Duke Energy Corporation

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H. B. Barron Vice President

January 10, 2000

U. S. Nuclear Regulatory Commission Document Control Desk Washington, D.C. 20555-0001

Subject: McGuire Nuclear Station Unit 2 Docket No. 50-370 Relief Request 99-001

Pursuant to 10CFR50.55a(g)(5)(iii), Duke Energy Corporation requests relief from some requirements of the ASME Boiler and Pressure Vessel Code as described in the attached Relief Request 99-001.

Questions should be directed to Julius Bryant, McGuire Licensing and Compliance, at (704) 875-4162.

Sincerely,

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H. B. Barron, Vice President McGuire Nuclear Station

Attachment

U.S. Nuclear Regulatory Commission January 10, 2000 Page 2 of 2

cc: Mr. L. A Reyes Regional Administrator, Region II U. S. Nuclear Regulatory Commission 101 Marietta Street, NW, Suite 2900 Atlanta, Georgia 30323

> Mr. F. Rinaldi, Project Manager Office of Nuclear Reactor Regulation U. S. Nuclear Regulatory Commission One White Flint North, Mail Stop 9H3 Washington, D.C. 20555

S. M. Shaeffer Senior NRC Resident Inspector McGuire Nuclear Station bxc w/att:

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Serial No.<u>99-001</u> Page 1 of 17

Duke Energy Corporation

Station McGuire Unit 2

SECOND 10-YEAR INTERVAL REQUEST FOR RELIEF NO. 99-001

Pursuant to 10CFR50.55a(g)(5)(iii), Duke Energy Corporation has determined that compliance with the specified examination requirements of ASME Section XI is impractical for McGuire Nuclear Station Unit 2. Information is therefore being submitted in support of this determination and request is being sought for relief from the applicable ASME Section XI requirements.

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

ASME Section XI Class 1 Components listed below:

Examination Category B-D, Items B3.110., B3.120., B3.140., Full Penetration Welds of Nozzles in Vessels and Nozzle Inside Radius Sections

Pressurizer (Nozzle-to-Vessel Welds)

ID Numbers	Item Numbers	End Of Cycle
2PZR-13	B03.110.004	12
2PZR-14	B03.110.005	12
2PZR-15	B03.110.006	12
2PZR-16	B03.110.007	12
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Pressurizer (Nozzle Inside Radius Section)

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ID Numbers	Item Numbers	End Of Cycle
2PZR-13R	B03.120.003	12
2PZR-14R	в03.120.004	12
2PZR-15R	B03.120.005	12
	B03.120.006	12
2PZR-16R	B03.120.000	

Steam Generator (Nozzle Inside Radius Section)

ID Numbers	Item Numbers	End of Cycle
2SGB-INLET	B03.140.003	12
2SGB-OUTLET	B03.140.004	12

Serial No.<u>99-001</u> Page 2 of 17

Examination Category B-F, Items B5.70., Pressure Retaining Dissimilar Metal Welds

Steam Generator (Nozzle-to-Safe End Butt Welds)

ID Numbers	Item Numbers	End Of Cycle
2SGB-INLET-W5SE	B05.070.003	12
2SGB-OUTLET-W6SE	B05.070.004	12

ASME Section XI Class 2 Components listed below:

Examination Category C-A, Items C1.10., C1.30 Pressure Retaining Welds in Pressure Vessels

Seal Water Injection Filter (Shell Circumferential Weld)

ID Numbers	Item Numbers	End Of Cycle
2ASWINJF-1	C01.010.100	12
2ASWINJF-2	C01.010.101	12

Containment Spray Heat Exchanger (Tubesheet-to-Shell Weld) ID Numbers Item Numbers End Of Cycle

TD Numbers	TCell Humbers	
2ACSHX-SH-48	C01.030.010	12

II. Code Requirement:

ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition with no Addenda, Tables IWB-2500 and IWC-2500, lists the following requirements for Examination Categories as shown below:

"Examination Category B-D, Full Penetration Welds of Nozzles in Vessels- Inspection Program B; Figure Number IWB-2500-7 (b)"

"Examination Category B-F, Pressure Retaining Dissimilar Metal Welds; Figure Number IWB-2500-8"

"Examination Category C-A, Pressure Retaining Welds in Pressure Vessels; Figure Number IWC-2500-1and IWC-2500-2". Note (1) adds the words "Includes essentially 100% of the weld length."

Note: Duke Energy Corporation with NRC approval has adopted Code Case N-460 which defines "essentially 100%" as greater than 90% coverage.

III. Code Requirement from which Relief is Requested:

Relief is requested from the requirement of examining essentially 100% of the weld length. Due to part geometry and actual physical barriers, obtaining greater than 90% of the weld volume as defined in Code Case N-460, which is utilized by Duke Energy, is not possible.

Examination Category B-D, Items B3.110., B3.120., B3.140., Full Penetration Welds of Nozzles in Vessels and Nozzle Inside Radius Sections

Pressurizer (Nozzle-to-Vessel Welds)

Item Numbers	Actual Coverage Obtained	
B03.110.004	62.70%	See Note 1
в03.110.005	62.70%	See Note 1
B03.110.006	62.70%	See Note 1
B03.110.007	62.70%	See Note 1

Note 1

ASME Section V, T-441.3.2 Scanning Requirements, 1989 Edition with no addenda as modified by Code Case N-460.

This Paragraph requires scanning of the examination volume(s) using three angle beams and a straight beam from both sides of the weld.

When scanning for reflectors parallel to the weld, the angle beams shall be aimed at right angles to the weld axis, with the search unit(s) manipulated so that the ultrasonic beams pass through the entire volume of weld metal. The adjacent base metal in the examination volume must be completely scanned by two angle beams, but need not be completely scanned by both angle beams from both directions (any combination of two angle beams will satisfy the requirement).

When scanning for reflectors transverse to the weld, the angle beam search units shall be aimed parallel to the axis of longitudinal and circumferential welds. The search unit shall be manipulated so that the ultrasonic beams pass through all of the examination volume. Scanning shall be done in two directions 180 degrees to each other to the extent possible. Areas blocked by geometric conditions shall be examined from at least one direction.

Serial No.<u>99-001</u> Page 4 of 17

Code Case N-460 allows credit for full volume coverage, if it can be shown that greater than 90% of the required weld volume has been examined.

Pressurizer (Nozzle Inside Radius Section)

Item Numbers	Actual Coverage Obtained	
B03.120.003	62.79%	See Note 2
B03.120.004	62.79%	See Note 2
в03.120.005	62.79%	See Note 2
в03.120.006	62.79%	See Note 2

Steam Generator (Nozzle Inside Radius Section)

Item	Numbers	Actual	Coverage	Obtained

B03.140.003	83.28%	See	Note	2
B03.140.004	83.28%	See	Note	2

NOTE 2

ASME Section XI, 1989 Edition, Examination Volume shown in Figure IWB-2500-7 (b)

Examination Category B-F, Items B5.70., Pressure Retaining Dissimilar Metal Welds

Steam Generator	(Nozzle-to-Safe End Butt	Welds)
Item Numbers	Actual Coverage Obtained	
B05.070.003	75.00%	See Note 3
в05.070.004	75.00%	See Note 3

Note 3

ASME Section XI, Appendix III, Paragraph III-4420, 1989 Edition with no addenda as modified by Code Case N-460.

The examination shall be performed using a sufficiently long examination beam path to provide coverage of the required examination volume in two-beam path directions. The examination shall be performed from two sides of the weld where practicable, or from one side of the weld, as a minimum.

Code Case N-460 allows credit for full volume coverage if it can be shown that greater than 90% of the required volume has been examined.

Serial No.<u>99-001</u> Page 5 of 17

ASME Section XI Class 2 Components listed below:

Examination Category C-A, Items C1.10., C1.30 Pressure Retaining Welds in Pressure Vessels

Seal Water Injection Filter (Shell Circumferential Weld)

Item Numbers	Actual Coverage Obtained	
C01.010.100	89.66%	See Note 4
C01.010.101	80.31%	See Note 4

Containment Spray Heat Exchanger (Tubesheet-to-Shell Weld)

Item Numbers	Actual Coverage Obtained	
C01.030.010	24.00%	See Note 4

NOTE 4

ASME Section XI, Appendix III, Paragraph III-4420, 1989 Edition with no addenda as modified by Code Case N-460.

The examination shall be performed using a sufficiently long examination beam path to provide coverage of the required examination volume in two-beam path directions. The examination shall be performed from two sides of the weld where practicable, or from one side of the weld, as a minimum.

IV. Basis for Relief:

ASME Section XI Class 1 Components listed below:

Examination Category B-D, Items B3.110., B3.120., B3.140., Full Penetration Welds of Nozzles in Vessels and Nozzle Inside Radius Sections

During the ultrasonic examination of the Pressurizer Safety Nozzle to Pressurizer Upper Head Welds: 2PZR-13 (Item Number B03.110.004) 2PZR-14 (Item Number B03.110.005) 2PZR-15 (Item Number B03.110.006), and 2PZR-16 (Item Number B03.110.007)

shown in Attachment 1, coverage of the required examination volume could not be obtained. The examination coverage was limited to 62.70%, due to single sided access caused by the nozzle geometry. In order to achieve more coverage, the nozzle would have to be redesigned to allow access from both sides.

Serial No.<u>99-001</u> Page 6 of 17

During the ultrasonic examination of the Pressurizer Safety Nozzle to Pressurizer Upper Head Inside Radius Sections:

2PZR-13R (Item Number B03.120.003) 2PZR-14R (Item Number B03.120.004) 2PZR-15R (Item Number B03.120.005), and 2PZR-16R (Item Number B03.120.006)

shown in Attachment 1, coverage of the required examination volume could not be obtained. The examination coverage was limited to 62.79%. The limitations are caused by the ratio of the nozzle O. D. to the vessel thickness. When the nozzle O. D. is small in relation to the vessel thickness, more coverage can be obtained when scanning from the vessel side. Conducting examinations from nozzle boss and OD blend radius using compound angles, determining which angles to use, metal paths to calibrate, and area of coverage are not accurate with manual calculations. Duke Energy is investigating the use of computer modeling to solve the limitation problems. Radiography is not practical because of the geometry of the component, which prevents placement of the film and exposure source.

Nozzle inside radius sections were examined with the ultrasonic method to the maximum extent practical from the vessel wall. Calibration blocks and procedures were in accordance with ASME Section V, Article 4.

During the ultrasonic examination of the Steam Generator Nozzles (Nozzle Inside Radius Section):

2SGB-Inlet (B03.140.003) 2SGB-Outlet (B03.140.004)

shown in Attachment 1, coverage of required examination volume could not be obtained. The examination coverage was limited to 83.28%. Limitations are caused by the ratio of the nozzle O.D. to the vessel thickness. When the nozzle O.D. is small in relation to the vessel thickness, more coverage can be obtained when scanning from the vessel side. Conducting examinations from nozzle boss and OD blend radius using compound angles, determining which angles to use, metal paths to calibrate, and area of coverage are not accurate with manual calculations. Duke Energy is investigating the use of computer modeling to solve the limitation problems. Radiography is not practical because of the

Serial No.<u>99-001</u> Page 7 of 17

geometry of the component, which prevents placement of the film and exposure source.

Nozzle inside radius sections were examined with the ultrasonic method to the maximum extent practical from the vessel wall. Calibration blocks and procedures were in accordance with ASME Section V, Article 4.

Examination Category B-F, Items B5.70., Pressure Retaining Dissimilar Metal Welds

During the ultrasonic examination of the Steam Generator Nozzle-to-Safe End Welds:

2SGB-Inlet-W5SE (B05.070.003) and 2SGB-Outlet-W6SE (B05.070.004)

shown in Attachment 2, coverage of required examination volume could not be obtained. Material characteristics and single sided access caused by the component geometry prevents two-beam path direction coverage of the examination volume and limits the examination coverage to 75%.

The most effective ultrasonic technique for the examination of dissimilar metal welds uses refracted longitudinal waves. The longitudinal wave is preferred, as the austenitic weld metal and buttering create highly attenuative barriers to shear wave ultrasound. The longitudinal wave is less affected by these difficulties. However, the longitudinal wave is affected by mode conversion when it strikes the inside surface of the safe end or pipe at any angle other than a right angle to the surface.

The calculations below shows that a 45° refracted longitudinal wave striking the inside surface of a pipe will produce a 22.9° refracted shear wave in addition to the normally expected 45° reflected longitudinal wave.

 $\operatorname{Sin}^{-1} = (\sin 45^{\circ} \times V_{\rm s}) \div V_{\rm L}$

 $= (0.707 \times 0.123) \div 0.223$

Where: \sin^{-1} is the shear wave angle

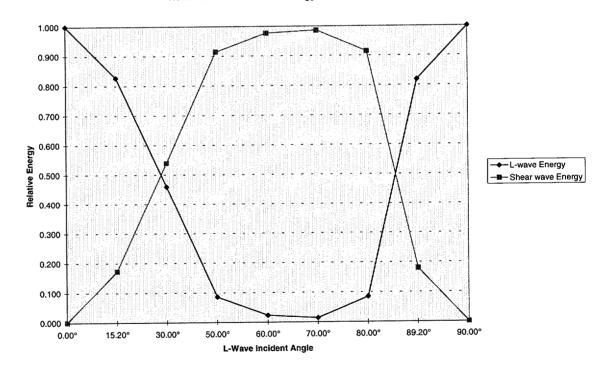
 $V_{\rm s}$ is the shear wave velocity of the stainless steel safe end/pipe material in inches/ $\mu {\rm sec.}$

Serial No.<u>99-001</u> Page 8 of 17

 V_L is the longitudinal wave velocity of the stainless steel safe/pipe end material in inches/ μ sec.

As shown in the graph below, the mode conversion process creates two sound beams of differing intensities reflecting off of the inside surface.¹ At incident angles greater than 30° the shear wave will predominate. However, the shear wave is attenuated and scattered by the austenitic weld metal and the layer of buttering. The examination sensitivity is degraded to such an extent that any examination using the second sound path leg is meaningless. Therefore, the two-beam path direction coverage requirement is impractical.

In order to obtain the required two-beam path direction coverage, welds would have to be re-designed to allow scanning from both sides.



Reflected Sound Beam Energy In Steel on A Free Face

ASME Section XI Class 2 Components listed below:

¹ Firestone, F. A. : Tricks with the Supersonic Reflectoscope, *J. Soc. Nondestructive Testing*, vol. 7, no. 2 Fall 1948.

Examination Category C-A, Items C1.10., C1.30 Pressure Retaining Welds in Pressure Vessels

During the ultrasonic examination of the Shell to Upper Flange Weld 2ASWINJF-1(CO1.010.100), shown in Attachment 3, coverage of the required examination volume could not be obtained. The examination coverage was limited to 89.66% of the required examination volume due to single sided access caused by the nozzle geometry. In order to achieve more coverage, the weld would have to be redesigned to allow for more access.

During the ultrasonic examination of the Shell to Upper Flange Weld 2ASWINJF-2(CO1.010.101), shown in Attachment 3, coverage of the required examination volume could not be obtained. The examination coverage was limited to 80.31% of the required examination volume due to single sided access caused by the nozzle geometry. In order to achieve more coverage, the weld would have to be redesigned to allow for more access.

During the ultrasonic examination of the Shell to Tubesheet Weld 2ACSHX-SH-48(C01.030.010), shown in Attachment 4, coverage of the required examination volume could not be obtained. The examination coverage was limited to 24% of the required examination volume due to the proximity of support beams that prevented scanning significant areas of the weld. In order to achieve more coverage, the equipment support would have to be redesigned or removed to allow for more access to the weld.

V. Alternate Examinations or Testing:

The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

Since radiography is impractical, Duke Energy Corporation will continue to use ultrasonic examination procedures to obtain maximum coverage to the extent practicable of the Item Numbers referenced in Section I of this Request for Relief. No additional ultrasonic examinations or alternate exams are planned during the

Serial No.<u>99-001</u> Page 10 of 17

current interval for the welds referenced in Section I of the request.

For the Class 1 Components listed in Section I above, Duke Energy proposes to use pressure test requirements to <u>compliment</u> the limited examination coverage. The Code requires (reference Table IWB-2500-1, Item Number B15.50) that a system leakage test be performed after <u>each</u> refueling outage. Additionally a system hydrostatic test (reference Table IWB-2500-1, Item Number B15.51) is required once during each 10-year inspection interval. These tests require a VT-2 visual examination for evidence of leakage. This testing will provide additional assurance of pressure boundary integrity.

For the Class 2 Components listed in Section I above, Duke Energy proposes to use pressure test requirements to <u>compliment</u> the limited examination coverage. The Code requires (reference Table IWC-2500-1, Item Number C7.10) that a system pressure test be performed once <u>each</u> period. Additionally a system hydrostatic test (reference Table IWB-2500-1, Item Number C7.20) is required once during each 10-year inspection interval. These tests require a VT-2 visual examination for evidence of leakage. This testing will provide additional assurance of pressure boundary integrity.

VI. Justification for the Granting of Relief

Examination Category B-D, Items B3.110., B3.120., B3.140., Full Penetration Welds of Nozzles in Vessels and Nozzle Inside Radius Sections

The Pressurizer (Nozzle-to-Vessel Welds) are: 2PZR-13(Item Number B03.110.004/Nozzle to Upper Head), 2PZR-14(Item Number B03.110.005/Nozzle to Upper Head), 2PZR-15(Item Number B03.110.006/Nozzle to Upper Head), and 2PZR-16 (Item Number B03.110.007/Nozzle to Upper Head). These four Pressurizer Nozzle to Head Welds are limited due to single sided access caused by the nozzles geometry. In order to achieve more coverage, the nozzles would have to be redesigned to allow access from both sides. During the examination of these welds, techniques were utilized to obtain the maximum possible coverage.

The Pressurizer (Nozzle Inside Radius Sections) are: 2PZR-13R (Item Number B03.120.003), 2PZR-14R (Item Number B03.120.004), 2PZR-15R (Item Number B03.120.005), and 2PZR-16R (Item Number B03.120.006).

These Pressurizer Nozzle to Upper Head Weld (Inside Radius Sections) are limited due to the ratio of the nozzle O.D. to the vessel thickness. When the nozzle O.D. is large in relation to the vessel thickness, less coverage can be obtained when scanning from the vessel side.

The Pressurizer Nozzle to Upper Head Welds/Inside Radius Sections (Weld Numbers 2PZR-13/2PZR-13R, 2PZR-14/2PZR-14R, 2PZR-15/2PZR-15R, 2PZR-16/2PZR-16R) are located on the upper head of the pressurizer and are not part of the reactor pressure vessel. The McGuire Nuclear Station Unit 2 Pressurizer was fabricated by Westinghouse and is free from unacceptable fabrication defects. Westinghouse performed rigorous state-of-theart inspections following fabrication to ensure no significant flaws existed.

Steam Generator (Nozzle Inside Radius Sections): 2SGB-Inlet (B03.140.003), and 2SGB-Outlet (B03.140.004). During the ultrasonic examination of the Steam Generator Nozzle Inside Radius Sections, coverage of required examination volume could not be obtained. Limitations are caused by the ratio of the nozzle O.D. to the vessel thickness. When the nozzle O. D. is large in relation to the vessel thickness, less coverage can be obtained when scanning from the vessel side. Examinations from the nozzle boss and O. D. blend radius using compound angles, determining which angles to use, and metal paths to calibrate for and area of coverage is not accurate with manual calculations.

The ten exams listed here for Examination Category B-D are located within the reactor coolant loop. These welds are not exposed to significant neutron fluence and are not prone to negative material property changes (i.e., embrittlement) associated with neutron bombardment. These welds were rigorously inspected by radiography and dye penetrant during component fabrication and installation (the last two during the Steam Generator replacement outage) and verified to be free from unacceptable fabrication defects.

The McGuire Operating License is maintained by compliance with the Plant Technical Specifications. These Technical Specifications require primary coolant

Serial No.<u>99-001</u> Page 12 of 17

leakage detection systems to be operable at all times or the Unit is to be taken to a shutdown condition. In accordance with Reg. Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems", these leakage detection systems are of sufficient sensitivity so as to detect an increase in primary leakage of 1 gpm within 1 hour. Plant Technical Specifications also impose limits on the total amount of primary coolant leakage allowable during Unit operation. As a result, the Primary Coolant leakage is required to be maintained at low levels at all times and surveillance requirements are performed to detect increases in the primary coolant leakage prior to exceeding Technical Specification allowable values.

In addition to the required leakage limits and detection systems, McGuire Engineering maintains an aggressive monitoring program to detect and trend all levels of leakage, regardless of magnitude. As a result, there is added confidence that pressure boundary leakage will be identified well within the scope of leak-before-break methodology.

Replacement or re-design of these nozzles is not a viable alternative. Duke Energy believes the amount of coverage obtained for these examinations, in conjunction with the Code required VT-2 visual examination after each refueling outage and the 10-year hydrostatic test, provides reasonable assurance of the continued structural integrity of the subject welds.

Pursuant to 10 CFR 50.55a(g)(6)(i), granting this relief for the welds listed under Examination Category B-D will provide reasonable assurance of weld/component integrity, and is authorized by law. In addition, the requested relief will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Examination Category B-F, Items B5.70., Pressure Retaining Dissimilar Metal Welds

Steam Generator (Nozzle-to-Safe End Butt Welds) 2SGB-INLET-SE (B05.070.003), and 2SGB-OUTLET-SE (B05.070.004)

are limited due to material characteristics and single sided access caused by the component geometry which

Serial No.<u>99-001</u> Page 13 of 17

prevents two-beam path direction coverage of the examination volume. In order to obtain the required two-beam path direction coverage, these two welds would have to be re-designed to allow scanning from both The Steam Generator Nozzle-to-Safe End Butt sides. Welds (Weld Numbers 2SGB-INLET-SE and 2SGB-OUTLET-SE) are located on the inlet and outlet of the steam generators The McGuire Unit 2 for the reactor coolant piping. Steam Generator Nozzle to Safe End Weld geometry prevented obtaining 100% volumetric examination coverage and therefore the 100% examinations are impractical. During the examination of these welds, techniques were utilized to obtain the maximum possible coverage.

The two welds listed here for Examination Category B-F are located within the reactor coolant loop. These welds are not exposed to significant neutron fluence and are not prone to negative material property changes (i.e., embrittlement) associated with neutron bombardment. These welds were rigorously inspected by radiography and dye penetrant during the construction of the replacement Steam Generators and verified to be free from unacceptable fabrication defects.

The McGuire Operating License is maintained by compliance with the Plant Technical Specifications. These Technical Specifications require primary coolant leakage detection systems to be operable at all times or the Unit is to be taken to a shutdown condition. In accordance with Reg. Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems", these leakage detection systems are of sufficient sensitivity so as to detect an increase in primary leakage of 1 gpm within 1 hour. Plant Technical Specifications also impose limits on the total amount of primary coolant leakage allowable during Unit operation. As a result, the Primary Coolant leakage is required to be maintained at low levels at all times and surveillance requirements are performed to detect increases in the primary coolant leakage prior to exceeding Tech Spec allowable values.

In addition to the required leakage limits and detection systems, McGuire Engineering maintains an aggressive monitoring program to detect and trend all levels of leakage, regardless of magnitude. As a result, there is added confidence that pressure boundary leakage will be identified well within the scope of leak-before-break methodology.

Serial No.<u>99-001</u> Page 14 of 17

Replacement or re-design of these nozzles is not a viable alternative. Duke Energy believes the amount of coverage obtained for these examinations, in conjunction with the Code required VT-2 visual examination after <u>each</u> refueling outage and the 10-year hydrostatic test, provides reasonable assurance of the continued structural integrity of the subject welds.

Pursuant to 10 CFR 50.55a(g)(6)(i), granting this relief for the welds listed under Examination Category B-F will provide reasonable assurance of weld/component integrity, and is authorized by law. In addition, the requested relief will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

ASME Section XI Class 2 Components listed below:

Examination Category C-A, Items C1.10., C1.30 Pressure Retaining Nozzle Welds in Vessels

During the ultrasonic examination of the Shell to Upper Flange Welds 2ASWINJF-1(C01.010.100) and 2ASWINJF-2(C01.010.101), coverage of the required examination volume was limited due to single sided access caused by the weld geometry. In order to achieve more coverage, these welds would have to be redesigned to allow for more access. During the examination of these welds, techniques were utilized to obtain the maximum possible coverage.

The seal water injection filter is one of two filters where one is normally in service and the other in standby. Each filter is manually isolable from the other. There is also capability to completely bypass both seal injection filters, although this is undesirable.

In the event of a leak, normal Technical Specification required surveillance on water inventory would identify the presence of a leak. If the leak were of severe magnitude, abnormal VCT level trends or NC pump seal injection flows would provide operator warning prior to the Technical Specification coolant inventory surveillance. It is not likely that gross failure would occur without a warning sufficient to prompt operator response to swap to the standby filter or

Serial No.<u>99-001</u> Page 15 of 17

bypass altogether. There are also abnormal procedures in place to deal effectively with a complete loss of seal injection were the failure to be catastrophic.

During the ultrasonic examination of the Shell to Tubesheet Weld 2ACSHX-SH-48(C01.030.010), coverage of the required examination volume was limited due to the proximity of support beams that prevented scanning significant areas of the weld. In order to achieve more coverage, the equipment support would have to be redesigned or removed to allow for more access to the weld. During the examination of these welds, techniques were utilized to obtain the maximum possible coverage.

The Shell to Tubesheet Weld on the 2A NS Heat Exchanger forms the pressure boundary for the raw water cooling supply for this heat exchanger. A leak in this weld would be detected by actuation of the safety-related sump pumps for this room. In addition, unexpected level indications in the floor drain tank (to which the sump pumps discharge to) will prompt investigation and identification of the leak by either Operations or Chemistry personnel. This heat exchanger is one of two safety-related vessels maintained in a non-operational standby mode. Failure of the weld in question would be of little consequence unless it was of such a magnitude as to constitute a major flood. This scenario is difficult to postulate given the volume examined and low pressures and temperatures to which the weld is exposed to during all modes of operation.

Although the examination volume requirements as defined in ASME Section XI 1989 Edition, Figure IWC-2500-1and IWC-2500-2 could not be met for the Examination Category C-A welds listed here, replacement or redesign of these welds is not a viable alternative. Duke Energy believes the amount of coverage obtained for these examinations, in conjunction with the Code required VT-2 visual examination after <u>each</u> refueling outage and the 10-year hydrostatic test, provides reasonable assurance of the continued structural integrity of the subject welds.

Pursuant to 10 CFR 50.55a(g)(6)(i), granting relief for the welds listed under Examination Category C-A will provide reasonable assurance of weld/component integrity, and is authorized by law. In addition, the requested relief will not endanger life or property or

Serial No.<u>99-001</u> Page 16 of 17

the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

VII. Implementation Schedule:

These examinations will continue to be scheduled as per the requirements of ASME Section XI for future inspection intervals at McGuire Nuclear Station, Unit 2.

<u>Attachment 1</u>. Drawings of Examination Category B-D affected welds/examination areas, and details, including calculation methods for:

> B03.110.004 B03.110.005 B03.110.006 B03.110.007 B03.120.003 B03.120.004 B03.120.005 B03.120.006 B03.140.003 B03.140.004

<u>Attachment 2</u>. Drawings of Examination Category B-F affected welds, and details, including calculation methods for:

> B05.070.003 B05.070.004

Attachment 3. Drawings of Examination Category C-A affected welds, and details, including calculation methods for:

C01.010.100 C01.010.101

Attachment 4. Drawings of Examination Category C-A affected welds, and details, including calculation methods for:

C01.030.001

Serial No.99-001 Page 17 of 17

The following individuals were involved in the development of this request for relief. Ken Pitser (McGuire Engineering) provided input to the engineering justification (section VI.) for granting relief. Jim McArdle (NDE Level III) provided sections III., IV., and V. Gary Scarboro (McGuire ISI Plan Manager) compiled and completed the request.

Sponsored By: <u>Aug D. Alabous</u> Date <u>8/16/99</u> Approved By: <u>Revin Rhyne</u> Date <u>8/16/99</u>

DUKE POV		PANY			Exam Sta	art: 12	253	Form	NDE-UT	-2A
ULTRASONIC EXAMINATION DAT	TA SHEET F	OR PLANAR	REFLEC	TORS	Exam Fin	ish: 12	257	Re	evision 4	
Station: McGuire ; I	Unit: 2	Component/W	/eld ID: 2F	2R-13				Date:	3/26/9	9
Weld Length (in.): 47.1	Surface Condi	tion: As Ma	nufacture	d Lo:	9.2.3	Surface T	emperat	ure: <u>7</u>	<u>2°</u> °.	F
Examiner: Larry Mauldin Kenn Thaulle	_	Scans:				Pyromete Cal Due:				3
Halley C - m	Level: II	45 🗆		70 □		Configura	ation:	Safety No	z to Up H	lead
Procedure: Rev.	FC:	45T 🗆	dB 7	от Ц	dB		2			
NDE-640 1	_ *	60 □	dB			<u>N</u>	OZZLE			_
Calibration Sheet No:		60Т 🗆	dB			Α	Scan a	Surface: D NDE-6		
9902075		Other:	0° @	<u>16</u> dl	3	Skew An			N/A	
IND# A Max Mp W % Max Max Max Ref	L Max L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps-
DO NOT WRITE IN THIS SPACE	20%0 HM 50%0 100%	A HMA Jac 50%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	DO IN		WRITI SPACE	
NRI 0°										

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Remarks: * 95-18, 95-19					
Limitations: (see NDE-UT-4)	90% or greate	r coverage obtai	ned: yes 🗋 no 🖾		Sheet of
Reviewed By:	Level:	Date:	Authorized Inspector:	Date:	Item No:
Rod Shellind	Ī	3-30-99	Rein	3-30-99	B03.110.004
Kod Sheffuld	عند		- Appen	000-11	

Serial No. 99-001 Attachment

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				UKE PO						Exam S	tart: 1	130	Form	NDE-U	T-2A
ULT	RASC		EXAMIN	ATION D	ATA SH	IEET F	OR PLAN	AR REFLE	CTORS	Exam Fi	nish: 1	246	-	Revision	
Statio	n:		McGuire		Unit:	2	Componen	t/Weld ID:	2PZR-13	_1			Date:	· · · · · ·	
Weld	Length	(in.):	47	.1	Surface	e Cond	ition: As			: 9.2.3	Quefecto		·····	3/26/	
Exami	ner: D	avid Zi	mmerman	1 10	ィ く ´Leve		Scans:			. 9.2.3		Temperat			
Exami	ner: L	arry Ma	uldin	Varelle e	7-			54 5 10				er S/N: 7		IDE 2701	8
	dure:			Rev:				51.5_dB				ation:		oz to Up I	Head
			20	rev. :		I /A		5 <u>1.5</u> dB	70Т Ц_	dB		32			
 Calibra	ation S	heet N			"	WA	60 🛛 _				1	Nozzle	to _	Head	
	7, 9902		0.				60Т 🛛 _ :	5 <u>5.5</u> dB				Scan Scan	Surface:	OD 80 only	·····
•	_	-		·			Othe	er:	d	В	Skew An	gle:	• 110 <u>-</u> - 0	N/A	
ND #	4	Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
		1	NOT W HIS SP			20%d HMA 50%d 100%c	HMA	HMA 50%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	D(IN		WRITI SPACE	
NRI	45°														
NRI	60°														•

Remarks:						—]
Limitations: (see NDE-UT-4)	90% or greate	r coverage obta	ined: yes □ no ⊠		Sheet of	
Reviewed By:	Level:	Date:	Authorized Inspector:	Date:	·	
Rod Shellight	Ŧ	3-30-99	- Or Rein	3-30-99	Item No: B03.110.004	前的
10			- noften		603.110.004	

DUKE	E POWER CON	IPANY		NDE-91-1						
Limited Exam	Limited Examination Coverage Worksheet									
Ex	amination Vo	lume/Area D	Defined	-						
Base Metal 🛛 Weld 🖾	- Near Surf	ace 🔲 🛛 E	Bolting 🔲	Inner Radius 🗖						
Area Calculation			Volume Calcu	ation						
· · · · ·			· · · ·							
		<i>.</i> .		· · · ·						
<u>.</u>	Coverage Cal	culations	· · · · · · · · · · · · · · · · · · ·							
Scan # Angle Beam Direction	Examined Exam	igth Volun hined Examin h) (cu.in	ned Required	Percent Coverage						
BASE METH	44.02 +	WEDT	Метик 8	1.4=2=						
ACCRE	GATE C	IVERNE	62.7							
				. •						
· • •			• .							
·. ·	-									
	. .									
				• •						
·			• ••							
		•								
•										
			Item No:	803.110.004						
epared BY: Louis Mr.	rulder	Level:	TIT	Date: 3 29.99						
wiewed By:	A A	· · ·								
NILLY NI V	ulte	Level: -	UL.	Date: 3-30-99						

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		·					Atlachment l Page 4 0 + 60
		DUK	EPOWER	СОМРА	NY	-	NDE-91-1
	L	mited Exar	nination C	overage	Worksheet		Revision 0
		Ε	xaminatio	n Volume	e/Area Defin	ed	
Base M	letal 🖾	Weld [] Near	Surface	Boltin	g 🛛 🐁 I	nner Radius 🔲
	Area	Calculation	<u> </u>		Volu	me Calcul	ation
.*.	5 CE	ATTACHE	ED SHEE	TS 1	5.8 sg 1N	X 47.5	[]KI. =
•					· · ·	750).5 cu. 1N.
			•				
•		··· · · · · · · · · · · · · · · · · ·	Coverage	e Calcula	tions		·
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in)		Volume Required (cu.in.)	Percent Coverage
1	0°	N/A			327.75		
					484.5		
3	45°	/	3.8	47,5	180.50	750.5	
4					570.0		
-	60°			• •	99.15		
6		CW		. .	327.75		
/		CCW			327.75		-
		• .			327.75	-	
9.	60'	CCW	6.9		327.75	·	·
			•	. 2	973.5	- 6754.	5×100
						44.	02 %
		A				iem No: 3	03. 110.004
epared B	Y: 7	an V	haulden		Level: <i>III</i>		Date: 3-29.99
viewed E	w H	ang Ti	> 1.1		Level: 70	r	
	1. XI	uj. <u>Z. D</u>	ull				Date: 3-30-49

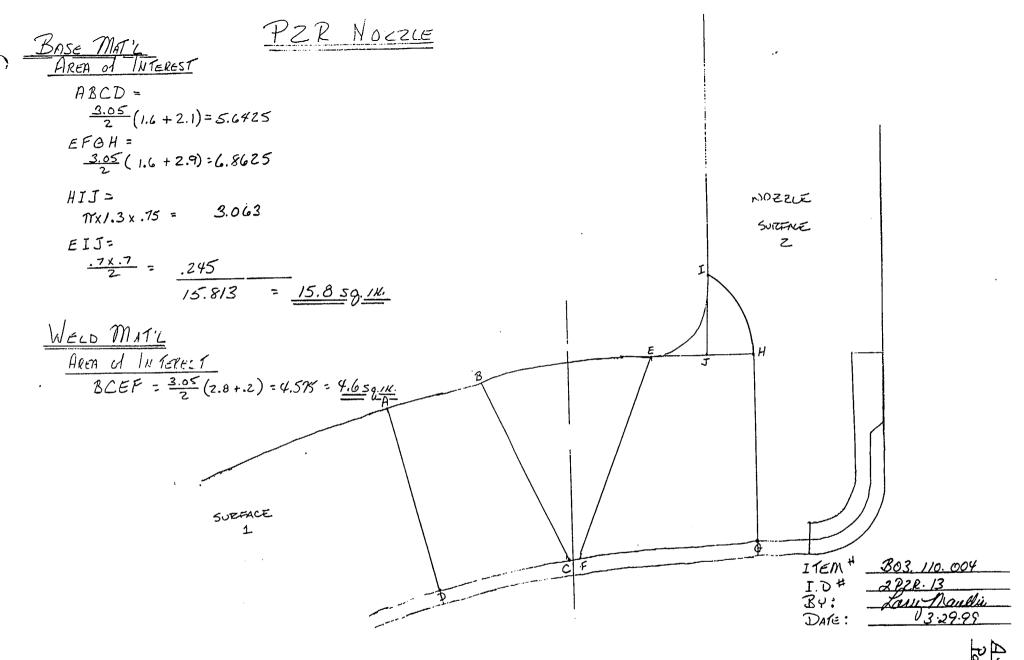
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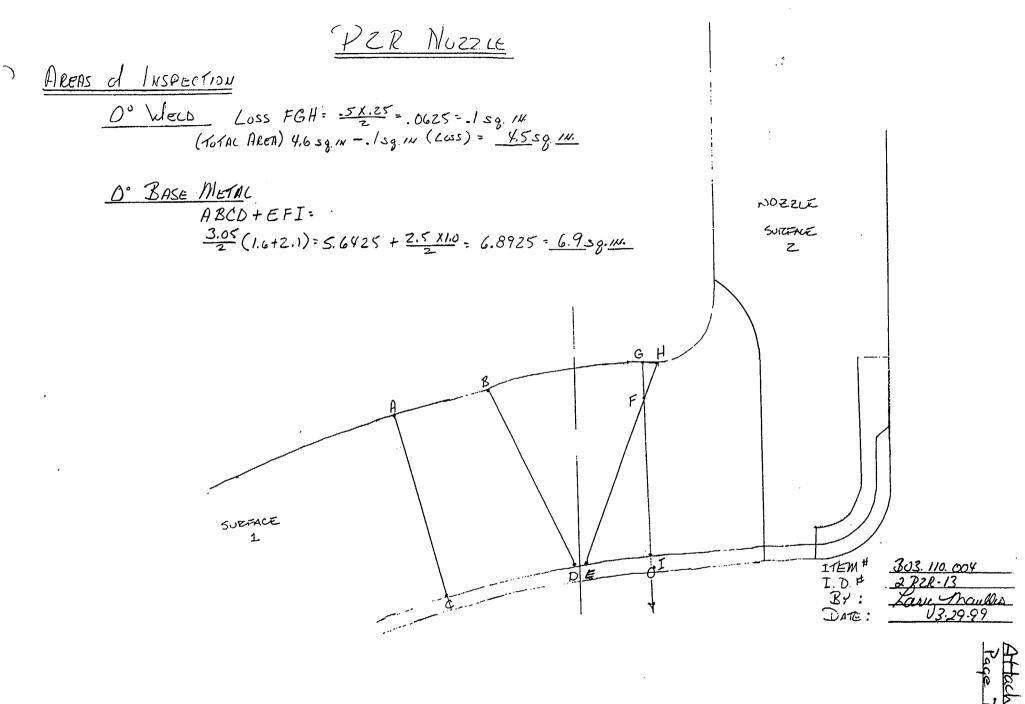
<u></u>		DUK	E POWER	СОМРА	NY		page 5 of 60 NDE-91-1
			mination C			•	Revision 0

Base I	Metal 🗖	t Weld [/		n volume Surface	Area Defin		nner Radius 🗖
•		Calculation	<u>.</u>			me Calcul	
2	E. A1	TACHED S	Heets	q	6 sq in	X (17,5	1k =
					<i>U</i>		18.5 CU.M.
						×	0.5 CU.N.
•	<u> </u>		Coverage		tions		
ican #	Angle	Beam Direction		Length Examined	Examined	Volume Required	Percent Coverage
/	0°	NA	(sq.in.) 4.5	(in) 47,5	(cu.in.) 2/3,75	(cu.in.) これをいて	
2 3	450	Z			204.25		
3	450	1	1.6	47.5	76	218.5	
4	600	2	4,4	47.5	209	218.5	
5	60°	1	.9		42.75		
) 7	45%	CW	4,5		213.75		
					213.25		
8					213.75		
7	60	CCW.	4.5		213.75		
		•		160	W.75 ?	1966.	5 x 100
						81.	4%
					۲.		10 11 011
	¥	0	h			em No: 🄏	03. 110.004
ared E	sy:	ny N.	Nauklui, Babb		Level:		Date: 3.29.99
iewed l	By:	un S.	Babb		Level: III	-	Date: 3-30-99

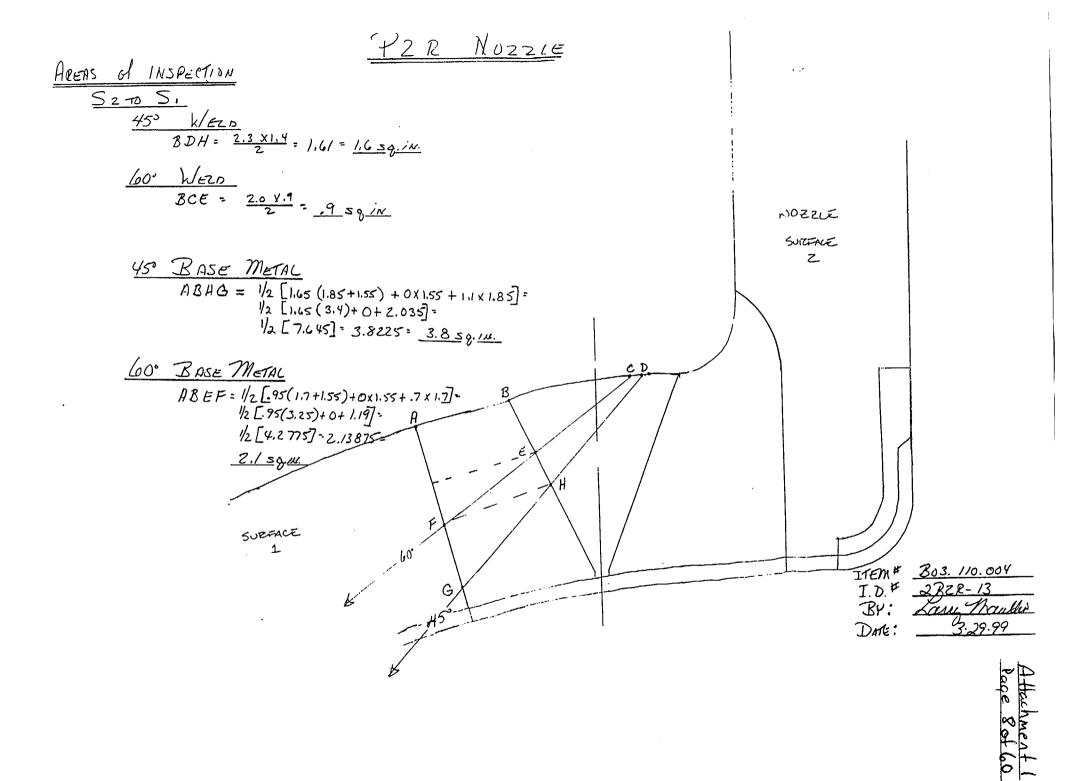
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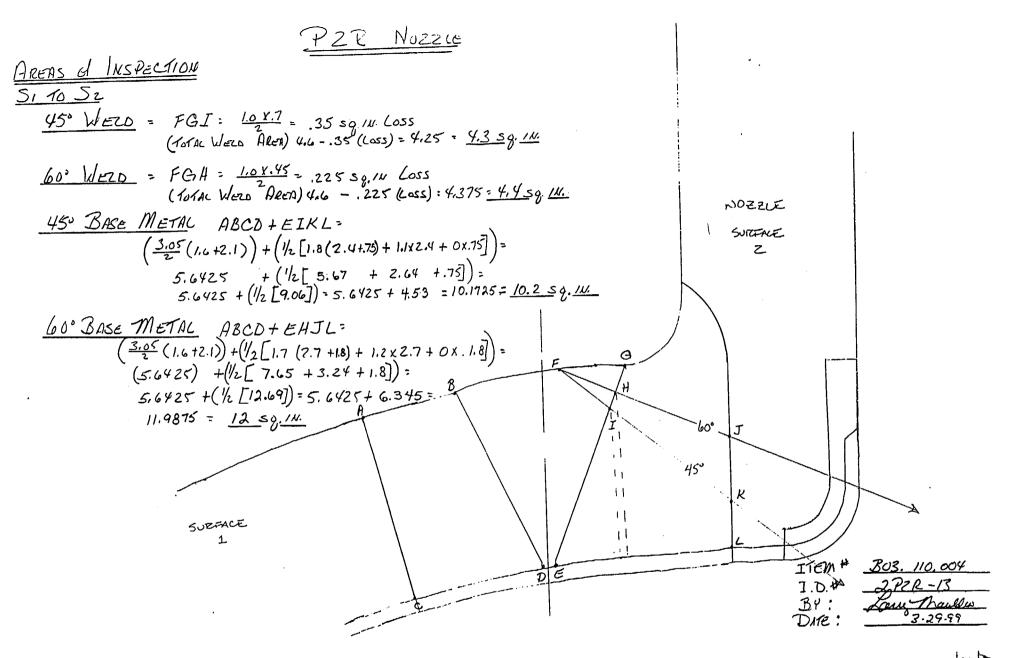


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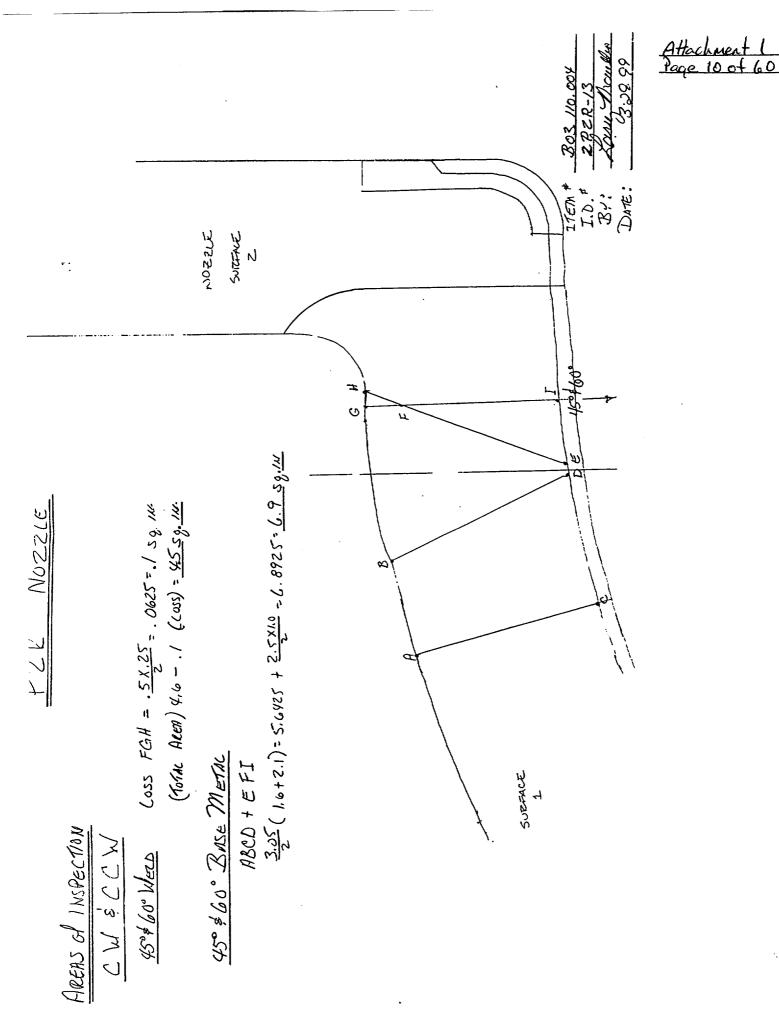


- 7 of 60





Attechment 1 Page 9 of 60



			DL	JKE PO	WER C	OMF	PAN	١Y			Exam Sta	art: 12	257	Form I	NDE-UT	-2A
ULTI	RASO		XAMINA		ATA SHE	ET F	OR	PLANAR	REFLEC	TORS	Exam Fir	nish: 13	301	Re	evision 4	
Station	n:	N	AcGuire		Unit:	2	Con	nponent/W	eld ID: 2F	PZR-14			C	Date:	3/26/9	9
Weld L	_ength ((in.):	47.	1	Surface	Condi	tion:	As Ma	nufacture	d Lo:	9.2.3	Surface T	emperat	ure: <u>7</u>	<u>2°</u> °.	<u> </u>
Exami	ner: La	rry Mai	uldin hall	Maul	Level:	111	Sc	cans:				Pyromete Cal Duci			DE 2701	<u>B</u>
			,	Davill ?			4	5 🗆	dB	70 🗆	dB	Cal Due: Configura				lead
Proced				Rev: _	FC:		45	т 🗆	dB 7	от 🗆	dB	_		Flow		
	1	NDE-64	40	. 1	•	r	60		dB				lozzle	to	Up Head	_
Calibra	ation Sh	neet N	0:				60	т 🗆	dB			A	Scan (pplies to	Surface: NDE-6		
990207	75							Other:	0° @	<u>) 16</u> d	В	Skew An			N/A	
IND #	4	Max % Ref	Mp Max	W Max	L Max	L1	1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan .	Damps
		DO	NOT W HIS SP			20%c HM 50%c 100%	A lac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	D(IN		WRIT SPACI	
NRI	0°				<u> </u>											
Rema	arks: * !	95-18,	95-19		• •			.	.							
Limita	ations: (see Ni	DE-UT-4)	⊠ 90	% or grea	ter co	vera	ge obtaine	ed: yes 🗆] no 🛛		<u></u>	<u></u>	Sheet	t	of
Revie	wed By	<i>'</i> :			Level:		Date	e: /	Authorized	I Inspecto	SLOO		Date:	Item I		
	Roc		file	1	I		3-30	1-99		- OK	<u>urx</u> ee	<u>~~3</u>	3044	B03.1	10.005	
Rema	arks: * s ations: (ewed By	see Ni		☑ 90	Level:		Date	e: /	-		r:, (Date: 230 99	Item I		of

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DUKE PO		IPANY			Exam Sta	art: 11	41	Form	NDE-UT-	2A
ULTRASONIC EXAMINATION D	ATA SHEET	FOR PLANA	R REFLEC	TORS	Exam Fir	nish: 12	:52	Re	evision 4	
Station: McGuire	Unit: 2	ComponentA	Neld ID: 2	PZR-14			٤	Date:	3/26/9	9
Weld Length (in.): 47.1	Surface Cond	dition: As M	anufacture	d Lo:	9.2.3	Surface T				
Examiner: David Zimmerman	<u>Level:</u> II			_		Pyromete Cal Due:			DE 27018	<u> </u>
Examiner: Larry Mauldin	Level: III	_				Configura			z to Up H	ead
Procedure: NDE-620	5 FC: N/A	45T ⊠ <u>5</u>		от Ц	dB				<u>S1</u>	
Calibration Sheet No:		60 ⊠ <u>_5</u>						Surface:		_
9902077, 9902078		60T 🖾 <u>5</u> 5	::aB	dI	В	A Skew Ang	pplies to gle:		80 only N/A	
IND # K Max Mp W % Max Max Max	L Max L	1 L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
DO NOT WRITE IN THIS SPACE	HN 50%	6dac 20%dac MA HMA 6dac 50%dac %dac 100%dac		20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	D(IN		WRITE SPACE	
NRI 45°										
NRI 60°										
			<u></u>	I	.1	, 4 ,,	t	<u>.</u>	L	-
Remarks:	. <u> </u>									
· · · · · · · · · · · · · · · · · · ·)% or greater c	<u> </u>		·				Sheet		of
Reviewed By:	Level:	Date: 3-30- 99	Authorized	Inspector		3-30	Date:	Item N	No: 10.005	
Rod Sheffil	· · · · · · · · · · · · · · · · · · ·	5-50- Mg		TWIN			<u>'/</u>		.0.000	

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A P	tachment 1 age 13 of 60
DUKE POWER COMPANY	NDE-91-1
Limited Examination Coverage Worksheet	Revision 0
Examination Volume/Area Defined	
	Inner Radius 🔲
Area Calculation Volume Ca	lculation
Coverage Calculations	
Scan # Angle Beam Area Length Volume Volum Direction Examined Examined Examined Requir (sq.in.) (in) (cu.in.) (cu.in.)	ed Percent Coverage
BASE METAL 44.02 + WERD METAL	81.4-2=
AGGREGATE COVERNEE 62	7 %
Item No:	B03, 110.005
Prepared BY: Law Manlaus Level: JH	Date: 3-29.99
Reviewed By: Tur & Buff Level: II	Date: 3-30-99

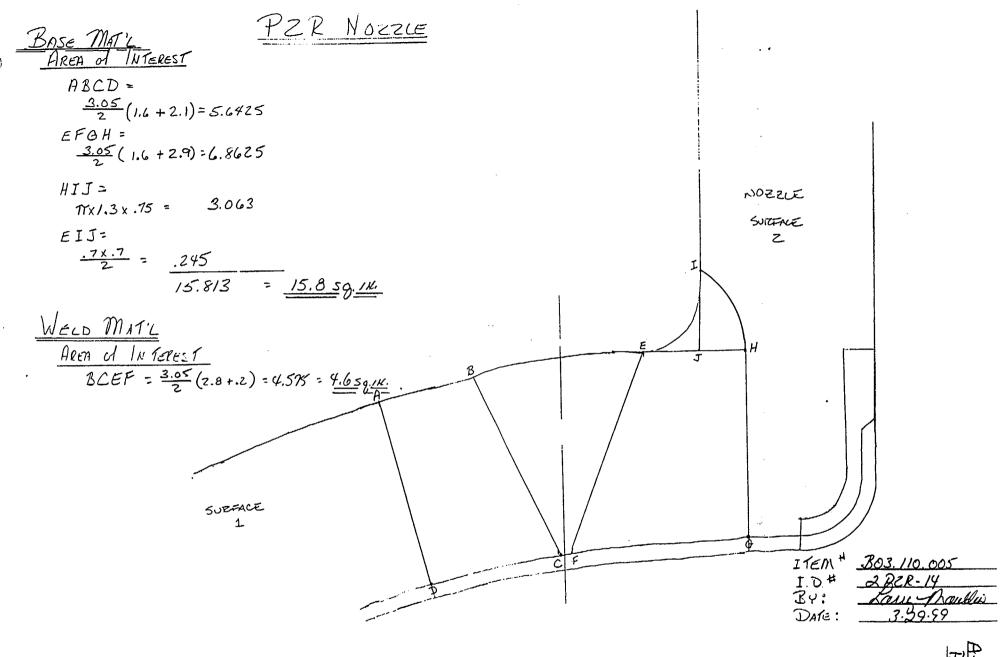
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	•	DUK	E POWER	COMPAN	14		NDE-91-1
	Ľ	mited Exa	nination C	overage	Worksheet		Revision 0
	· · ·	E	ixaminatio	n Volume	/Area Defin	ed	
Base N	letal 🛛	Weld [] Near	Surface [Boltin	ig 🗖 🕛 II	nner Radius 🗖 .
	Area	Calculation)		Volu	me Calcula	ation
.*	500	ATTACHE	ED SHEE	TS 1.	5.8 5g IN	X 47.5	1NI. =
_						750	.5 cu. 1N.
		×					
•			Coverage	e Calculat	ions		
Scan#	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in)		Volume Required (cu.in.)	Percent Coverage
1	0°	NA	6.9	47,5	327.75	750.5	
2 2)	(150	2	10,2	47.5	484.5	750,5	
	45°	/			180.50		
					570.0		
	60°				99.15	750.5	
6	450	CW			327.75		
7	450	CCW	6.9		327.75		
					327.75		
9.	60'	CCW.	6.9	47.5	327.75	7.50.5	·
			·	. 20	773.5 -	- 6754.	5 X 100
						44.	02 %
					[11	em No: RA	3. 110. 005
pared B	Y:	Paul	Mar M.		"		<u>مروری کی Date:</u> Date: کریز Date:
		ving 1	Kaullu Bibb		4		000. 277)

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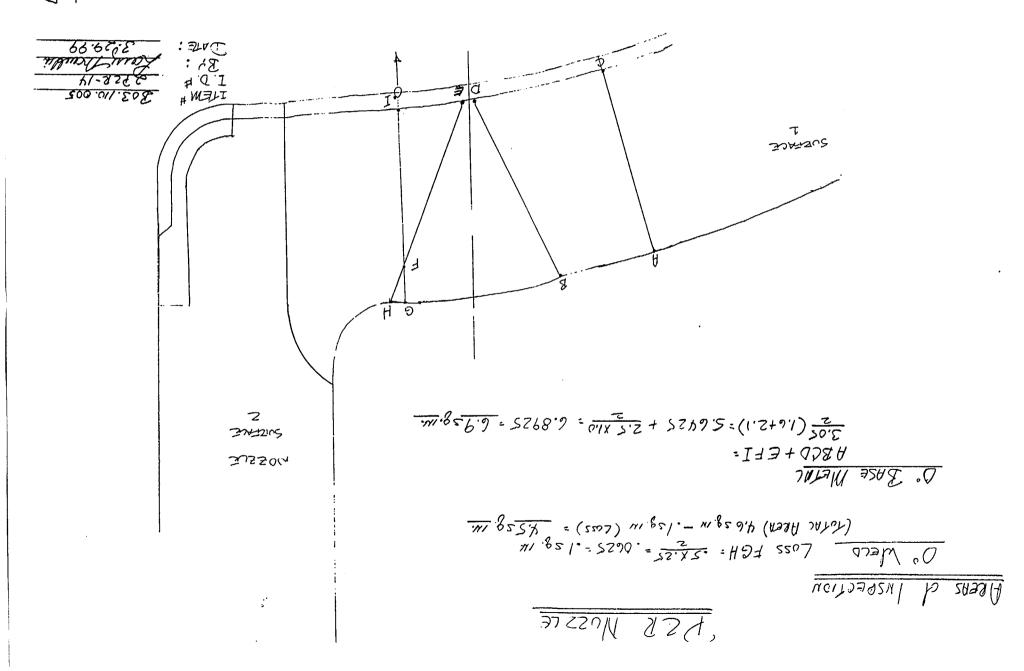
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·	DUKE POWER COMPANY						
Limited Examination Coverage Worksheet							Revision (
	-		Examinatio	n Volum	e/Area Defi	ned	
Base	Metal 🗖	Weld (X Nea	Surface	Bolti	ng 🖸 👘	Inner Radius 🗖
	Area	a Calculatio	n		Vol	ume Calcul	ation
2	Ge. M	MACHED -	SHEETS	· 9	46 sqin	X 47.5	The =
		•					18.5 cu. M.
						•	
			<u>،</u>				· ·
•		-	Coverage	e Calcula	tions		<u> </u>
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Covera
1	0°	MA	4.5	47.5	213.75	218.5	
23	450	Z			204.25	218.5	
	450	/	1.6		76	-	
4	60°	2			209		
6	450	ĊW	.9 4,5		42.75		
.7	450	CCW			213.75 213.25		
8	60°.	CKI			213.75		
9.	_	ĊCW.					•
1	U V	UC M	4.3.		213.75		
		· .		160	20.75 -	1966.	5 × 100
						81.	4%
		D .	n		····.	tem No: B	03.110.005
Prepared B	IY:	Lang	Mauld	<u>4 </u>	Level: III	• <u>•</u> •••••	Date: 3 :29.9
Reviewed (By:	Jun 6	1. Rel	el 1	Level: Z	Ţ	Date: 3-30-9

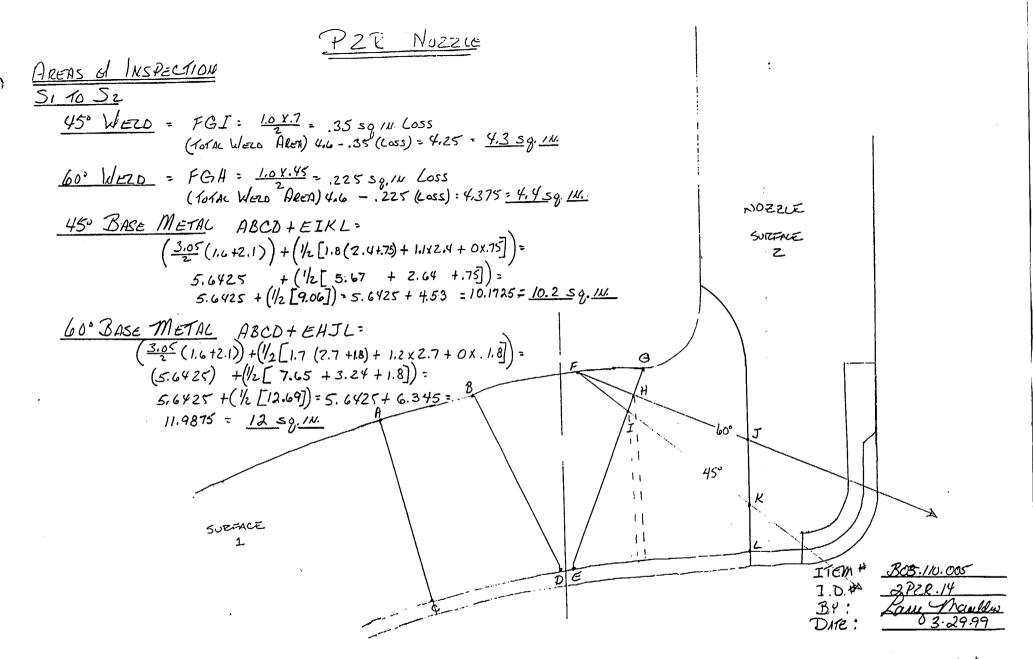


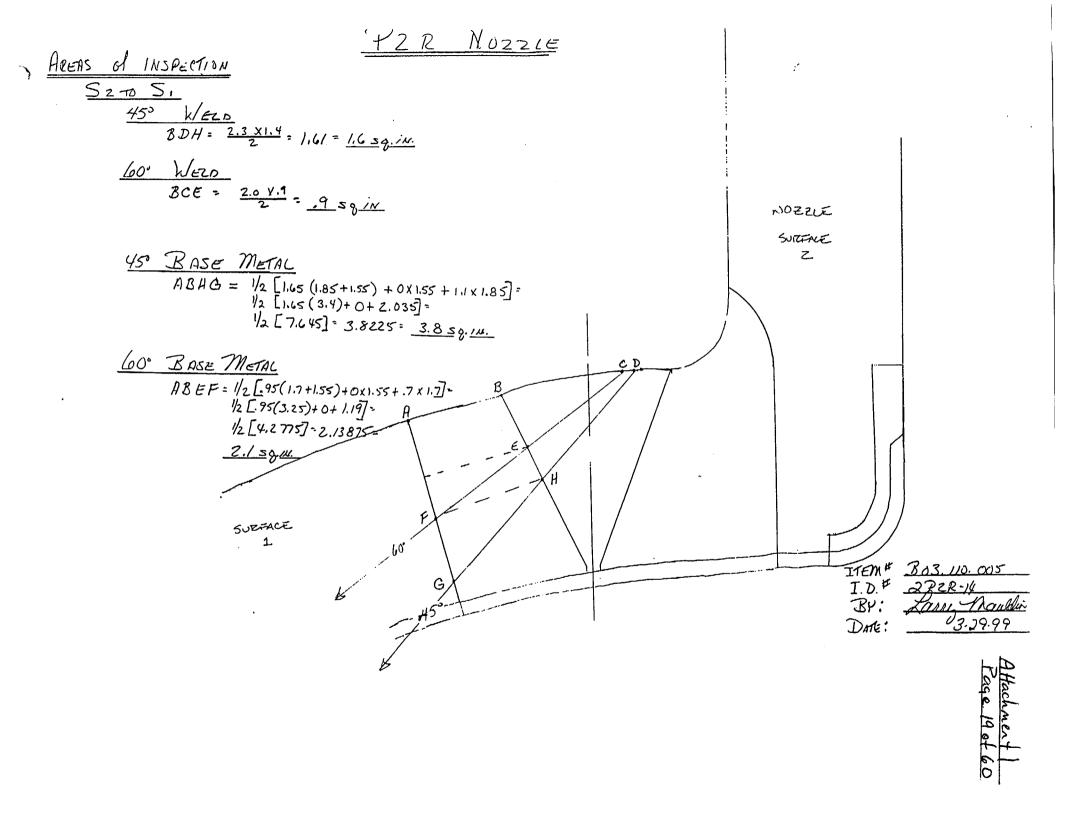
Hechment 1 Page 16 of 60

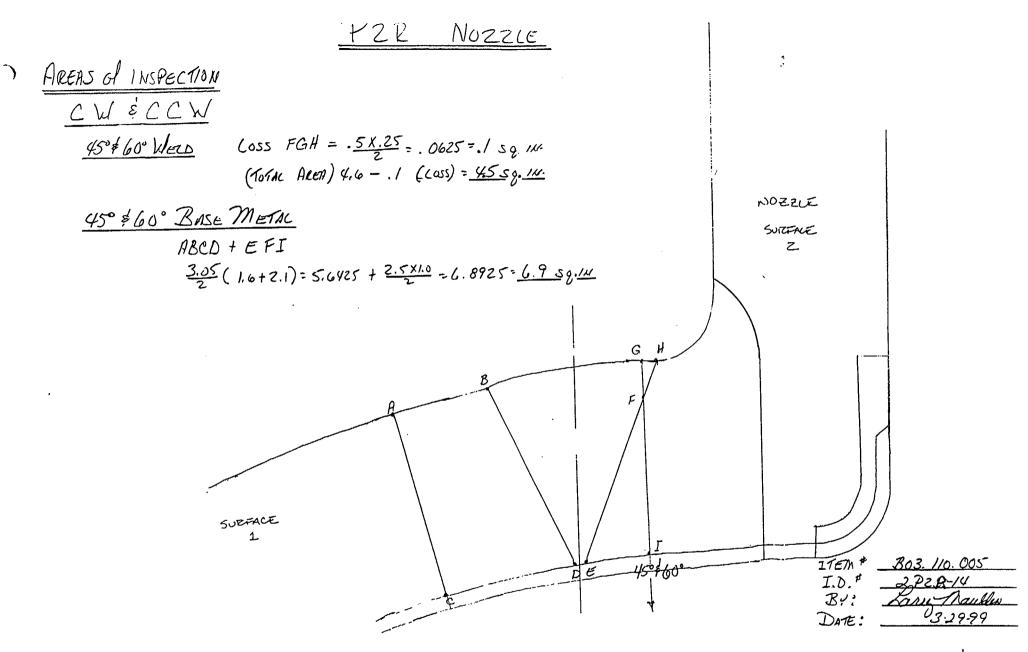
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	DUKE POWER COMPANY											Exam Start: 1133 F			Form NDE-UT-2A	
ULT	RASO	NIC E	XAMINA		ATA SHI	EET F	OR P	LANAR	REFLEC	TORS	Exam Fir	nish: 11	138	Re	evision 4	
Statior	ר:	١	AcGuire		Unit:	2	Com	ponent/M	Veld ID: 21	PZR-15	•			Date:	3/26/9	99
Weld I	_ength	(in.):	47.	1	Surface	Cond	ition:	As Ma	anufacture	d Lo:	9.2.3	Surface T	[emperat	ure: <u>7</u>	2° °	F
Exami	ner: G	ayle E.	Houser	Lele Hous	Level	: 11	Sca	ans:				Pyromete	-		DE 2701	8
			C. Leeper/		Aevel		45		dB	70 🗆	dB	Cal Due:				
Proced			ų	Rev:	FC:		1		dB 7			Configura		Safety No Flow		
	l	NDE-6	40	1		*									Up Head	
Calibra	ation SI	heet N	o:										Scan	Surface:	ÓD	
990207	74								0° @	16 4	D	A Skew Ang		o NDE-6	80 only N/A	
•			T						<u> </u>	<u>_ 10 _</u> u	.					
IND #	4	Max % Ref	Mp Max	W Max	L Max	L1		L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
			NOT W HIS SP	1		20%c HM 50%c 100%	A dac d	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	D(IN		WRIT SPAC	1 1
NRI	0°	1														
Rema	rks: * 9	95-18,	95-19	<u>I</u>		L	I		L		L	I	1	I	L	L
Limita	tions: (see N[DE-UT-4)	⊠ 90°	% or grea	iter cov	verage	e obtaine	d: yes 🗆	l no 🛛	<u> </u>		···	Sheet		of
Revie	wed By	•			Level		Date:		Authorized				Date:	Item N		
	R	L.	&h. 1/.	11	T	ق	5-30-	99		(XO)	flein	33	0-99	B03.1	10.006	

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Attachment 1 Page 21 of 60

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			DL	JKE PC	WER C	COMP	PANY	- · · · · · · · · · · · · · · · · · · ·		Exam Sta	art: 1	143	Form	NDE-UT	-2A	
ULTI	RASO	NIC E	XAMINA		ATA SHE	EET FO	OR PLANA	AR REFLE	CTORS	Exam Fir	nish: 1:	240	Re	evision 4		
Station	:	Ν	AcGuire		Unit:	2	Component	/Weld ID: 2	PZR-15	•		1	Date:	3/26/9	99	
Weld L	ength	(in.):	47.	1	Surface	Condit	tion: As l	Manufacture	d Lo:	9.2.3	Surface ⁻	Temperat	ture: <u>7</u>	72 [°] °	F	
1			Houser		11.		Scans:				Pyromete Cal Due:	-			8	
Proced			20	Rev: 5				5 <u>1.5</u> dB 5 <u>1.5</u> dB 7 55.5 dB			Configura		Safety No Flow	oz to Up ⊦		
Calibra 990207		-	o:	***			60т 🛛 🔄		ď	В		Scan Applies t	Surface: o NDE-6	OD 80 only		
IND #	4	Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps	
			NOT WI HIS SP/			20%da HMA 50%da 100%d	A HMA	HMA 50%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	D IN	O NOT	WRITI SPACE		Page 22 of
1	45°	20	2.9	1.5	23.5	N/A	N/A	N/A	N/A	N/A	N/A	1	2	AX	No	201
NRI	60°															60

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Remarks:						7
Limitations: (see NDE-UT-4) 🖂	90% or greate	r coverage obta	ined: yes 🗆 no 🖾		Sheet of	
Reviewed By:	Level:	Date:	Authorized Inspector:	Date:	Item No:	- 4112/2
Rod Stellub	T	3-30-99	Robein	3.30-99	B03.110.006	

	DUKE F	POWER COM	PANY		NDE-91
L	imited Examin	ation Covera	ge Workshee	t	Revision
	Exa	nination Vol	ume/Area Defi	ned	
Base Metal 図	Weld 🛛	Near Surfa	ce 🔲 🕺 Bolt	ing 门 🛛 👔	nner Radius (
Area	a Calculation		Vo	ume Calcul	ation
	•		• •		
			·····		· .
• • •	Co	overage Calc	ulations	·	
Scan # Angle	Direction Ex	Area Leng camined Exami sq.in.) (in)	ned Examined	Volume Required (cu.in.)	Percent Cove
BASE I	Mettic 4	4.02 +	Wezo M	enne 8,	1.4 - 2:
	Acore	SATE CO	i/eRAC L E	62.7	ð) 10
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-					
	<u></u>		[Item No: Bo	03.110.00
Prepared BY:	au Ma	ulder.	Level: 🎵	~	Date: 3-29.
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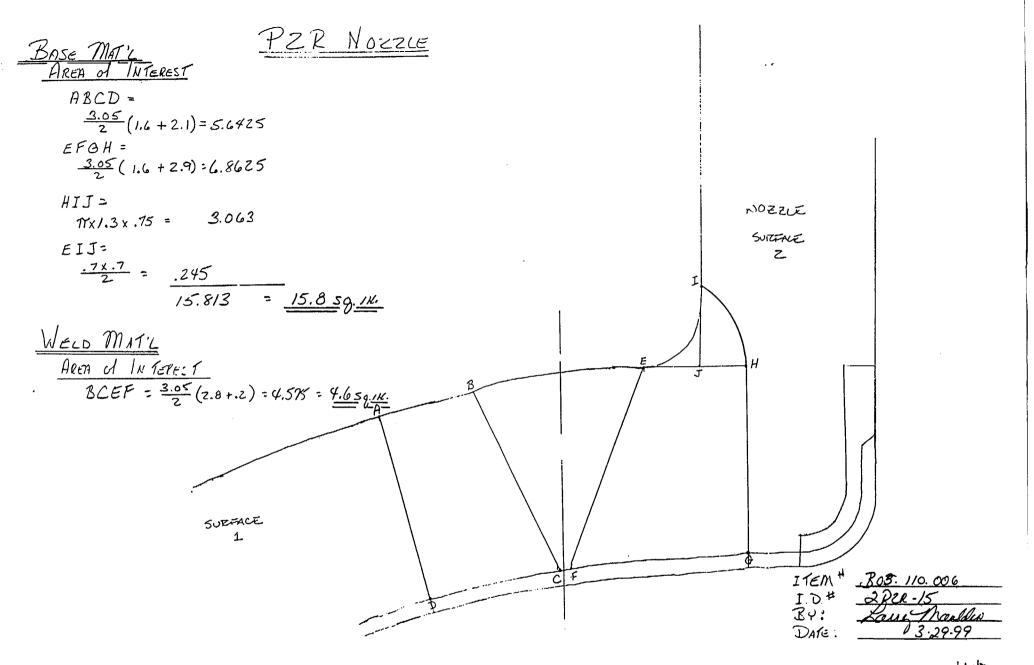
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		DUI		COMPA	NY		Page 24.01 NDE-91-1			
	L	mited Exa	mination C	overage	Worksheet		Revision 0			
		£	Examinatio	n Volume	Area Defin	ed				
Base N	letal 🛛	Weld [] Near	Surface I	face 🔲 Bolting 🗌 Inner Radius 🗆					
	Area	Calculation	n		Volu	me Calcul	ation			
.*.	5 <i>6</i> 2	ATTACH	ed Shee		5.8 sg. 1N		(1.к. =).5 си. ін.			
			Coverage	e Calculat	tions					
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in)		Volume Required (cu.in.)	Percent Covera			
1	0°	N/A	6.9	47,5	327.75	750.5				
23	(150	2			484.5	· –				
	45°	/			180.50		•			
45	600	2			570.0					
5 (0	60° 450	Chi		•••=	99.15	-				
0 7	45	CW CCW	6.9 6.9	47.5	327.75					
· /	•				327.75					
0 Q.		C W	6.7	41.5	27.15	150,5				
9	ωO	UCW.	0.7	41.5	327.75	1.50.5				
				. 20	173.5 -	- 6754.	5 × 100			
						44	02 %			
						,	/-			
					[om bles T	10 UD 000			
		\mathcal{O}	1			em No: 3	03.110.006			
Prepared B	·····	any M.	Caulder	[evel: TH		Date: 3.29.			

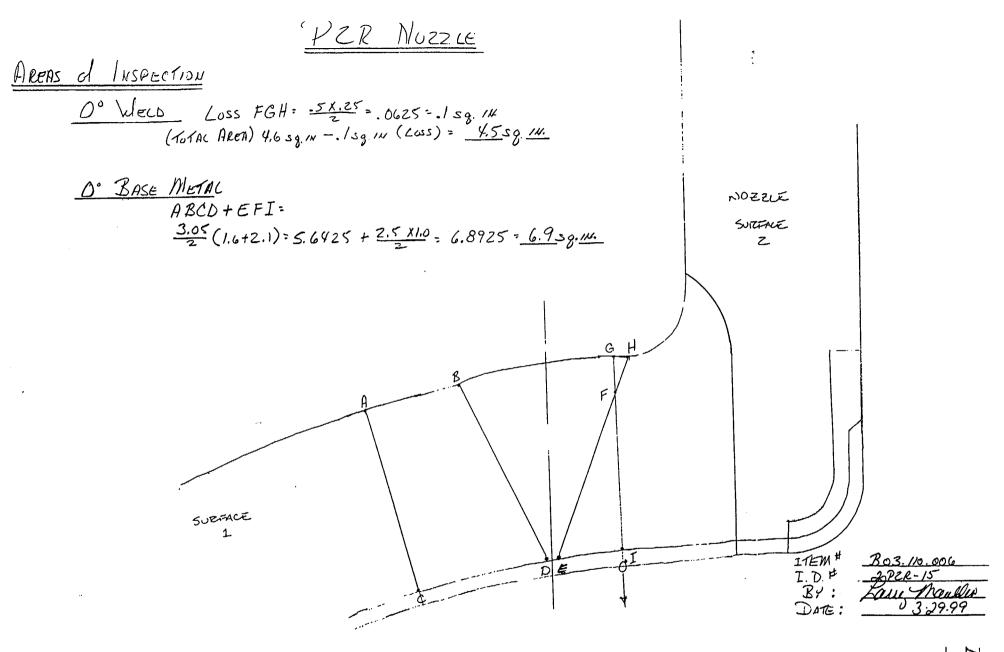
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				•	•	NDE-91-1
	Limited Exa		overage	WOrksnee		Revision 0
		Examinatio		•	-	•
Base Metal			Surface			Inner Radius 🔲
•	rea Calculatio		. 	······	ume Calcu	
SEE.	ATTACHED .	SHEETS	. 4	46 Sq. 126	X 47.5	SIN =
		•		• •	2	18.5 cu.IN.
		<u></u>				
		Coverage				
Scan # Ang	le Beam Direction	Area Examined (sq.in.)	Length Examined (in)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverag
1 0'	o A/A	4.5	47.5	213.75	218.5	
2 45 3 45				204.25		
, .	,			76		
4 60				209		
5 60 6 45	•			42.75		
.7 45			41.5	213.75	5 217.	۲ ·
	· CCW	4.5	41.5	213.23	F ~218.	S
0 <u>0</u> 0	CKJ CCKJ	4.5	47,5	213.75	218.	5
1 00	CCW.	Y.5.			-	
	-		160	W.75 -	1966.	5 X 100
					51	4%
					01	1 /0
<u> </u>					tem No: Bo	3.110.006
repared BY:	Lary M. Juny S.	hauldy	(.evel: 77	Ţ	Date: 3-29.99
eviewed By:	_			.evel: 7	T	Date: 3-30-9

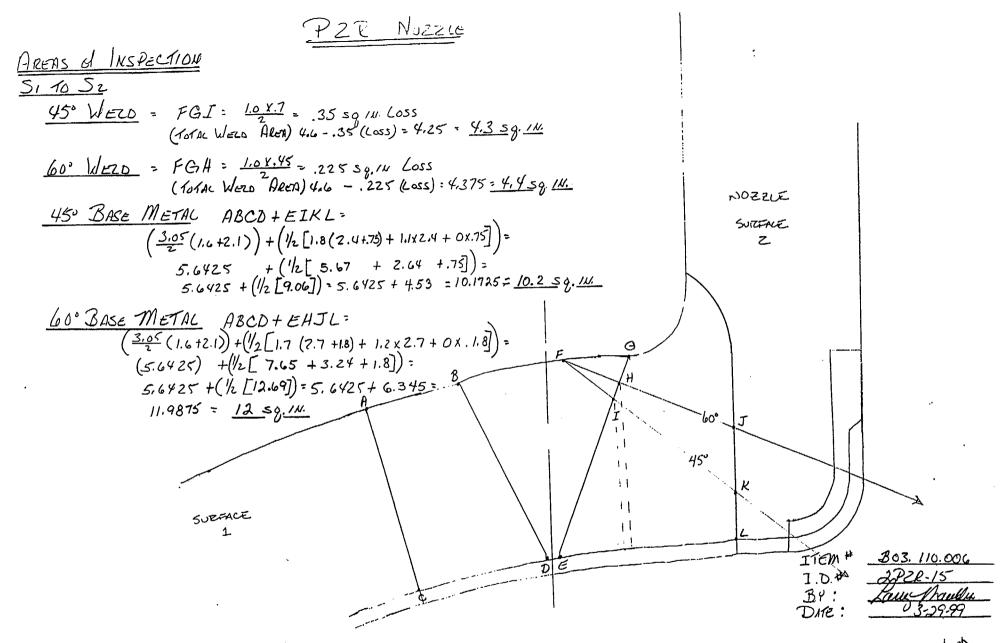
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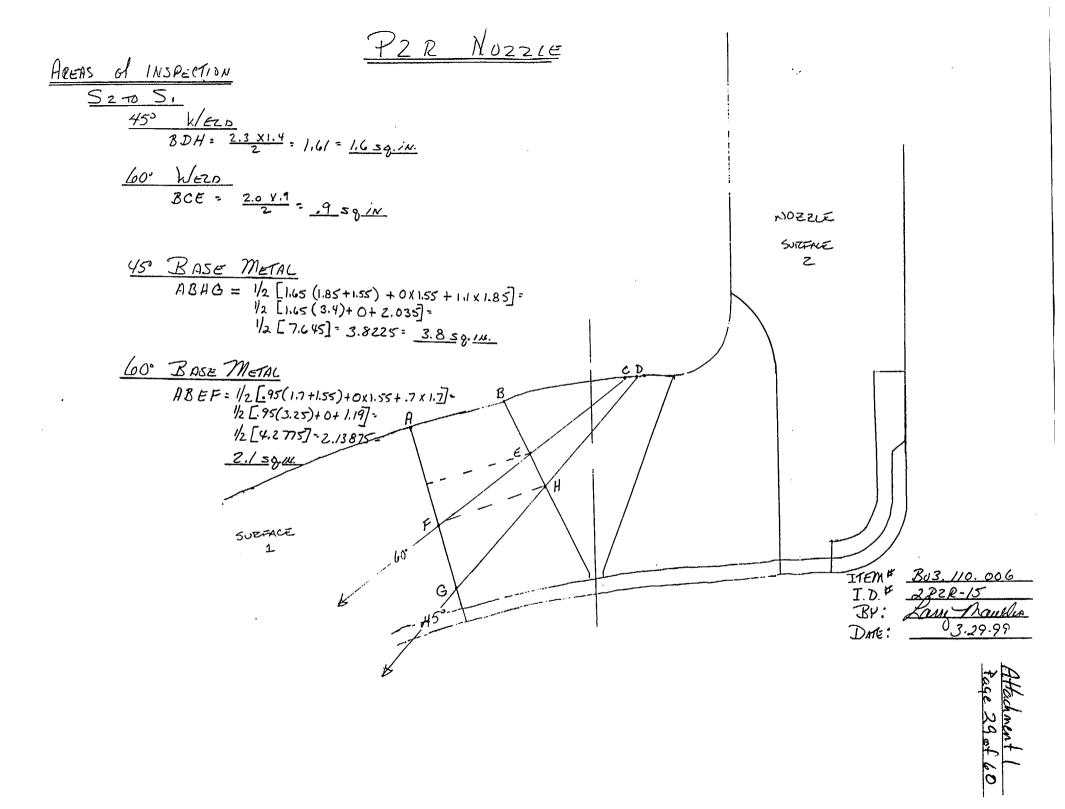


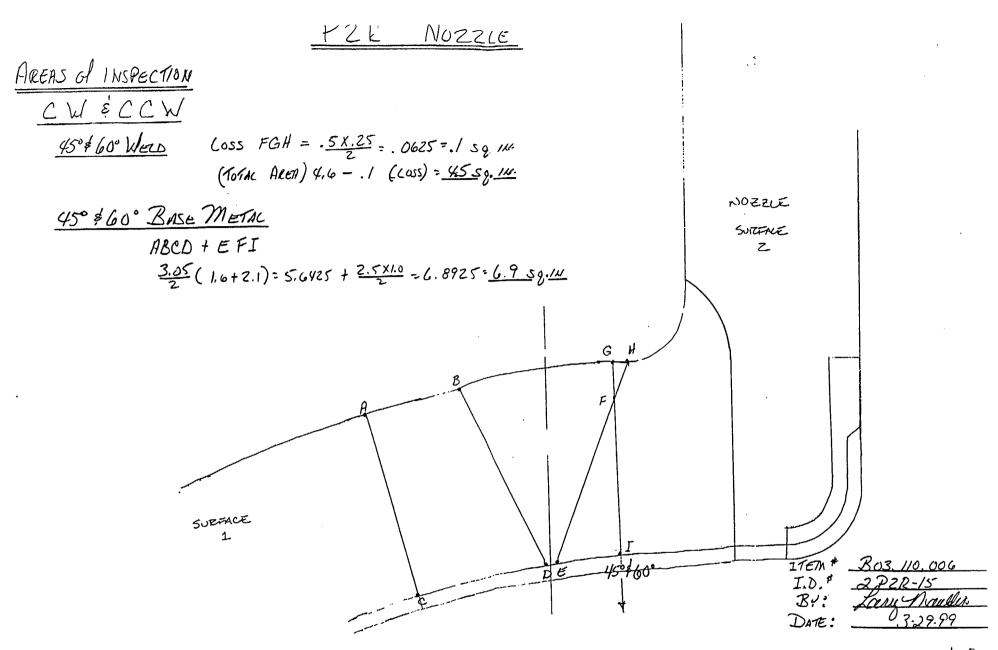
Attachment 1 Page 26 of 60



Attachment 1 Page 27 of 60







Attachment 1 Page 30 of 60

			DL	JKE PC	WER (COMF	PANY			Exam St	art: 1	138	Form	NDE-UT	Г-2А
ULTI	RASO	NIC E	XAMINA		ATA SHI	EET F	OR PLAN	AR REFLE	CTORS	Exam Fir	nish: 1	142	R	evision 4	1
Statior	n:	1	McGuire		Unit:	2	Component	Weld ID: 2	PZR-16	- L		0	Date:	3/26/	99
Weld L	ength	(in.):	47.	1	Surface	Condit	tion: As	Manufacture	ed Lo:	9.2.3	Surface *	Temperat	ure:	7 <u>2°</u> °	F
Exami	ner: G	ayle E.	Houser	retouse	Level	: 11	Scans:		••		1	er S/N:		DE 2701	8
Exami	ner: W	infred (C. Leeper/	Virla	Revel	: II'	45 🗆 _	dB	70 🗆	dB		7/			
Proced	dure:			Rev:	FC:		45T 🗆	dB dB	70т 🗆	dB		ation: 32			
		NDE-6	40			*	60 🗆				<u>~</u>	Nozzie		Up Head	
Calibra	ation S	heet N	lo:				60т 🗆						Surface:	OD	-
990207	'4 							er: <u>0° (</u>	<u>2)16</u> d	В	A Skew An	Applies to gle:		80 only N/A	
IND #	4	Max % Ref	Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
		1	NOT WI HIS SP/			20%da HMA 50%da 100%c	A HMA ac 50%dad	HMA	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	D(IN		WRIT SPACI	L
NRI	0°							_							·
Remar	'ks: * {	95-18,	95-19			·····		I	····	.	L.,,,,	L	L	L	· · · · · · · · · · · · · · · · · · ·
Limitat	ions: (see NI	DE-UT-4)	⊠ 909	% or grea	ter cov	erage obtai	ned: yes [] no 🛛				Sheet		 of
Review	•	-			Level:			Authorized	Inspector	•		Date:	Item N		
	Roz	l Sh	full		I	3-	30-99		AR S	en_	3-30	0~29	B03.1	10.007	

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			DI	UKE PC	WER	COM	PAI	NY			Exam Sta	art: 1	155	Form	NDE-UT	-2A
ULTI	RASO	NIC E	XAMINA		ATA SHI	EET F	OR	PLANAR		CTORS	Exam Fir	nish: 1	249	R	evision 4	
Statior	1:	1	McGuire		Unit:	2	Cor	nponent/V	Veld ID: 2	PZR-16	I			Date:	3/26/9	99
Weid L	.ength	(in.):	47.	1	Surface	Condi	tion:	As Ma	anufacture	d Lo:	9.2.3	Surface *	Tempera	ture:7	′ <u>2°</u> °	_F_
Exami	ner: G	ayle E.	Houser	all tous	Level	: 11		cans:				Pyromete Cal Due:			DE 2701	8
Exami	ner: W	infred (C. Leeper/	Vinfall	D Level:	: 11	4	5 🛛 _ 51	<u>.5</u> dB	70 🗆	dB	Configura			z to Up H	lead
Proced				Rev: 5		l		т 🛛 _ <u>51</u>	<u>.5</u> dB 7	ют 🗆	dB	_		Flow _		
					N	/A	60	o⊠_ <u>55</u>	<u>.5</u> dB				Nozzle	to _	Head	
Calibra	ation S	heet N	o:				60	т 🛛 _55	.5 dB					Surface:		
990207	6, 9902	2079	••••							dI	3	Skew An		o NDE-6	N/A	
IND #	4	Max % Ref	Mp Max	W Max	L Max	L1		L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
			NOT W HIS SP			20%d HMA 50%d 100%d	A ac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	-	O NOT	WRITI SPACE	
NRI	45°	[
NRI	60°															
Remar	ks:															
			DE-UT-4)	⊠ 90%	% or great	ter cov	erag	ge obtaine	d: yes 🗆	no 🛛				Sheet	(of
Review	•	- ^	04 A		Level:		Date		Authorized	Inspector	•		Date:	Item N		
	10	nd z	Hefful	1	T	3	-30	-99	A	TWE	un	3-30	-99	B03.1	10.007	

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				Atta Par	<u>chment (</u> <u>qe 33 of 6</u> 0
	DUKE	POWER COM	PANY		NDE-91-1
	Limited Exami	nation Covera	ige Workshee	t	Revision 0
Base Met		amination Vol Near Surfa	•		nner Radius 🔲
	Area Calculation			lume Calcula	
	•		· . · .		
	·				
	(Coverage Calc	ulations		
Scan # A	ingle Beam Direction	Area Leng Examined Exami (sq.in.) (in)	ned Examined	Volume Required (cu.in.)	Percent Coverage
BASC	е Мытас	44.02 +	Wezo W	lenne 8.	14=2=
	Accre	GATE CO	VERNEE	62.7	0
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•	•••••				
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Prepared BY:	D M				
Reviewed By:	Law MR	<u>Auldin</u>		<u>II.</u>	Date: 3.29.9
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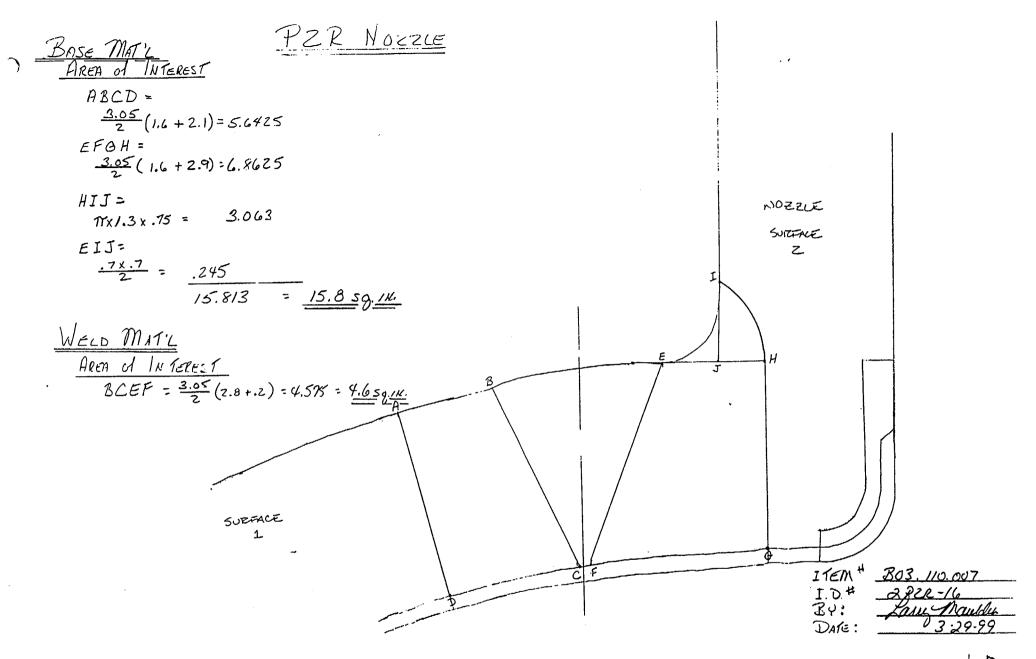
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		DUK		R COMPA	NY	-	NDE-91-1
	Li	mited Exa	mination C	coverage	Worksheet		Revision 0
		E	Examinatio	on Volume	e/Area Defir	ed	
Base M	etal 🛛	Weld [] Nea	r Surface I	Boltir	ng 🗖 🕛 I	nner Radius 🔲
e	Area	Calculation	1		Volu	me Calcul	ation
*_	5 <i>C</i> E	ATTACH	ED SHEE		5.8 sg. 1N		(1), =).5 си. 1.н.
<u> </u>			Coverag	e Calcula	tions		
Scan#	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in)		Volume Required (cu.in.)	Percent Coverag
1	0°	~/A	6.9	47,5	327.75	750.5	
2 3	(150		10,2	47.5	484.5	750,5	
	45°	•			180.50		
					570.0		
	60°	-	_		99.15		
6	45	CW		47.5			
. /	450	CCW			327.75		
					327.75		
9.	60'	CCW	6.9	47.5	327.75	7.50.5	
			·	. 2	973.5	- 6754.	5×100
						44.	02 %
					Г .		
	¥	D , I	1 .1	· · · · · · · · · · · ·		em No: 30	03.110.007
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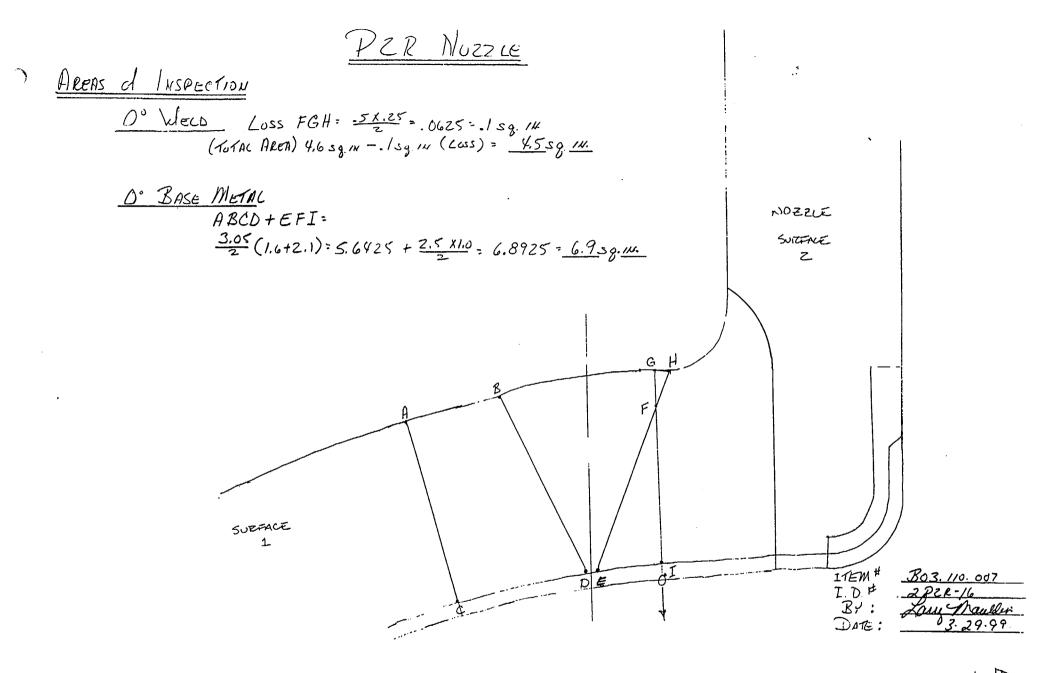
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		DUK		COMPA	Y		NDE-91-1
	L	imited Exa	mination C	overage '	Worksheet		Revision 0
		E	Examinatio	n Volume	Area Defir	ned	
Base I		Weld 🖟	Near	Surface [Boltir	ng 🗖 🔬 🕴	nner Radius 🗆
	Area	Calculation	1		Volu	ime Calcul	ation
. 2	. EE . A1	TACHED S	SHEETS	• 4	6 50 i.u.	X 47.5	11/2 =
							18.5 cu.m.
			•				
•			Coverage	e Calculat	lions		
Scan#	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in)		Volume Required (cu.in.)	Percent Coverage
/	0°	MA	4.5	47.5	213.75	218.5	
23	450				204.25		•
		1	1.6	47,5	76	218.5	
4	60"	2			209		
5	60"		.9		42.75		
6	450	CW	4,5	47,5	213.75	- 218.5	
• /	450				213.25		
8.		CW					
9	600	CCW.	4.5	47.5	213.75	218.9	5
				160	U.75 :	1966.	5 x 100
						81.	4%
		- <u></u>			1	tem No: \mathcal{B}_{0}	13. //0.007
repared E	8Y:	Law 1	hauld	in l	evel: III	• • • • • • • • • • • • • • • • • • • •	Date: 3.29.9
eviewed l	Bv:	1 1	Bille	r	.evel: 77	T.	Date: 3-30-99

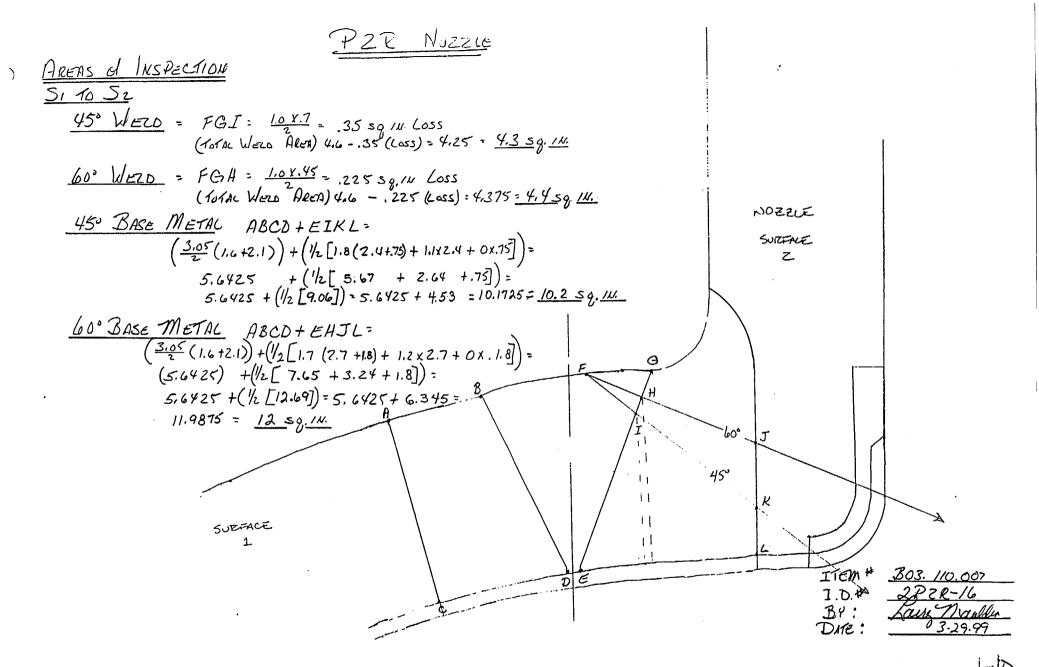
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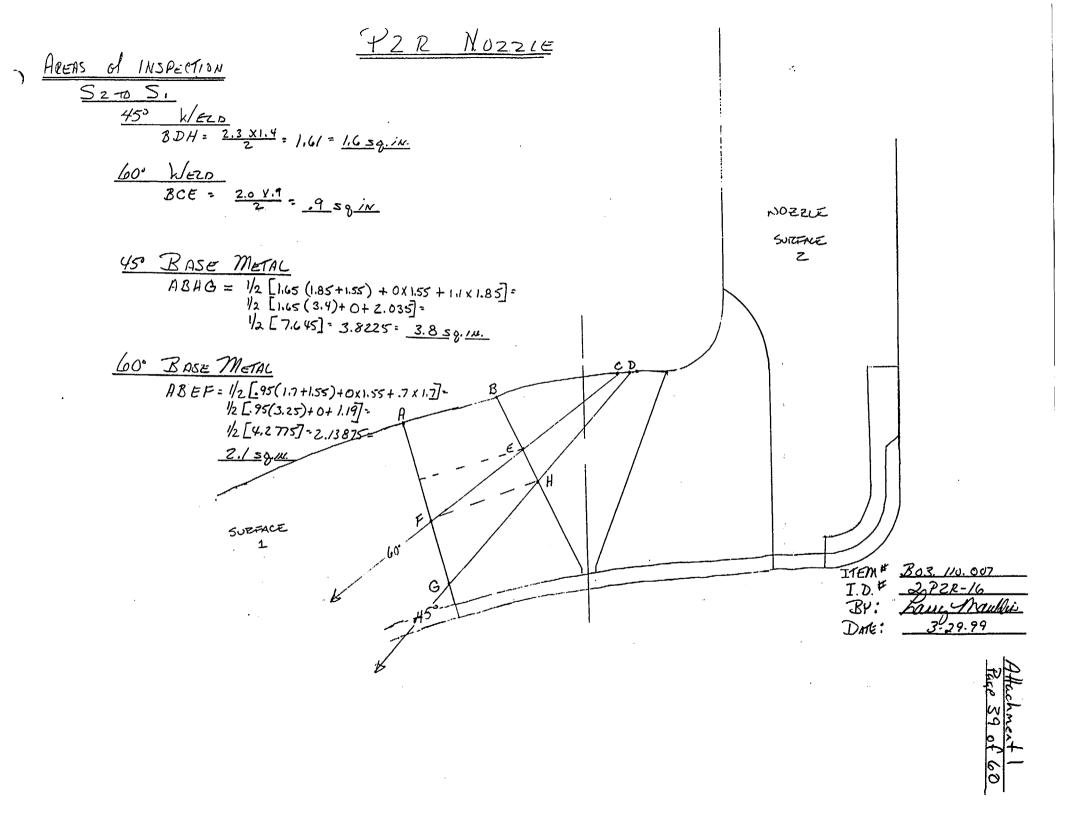


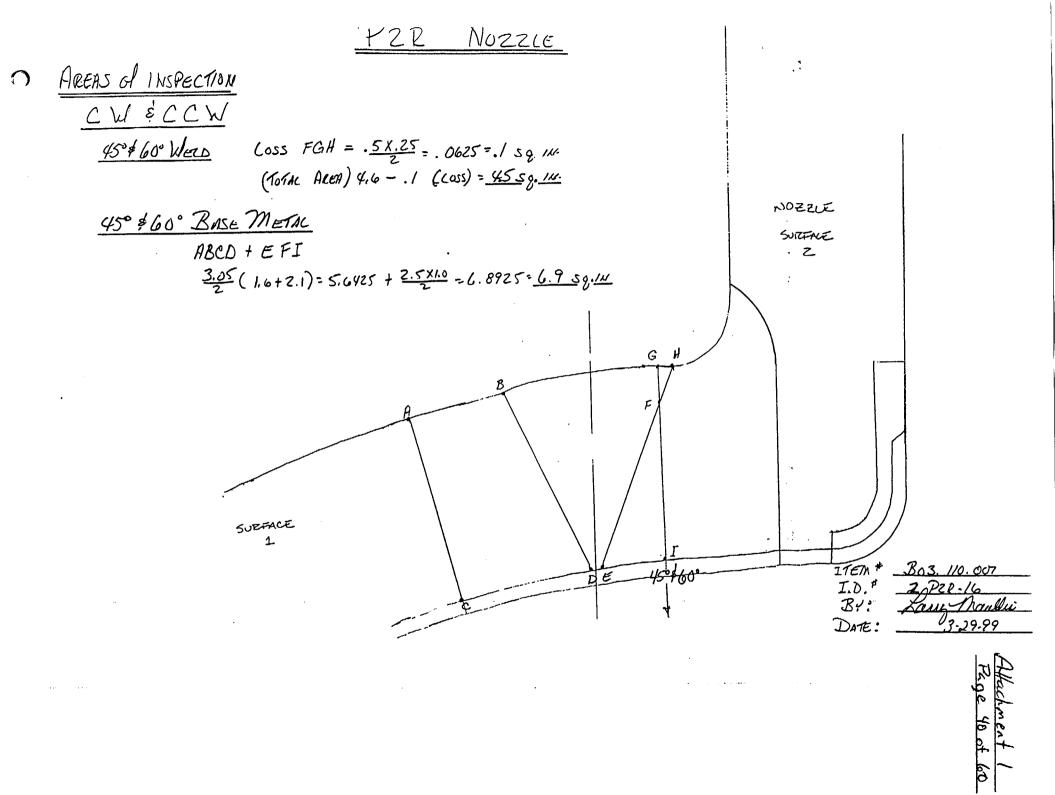
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			DU	JKE PC	WER C	OM		Exam Start: 1153			Form NDE-UT-2A					
ULTI	RASO	NIC E	XAMINA		ATA SHE	EET F	OR	PLANAR	REFLEC	TORS	Exam Fir	Exam Finish: 1222 Revisi				
Station	1:	N	AcGuire		Unit:	2	Con	Component/Weld ID: 2PZR-13R					C	Date:	3/26/9	9
Weld L	Weld Length (in.): 47.1 Surface Co							As Ma	anufacture	9.2.3	Surface Temperature: 72° ° F				F	
			nmerman		Level	: 11	So	cans:				Pyromete Cal Due:	_		DE 2701	<u> </u>
Exami	ner: La	arry Ma	uldin	Mou	Level	: 111	4	5 🗆	dB	70 🗆 _	dB	Car Due.			R RADIUS	 3
Procedure: NDE-680 ^O Rev: 1 FC:						45	т 🗆	dB 7	от 🛛 _	<u>59</u> dB	-	2				
					95	-16	60)	dB				her Rad	_	فالتقابيب ليائز ويستجف والمتعالية	
Calibra 990208			0:				60	т 🛛 _ 55	. <u>5</u> dB			Scan Surface: OD Applies to NDE-680 only				
	50, 5502	.002						Other:	<u></u>	c	IB	Skew An	gle:	60&7	70@14°	
IND #	4	Max % Ref	Mp Max	W Max	L Max	L1		L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
		1	NOT W HIS SP			20%0 HM 50%0 100%	A dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	D(IN	1	WRITI	ι ι.
NRI	60°		-													
NRI	70°															
L	4								X					•	•	
Rema	rks:								<u> </u>							
		•	DE-UT-4)	⊠ 90				-	ed: yes ⊑					Sheet	t (of g
Revie	wed By	г. ГЛ	01	20	Level:		Date	: .99	Authorized		pr:	3-30	Date:	Item I		41
	/	Kod	<u> Heffiel</u>	<i>₩</i>	مشکسر	<u> </u>	-50-	.77		Me	<u>xun</u>	5-51	77	DU3.1	20.003	

		•	·	-		<u>.94</u> 1	tachment 1 age 42 of 60
		DU	KE POWER	R COMPAN	łY		NDE-91-1
	Lit	nited Exa	mination (Coverage V	Norksheet	Revision 0	
		E	Examinatio	on Volume	/Area Defi	ned	
Base I	Metal 🔲	Weld [r Surface [Inner Radius 🛛
		Calculation				ume Calcu	
¥ 20	EE . 477,	AC AE 15 S	SHEETS	· 7.7.	2 ѕд. ші.	X 4451	и. = 81.7 си.
•		-	Coverag	e Calculat	ions		
Scan #	Angle	Beam Direction	Area	Length Examined	Volume	· · · • • · · · · · · · · · · · · · · ·	Percent Covera
/	60° ho.	CW	1.08	47,5	51.3	81.7	
2	60'/70'	CW	1,08	47.5	51.3	81.7	
				10	12.6 -	163.4	× 100= 62.79%
	•••	· ·					
	-		· .				
				•			
·····		9				tem No: Ba	03. 120.003
epared B	Y: La	M M.	Raubler	L	evel: .777	r 	Date: 3-29.
eviewed 8	D	, 0 ,			evel: 7		Date: 3-29-9

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NOZZLE INNER RADIUS AREA of INTEREST H X 1"- + X.5"2 ÷ 4 = 3.1415 - .7853 ÷ 4 = .589 sq IN (RADIUS) ABCD = 2.25" X.5" = 1,125 so, IN (NOZZIE) Nozzie 1.125 + .589 = 1.72 sg. 1. AREA of Loss CDEF+EFG=1.2" X.5" + .15 x.5" = .64 sq. 14 AREA of COVERAGE = 1.72 sg. IN - . 64 sg. IN. = 1.08 sg. IN. 70° ITEM # BOS. 120.003 272R-13R I.D. # Law Maulle BY : DATE :

Ref 20%dac 50%dac				C	UKE PC	WER (COM	PAN	1			Exam St	art: 1	202	Form	NDE-UT	-2A	
Weld Length (in.):47.1Surface Condition:As ManufacturedLo:9.2.3Surface Temperature: 72° °FExaminer:David Zimmerman factor A° Level:IIScans:Scans:Surface Temperature: 72° °FExaminer:David Zimmerman factor A° Level:IIScans:Surface Temperature: 72° °FExaminer:Larry MauldinMax factor evel:IIScans:Scans:Surface Temperature: $728/99$ Procedure:NDE-680Rev:1FC:45TdBdB70T59dB95-1660dBdB60T 55.5 dBScan Surface: OD902080, 99020829902082Other:dBdBScan Surface: ODIND # A° MaxMaxLL1L2W1Mp1W2Mp2BeamExamIND # A° MaxMaxLL1L2W1Mp1W2Mp2D0NOTWRITEIND # A° MaxMaxL1L220%dac20%dac20%dac20%dac20%dacSo%dacSo%dacSo%dacSo%dacSo%dacSo%dacSo%dacSo%dacINTHISSPACE	ULT	RASO	NIC E	EXAMIN	ATION D	ATA SH	EET F	OR PI	_ANAF		CTORS	Exam Fir	nish: 1	231	R	evision 4	<u>ــــــ</u>	
Examiner: David Zimmerman Image: Construction of the sector of the	Statio	Station: McGuire Unit: 2							Component/Weld ID: 2PZR-14R						Date:	3/26/9	99	
Examiner: Larry Mauldin Augustic evel: III 45 \Box dB 70 \Box dB Cal Due:7/28/99 Cal Due:7/28/99 Procedure: NDE-680 Rev: 1 FC: 45 \Box dB 70 \Box 59 dB Configuration:INNER RADIUS Calibration Sheet No: 95-16 60 \Box dB dB 70 \Box dB S2 FlowS1 902080, 9902082 Max Mp L L1 L2 W1 Mp1 W2 Mp2 Beam Dir. Exam Surf. Scan Dam IND # Max Mp W L L1 L2 W1 Mp1 W2 Mp2 Beam Dir. Scan Dam Dam DO NOT WRITE 20%dac 20%dac 20%dac 50%dac 50%dac 50%dac 50%dac 50%dac 50%dac S0%dac DO NOT WRITE	Weld	Length	(in.):	47	7.1	Surface	e Condi	ition:	As M	anufacture	d Lo:	9.2.3	Surface ⁻	Тетрега	iture:	7 <u>2</u> °°	_ <u>F_</u>	
Examinate:Larry Mauluin Xull Xull Xull Xull Xull Xull Xull Xul						Leve	I: II	Sca	ns:		<u> </u>		4		· · · · · ·	<u>DE 2701</u>	8	
Procedure:NDE-680Rev:1FC:45T \square dB70T $\boxed{59}$ dB $\boxed{S2}$ Flow $\underline{S1}$ Calibration Sheet No:9902080, 9902082 60 \square dB dB dB \boxed{B} \boxed	Exam	iner: La	arry Ma	uldin	withou	Leve	I: III	45		dB	70 🗆	dB						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $							1	1				Configuration: INNER RADIUS						
Calibration Sheet No: 9902080, 9902082 $IND # \checkmark Max Mp W Ax Max Max Max Max L1 L2 W1 Mp1 W2 Mp2 Beam Bar Scan Surface: OD Applies to NDE-680 only Skew Angle: 60&70@14° Max Mp Max Max Max L1 L2 W1 Mp1 W2 Mp2 Beam Bar Scan Dam DO NOT WRITE 20%dac HMA 50%dac 20%dac HMA 50%dac 5$						95												
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Calibr	ation S	heet N	lo:														
IND # Max Mp W L Max L1 L2 W1 Mp1 W2 Mp2 Beam Dir. Exam Surf. Scan Dam DO NOT WRITE 20%dac HMA 50%dac 20%dac HMA 50%dac 50%da	99020	80, 9902	2082															
IND # % Max Max Max L1 L2 W1 Mp1 W2 Mp2 Dealing Dealing Dealing Dealing Dir. Exam Scan Dam DO NOT WRITE 20%dac HMA 50%dac									Other:	·	dl	В	Skew An	gle:	60&	70@14°		
DO NOT WRITE HMA HMA HMA HMA HMA HMA HMA HMA DO NOT WRITE IN THIS SPACE 50%dac 50%dac 50%dac 50%dac 50%dac 50%dac IN THIS SPACE	IND #	4	%	Max			L1		L2	W1	Mp1	W2	Mp2			Scan	Damps	
				1	1		HM/ 50%d	A lac 50	HMA 0%dac	HMA 50%dac	НМА	HMA 50%dac	HMA 50%dac			1	1 1	
NRI 60°	NRI	60°				<u> </u>												
NRI 70°	NRI	70°							M							<u> </u>		
		J	1	1		<u>I</u>	<u></u>	I		I	I]	<u>I</u>	I				
Remarks:	Rema	rks:								,	····							
Limitations: (see NDE-UT-4) 90% or greater coverage obtained: yes no no	Limita	tions: (see NI	DE-UT-4) 🛛 909	% or grea	iter cov	/erage	obtaine	ed: yes 🗆] no 🖂				Sheet	(of	
Reviewed By: Level: Date: Authorized Inspector: Date: Item No:		wed By	:	· · · · · · · · · · · · · · · · · · ·									···· =	Date:				
Rod Sheffull II 3-30-99 . Alter 3-30-99 B03.120.004		7	od	Stell	M	I	.3.	-30-9	9	-	Alte		<u> </u>	-99	B03.1	20.004		

Attrachment 1 Rege 44 of 60

			-		<u>Ath</u> Pag	alhment (e 45 of 60
·····	DUK	E POWER	COMPAN	Y	•	NDE-91-1
Lin	nited Exam	ination Co	overage V	Vorksheet		Revision 0
	E	amination	1 Volume	Area Defir	ned	•
Base Metal	Weld 🗌	Near	Surface [] Boltin	ng 🗖 🖂 I	nner Radius 🛛
	Calculation			Volu	ime Calcul	ation
KS€E ATT	nc <i>her</i> o Si	læts .	1.7_	2 ѕд. ш.	X 47251	u. = 81.7 cu. ı.
		Coverage	Calculat	ons	·····	
Scan # Angle	Beam Direction	Area Examined (sq.in.)	Length Examined	Volume Examined	Volume Required (cu.in.)	Percent Coverage
1 600 /200 2 600 /200	CW	1.08	47,5	51,3	81.7	
2 601/70	CW	1,08				_
			10	12.6 -	163.4	x 100= 62.79%
• •			·			
-	0				Item No: 7	03. 120.004
Prepared BY:	m. M	aulles	L	evel:]]]		Date: 3:29.9
Reviewed By:	~D	Rill		evel: 14	T	Date: 3-29-99

-

NOZZLE INNER RADIUS AREA of INTEREST H X 1"- + X.5"2 ÷ 4 = 3.1415 - .7853 + 4 = .589 sq. m. (RADIUS) ABCD = 2.25" X.5" = 1,125 sq, IN (NOTELE) Nozzie 1.125 + . 589 = 1.72 sg. 1. AREA of Loss CDEF+EFG=1.2" X.5" + .15 x.5" = .64 sq. 11 AREA of COVERAGE = 1.72 sg. m - . 64 sg. m. = 1.08 sq. 1. 70° ITEM # BO3. 120.004 2.PZR-14R I.D. * Law Maulle BY : 3-29-59 DATE:

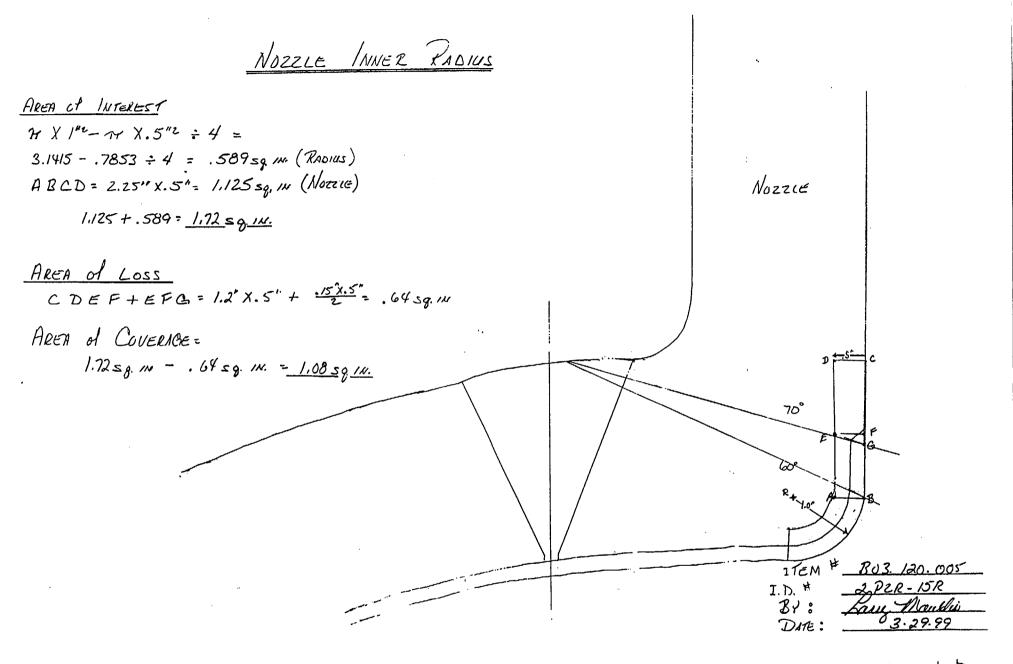
DUKE PC	WER COMP	ANY	Exam St	art: 1249	Form	NDE-UT-2A		
ULTRASONIC EXAMINATION D	ATA SHEET FO	OR PLANAR REFLECTOR	S Exam Fi	nish: 1318	R	Revision 4		
Station: McGuire		Date:	3/26/99					
Weld Length (in.): 47.1	•	ion: As Manufactured	Lo: 9.2.3	Surface Tempe	erature:	72°°F		
Examiner: Gayle E. Houser All Anus	Level: II	Scans:		Pyrometer S/N Cal Due:		DE 27018		
	Level: II	45 🗆 dB 70 🗖		Configuration:		R RADIUS		
Procedure: NDE-680 Kev: 1		45T □dB 70T ⊠	<u>59</u> dB		Flow			
Collibration Shoot No.	95-16	60 🗆 dB		Inner Rad to Head Scan Surface: OD				
Calibration Sheet No: 9902081, 9902083		60T ⊠ <u>55.5</u> dB	_ dB	Applies to NDE-680 only Skew Angle: 60&70@14°				
IND # A Max Mp W % Max Max Ref	L Max L1	L2 W1 Mp	1 W2	Mp2 Bea Dir.		Scan Damps		
DO NOT WRITE IN THIS SPACE	20%da HMA 50%da 100%d	A HMA HMA HM ac 50%dac 50%dac 50%d	A HMA ac 50%dac	HMA 50%dac	DO NOT IN THIS	WRITE SPACE		
NRI 60°								
NRI 70°						·		
III	<u></u>			_II.	l			
Remarks:								
Limitations: (see NDE-UT-4) 2 90						t of		
Reviewed By:		Date: Authorized Inspective	ctor:	Date ?- 3-30		No: 120.005		

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				<u>chment 1</u> <u>e 48 of 60</u>		
DUK	E POWER CO	MPANY		NDE-91-1		
Limited Exam	nination Cove	rage Workshe	et	Revision 0		
E	xamination Vo	olume/Area De	fined			
Base Metal 🖾 Weld 🗆	Near Sur	face 🔲 🛛 Bol	ting 🔲 🐳	Inner Radius 🛛		
Area Calculation		Vo	olume Calcu	lation		
* SELE ATTACHED S	H <i>C</i> ETS	1.72 sg. iu.	X 47.51	н. = 81.7 си.		
	Coverage Ca					
Scan # Angle Beam	Coverage Cal Area Lea Examined Exar	ngth Volume	Volume I Required	Percent Coverage		
Direction	(sq.in.) (i	in) (cu.in.)	(cu.in.)	Leicein Coneidi		
1 60'to CW	1.08 47	15 51.3	81.7			
2 60'/70' C'k/	1,08 Y1.	5 <u>51.3</u> 102.6 -		X 100= 62.79%		
•		•				
· · · · ·						
•				<i>'</i> .		
				• .		
· · ·						
			Item No: Bo	03. 120. 005		
Prepared BY: Land M	ullu	Level: 7	7	Date: 3.29.9		
Reviewed By:	RIA	Level: 7	T.	Date: 3.29-4		

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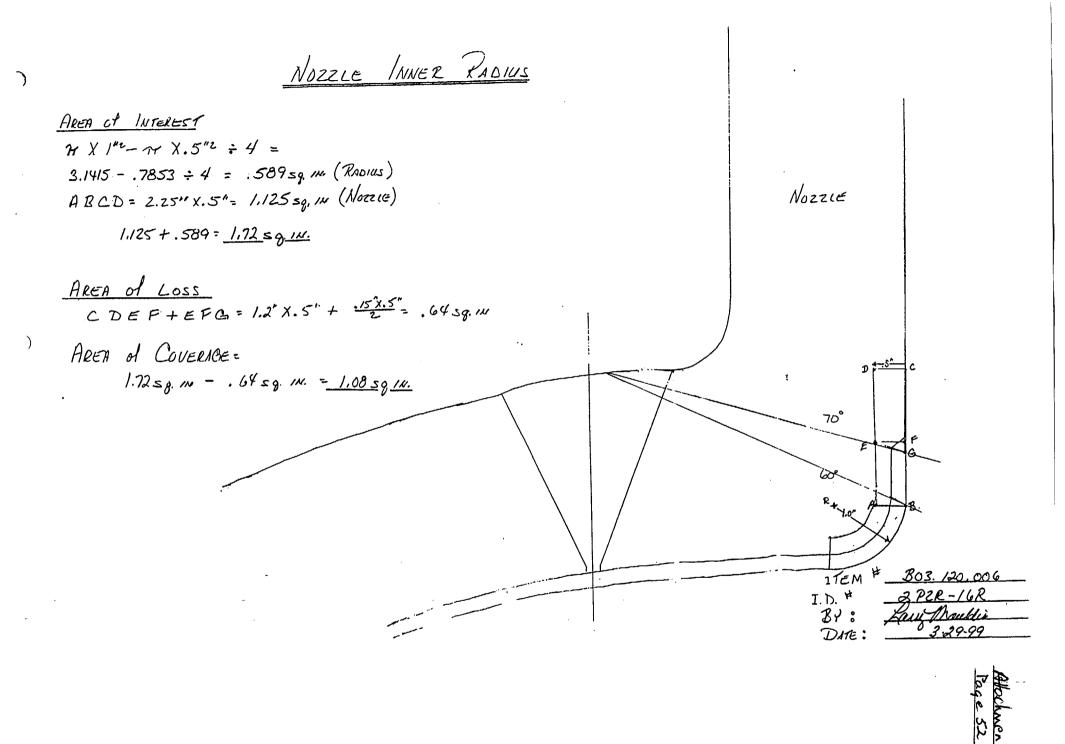


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			D	UKE PC	WER	COM		Exam St	tart: 1258		Form NDE-UT-2A					
ULT	RASO	NIC E	XAMINA	ATION D	ATA SH	EET F	FOR	PLANAF		CTORS	Exam Finish: 1329			Revision 4		
Station	า:		McGuire		Unit:	2	Cor	nponent/V	t/Weld ID: 2PZR-16R					Date:	3/26/9	99
			47.					: As Ma	anufacture	d Lo:	9.2.3	Surface 7		· · · · · · · · · · · · · · · · · · ·		
				ofe Jour				cans:				Pyromete Cal Due:			DE 2701	8
				Unifield.				5 □				Configura			R RADIU	S
Procedure: NDE-680									′0T ⊠	<u>59</u> dB	S2 Flow S1					
Calibra	ation S	heet N	o:				1	D□				Inner Rad to Head Scan Surface: OD				-
990208	31, 9902	2083					60	T⊠ <u>55</u> Othjer:	. <u>5</u> dB	dl	В	م Skew Ang		o NDE-6 60&7		
IND #	4	Max % Ref	Mp Max	W Max	L Max	L1		L2 '	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps .
			NOT W HIS SP	1		20%0 HM 50%0 100%	IA dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	D		WRIT SPACI	1 1
NRI	60°															
NRI	70°															
Rema	rks:														 	
Limita	tions: (see NI	DE-UT-4)	⊠ 90%	% or grea	ter co	veraç	ge obtaine	d: yes 🗆] no 🛛		<u> </u>		Sheet		
Review	wed By		0/ 1	171	Level		Date		Authorized	Inspector	• • •		Date:	Item N	lo:	of R. 411
		-od	Sheffe				5-32	-99		AN	en	3-30	» 9 9	B03.1	20.006	

							tachment 1 ge 51 of 60		
		DUK	EPOWER	COMPAN	IY	•	NDE-91-1		
	Lin	nited Exar	nination C	overage V	Norksheet		Revision 0		
	· · · · · · · · · · · · · · · · · · ·	E	xaminatio	n Volume	Area Defi	ned			
Base I	Metal 🗌	Weld [Nea	r Surface [] Bolti	ng 🔲 🐁	Inner Radius 🛛		
•		Calculation				ume Calcu			
* 5	EE ATTA	ICHED S	Acets	· /.7_	2 ѕд. ш.	X 47.51	н. = 81.7 си.		
•			Coverag	e Calculat	ions		<u></u>		
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverag		
/	.60 ho	CW	1.08	47,5 47,5	51,3	81.7			
2	(0J*/7J*	CW	1,08				X 100= 62.79%		
•									
	••	•			·				
•	•								
				•					
						Item No: B	03. 120.006		
repared E	BY: Kan	u Ma	ulderi	L	èvel:]]]		Date: 3:29.2		
leviewed	By: A	0	R. Mr	1	evel: 1	T	Date: 3-29-9		
	· ×µu	p. K.	JARKE		<u> </u>	+	3-27-4		

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			DL	JKE PC		COMP	ANY			Exam Sta	art: 14	450	Form	NDE-UT	-2A
ULTI	RASO	NIC E	XAMINA		ATA SHE	EET FC	OR PLANAF		CTORS	Exam Fir	Finish: 1635		R	evision 4	
Statior	ו:	Ν	AcGuire		Unit:	2 (Component/V	Veld ID: 2	SGB-INLE	ĒT		[Date:	3/17/9	99
Weld L	ength	(in.):	N/A		Surface	Conditi	ion: AS N	ACHINE) Lo:	RT "0"	Surface 1	remperat	ure:	97 °	F
Exami	ner: Ja	ay A. Ea	aton (THE	Level:	: 11	Scans:				Pyromete			DE 2702	2
Exami	ner: Da	avid Zin	nmerman	ON C	Z Level:	: 11	45 🗆	dB	70 🗆	dB	Cal Due:				
Proced	dure: I	NDE-6	<i>~</i>	Rev:			45T 🗆 dB 70T 🖾			Configura					
						-16	60 □dB					/A			<u>\</u>
Calibration Sheet No:												N/A Scan :	το Surface:	N/A OD	
9902035, 9902036						60т 🛛6					Applies to	ies to NDE-680 only 23.5°.23			
•		· · _ · · · · · · · · · · · · · · ·					Other		d	В	Skew An	gle:	23.	5°.23	
IND #	4	Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
			NOT WI HIS SP			20%da HMA 50%da 100%d	HMA	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	i	1	WRITI SPACE	1
NRI	60°				1										
NRI	70°				1									ļ	
	·;		I	I	<u> </u>	1		.I	I	I	1	I	<u> </u>	[l
Remai	rks:				<u> </u>									•	
Limitat	tions: (:	see NE	DE-UT-4)	⊠ 90 [°]	% or great	ter cove	erage obtaine	ed: yes □] no 🛛				Sheet		of
	wed By				Level:		Date:	Authorized		/ 、		Date:	Item 1	No:	
	A.	\mathcal{A}	Bill		II	2	-23-99		Sha k	flein	2	24 99	I B03 1	40.003	

Attachment 1 Page 53 of 60

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DUKE POWER COMPANY ISI LIMITATION REPORT

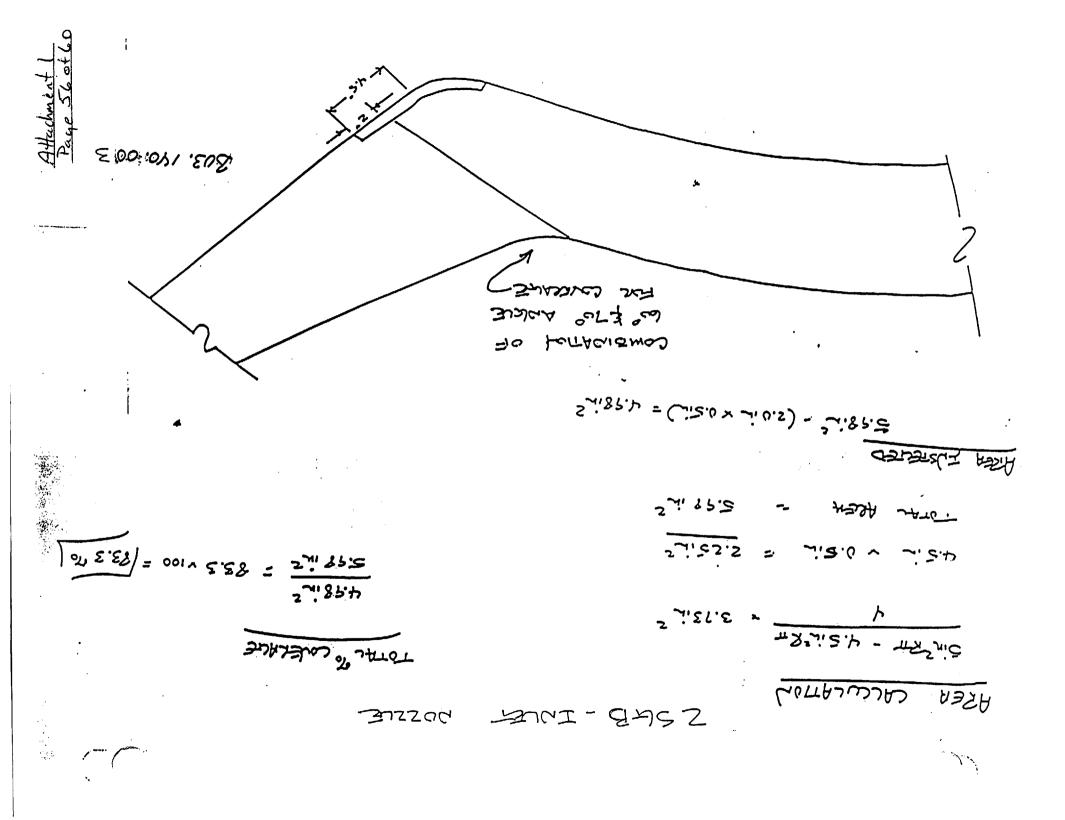
FORM NDE-UT-4

Revision 1

		TION KEFORI		Revision 1
Component/Weld ID: 2SGB-INLET		Item No: B03.140.003	Remarks:	
□ NO SCAN ☑ LIMITED SCAN	SURFACE	BEAM DIRECTION	SUPPORT CORNER OF NOZZLE OD RAD	
FROM L to L	2.5" INCHES	FROM WO <u>N/A</u> to <u>N/A</u>		
□ NO SCAN □ LIMITED SCAN	SURFACE	FROM <u>N/A</u> DEG to <u>N/A</u> DEG BEAM DIRECTION	ELECTRICAL BOX C	N HEAD
		FROM WO <u>C/L + 6"</u> to <u>C/L + 10"</u> FROM <u>176</u> DEG to <u>184</u> DEG		
☑ NO SCAN□ LIMITED SCAN	SURFACE	BEAM DIRECTION	LIMITED ON NOZZLI RADIUS	E C/L OF BLEND
FROM L N/A to L N/A ANGLE: □ 0 □ 45 ⊠ 60 ⊠ Other		FROM WO <u>C/L RADIUS</u> to <u>BEYOND</u> FROM <u>0</u> DEG to <u>360</u> DEG		
NO SCAN LIMITED SCAN	SURFACE			
FROM L to L ANGLE: 0 0 45 0 60 0 Oth		FROM WO to FROM DEG to		
Prepared By: Reviewed By: Suy S. Bull		Date: 3 9 Sketch(s) attached 3-99 Authorized Inspector:	Iyes □no Si Lein	heetof Date: 3 July 90

					•			A H Pac	achment 1 ac 55 of 60
		DUKE	POWER	COMP	ANY	,	-		NDE-91-1
		Limited Exam	nination Co	verage \	Nork	sheet			Revision 0
	- And	 A starte A (A) (A) (A) (A) (A) (A) (A) (A) (A) (Examinat	ion Volu	me/A	Area Defined		A	
🛛 Base M	leta	I 🗆 We	eld	🗆 Nea	ar Sui	rface	🗆 Bolting	3	🛛 Inner Radius
		Area Calcula	tion			Vo	olume Ca	Icula	tion
TOTAL ARE	EA =	5.98 SQ. IN.			5.98	SQ. IN. X 30	IN DIA. TT	r = 56	3.6 IN CU.
			Co	verage (Calcu	lations			
Scan # Ang	gle	Beam Direction	Area Examined (sq.in.)	Leng Exami (in	ined	Volume Examined (cu.in.)	Volu Requ (cu.	ired	Percent Coverage
60/	70	23.5/23°SKEW	4.98	94.2	5	469.37	563	3.6	83.28

	.	p	
		Item No:	B03.140.003
Prepared By:	GHAS	Level: T	Date: 3/17/99
Reviewed By:	Sun S. Bill	Level: III	Date: 3-23-99



			DL	JKE PC	WER (COMI	PAI	NY			Exam Sta	art: 14	450	Form	NDE-UT	-2A
ULT	RASO	NIC E	XAMINA		ATA SHI	EET F	OR	PLANAR	REFLEC	TORS	Exam Fir	nish: 16	635	Revision 4		
Station	1:	I	McGuire		Unit:	2	Cor	nponent/V	Veld ID: 2	SGB-OUT	LET			Date: 3/17/99		
Weld I	ength	(in.):	N/A		Surface Condition: AS MACHINED Lo:				RT "0"	Surface 1	remperat	ure:	97°	<u>F</u>		
Exami	ner: Ja	ay A. Ea	aton (AF	Level	: 11	S	cans:				Pyromete	_		DE 2702	2
Exami	ner: Da	avid Zir	nmerman	Jul C2	Level	: 11				70 🗆	dB	Cal Due:				
	dure:			Rev:	FC:		45	т 🗆	dB 7	ют 🛛	<u>76</u> dB	Configura	A			
	· · · · · · · · · · · · · · · · · · ·				95	-16	60	o □	dB				N/A		N/A	·
Calibration Sheet No:]			т 🛛67						Surface:	OD		
9902035, 9902036										di	В	A Skew An	Applies to gle:			
IND #	4	Max % Ref	Mp Max	W Max	L Max	L1		L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
		4	NOT WI HIS SP/	1		20%d HM/ 50%d 100%	A lac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	D(IN	NOT THIS	WRITI SPACE	ŧ
NRI	60°				:											
NRI	70°															
	<u></u>			4	<u></u>	I		L	L	1	I	I <u></u>	1	<u>t</u>	1	<u></u>]
Rema	rks:									<u>.</u>						
Limita	tions: (see N[DE-UT-4)	⊠ 909	% or grea	ter cov	/era	ge obtaine	d: yes 🗌	l no 🛛				Sheet	(of
Review	wed By				Level:		Date	e: /	Authorized	Inspector			Date:	Item N	10:	of {
	Juy	<i>D</i> .	Bill		T		3-2	3-99		A	flein	~ 3~	NY -99	B03.1	40.004	
	1									-						

Allachment 1 Page 57 of 60

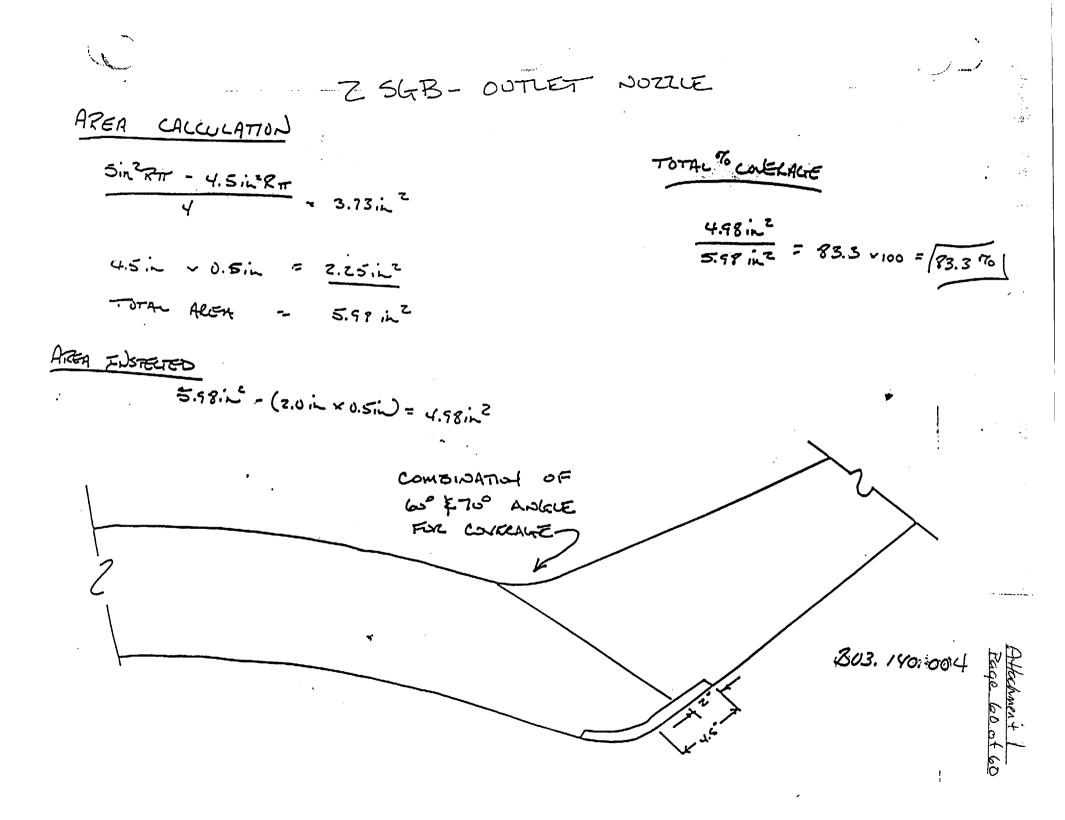
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Component/Weld ID: 2SGB-OUTLET	ISI LIMITA	ER COMPANY TION REPORT		Revision 1				
Component/Weld ID: 2SGB-OUTLET	ISI LIMITATION REPORT							
		Item No: B03.140.004	Remarks:	•				
	SURFACE	BEAM DIRECTION		RNER IS 1.0 FROM C/L				
LIMITED SCAN	⊠ 1 □ 2	🗌 1 🖾 2 🖾 cw 🖾 ccw	OF NOZZLE O	D RADIUS				
FROM L 0+23.5 to L 0+	43.8 INCHES	FROM WON/A toN/A						
ANGLE: 0 0 45 8 60 0 0t	her <u>70°</u>	FROM <u>N/A</u> DEG to <u>N/A</u> DEG						
	SURFACE	BEAM DIRECTION		OZZLE FROM C/L OF				
	🗌 1 🖾 2	🗌 1 🖾 2 🖾 cw 🖾 ccw	BLEND RADIU	S				
FROM L to L!	N/A INCHES	FROM WO C/L RADIUS to BEYOND						
ANGLE: 0 45 60 0 Ot	her <u>70°</u>	FROM 0 DEG to 360 DEG						
	SURFACE	BEAM DIRECTION						
	□ 1 □ 2	🗌 1 🗌 2 🔲 cw 🗋 ccw						
FROM L to L	INCHES	FROM WO to						
ANGLE: 0 0 45 60 0t	her	FROM DEG toDEG						
	SURFACE	BEAM DIRECTION						
	□ 1 □ 2							
FROM L to L	INCHES	FROM WO to						
Prepared By:		Date: 3/17/99 Sketch(s) attached	yes 🗌 no	Sheetof				
Reviewed By: Jun J. Bu		23-99 Authorized Inspector:	Elein	Date: 324 -99				

					•		,	A lla Pae	<u>cchment</u>
		DUKE	POWER	COMP	ANY		, <u>.</u> <u>.</u>		NDE-91-1
		Limited Exam	nination Cov	verage \	Norksl	neet			Revision 0
1994 - DAN 1996 - DAN 1997 - DAN 1996 - DAN 1997 - DAN 1 1997 - DAN 1997 - DAN 1		ACTORIST & BELOWING FOR THE STORE	Examinati	ion Volu	ıme/A r	ea Define	ed		
🗆 Bas	se Meta	il 🗆 We	əld	🗆 Nea	ar Surfa	ace		g	🖾 Inner Radius
	<u>.</u> .	Area Calcula	tion			N	Volume Ca	lcula	tion
TOTAL	AREA =	5.98 SQ. IN.			5.98 S	iQ. IN. X 3	0 IN DIA. T	T = 56	3.6 IN CU.
			Cov	veragé (Calcula	tions			
Scan#	Angle	Beam Direction	Area Examined (sq.in.)	Leng Exam (in	ined	Volume Examined (cu.in.)	•		Percent Coverage
<u> </u>	60/70	23.5/23°SKEW	4.98	94.2	25	469.37	56	3.6	83.28

		···-	Item No:	B03.140.004
Prepared By:	Chilles	Level:	I	Date: 3/17/99
Reviewed By:	Sun & Bibb	Level:	TI	Date: 3-23-99







ATTACHMENT 2. PAGE 1 OF 8

			DI	JKE PC	WER (COMF	PANY			Exam St	art: 1	428	Form	NDE-U	Г-2А
ULTRA	ASO		XAMINA		ATA SHI	EET F	OR PLAN	R REFLE	CTORS	Exam Fi	inish: 1510		Revision 4		ţ
Station:		N	AcGuire		Unit:	2	Component	/Weld ID: 2	SGB-INL	ET-W5SE			Date:	3/17/	99
Weld Ler	ngth ((in.):	121.	.0	Surface	Condit	tion: AS	MACHINE	D Lo	: RT"0"	Surface '	Tempera	ature:	94 °	F
Examine	er: Gu	ıy G. B	ibb	uy S.Ba	/ Level	: 111	Scans:				Pyromete	er S/N:			
Examine	er: Jar	mes L.		no zlan			45 🗆	dB	70 🗆	dB	Cal Due:				
Procedur			//	Rev: 1			45T 🛛 🧯	<u>8.5</u> dB	 70т 🗆	dB	-				
					N	/A	60 🗆	 dB				/A 7 -SUR1	_ ^{Flow} to ∵		
Calibratio	on Sh	eet No	o:				60T 🗆					Scan	Surface:	OD	
9902033, 	99020)34						dB er: <u>*33°</u>	<u>62.5</u> d	B	A Skew An	Applies gle:	to NDE-6	80 only N/A	
IND #	4	Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
	i		NOT WE			20%da HMA 50%da 100%c	HMA Ac 50%dad	HMA 50%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac		OO NOT N THIS	WRIT SPACI	
NRI 3	33°L												-		
NRI 4	45°L														

Remarks: * SCANED AT 62.5 db DUE	TO SIGN	AL TO NOISE R	ATIO			
Limitations: (see NDE-UT-4) 🛛 90%	or greate	r coverage obta	ined: yes 🛛 no 🖾		Sheet of	
Reviewed By:	Level:	Date:	Authorized Inspector:	Date:	Item No:	$=$ $\frac{\kappa}{\omega}$
have Maulder	T	3.23.99	Allin	3-24-99	B05.070.003	64 4/12/2
0				and the second second second		l

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LIMITED SCAN Image: 1 I I I I I I I I I I I I I I I I I I				
INCREPTORY LINUTATION REPORT Revision 1 Component/Weld ID: 2SGB-INLET-W5SE Item No: B05.070.003 Remarks: Component/Weld ID: 2SGB-INLET-W5SE Item No: B05.070.003 Remarks: IDID SCAN SURFACE BEAM DIRECTION DUE TO NOZZLE CONFIGURATION ILIMITED SCAN IDID 1 IDID 0 IDID 0 IDID 0 ANGLE: 0 45 60 Other FROM				
Component/Weld ID: 2SGB-INLET-W	/5SE	Item No: B05.070.003	Remarks:	
	SURFACE	BEAM DIRECTION	DUE TO NOZZ	LE CONFIGURATION
	⊠ 1 □ 2	🖾 1 🗆 2 🔲 cw 🗌 ccw		
FROM L to L1	21.0 INCHES	FROM WO N/A to N/A		
			•	
	□ 1 □ 2			
FROM L to L		FROM WO to		
ANGLE: 0 0 45 60 0th	her			
	□ 1 □ 2	🗆 1 🗌 2 🔲 cw 🗌 ccw		
FROM L to L		FROM WO		
ANGLE: 0 45 60 0tt	her		•	
	SURFACE			
ISI LIMITATION REPORT Revision 1 Component/Weld ID: 2SGB-INLET-WSSE Item No: B05.070.003 Remarks: Image:				
FROM L to L		FROM WO	_	
			 ⊠yes []no	Sheet of
IST LIMITATION REPORT Revision 1 Component/Weld ID: 2SGB-INLET-W5SE Item No: E05.070.003 Remarks: Image: Document/Sectors SURFACE BEAM DIRECTION DUE TO NOZZLE CONFIGURATION Image: Limitation DIF 1 2 0				

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ATTACHMENT 2 PAGE 30F8

AGE	301	8
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		DUK	E POWER (COMPA	NY		NDE-91-1	
		Limited Exa	amination Cov	verage W	/orksheet		Revision 0	I C
	Plui prustis j (Fig. 6, and the second seco	Examinati	on Volur	ne/Area Def	ined		
🖾 Bas	se Metal	⊠ v	Veld	🗆 Neai	r Surface	Bolting	Inner Radius	
		Area Calcu	lation			Volume Cal	culation]
3.2" X 1	.25" = 4 :	SQ. IN.			4 SQ. IN. X 1:	21"(WELD LEN	GTH) = 484 CU. IN.	
							(
	•		Cov	verage Ca	alculations			-
Scan #	Beam Exa		Area Examined (sq.in.)	Lengt Examin (in.)	ed Examin	ied Requi	red Percent Coverage	
1	33	1	4	121	484	484	100.00	
2	45	2	0	121	0	484	4 0.00	
3	45	CW	4	121	484	484	4 100.00	
4	45	CW	4	121	484	484	100.00	
		TOTAL	AGGREGATE	COVERA	GE 145	2 193	6 75.00	

	Item No:	B05.070.003
Prepared By: GUY G. BIBB Juny & Bibb	Level: III	Date: 3/17/99
Reviewed By: Law Maulder	Level: III	Date: 3.23.99
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	DUKE P	OWER	COMP	ANY			Exam St	art: 1	330	Form	NDE-UT	Г-2А
ULTRASONIC	EXAMINATION D	ATA SH	EET FC	R PLANAF		CTORS	Exam Fii	nish: 1	415	R	evision 4	ţ
Station:	McGuire	Unit:	2 0	Component/V	Veld ID: 2	SGB-OUT	LET-W6S	E		Date:	3/17/	99
Weld Length (in.):	121.0	Surface	Conditi	on: AS M	ACHINE	D Lo:	RT"0"	Surface ⁻	Temperat	ture:	94 °	
Examiner: Guy G.	Bibb Suy S. Be	A Level	: 111	Scans:				Pyromete			DE 2702	2
1	L. Panel James & Fo			45 🗆	dB	70 🗆	dB	Cal Due:				
Procedure: NDE	11	1 FC:		45T 🛛 <u>68</u>					/A	Flow _	N/A	۸
Calibration Sheet	No:								Z -SUR1 Scan	Surface:		<u>K</u>
9902033, 9902034					dB <u>*33°</u>	<u>62.5</u> dl	3	A Skew An	Applies to gle:	o NDE-6	80 only N/A	
IND # 🕂 Ma % Re	Max Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
DO IN	NOT WRITE THIS SPACE		20%dad HMA 50%dad 100%da	HMA 50%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	DO			
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Limitations: (see NDE-UT-4) ☑ 90% or greater coverage obtained: yes □ no ☑ No ☑ Sheetof Reviewed By: Level: Date: Authorized Inspector: Date: Item No: Manuffui: TTT 3, 22, 99 Op M0 Date: Date: Date:	Remarks: * SCANED AT 62.5 dt	DUE TO SIGN	AL TO NOISE R	ATIO			
Date, I tem No:	Limitations: (see NDE-UT-4)	90% or greate	r coverage obtai	ined: yes 🗆 no 🖾	······································	Sheet of	
Falls the 3.2200 Parto	- / /		Date:		Date:	Item No:	
/ Ulin 3-24 49 B05.070.004	Lary Man	dii II	3.23-99	Acklein	3-24-49	B05.070.004	1

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ATTACHMENT 2 PAGE 5 OF 8

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FORM NDE-UT-4 DUKE POWER COMPANY **ISI LIMITATION REPORT Revision 1** Component/Weld ID: 2SGB-OUTLET-W6SE Item No: B05.070.004 Remarks: SURFACE BEAM DIRECTION DUE TO NOZZLE CONFIGURATION □ LIMITED SCAN FROM L _____ 0 ____ to L ____121.0 ____ INCHES FROM WO _____N/A ____ to _____N/A ____ ANGLE: 0 0 45 0 60 0ther _____ FROM 0 DEG to 360° DEG SURFACE BEAM DIRECTION □ LIMITED SCAN FROM L ______ to L _____ INCHES FROM WO ______ to _____ to _____ ANGLE: 0 45 60 Other FROM DEG to DEG SURFACE BEAM DIRECTION □ LIMITED SCAN FROM L _____ to L _____ INCHES FROM WO _____ to _____ ANGLE: 0 45 60 Other _____ DEG to ____ DEG to ____ DEG SURFACE BEAM DIRECTION LIMITED SCAN FROM L _____ to L _____ INCHES FROM WO ______ to _____ ANGLE: 0 45 60 Other _____ DEG to ____ Prepared By: GUY G. BIBB Jury & Bill Level: III Date: 3/17/99 Sketch(s) attached 🛛 yes 🗌 no Sheet of Reviewed By: haw Mauldup Date: 3-23-99 Authorized Inspector: Klein Date: 324 4

ATTACHMENT PAGE G OF B

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ATTACHMENT Z PAGE 7 OF 8

			E POWER (amination Cov	•			NDE-91-1 Revision 0
			Examinati	on Volume//	Area Defined		ang na ng
🖾 Bas	se Metal	⊠ v	Veld	Near Su	rface [Bolting	Inner Radius
		Area Calcu	lation	T	Vo	lume Calcula	ation
		Соу					
			Cov	erage Calcu	lations		
Scan #	Angle	Beam Direction	Cov Area Examined (sq.in.)	rerage Calcu Length Examined (in.)	lations Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
Scan #	Angle 33		Area Examined	Length Examined	Volume Examined	Required	Percent Coverage
		Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Required (cu.in.)	
1	33	Direction 1	Area Examined (sq.in.) 4	Length Examined (in.) 121	Volume Examined (cu.in.) 484	Required (cu.in.) 484	100.00
1 2	33 45	Direction 1 2	Area Examined (sq.in.) 4	Length Examined (in.) 121 121	Volume Examined (cu.in.) 484 0	Required (cu.in.) 484 484	100.00 0.00

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			Item No:	B05.070.004
Prepared By: GU	YB. BIBB Suy of Bibb	Level:	111	Date: 3/17/99
Reviewed By:	have Maulder	Level:	7 77 ″	Date: 3.23.99

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Statio	n:		McGuire		Unit:	2	Cor	nponent/V	Veld ID: 2	ASWINJF	-1			Date:	3/4/9		
Weld I	Length	(in.):	14.	5"	Surface	Cond	ition	AS	GROUND	Lo:	NT W	Surface '	Tempera	ture:	74° °	F	1
Exami	ner: G	ary J. N	Moss J	ou MMo	Level a	: 11	S	cans:				Pyromete	er S/N:	MCN			
Exami	ner: Ja	ay A. Ea	aton (THE	Level		4	5 🗆 _56	<u>6*</u> dB	70 🗆	dB	Cal Due:		6/15/99			
Proce	dure:	NDE-6	30	Rev: 2	Presented FC:		45	T 🛛 _ 45	5* dB 7	7от 🗆	dB					فمنقوص فتقصبن كبينا القار	
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990201	15, 9902	2016, 9	902017							dl	D	ہ Skew An		o NDE-6	80 only N/A		
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IND #	¥	Max % Ref	Mp Max	W Max	L Max	L1		L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps	
			NOT WI HIS SP			20%0 HM 50%0 100%	A dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	D IN	Ø NOT I THIS			PA
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Rema	rks: * I		DUCED T	O OBTAI	N 2:18	SIGNA	L TC	NOISE R	ATIO.	L		<u></u>		.I	l	<u>l</u>	
Limitat	tions: (see NI	DE-UT-4)	⊠ 90%	% or grea	ter cov	veraç	je obtaine	d: yes 🗆] no 🛛				Sheet	C	of	
Review	wed By				Level:		Date		Authorized	Inspector	: 、		Date:	Item N			R
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	DUKE POWE	ER COMPANY		FORM NDE-UT-4
	ISI LIMITAT	TION REPORT		Revision 1
Component/Weld ID: 2ASWINJF-1		Item No: C01.010.100	Remarks:	
	SURFACE	BEAM DIRECTION	COUPLING W	VELD
LIMITED SCAN	□ 1 ⊠ 2	🛛 1 🗌 2 🔲 cw 🗌 ccw		
FROM L to L	5" INCHES F	FROM WO C/L + .75 to BEYON	<u>D</u>	
ANGLE: 0 🛛 45 🖾 60 🗋 Other		FROM DEG toI	DEG	
	SURFACE	BEAM DIRECTION	FLANGE TAP	PER
	⊠ 1 □ 2	🗌 1 🖾 2 🔲 cw 🔲 ccw		
FROM L to L		ROM WO toBEYON	<u>D</u>	
ANGLE: □ 0 ⊠ 45 ⊠ 60 □ Other		FROM _ 0 _ DEG to _ 360 _ I	DEG	
	SURFACE	BEAM DIRECTION	······	
	□ 1 □ 2	🗌 1 🗌 2 🔲 cw 🗌 ccw		
FROM L to L	INCHES F	FROM WO to		
ANGLE: 0 45 60 0000000000000000000000000000000				
	SURFACE	BEAM DIRECTION		
	□ 1 □ 2	□ 1 □ 2 □ cw □ ccw		
		FROM WO to		
		FROM DEG to		
Prepared By:		Date: 3/4/29 Sketch(s) attached	I ⊠yes □no	Sheet of
Reviewed By: Rod Shelling		Authorized Inspector:		Date: 2+7_00
I D				

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ATTACHMENT 'S PAGE 3 OF 10

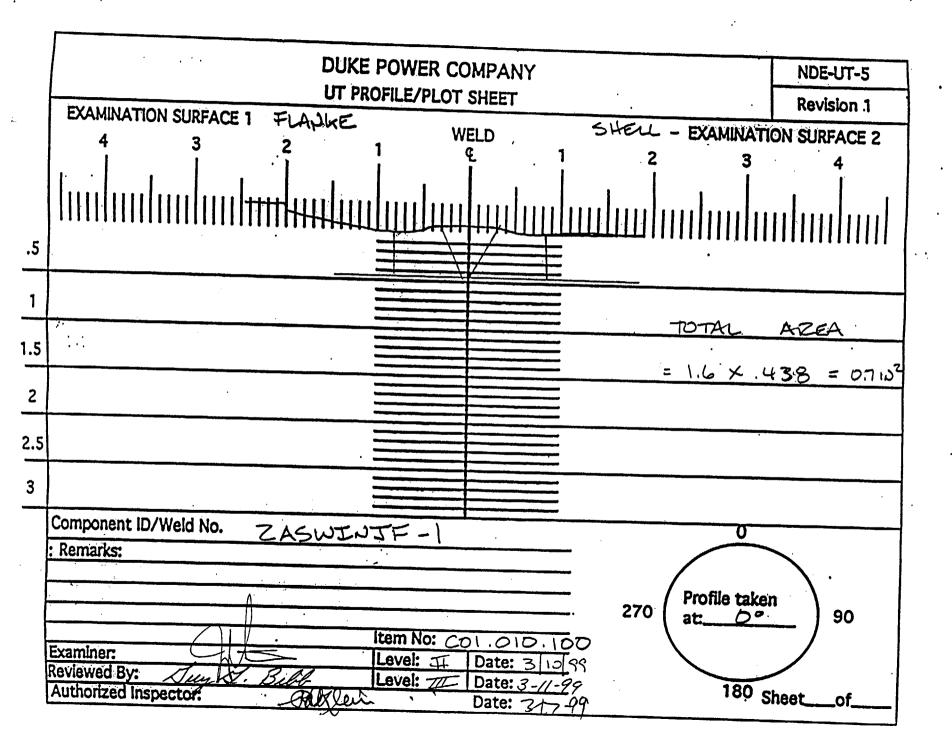
		DUK	E POWER (COMPAN	IY		NDE-91-1				
		Limited Exa	amination Cov	verage Wol	rksheet		Revision 0				
Examination Volume/Area Defined											
🛛 Ba	se Metal	Bolting	Inner Radius								
		Area Calcu	lation		V	olume Cal	culation				
			Cov	erage Calc	culations						
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volun Requi (cu.iu	red Percent Coverage				
1	45°	CW	0.7	14.5	10.15	10.1	5 100.00				
2	45°	CCW	0.7	14.5	10.15	10.1	5 100.00				
3	45°	S1/S2	0.7	11.5	8.05	10.1	5 79.31				
							• ••••				
4	60°	S1/S2	0.7	11.5	8.05	10.1					

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<u> </u>		Item No:	C01.010.100
Prepared By:	Chiles	Level: II	Date: 3/10/99
Reviewed By:	Suy S. Bill	Level: III	Date: 3-11-99
		•	



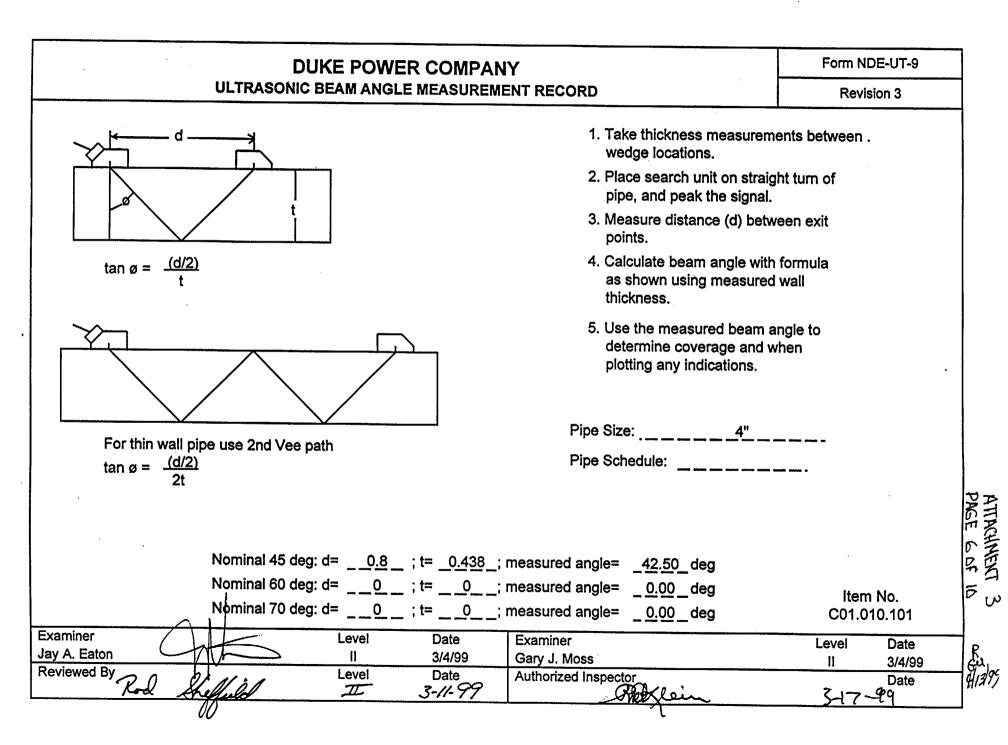
ATTACHMENT 3 PAGE 4 OF 10

		DL	JKE PC	WER (COM	PAN	IY			Exam Sta	art: 1:	321	Form	NDE-UT	-2A
ULTRASC	NIC E	XAMINA		ATA SH	EET F	OR	PLANAF	REFLE	CTORS	Exam Fir	nish: 1	358	R	evision 4	
Station:		McGuire		Unit:	2	Corr	ponent/V	Veld ID: 2	ASWINJF-	-2		r	Date:	3/4/9	9
Weld Length	(in.):	14.5	5"	Surface	Cond	ition:	AS	GROUND	Lo:	NT W	Surface 7		ure: 7	74° °	F
Examiner: 0	Bary J. N	noss J	mAn	Level	: 11	Sc	ans:		I		Pyromete	er S/N:			
Examiner: J	ay A. Ea	aton	HE			45	5 🖾 56	S* dB	70 🗆	dB	Cal Due:		/15/99		
Procedure:	NDE-6	30	Rev: 2			-1			ют 🗆		Configura				
							⊠ <u>_52.</u>		··· —	0		1			
Calibration S	heet N	0:			~~							HELL Scan	to <u>L</u> Surface:	. FLANG	
9902015, 990	2016, 99	902017		99	-02	601	r 🗆					pplies to		-	
a 							Other:		dł	3	Skew An	gle:	l	N/A	
	Max % Ref	Mp Max	W Max	L Max	L1		L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
	1	NOT WI HIS SP/			20%c HM, 50%c 100%	A dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	D(IN	i	WRITI SPACE	
1 45°L	178%	.655	.65	INT	360	0		N/A	N/A	N/A	N/A	2	1	AXIAL	NO
2 60°L	158%	.916	.95	INT	360	0		N/A	N/A	N/A	N/A	2	1	AXIAL	NO
NRI 45°															
Remarks: *	Db REI	DUCED T	O OBTAI	N 2 : 1 S	IGNAL	TO	NOISE R	ATIO					l		L
Limitations:	see NE)E-UT-4)	⊠ 90%	% or grea	ter cov	verag	e obtaine	d: yes 🗆	no 🛛	• • • • •			Sheet	0	of
Reviewed By				Level:		Date:	1.	Authorized	Inspector		• • • • • • • • • • • • • • • • • • • •	Date:	Item N		
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ATTACHMENT 3 PAGE 5 OF 10

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	DUKE POWE	CR COMPANY		FORM NDE-UT-4				
	ISI LIMITATION REPORT							
Component/Weld ID: 2ASWINJF-2		Item No: C01.010.101	Remarks:					
	SURFACE	BEAM DIRECTION	FLANGE TAPE	२				
LIMITED SCAN	⊠ 1 □ 2	🗌 1 🖾 2 🔲 cw 🗌 ccw						
		ROM WO to BEYOND						
ANGLE: 0 9 45 9 60 0 Other		FROM <u>0</u> DEG to <u>360</u> DEG						
	SURFACE	BEAM DIRECTION						
	1 2	🗆 1 🗌 2 🗆 cw 🗍 ccw						
FROM L to L	INCHES FI							
•		FROM DEG to DEG						
	SURFACE	BEAM DIRECTION						
	□ 1 □ 2	□ 1 □ 2 □ cw □ ccw						
		ROM WO to						
ANGLE: 0 0 45 0 60 0 Other								
		BEAM DIRECTION						
	□ 1 □ 2							
FROM L to L		ROM WO to						
ANGLE: 0 0 45 60 0 Other								
		Date: 3/4/99 Sketch(s) attached	_i ≩ yes □ no	Sheet of				
Reviewed By: Rod Shellind			lein	Date: حرب 99				

ATTACHMENT 3 PAGE & OF 10

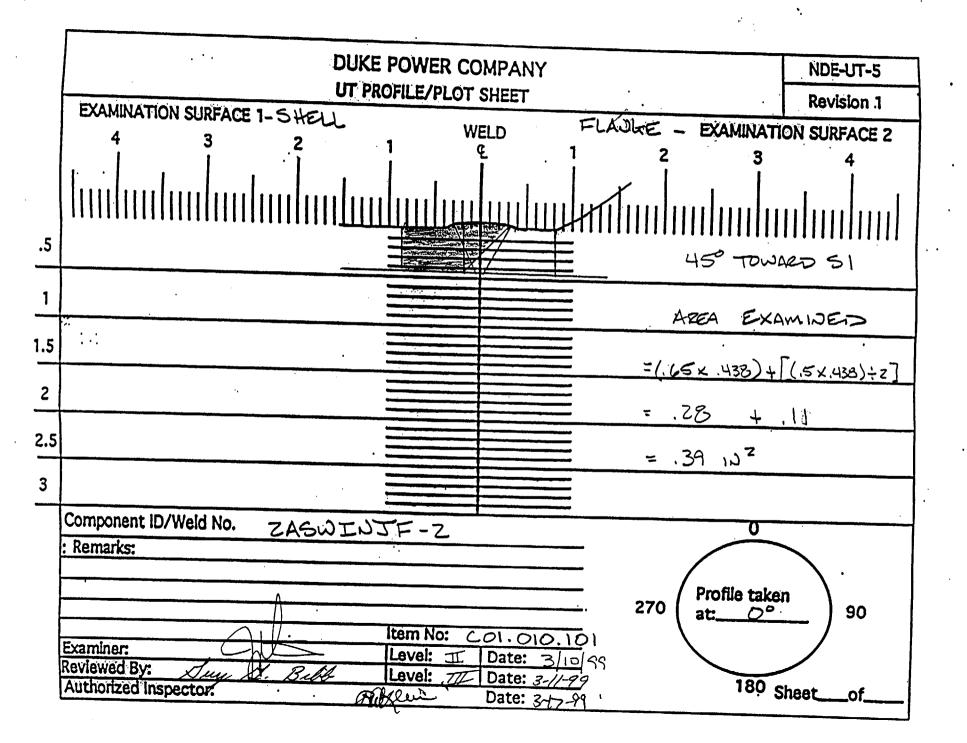
			E POWER C						NDE-91-1		
			ammation Cov	erage v	YOIKS	Sneet			Revision 0		
Examination Volume/Area Defined											
🖾 Bas	se Metal	🛛 Bolting]	Inner Radius							
		Area Calcu	lation			V	olume Ca	Icula	tion		
SEE AT	TACHE) SHEETS			SEE	ATTACHED	SHEETS				
-											
		·	Cov	verage C	alcul	ations					
			Area	Leng	th	Volume	Volu	me			
Scan #	Angle	Beam	Examined	Exami	ned	Examined	Requ	ired	Percent Coverage		
	-	Direction	(sq.in.)	(in.))	(cu.in.)	(cu.	in.)	i cicent obverage		
1	45°	CW	.7	14.5	i	10.15	10.	15	100.00		
2	45°	CCW	.7	14.5	5	10.15	10.	15	100.00		
3	45°	S1	.39	14.5	5	5.7	10.	15	56.16		
4	45°	S2	.6	14.5	i	8.7	10.	15	85.71		
5	60°	S1	.36	14.5	i	5.22	10.	15	51.43		
6	60°	S2	.62	14.5		8.99	10.	15	88.57		
		TOTAL	AGGREGATE	COVER	AGE	48.91	60	.9	80.31		

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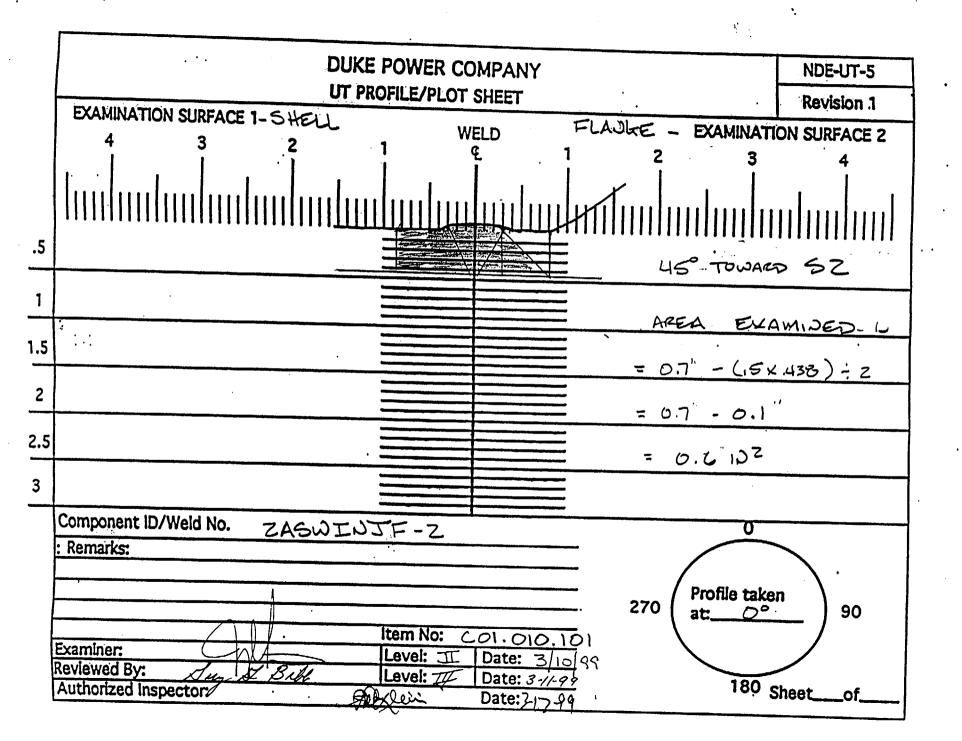
j

			Item No:	C01.010.101
Prepared By:	CHAS	Level:	I	Date: 3/10/99
Reviewed By:	Sun J. Bible	Level:	T	Date: 3-//-99
			<u></u>	

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ATTACHMENT 3 PAGE 9 OF 10



ATTACH MENT 3 PAGE 10 OF 10

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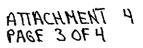
			DI		WER	COM	PAI	NY			Exam St	art: 0	810	Form	NDE-UT]
ULT	RASC	NIC E	XAMINA	TION D	ATA SH	EET F	OR	PLANAF		CTORS	Exam Fir	nish: 0	829	R	evision 4		
Station	n:		McGuire	Λ	Unit:	2	Con	nponent/V	Veld ID: 2	ACSHX-SI	H-48			Date:	3/12/9	99	
Weld I	ength	(in.):	175	5"	Surface	Cond	ition:	AS	GROUND	Lo:	0°	Surface 7	Tempera	ture:	74_ °	F	1
	ner: Ja			, the			s	cans:				Pyromete Cal Due:	-	<u>MCNI</u> 5/15/99	DE 2700	8	
			Houser	Larle Hou	2 Level	: 11	4	5 🖾3	<u>3</u> dB	70 🗆	dB	Configura			TUBESH	IFET	-
Proce	dure:	NDE-6	30	Ŕev: 2	? FC:		45	т 🛛3	<u>3</u> dB 7	ют 🗆 _	dB	-	1	Flow _		**	
Calibra		haat N			_) 🗆					SHEET	to Surface:	SHELL	_	
990202			0.		99	-02	60	т 🗆				A	pplies t	o NDE-6	80 only	• • •	-
	·····							Other:		dl	B	Skew An	gle:		N/A		
IND #	4	Max % Ref	Mp Max	W Max	L Max	L1		L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps	-
			NOT WI HIS SP	-		20%d HM/ 50%d 100%	A lac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	D(IN	T	WRITI SPACE		ATTACHMENT PAGE 1 OF 4
1	45°	100	1.1	0.4	163.0"	360)°	INT	N/A	N/A	N/A	N/A	2	1	AXIAL	NO	- AF
			<u> </u>												<u> </u>	L	
Rema	rks:															····	
			DE-UT-4)	⊠ 90%			_		d: yes 🗆	l no 🛛				Sheet	0	of	
Review	, '		011	,	Level:		Date		Authorized	·			Date:	Item N		· · · · · ·	- R (13)99
	un.	A.	Bill		TI	<u>.</u>	-16-	99		-open	lei	3-21	5-49	C01.0	30.010		J 4113177

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	DUKE POWER COMPANY								
	ISI LIMITATION	REPORT		Revision 1					
Component/Weld ID: 2ACSHX-SH-48	11	tem No: C01.030.010	Remarks:						
	SURFACE	BEAM DIRECTION	THESE AREAS WERE NOT						
	🖾 1 🖾 2	🖾 1 🖾 2 🖾 cw 🖾 ccw	ACCESSABLE	TO PREP THE WELD.					
FROM L to L to L to L	0" INCHES FROM	A WO <u>S1 + 1.5</u> to <u>S2 + .5</u>							
ANGLE: 🛛 0 🖾 45 🗌 60 🔲 Other	······	FROM DEG toDEG							
🛛 NO SCAN	SURFACE	BEAM DIRECTION		EXAMINED IN AREAS					
	⊠ 1 ⊠ 2	🖾 1 🖾 2 🖾 cw 🖾 ccw	THAT WERE SO	JANNED					
FROM L to L to L65	5.5" INCHES FROM	1 WO <u>S1 + 1.5</u> to <u>S2 + .5</u>							
ANGLE: 🛛 0 🖾 45 🗌 60 🔲 Other	r	FROM DEG toDEG							
	SURFACE	BEAM DIRECTION	TOTAL COVER	AGE = 24%					
	⊠ 1 ⊠ 2	🖾 1 🖾 2 🖾 cw 🖾 ccw							
FROM L _ 0 + 77.5" to L _ 0 + 95	5.5" INCHES FROM	1 WO <u>S1 + 1.5</u> to <u>S2 + .5</u>							
ANGLE: 🛛 0 🖾 45 🗌 60 🔲 Other	r	FROM DEG toDEG							
	SURFACE	BEAM DIRECTION							
	⊠ 1 ⊠ 2	🖾 1 🖾 2 🖾 cw 🖾 ccw							
FROM L <u>0 + 105.5</u> " to L <u>0 + 15</u>	55" INCHES FROM	NWO <u>S1 + 1.5</u> to <u>S2 + .5</u>							
ANGLE: 🛛 0 🖾 45 🗆 60 🗌 Other	r	FROM DEG to							
Prepared By: JAY A. EATON	1 .	ate: 3/12/99 Sketch(s) attached	yes 🗌 no	Sheetof					
Reviewed By: Juny J. Bill	Date: 3-/6-99	Authorized Inspector:	in	Date: 3~20-91					

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	DUKE POWER COMPANY									
	Limited Examination Coverage Worksheet									
	and the first of a low	Examina	ation Volu	.me/A	rea Define	ed	i di si ka	and other states of states for the		
🖾 Base Meta	al 🛛	Weld	🗆 Ne	ar Sur	face	Bolting	I	Inner Radius		
	Area Cal	culation			\	Volume Cal	lculat	ion		
SEE ATTACHE = 1.4 Sq II					nde-ut-4. Sth inspe		OF 17	'5" TOTAL WELD		
		С	overage	Calcul	ations					
Scan # Angle	Beam Directior	Area Examineo (sq.in.)	Lenı i Exam (in	ined	Volume Examined (cu.in.)	Volui Requi (cu.i	ired	Percent Coverage		
1-4 45	ALL	1.4	42	2	58.8	24	5	24.00		

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	Item No:	C01.030.010
Prepared By: JAY A. EATON	Level: II	Date: 3/12/99
Reviewed By: Suy S. Bibb	Level: III	Date: 3-16-99

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