IN.

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60S	2	0	21	0	5.59	0.00
2	60S	1	.105	21	2.205	5.59	39.45
3	45	CW	.266	21	5.59	5.59	100.00
4	45	CCW	.266	21	5.59	5.59	100.00
	SHEAR	WAVE	AGGREGATE	COVERAGE	13.385	22.36	59.86
2	60L	1	.161	21	3.381	5.59	60.48

LONG WAVE 60.48% OF 25% (SCAN 1) = 15.1
LONG WAVE COVERAGE 15.12% OF TOTAL WELD

R GH 10/10/00

Item No: C05.011.129

Prepared By: Larry Saunders Level: III Date: 9-12-00

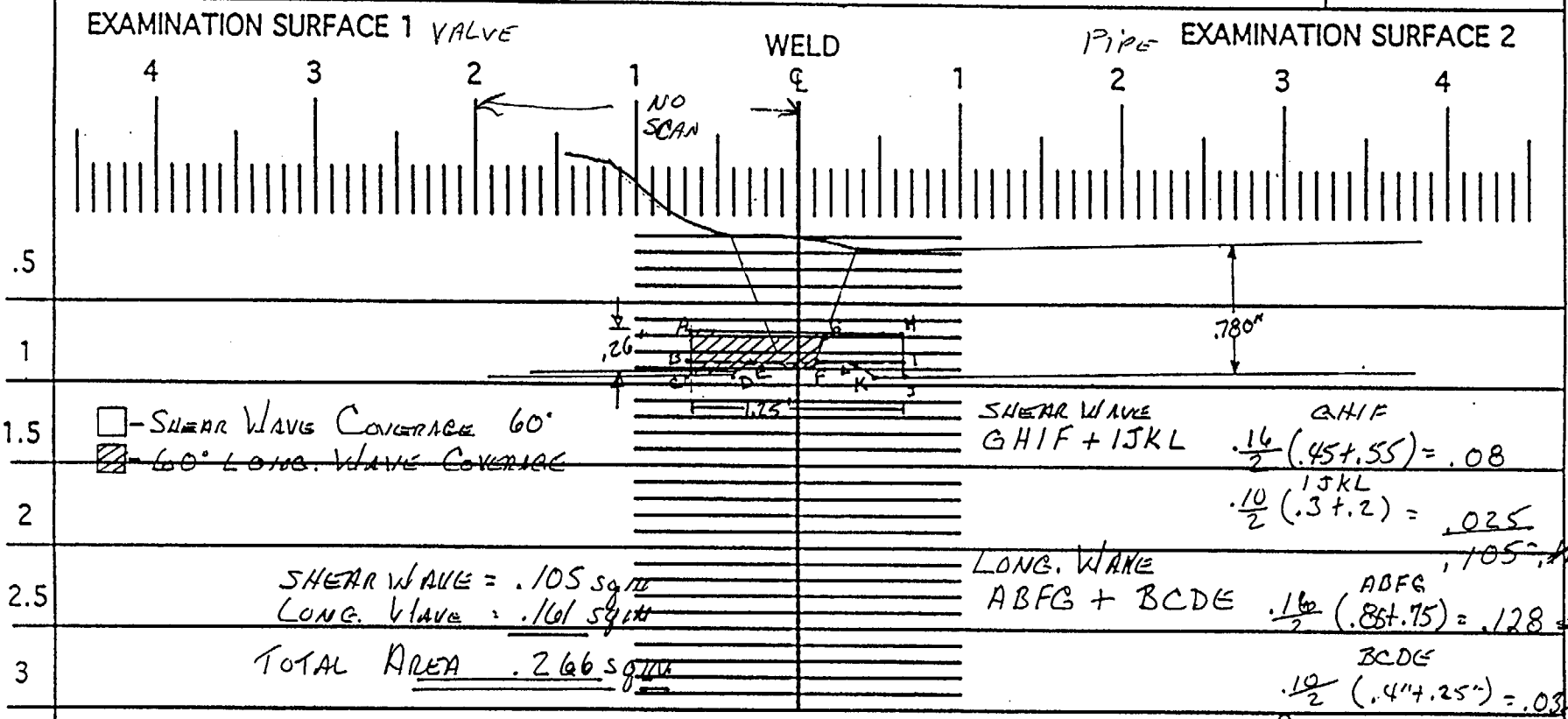
Reviewed By: Guy L Bibb Level: III Date: 9-15-00

DUKE POWER COMPANY

UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1



SHEAR WAVE GHIF + IJKL

GHIF $\frac{.16}{2}(.45+.55) = .08$

IJKL $\frac{.10}{2}(.3+.2) = .025$

$.105 \div .75 = .14$ sq. in.

SHEAR WAVE = .105 sq. in.

LONG. WAVE = .161 sq. in.

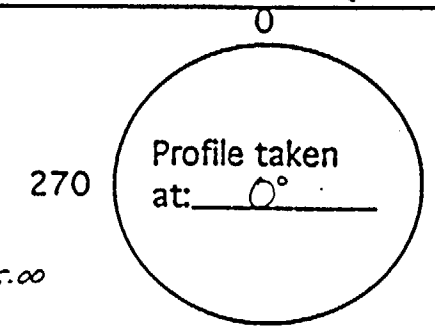
TOTAL AREA .266 sq. in.

LONG. WAVE ABFG + BCDE

ABFG $\frac{.16}{2}(.85+.75) = .128 = .8$ IN

BCDE $\frac{.10}{2}(.4"+.25") = .0325 \div .033$

.161 sq. in.



Component ID/Weld No. 2NI2F493

: Remarks:

COS.011.129

Item No: ~~B09.011.129~~ DSB 9-15-00

Examiner: Larry Maulden	Level: III	Date: 9-12-00
Reviewed By: Judy L. Bibb	Level: III	Date: 9-15-00
Authorized Inspector:		Date: 9-16-00

Sheet 4 of 4

RGL 10/10/00

Page 44

DUKE POWER COMPANY
ULTRASONIC EXAMINATION DATA SHEET FOR LAMINAR REFLECTORS

Exam Start: 1413			NDE-UT-3A
Exam Finish: 1416			Revision 2
Station: McGuire	Unit: 2	Component/Weld ID: 2RCPA-TE	Date: 8/31/00
Nominal Material Thickness (in): 0.438		Weld Length (in.): 10.9	Surface Temperature: 76° Deg F
Measured Material Thickness (in): .460		Lo: 9.1.1.3	Pyrometer S/N: MCNDE 27021
Surface Condition: AS GROUND		Calibration Sheet No: 0002009	Cal Due: 10/11/00
Examiner: James L. Panel James L Panel	Level: II		Configuration: Tee to RCHP ACCUMULATOR
Examiner: James H. Reso James H Reso	Level: II		S2 Flow S1
Procedure: NDE-640	Rev: 1 FC: *		TEE to ACCUM

IND NO.	∠	Ampl ≥ rem BW LOB	L1 ≥ rem BW LOB	W1 ≥ rem BW LOB	Mp1 ≥ rem BW LOB	W2 ≥ rem BW LOB	Mp2 ≥ rem BW LOB	L2 ≥ rem BW LOB	W1 ≥ rem BW LOB	Mp1 ≥ rem BW LOB	W2 ≥ rem BW LOB	Mp2 ≥ rem BW LOB	Exam Surf.	Damps
NRI	0°													

Remarks: * FC 95-18, 95-19

Limitations: see NDE-UT-4 ☐ None: ☒

Sheet 1 of 6

Reviewed By: Gary L. Bebb Level: III Date: 9-6-00

Authorized Inspector: [signature] Date: 9-9-00

Item No: C05.021.081

R1 Gal 10/16/00

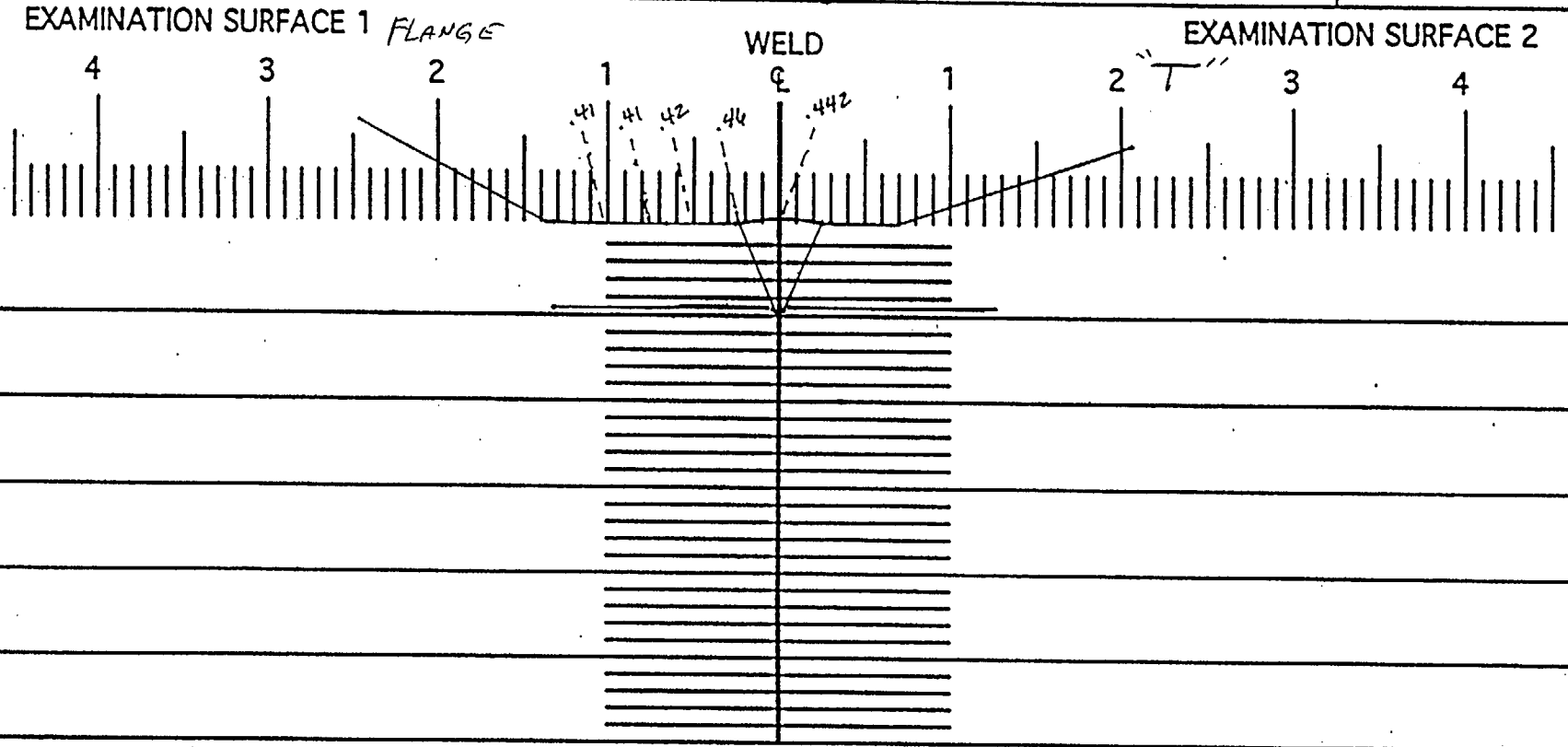
REQUEST FOR RELIEF 01-009
ATTACHMENT 3
PAGES 5 of 10

DUKE POWER COMPANY

UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1

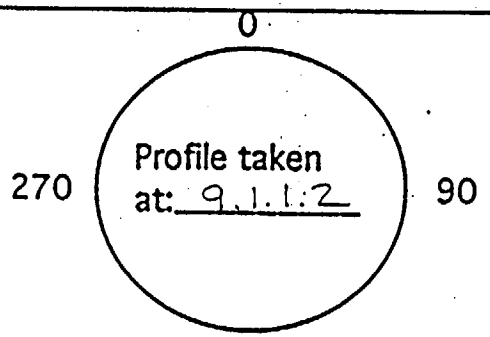


Component ID/Weld No. 2RCPA-TE

Remarks:

Item No: C05.021.081

Examiner: James H. Bessor	Level: II	Date: 8-31-00
Reviewed By: Gary L. Bibb	Level: III	Date: 9-6-00
Authorized Inspector:		Date: 9-9-00



Sheet 2 of 6

R GH 10/10/00

McGuire Unit #2
EOC13

Item # C05.021.081

Weld # 2RCPA-TE

No Data Recorded. Reference Calibration Sheet #'s

000200 7

000 200 8

3 of 6

R
GA
10/10/00

DUKE POWER COMPANY

Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

Examination Volume/Area Defined

☒ Base Metal ☒ Weld ☐ Near Surface ☐ Bolting ☐ Inner Radius

Area Calculation	Volume Calculation
1.0 X .15 = .15 SQ. IN.	.15 SQ. IN. X 11" = 1.65 CU. IN.

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	45°	CW	.15	11	1.65	1.65	100.00
2	45°	CCW	.15	11	1.65	1.65	100.00
3	60°S	S1	0	11	0	1.65	0.00
4	60°S	S2	.049	11	0.539	1.65	32.67
	60 S L-WAVE	SHEAR WAVE	AGGREGATE	COVERAGE	3.839	6.6	58.17
4	60L	2	.083	11	0.913	1.65	55.33

L-WAVE COVERAGE = 55.33% OF 25% (SCAN 4) =13.8 %
13.8% OF TOTAL WELD

Item No: C05.021.081

Prepared By: James H. Bass Level: II Date: 9-6-00

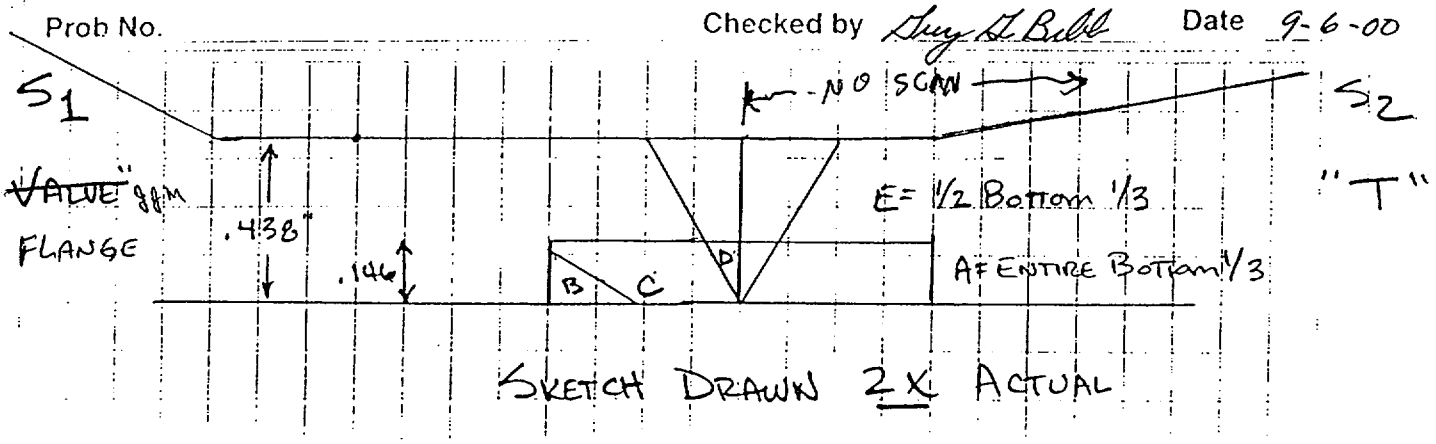
Reviewed By: Guy D Bibb Level: III Date: 9-6-00

Station MNS Unit 2 Rev File No. Sheet 5 of 6

Subject C05.021.081 2 RCPA-TE

By JAMES H. BESOR Date 9-6-00

Prob No. Checked by Larry A. Bibb Date 9-6-00



SKETCH DRAWN 2X ACTUAL

A= 1.0 x .15 = .15" (TOTAL DESIRED VOLUME) or (AREA CALCULATION)

B= $\frac{.25 \times .15}{2}$ = .01875 (AREA NOT COVERED BY SHEARWAVE)

C= .075 - .01875 - .0075 = .04875 (60° SHEAR COVERAGE)

D= $\frac{.10 \times .15}{2}$ = .0075 + .075 = .0825 (D+E) = (AREA SHEARWAVE WONT PUNCH DO TO WELD)

E= .15 ÷ 2 = .075 1/2 Bottom 1/3

L-WAVE COVERAGE = .075 + .0075 = .0825

DUKE POWER COMPANY
ISI LIMITATION REPORT

FORM NDE-UT-4
Revision 1

Component/Weld ID: 2RCPA-TE | Item No: C05.021.081 | Remarks:

☐ NO SCAN
☒ LIMITED SCAN
SURFACE: ☐ 1 ☒ 2
BEAM DIRECTION: ☒ 1 ☐ 2 ☐ cw ☐ ccw
FROM L _____ to L _____
INCHES FROM WO CL + .5" to BEYOND
ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other 60L
FROM 0 DEG to 360° DEG

Remarks: LIMITED TO WELD TO VALVE CONFIGURATION

☐ NO SCAN
☐ LIMITED SCAN
SURFACE: ☒ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L _____ to L _____
INCHES FROM WO CL + 1.4 to BEYOND
ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other _____
FROM 0 DEG to 360° DEG

Remarks: LIMITED TO PIPE TO "T" CONFIGURATION

☐ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L _____ to L _____
INCHES FROM WO _____ to _____
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____
FROM _____ DEG to _____ DEG

☐ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L _____ to L _____
INCHES FROM WO _____ to _____
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____
FROM _____ DEG to _____ DEG

Prepared By: Tommy H Bison | Level: II | Date: 9-6-00 | **Sketch(s) attached** ☒ yes ☐ no | Sheet 6 of 6

Reviewed By: Tony L Bobb | Date: 9-6-00 | Authorized Inspector: [signature] | Date: 9-9-00

10/10/00