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A Duke Energy Company

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January 15, 1998

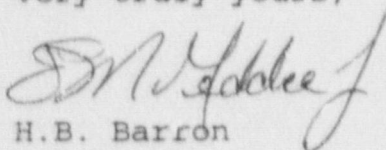
U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Subject: Duke Energy Corporation
McGuire Nuclear Station, Unit 1
Docket No. 50-369
Request for Relief, 97-004

Duke has determined that it is impractical to comply with the examination requirements of ASME Section XI for McGuire Nuclear Station Unit 1. Pursuant to 10CFR50.55a(g)(5)(iii), please find enclosed information to support this determination and a request for relief from the applicable ASME Section XI requirement(s).

Should you have any questions regarding this issue, please contact Michael Cash at (704) 875-4117.

Very truly yours,

For

H.B. Barron

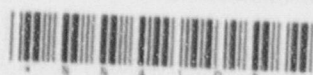
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Enclosures

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File: Relief Request 97-004

Duke Energy Corporation

Station McGuire Unit 1

FIRST 10-YEAR INTERVAL REQUEST FOR RELIEF NO. 97-004

Pursuant to 10CFR50.55a (g) (5) (iii), Duke Energy Corporation has determined that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Conformance with examination requirements of ASME Section XI is not practical for McGuire Nuclear Station Unit 1. Information is therefore being submitted in support of this determination and a request is being sought for relief from the applicable ASME Section XI requirement(s).

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

Reactor Vessel

<u>Weld Numbers</u>	<u>Item Numbers</u>	<u>Description</u>
1RFV10-442	B01.011.003	Lower Shell to Bottom Head
1RPV1-442A	B01.012.001	Upper Shell Long Seam @ 60 degrees
1RPV1-442B	B01.012.002	Upper Shell Long Seam 180 @ degrees
1RPV1-442C	B01.012.003	Upper Shell Long Seam @ 300 degrees
1RPV3-442A	B01.012.007	Lower Shell Long Seam @ 60 degrees
1RPV3-442B	B01.012.008	Lower Shell Long Seam @ 180 degrees
1RPV3-442C	B01.012.009	Lower Shell Long Seam @ 300 degrees
1RPV4-469	B01.021.002	Bottom Head
1RPV7-442	B01.030.002	Nozzle Belt to Flange
1RPV5-445A	B03.090.001	Inlet Nozzle to Shell @ 67 degrees

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

Reactor Vessel

<u>Weld Numbers</u>	<u>Item Numbers</u>	<u>Description</u>
1RPV5-445A	B03.090.001A	Inlet Nozzle to Shell @ 67 degrees
1RPV5-445B	B03.090.002	Inlet Nozzle to Shell @ 113 degrees
1RPV5-445B	B03.090.002A	Inlet Nozzle to Shell @ 113 degrees
1RPV5-445C	B03.090.003	Inlet Nozzle to Shell @ 247 degrees
1RPV5-445C	B03.090.003A	Inlet Nozzle to Shell @ 247 degrees
1RPV5-445D	B03.090.004	Inlet Nozzle to Shell @ 293 degrees
1RPV5-445D	B03.090.004A	Inlet Nozzle to Shell @ 293 degrees
1RPV5-445E	B03.090.005	Outlet Nozzle to Shell @ 22 degrees
1RPV5-445E	B03.090.005A	Outlet Nozzle to Shell @ 22 degrees
1RPV5-445F	B03.090.006	Outlet Nozzle to Shell @ 158 degrees
1RPV5-445F	B03.090.006A	Outlet Nozzle to Shell @ 158 degrees
1RPV5-445G	B03.090.007	Outlet Nozzle to Shell @ 202 degrees
1RPV5-445G	B03.090.007A	Outlet Nozzle to Shell @ 202 degrees
1RPV5-445H	B03.090.008	Outlet Nozzle to Shell @ 338 degrees
1RPV5-445H	B03.090.008A	Outlet Nozzle to Shell @ 338 degrees
1RPV5-445AR	B03.100.001	Inlet Nozzle to Shell @ 67 degrees
1RPV5-445BR	B03.100.002	Inlet Nozzle to Shell @ 113 degrees

<u>Weld Numbers</u>	<u>Item Numbers</u>	<u>Description</u>
1RPV5-445CR	303.100.003	Inlet Nozzle to Shell @ 247 degrees
1RPV5-445DR	B03.100.004	Inlet Nozzle to Shell @ 293 degrees
1RPV5-445ER	B03.100.005	Outlet Nozzle to Shell @ 22 degrees
1RPV5-445FR	B03.100.006	Outlet Nozzle to Shell @ 158 degrees
1RPV5-445GR	B03.100.007	Outlet Nozzle to Shell @ 202 degrees
1RPV5-445HR	B03.100.008	Outlet Nozzle to Shell @ 338 degrees

II. Code Requirement:

"Examination Category B-A, Pressure Retaining Welds in Reactor Vessel per Table IWB-2500-1, Figure Nos. IWB-2500-1, IWB-2500-2, IWB-2500-3 and IWB-2500-4"

Note (2) adds the words "Includes essentially 100% of the weld length."

"Examination Category B-D, Full Penetration Welds of Nozzles in Vessels Inspection Program B" per Table IWB-2500-1, Figure No. IWB-2500-7

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 outlined in Code Case N-460, which is utilized by Duke Energy is not possible.

ASME Section V, Article 4, T441.4.4 Scanning Requirements, 1980 Edition through winter 1980 Addenda as (modified by Code Case N-460) 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 both 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.

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.

IV. Basis for Relief:

During the ultrasonic examination of the Reactor Vessel welds during Refueling Outage 7, the minimum coverage requirement of ASME Section XI, 1980 Edition through Winter 1980 Addenda, clarified by Code Case N-460, could not be met. Due in part to geometry and actual physical barriers this coverage was unattainable. A combination of multiple beam angles was used to obtain the maximum coverage possible. The attached examination reports document the actual amount of examination coverage obtained. Drawings showing details of the affected welds including calculation methods are included as Attachment 2.

Request for Relief 97-004, Part 1 Examination Category B-A, Pressure Retaining Welds in Reactor Vessel.

The Reactor Vessel Lower Shell to Bottom Head Weld (IRPV10-442) (Item Number B01.011.003) was limited to 59.00% aggregate coverage of the required weld volume. The principal limitation for this weld is the presence of six core guide lugs, which limit scanning in the axial and circumferential directions.

The Reactor Vessel Upper Shell Long Seam Weld (IRPV1-442A) (Item Number B01.012.001) was limited to 90.00% aggregate coverage of the required weld volume. The principal limitation for this weld is due to nozzle location which splits the weld into two sections.

The Reactor Vessel Upper Shell Long Seam Weld (IRPV1-442B) (Item Number B01.012.002) was limited to 31.00% aggregate coverage of the required weld volume. The principal limitation for this weld is due to nozzle location on both sides of the weld.

The Reactor Vessel Upper Shell Long Seam Weld (IRPV1-442C) (Item Number B01.012.003) was limited to 90.00% aggregate coverage of the required weld volume. The principal limitation for this weld is due to nozzle location, which splits the weld into two sections.

The Reactor Vessel Lower Shell Long Seam Welds at 60, 180 and 300 degrees (IRPV3-442A, IRPV3-442B, IRPV3-442C) (Item Numbers B01.012.007, B01.012.008 and B01.012.009) were limited to 84.00% aggregate coverage of the required weld volume. The principal limitations for these welds were the presence of the core guide lugs located at the bottom end of the welds.

The Reactor Vessel Bottom Head Weld (IRPV4-469) (Item Number B01.021.002) was limited to 29.00% aggregate coverage of the required weld volume. The principal limitation for this weld is the presence of the incore nozzles.

The Reactor Vessel Nozzle Belt to Flange Weld (IRPV7-442) (Item Number B01.030.002) was limited to 82.00% aggregate coverage of the required weld volume. The principal limitation for this weld is the presence of keyway and specimen tube cutouts and the flange configuration itself.

Request for Relief 97-004 Part 2, Examination Category B-D, Full Penetration Welds of Nozzles in Vessels, Inspection Program B

The Reactor Vessel Inlet Nozzle to Shell Welds at 67, 113, 247 and 293 degrees. (IRPV5-445A, IRPV5-445B, IRPV5-445C and IRPV5-445D) (Item Numbers B03.090.001, B03.090.001A; B03.090.002, B03.090.002A; B03.090.003, B03.090.003A; and B03.090.004, B03.090.004A) were limited to 85.00% aggregate coverage of the required weld volume. The four Inlet Nozzle to Shell Welds were limited due to the reactor vessel nozzle configuration.

The Reactor Vessel Outlet Nozzle to Shell Welds at 22, 158, 202 and 338 degrees (IRPV5-445E, IRPV5-445F, IRPV5-445G and IRPV5-445H) (Item Numbers B03.090.005, B03.090.005A; B03.090.006, B03.090.006A; B03.090.007, B03.090.007A; and B03.090.008, B03.090.008A) were limited to 43.00% aggregate coverage of the required weld volume. The four Outlet Nozzle to Shell Welds were limited due to the reactor vessel nozzle configuration.

The examinations of the inner radius of the Reactor Vessel Inlet Nozzles at 67, 113, 247 and 293 degrees (1RPV5-445AR, 1RPV5-445BR, 1RPV5-445CR and 1RPV5-445DR) Item Number B03.100.001, B03.100.002, B03.100.003 and B03.100.004 were limited to 58.00% aggregate coverage of the required volume. The four Inlet Nozzle Inner Radius Sections are limited due to the reactor vessel nozzle configuration.

The examinations of the inner radius of the Reactor Vessel Outlet Nozzles at 22, 158, 202 and 338 degrees (1RPV5-445ER, 1RPV5-445FR, 1RPV5-445GR and 1RPV5-445HR) (Item Number B03.100.005, B03.100.006, B03.100.007 and B03.100.008) were limited to 74.00% aggregate coverage of the required volume. The four Outlet Nozzle Inner Radius Sections are limited due to the reactor vessel nozzle configuration.

V. Alternate Examination or Testing:

In addition to the volumetric examination that has been performed on the McGuire reactor vessel, Duke Energy has performed a visual examination of the internals and the inside of the reactor vessel as required by ASME Section XI, Table IWB-2500-1. This visual examination did not identify any rejectable conditions per ASME Section XI acceptance standards.

The use of radiography as an alternate volumetric examination method is not feasible due to component thickness and restrictions from physical barriers which prohibit access for the placement of source, image quality indicators, film, etc. In addition, the background radiation levels would not allow for a radiographic examination that would render meaningful results.

Performing the ultrasonic examination from the outside of the reactor vessel is not a viable option. The design of McGuire's reactor building prohibits access for the equipment and personnel from outside the vessel.

Duke Energy Corporation will continue to perform ultrasonic examinations of all reactor vessel welds to the maximum extent practical in accordance with the requirements of ASME Section V, Article 4, 1989 Edition and Regulatory Guide 1.150, Revision 1, Appendix A. Code Case N-460 will be utilized in all cases where less than 100% but greater than 90% weld coverage is obtained. In cases where weld coverage of 90% or less is obtained, a request for relief from ASME Section XI Code requirements will be submitted per the requirements of 10CFR50.55a.

Duke Energy Corporation proposes in lieu of the greater than 90% coverage requirement of Code Case N-460 that the examination coverage obtained on the welds listed in Attachment 1 be considered to provide an acceptable level of quality and safety.

No additional examinations will be performed.

VI. **Justification for the Granting of Relief Part 1:**

The Reactor Vessel Lower Shell to Bottom Head, Upper Shell Long Seam, Lower Shell Long Seams at 60, 180 and 300 degrees, and the Bottom Head Welds were examined to the maximum extent practical using ultrasonic techniques in accordance with the requirements of Section V, Article 4 of the 1980 Edition thru Winter 1980 Addenda of the ASME Boiler and Pressure Vessel Code.

Duke Energy Corporation will continue to ultrasonically examine the welds, including inside radius sections, to the extent practical within the limits of original design and construction. This will provide reasonable assurance of weld/component integrity. Thus, an acceptable level of quality and safety will have been achieved and public health and safety will not be endangered by allowing relief from the aforementioned Code requirements.

The Reactor Vessel Lower Shell to Bottom Head Weld (2,1-V10-442) (Item Number B01.011.003): The principal limitation for this weld is the presence of six core guide lugs welded to the vessel ID just above the weld on the lower shell section. These lugs are approximately 19 inches tall, 27 inches wide and extend 8 inches radially toward the center of the vessel, each positioned every 60 degrees around the vessel circumference. These dimensions include the attachment weld radius which physically limits the contact transducer head travel. The weld was scanned in two directions, perpendicular (axial) and parallel (circumferential) to the weld between the six guide lugs. Some physical limitations also exist due to the surface profile where the hemispherical head and lower shell cylinder meet. Therefore, the 100% volumetric examination is impractical for this weld. The imposition of this requirement would create a considerable burden on Duke Energy Corporation. During the examination of this weld, the Utilized Wall Transducer Head process was used to obtain the maximum possible coverage.

The Reactor Vessel Upper Shell Long Seam Welds (1RPV1-442A, 1RPV1-442B, 1RPV1-442C) (Item Number B01.012.001, B01.012.002, B01.012.003): The long seam welds join sections of the upper reactor shell (nozzle belt) to each other. The principal limitation for these welds is the present nozzle geometry. Due to the nozzle geometry, 100% volumetric examination is impractical for these welds. The imposition of this requirement would create a considerable burden on Duke Energy Corporation. During the examination of these welds, the Utilized Wall Transducer Head process was used to obtain the maximum possible coverage. Reference drawing 1213926D for scan coverage.

The Reactor Vessel Lower Shell Long Seam Welds at 60, 180 and 300 degrees (1RPV3-442A, 1RPV3-442B, 1RPV3-442C) (Item Numbers B01.012.007, B01.012.008 and B01.012.009): These longitudinal seam welds join the lower circumferential shell sections in the core region of the reactor vessel. The principal limitations for these welds were the presence of the core guide lugs welded to the vessel ID above the weld (weld 10-442) on the lower shell section. These lugs are approximately 19 inches tall, 27 inches wide, and extend 8 inches radially toward the center of the vessel, and are positioned every 60 degrees around the vessel circumference. These dimensions include the attachment weld radius. These guide lugs interfere with the axial and circumferential scans.

These welds were scanned in two directions, perpendicular (axial) and parallel (circumferential) to the weld. Scan coverage from the perpendicular (axial) and parallel (circumferential) scans in the vicinity of the six guide lugs is limited due to interference with the contact transducer head. Therefore, the 100% volumetric examination is impractical for these welds. The imposition of this requirement would create a considerable burden on Duke Energy Corporation. During the examination of these welds the Utilized Wall Transducer Head process was used to obtain the maximum possible coverage.

The Reactor Vessel Bottom Head Weld (1RPV4-469) (Item Number B01.021.002): This circumferential weld joins the reactor vessel transition ring (lower head) to bottom head. The principal limitation for this weld is the presence of the incore nozzles. Therefore, the 100% volumetric examination is impractical for this weld. The imposition of this requirement would create a considerable burden on Duke Energy Corporation. During the examination of this weld, the Utilized Wall Transducer Head process was utilized to obtain the maximum possible coverage. Reference drawing 12139276D for scan coverage.

The Reactor Vessel Nozzle Belt to Flange Weld (IRPV7-442) (Item Number B01.030.002): This weld joins the reactor vessel flange to the upper shell (nozzle belt). The principal limitation for this weld is the presence of keyway and specimen tube cutouts and the flange configuration itself. Therefore, the 100% volumetric examination is impractical for this weld. The imposition of this requirement would create a considerable burden on Duke Energy Corporation. During the examination of this weld, the Utilized Wall Transducer Head process was used to obtain the maximum possible coverage. Reference drawing 1213923D for scan coverage.

Pursuant to 10 CFR 50.55a(g)(6)(i), granting this relief for the Reactor Vessel Lower Shell to Bottom Head, Upper Shell Long Seam, Lower Shell Long Seams at 60, 180 and 300 degrees, and the Bottom Head welds 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.

Justification for the Granting of Relief Part 2:

The four Reactor Vessel Inlet Nozzle to Shell Welds and the Inner Radius Exams at 67, 113, 247 and 293 degrees, the four Reactor Vessel Outlet Nozzle to Shell Welds and the Inner Radius Exams at 22, 158, 202 and 338 degrees were examined to the maximum extent practical using ultrasonic techniques in accordance with the requirements of Section V, Article 4 of the 1980 Edition thru Winter 1980 Addenda of the ASME Boiler and Pressure Vessel Code.

The Reactor Vessel Inlet Nozzle to Shell Welds at 67, 113, 247 and 293 degrees (IRPV5-445A, IRPV5-445B, IRPV5-445C and IRPV5-445D) (Item Numbers B03.090.001, B03.090.001A; B03.090.002, B03.090.002A; B03.090.003, B03.090.003A; and B03.090.004, B03.090.004A): The four Inlet Nozzle to Shell Welds were limited due to the reactor vessel nozzle configuration. Therefore, the 100% volumetric examination is impractical for this weld. The imposition of this requirement would create a considerable burden on Duke Energy Corporation. During the examination of this weld, techniques were utilized to obtain the maximum possible coverage. Reference drawing 1213931D for scan coverage.

The Reactor Vessel Outlet Nozzle to Shell Welds at 22, 158, 202 and 338 degrees (1RPV5-445E, 1RPV5-445F, 1RPV5-445G and 1RPV5-445H) (Item Numbers B03.090.005, B03.090.005A; B03.090.006, B03.090.006A; B03.090.007, B03.090.007A; and B03.090.008, B03.090.008A): The four Outlet Nozzle to Shell Welds were limited due to the reactor vessel nozzle configuration. Therefore, the 100% volumetric examination is impractical for this weld. The imposition of this requirement would create a considerable burden on Duke Energy Corporation. During the examination of these welds, techniques were utilized to obtain the maximum possible coverage. Reference drawing 1213930D for scan coverage.

The Reactor Vessel Inlet Nozzle Inner Radius Exam (1RPV5-445AR, 1RPV5-445BR, 1RPV5-445CR and 1RPV5-445DR) (Item Number B03.100.001, B03.100.002, B03.100.003 and B03.100.004): The four Inlet Nozzle Inner Radius Sections are limited due to the reactor vessel nozzle configuration. Therefore, the 100% volumetric examination is impractical for this weld. The imposition of this requirement would create a considerable burden on Duke Energy Corporation. During the examination of these welds, techniques were done to utilized to obtain the maximum possible coverage. Reference drawing 1213931D for scan coverage.

The Reactor Vessel Outlet Nozzle Inner Radius Exams (1RPV5-445ER, 1RPV5-445FR, 1RPV5-445GR and 1RPV5-445HR) (Item Number B03.100.005, B03.100.006, B03.100.007 and B03.100.008): The four Outlet Nozzle Inner Radius Sections are limited due to the reactor vessel nozzle configuration. Therefore, the 100% volumetric examination is impractical for this weld. The imposition of this requirement would create a considerable burden on Duke Energy Corporation. During the examination of these welds, techniques were utilized to obtain the maximum possible coverage. Reference drawing 1213930D for scan coverage.

Pursuant to 10 CFR 50.55a(g)(6)(i), granting this relief for the four Reactor Vessel Inlet Nozzle to Shell Welds and the Inner Radius Exams at 67, 113, 247 and 293 degrees, the four Reactor Vessel Outlet Nozzle to Shell Welds and the Inner Radius Exams at 22, 158, 202 and 338 degrees 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.

Weld Examination Summary

The reactor vessel welds were examined from the vessel inside surface using automated ultrasonic examination equipment. The examinations were done with various contact head arrangements to optimize the maximum examination coverage. This allowed each transducer to scan as close as possible to any obstruction around the area examined. Although the greater than 90% coverage requirements of the Code Case N-460 could not be met, the examinations were performed with modified equipment and tooling designed to obtain the maximum coverage possible.

As a result of inspections performed, the greater than 90% requirement has been determined to create a hardship for McGuire Nuclear Station. The reactor vessel welds were examined to the maximum extent practical to the requirements of Section V, Article 4 of the 1980 Edition through the Winter 1980 Addenda of the ASME Boiler and Pressure Vessel Code and the additional requirements of Regulatory Guide 1.150. To meet the examination coverage requirements, design modifications would be necessary to gain access to the welds in order to obtain complete coverage. The design modifications are impractical due to the vast scope of work that would be required. Imposition of this requirement would cause a considerable burden on Duke Energy with no commensurate safety benefit realized.

VII. Implementation Schedule:

These examinations will continue to be scheduled in accordance with the requirements of ASME Section XI for future inspection intervals at McGuire Nuclear Station Unit 1, utilizing the examination techniques in use by Duke Energy Corporation at that time.

Attachments:

1. Detailed listing of welds with limited ultrasonic coverage.
2. Drawings of affected weld details including calculation methods.
3. History of limited ultrasonic examinations of reactor vessel welds.

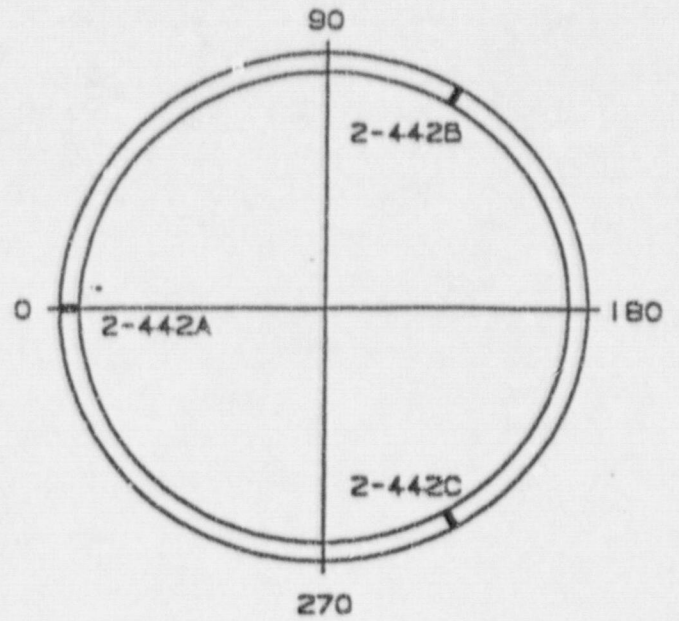
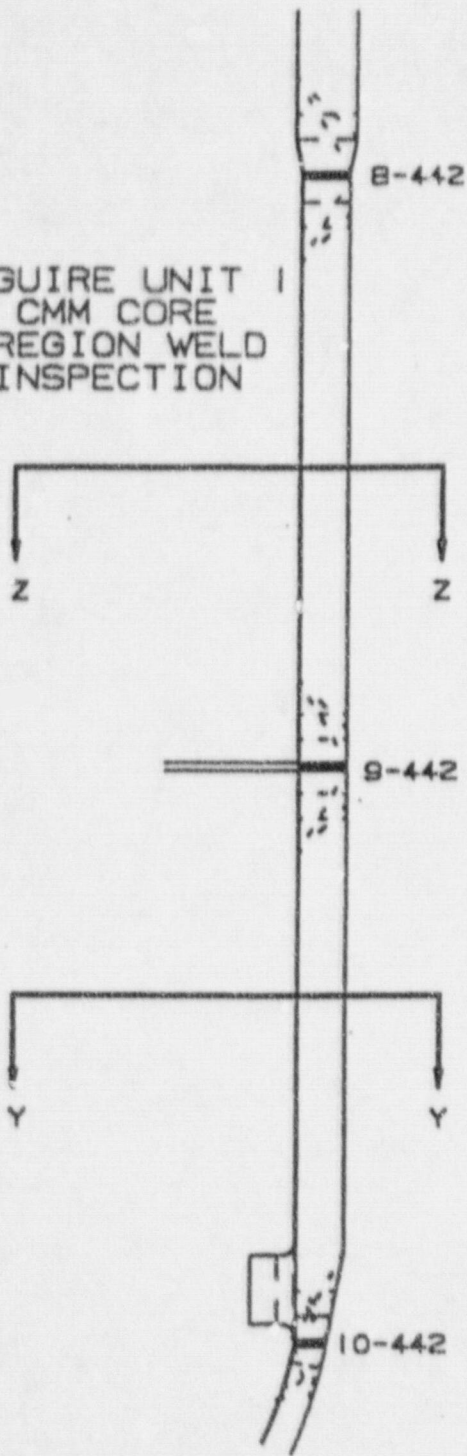
Evaluated By: Gary J. Underwood Date 12/2/97
Technical Review By: James J. McAdams Date 12/3/97
Reviewed By: Gary D. Scarborough Date 12/8/97
Approved By: Jo Barbour Date 12/8/97

Item No.	Exam Category/ Figure No.	System Or Component	Function	Area To Be Examined	Reason For Request	Weld ID No.	Licensee Proposed Alternate Examination
B01.011.003	B-A IWB-2500-1	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Lower Shell to Bottom Head Weld	Limited scan due to geometric configuration. Actual coverage obtained = 59.00%	1RPV10-442	None
B01.012.001	B-A IWB-2500-2	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Upper Shell to Long Seam Weld 60 Degrees	Limited scan due to geometric configuration. Actual coverage obtained = 90.00%	1RPV1-442A	None
B01.012.002	B-A IWB-2500-2	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Upper Shell to Long Seam Weld 180 Degrees	Limited scan due to geometric configuration. Actual coverage obtained = 31.00%	1RPV1-442B	None
B01.012.003	B-A IWB-2500-2	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Upper Shell to Long Seam Weld 300 Degrees	Limited scan due to geometric configuration. Actual coverage obtained = 90.00%	1RPV1-442C	None
B01.012.007	B-A IWB-2500-2	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Lower Shell to Long Seam Weld 60 Deg	Limited scan due to geometric configuration. Actual coverage obtained = 84.00%	1RPV3-442A	None
B01.012.008	B-A IWB-2500-2	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Lower Shell to Long Seam Weld 180 Deg	Limited scan due to geometric configuration. Actual coverage obtained = 84.00%	1RPV3-442B	None
B01.012.009	B-A IWB-2500-2	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Lower Shell to Long Seam Weld 300 Deg	Limited scan due to geometric configuration. Actual coverage obtained = 84.00%	1RPV3-442C	None
B01.021.002	B-A IWB-2500-3	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Bottom Head	Limited scan due to geometric configuration. Actual coverage obtained = 29.00%	1RPV4-469	None
B01.030.002	B-A IWB-2500-4	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Nozzle Belt to Flange	Limited scan due to geometric configuration. Actual coverage obtained = 82.00%	1RPV7-442	None
B03.090.001	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Inlet Nozzle to Shell 67 Deg. UT from Vessel ID	Limited scan due to geometric configuration. Actual coverage obtained = 85.00%	1RPV5-445A	None
B03.090.001A	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Inlet Nozzle to Shell 67 Deg. UT from Nozzle ID	Limited scan due to geometric configuration. Actual coverage obtained = 85.00%	1RPV5-445A	None
B03.090.002	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Inlet Nozzle to Shell 113 Deg. UT from Vessel ID	Limited scan due to geometric configuration. Actual coverage obtained = 85.00%	1RPV5-445B	None
B03.090.002A	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Inlet Nozzle to Shell 113 Deg. UT from Nozzle ID	Limited scan due to geometric configuration. Actual coverage obtained = 85.00%	1RPV5-445B	None

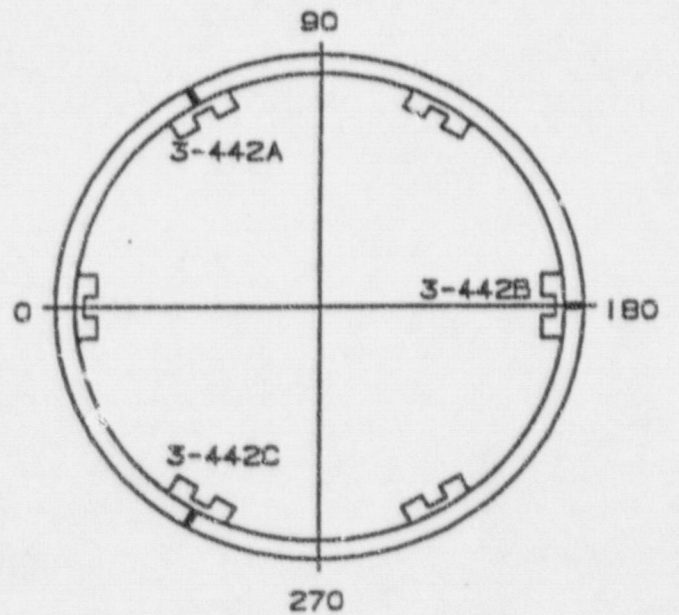
Item No.	Exam Category/ Figure No.	System Or Component	Function	Area To Be Examined	Reason For Request	Weld ID No.	Licensee Proposed Alternate Examination
B03.090.003	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Inlet Nozzle to Shell 247 Deg. UT from Vessel ID	Limited scan due to geometric configuration. Actual coverage obtained = 85.00%	IRPV5-445C	None
B03.090.003A	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Inlet Nozzle to Shell 247 Deg. UT from Nozzle ID	Limited scan due to geometric configuration. Actual coverage obtained = 85.00%	IRPV5-445C	None
B03.090.004	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Inlet Nozzle to Shell 293 Deg. UT from Vessel ID	Limited scan due to geometric configuration. Actual coverage obtained = 85.00%	IRPV5-445D	None
B03.090.004A	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Inlet Nozzle to Shell 293 Deg. UT from Nozzle ID	Limited scan due to geometric configuration. Actual coverage obtained = 85.00%	IRPV5-445D	None
B03.090.005	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Outlet Nozzle to Shell 22 Deg. UT from Vessel ID	Limited scan due to geometric configuration. Actual coverage obtained = 43.00%	IRPV5-445E	None
B03.090.005A	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Outlet Nozzle to Shell 22 Deg. UT from Nozzle ID	Limited scan due to geometric configuration. Actual coverage obtained = 43.00%	IRPV5-445E	None
B03.090.006	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Outlet Nozzle to Shell 158 Deg. UT from Vessel ID	Limited scan due to geometric configuration. Actual coverage obtained = 43.00%	IRPV5-445F	None
B03.090.006A	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Outlet Nozzle to Shell 158 Deg. UT from Nozzle ID	Limited scan due to geometric configuration. Actual coverage obtained = 43.00%	IRPV5-445F	None
B03.090.007	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Outlet Nozzle to Shell 202 Deg. UT from Vessel ID	Limited scan due to geometric configuration. Actual coverage obtained = 43.00%	IRPV5-445G	None
B03.090.007A	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Outlet Nozzle to Shell 202 Deg. UT from Nozzle ID	Limited scan due to geometric configuration. Actual coverage obtained = 43.00%	IRPV5-445G	None
B03.090.008	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Outlet Nozzle to Shell 338 Deg. UT from Vessel ID	Limited scan due to geometric configuration. Actual coverage obtained = 43.00%	IRPV5-445H	None
B03.090.008A	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Outlet Nozzle to Shell 338 Deg. UT from Nozzle ID	Limited scan due to geometric configuration. Actual coverage obtained = 43.00%	IRPV5-445H	None

Item No.	Exam Category/ Figure No.	System Or Component	Function	Area To Be Examined	Reason For Request	Weld ID No.	Licensee Proposed Alternate Examination
B03.100.001	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Inlet Nozzle to Shell 67 Deg. Inside Radius Section	Limited scan due to geometric configuration. Actual coverage obtained = 58.00%	IRPV5-445AR	None
B03.100.002	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Inlet Nozzle to Shell 113 Deg. Inside Radius Section	Limited scan due to geometric configuration. Actual coverage obtained = 58.00%	IRPV5-445BR	None
B03.100.003	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Inlet Nozzle to Shell 247 Deg. Inside Radius Section	Limited scan due to geometric configuration. Actual coverage obtained = 58.00%	IRPV5-445CR	None
B03.100.004	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Inlet Nozzle to Shell 293 Deg. Inside Radius Section	Limited scan due to geometric configuration. Actual coverage obtained = 58.00%	IRPV5-445DR	None
B03.100.005	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Outlet Nozzle to Shell 22 Deg. Inside Radius Section	Limited scan due to geometric configuration. Actual coverage obtained = 74.00%	IRPV5-445ER	None
B03.100.006	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Outlet Nozzle to Shell 158 Deg. Inside Radius Section	Limited scan due to geometric configuration. Actual coverage obtained = 74.00%	IRPV5-445FR	None
B03.100.007	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Outlet Nozzle to Shell 202 Deg. Inside Radius Section	Limited scan due to geometric configuration. Actual coverage obtained = 74.00%	IRPV5-445GR	None
B03.100.008	B-D IWB-2500-7	Reactor Vessel	Houses the fuel assemblies, control rods, and vessel internals, also directs the flow of reactor coolant	Outlet Nozzle to Shell 338 Deg. Inside Radius Section	Limited scan due to geometric configuration. Actual coverage obtained = 74.00%	IRPV5-445HR	None

MCGUIRE UNIT 1
CMM CORE
REGION WELD
INSPECTION



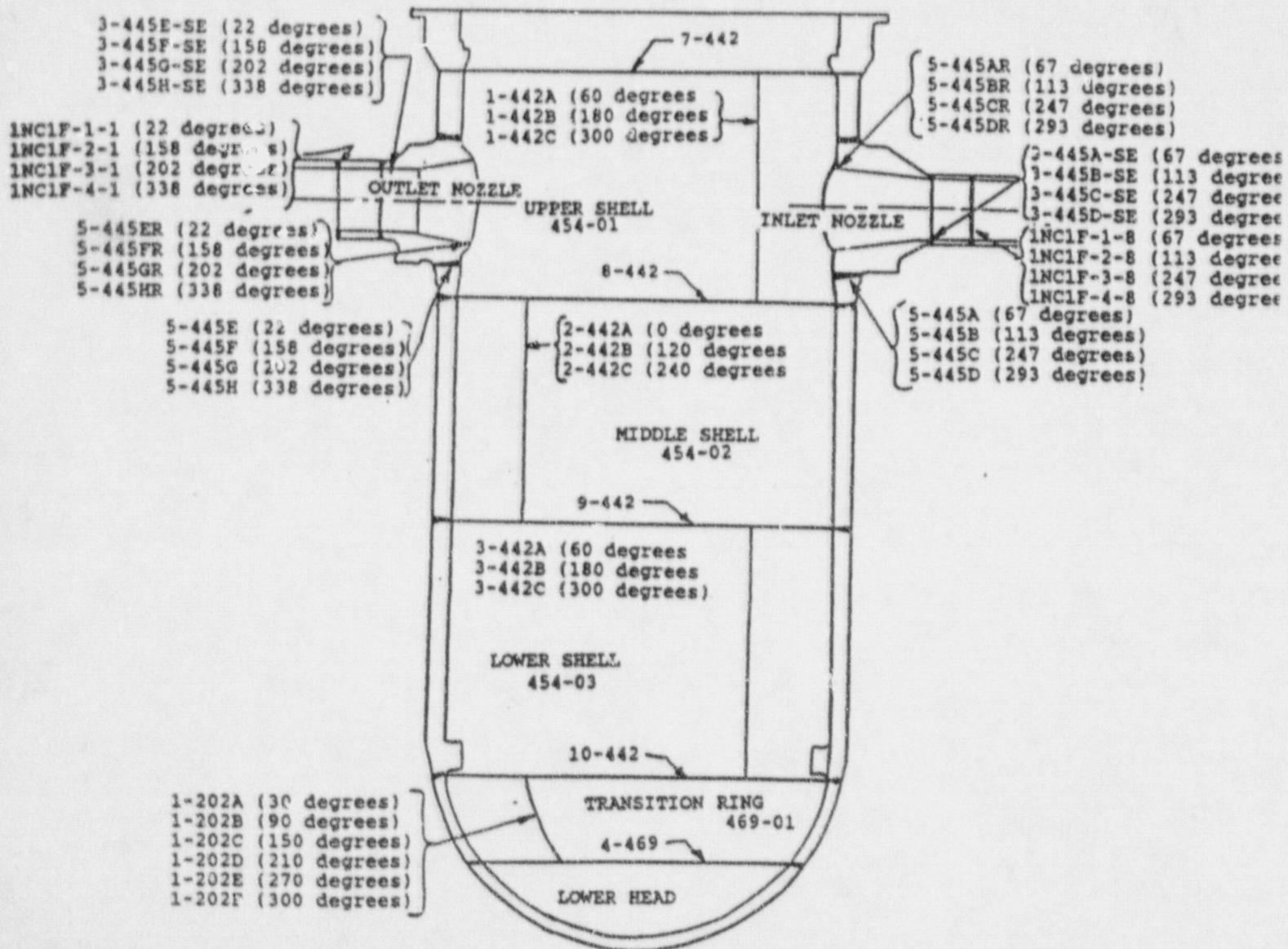
SECTION Z-Z
MIDDLE LONGITUDINAL WELD



SECTION Y-Y
LOWER LONGITUDINAL WELD

Vessel Weld Layout
Figure 1

DUKE POWER COMPANY
 MC GUIRE UNIT 1
 REACTOR VESSEL EXAMINATION



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 REACTOR VESSEL OUTLINE
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Figure 2

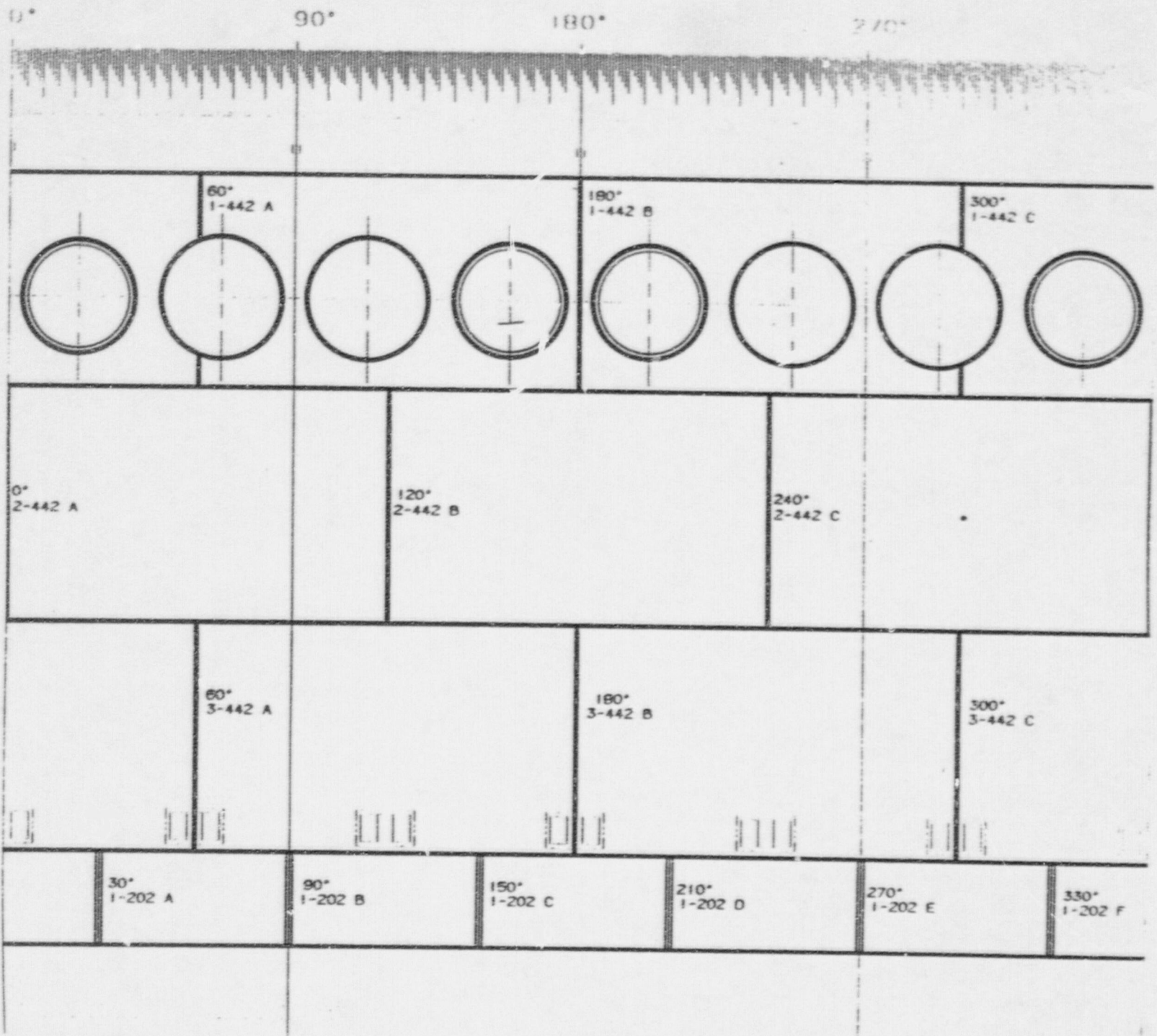


Figure 3

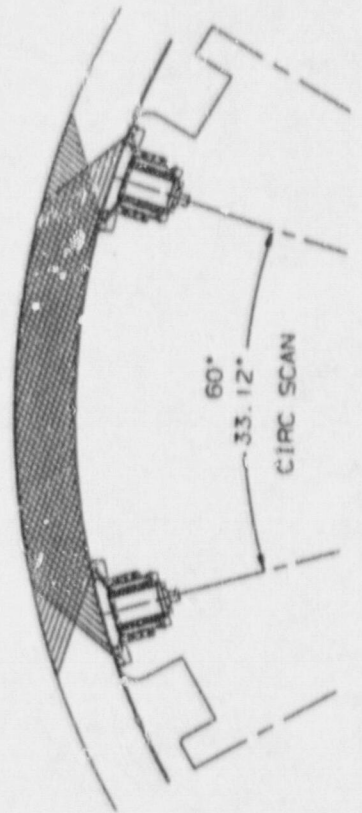
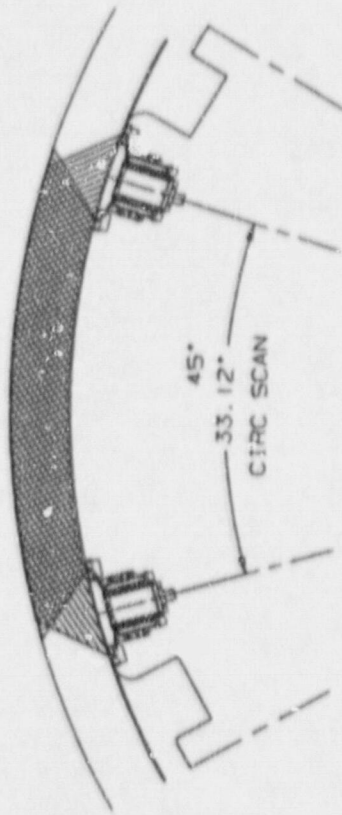
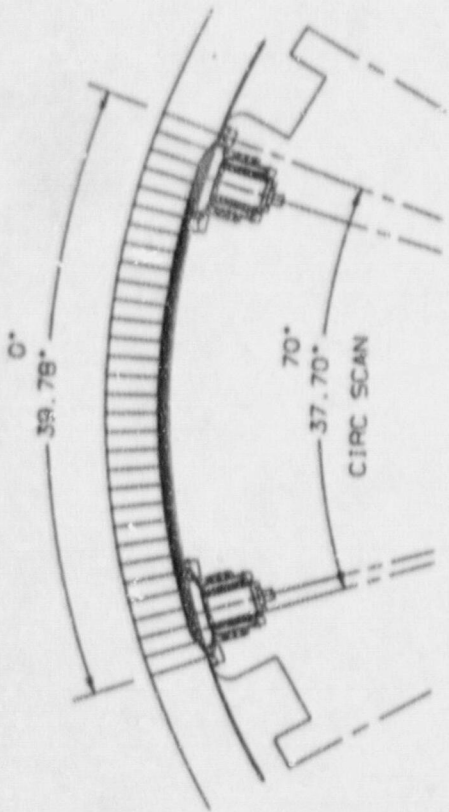
STR NO. 97-004
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 REACTOR VESSEL OUTLINE
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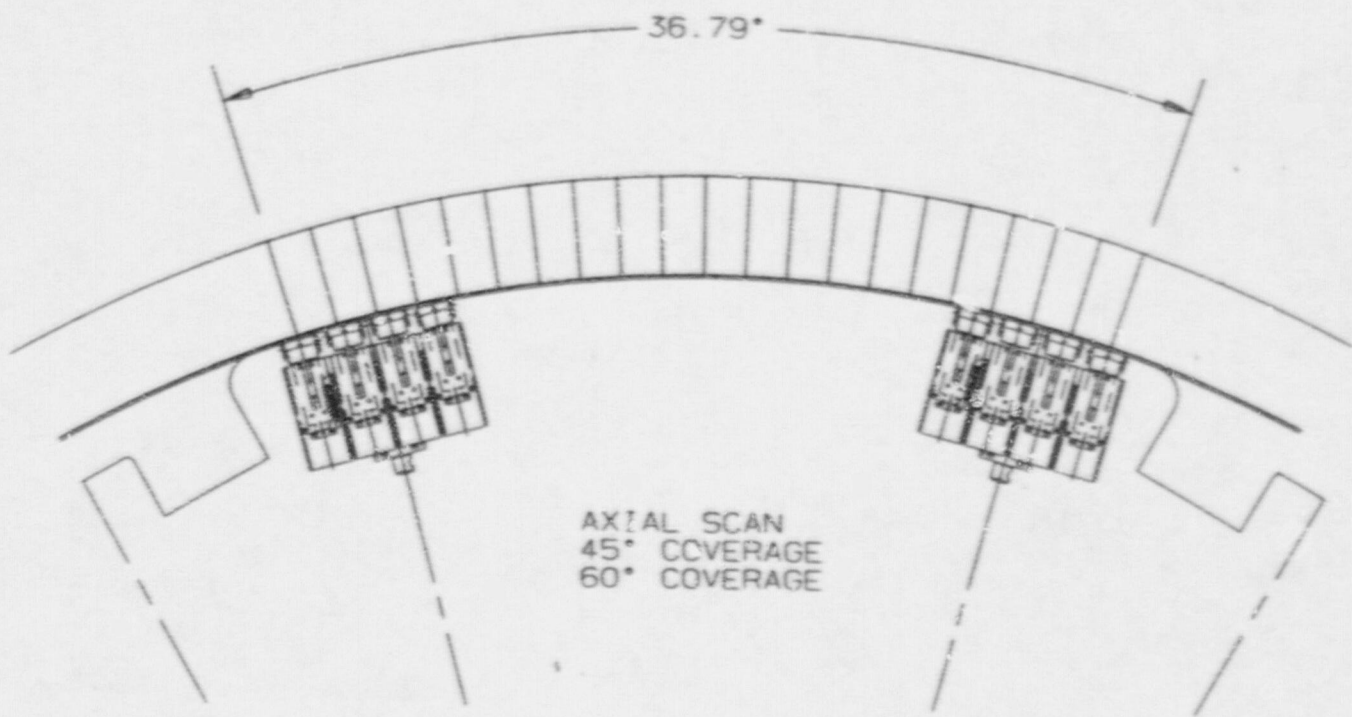
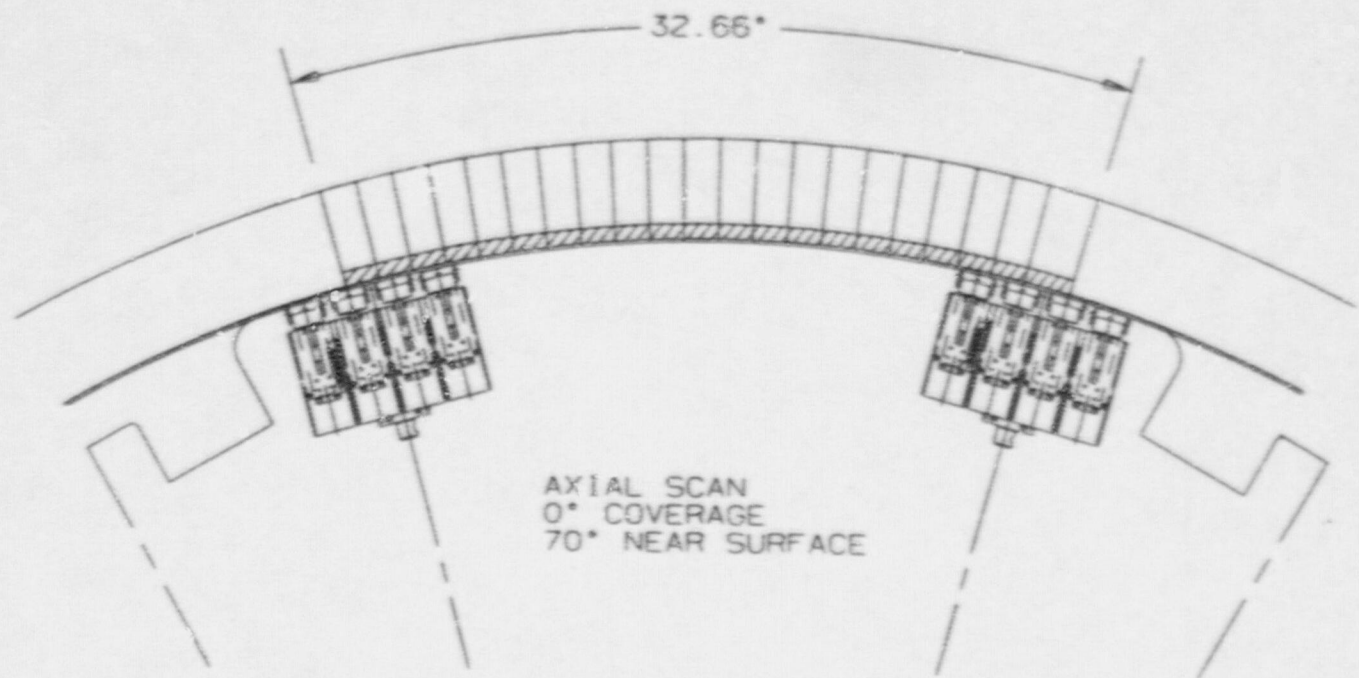
EXAMINATION COVERAGE FOR WELD: 10-442

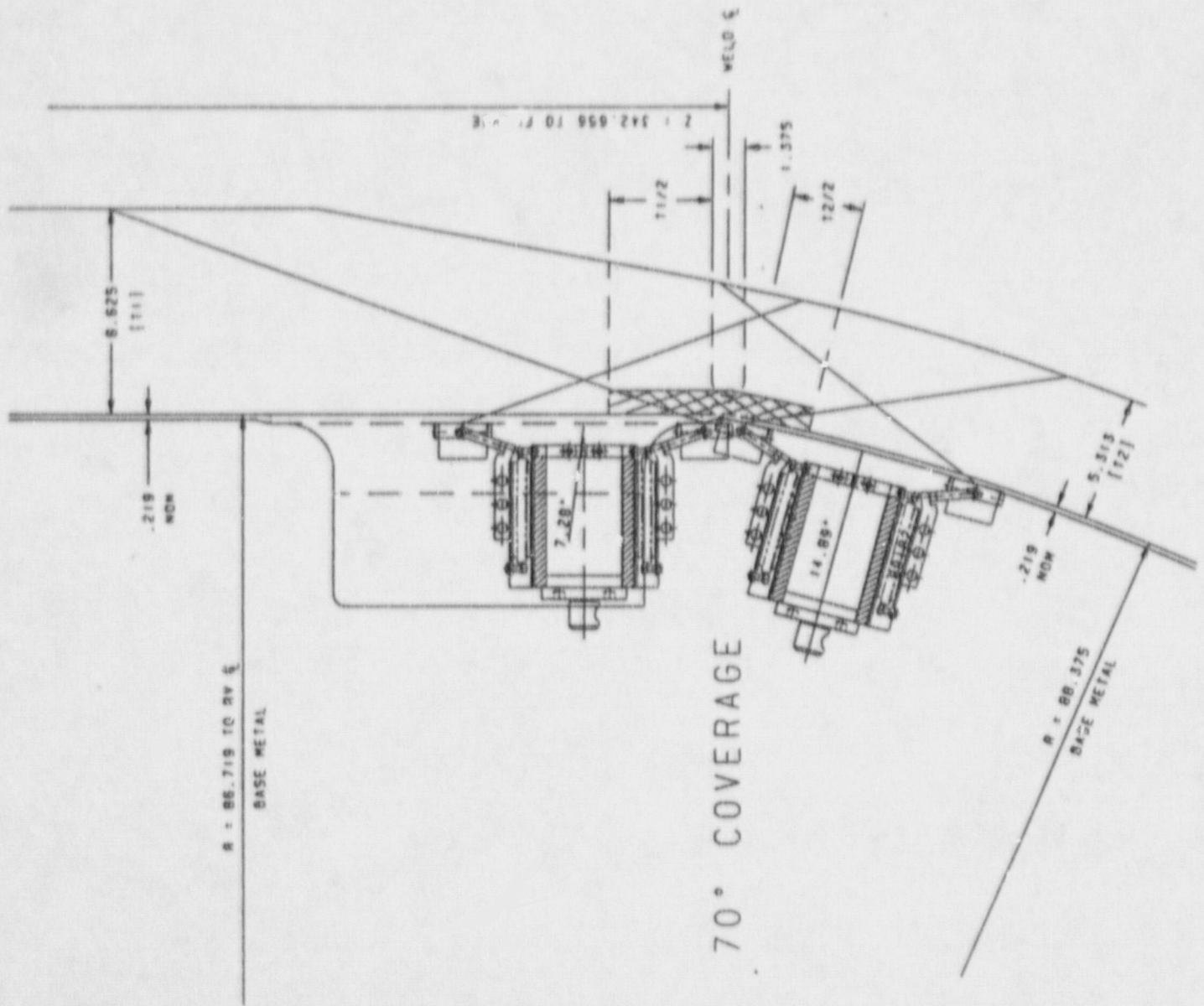
LWR SHELL TO LWR HEAD CIRC WELD
AGGREGATE COVERAGE OBTAINED: 59%
 SCAN PLAN DRAWING: 1213929D-02

Zone Coverage Obtained							
Weld: 63%		Adjacent Base Metal: 59%			Near (ID) Surface: 60%		
Weld Length: 544.372 in.							
Area Measurement				Volume Calculation			
Weld	7.51 sq. in.			Weld	4091.989 cu. in.		
Adjacent Base Metal	43.88 sq. in.			Adjacent Base Metal	23905.98 cu. in.		
Near Surface	8.58 sq. in.			Near Surface	4675.002 cu. in.		
Weld Examination Coverage Calculations							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	7.5	361.3	2713.0	2713.0	100%
2	0	n/a	0.0	183.6	0.0	1379.0	0%
3	45	1	7.5	334.1	2509.1	2509.1	100%
4	45	2	7.5	334.1	2509.1	2509.1	100%
5	45	1	0.0	210.8	0.0	1583.0	0%
6	45	2	0.0	210.8	0.0	1583.0	0%
7	45	3	7.5	300.8	2258.8	2258.8	100%
8	45	4	7.5	300.8	2258.8	2258.8	100%
9	45	3	0.0	244.1	0.0	1833.2	0%
10	45	4	0.0	244.1	0.0	1833.2	0%
11	60	1	7.5	334.1	2509.1	2509.1	100%
12	60	2	7.5	334.1	2509.1	2509.1	100%
13	60	1	7.5	210.8	1583.1	1583.1	100%
14	60	2	0.0	210.8	0.0	1583.1	0%
15	60	3	7.5	300.8	2258.8	2258.8	100%
16	60	4	7.5	300.8	2258.8	2258.8	100%
17	60	3	0.0	244.1	0.0	1833.2	0%
18	60	4	0.0	244.1	0.0	1833.2	0%
Totals:					23367.6	36828.4	63%
Adjacent Base Metal Examination Coverage Calculations							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	43.9	361.3	15851.7	15851.7	100%
2	0	n/a	0.0	183.6	0.0	8057.2	0%
3	45	1&2	43.9	334.1	14660.3	14660.3	100%
4	45	1&2	0.0	210.8	0.0	9249.0	0%
5	45	3	43.9	300.8	13197.8	13197.8	100%
6	45	4	43.9	300.8	13197.8	13197.8	100%
7	45	3	0.0	244.1	0.0	10711.1	0%
8	45	4	0.0	244.1	0.0	10711.1	0%
9	60	1&2	43.9	334.1	14660.3	14660.3	100%
10	60	1&2	0.0	210.8	0.0	9249.0	0%
11	60	3	43.9	300.8	13197.8	13197.8	100%
12	60	4	43.9	300.8	13197.8	13197.8	100%
13	60	3	0.0	244.1	0.0	10711.1	0%
14	60	4	0.0	244.1	0.0	10711.1	0%
Totals:					97963.4	167364.0	59%
Near Surface Examination Coverage Calculations							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	70	axial	8.6	296.6	2544.8	2544.8	100%
2	70	axial	0.0	248.3	0.0	2130.2	0%
3	70	circ	8.6	361.3	3099.5	3099.5	100%
4	70	circ	0.0	183.6	0.0	1575.5	0%
Totals:					5644.3	9350.0	60%

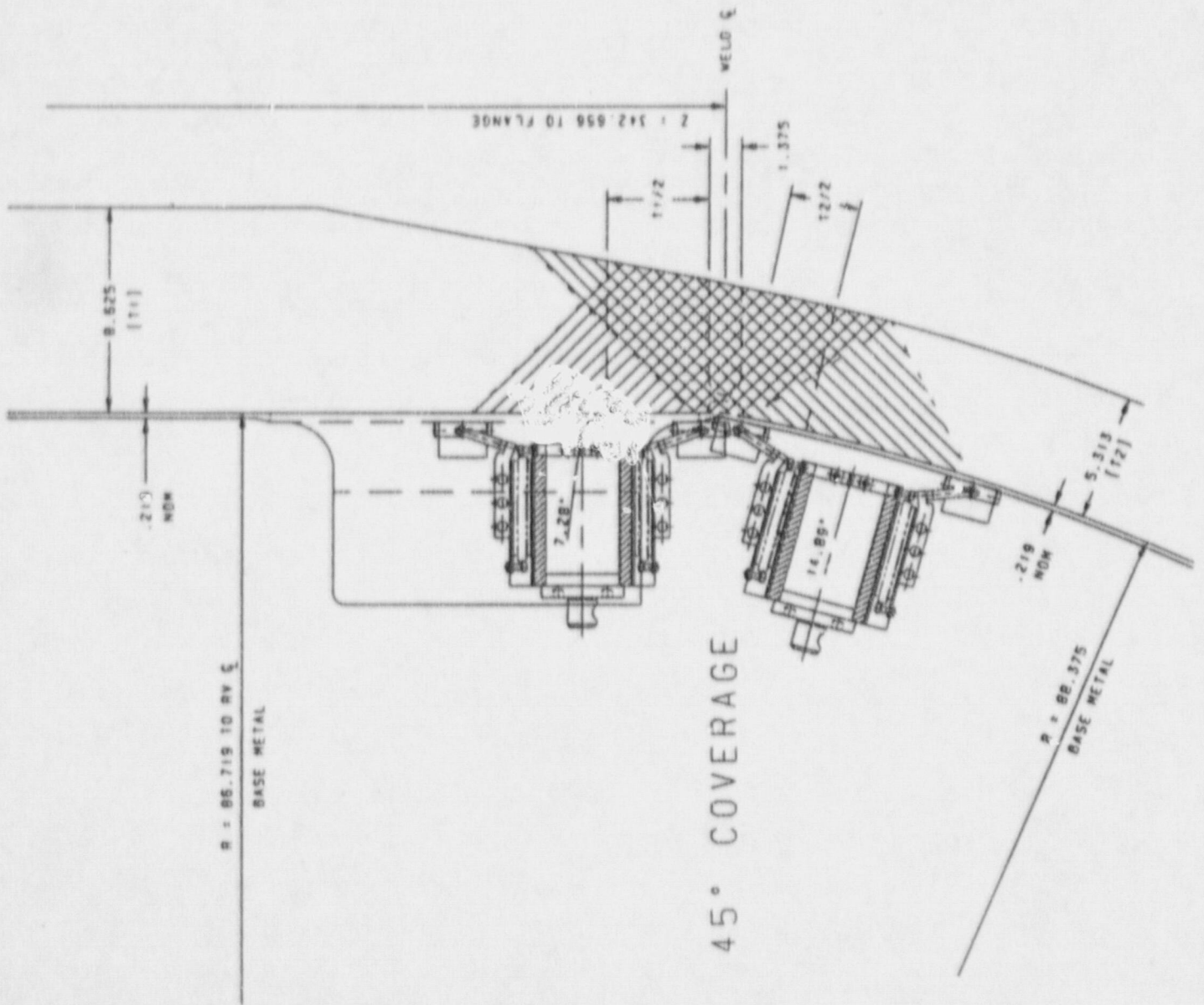
SER NO. 97-004
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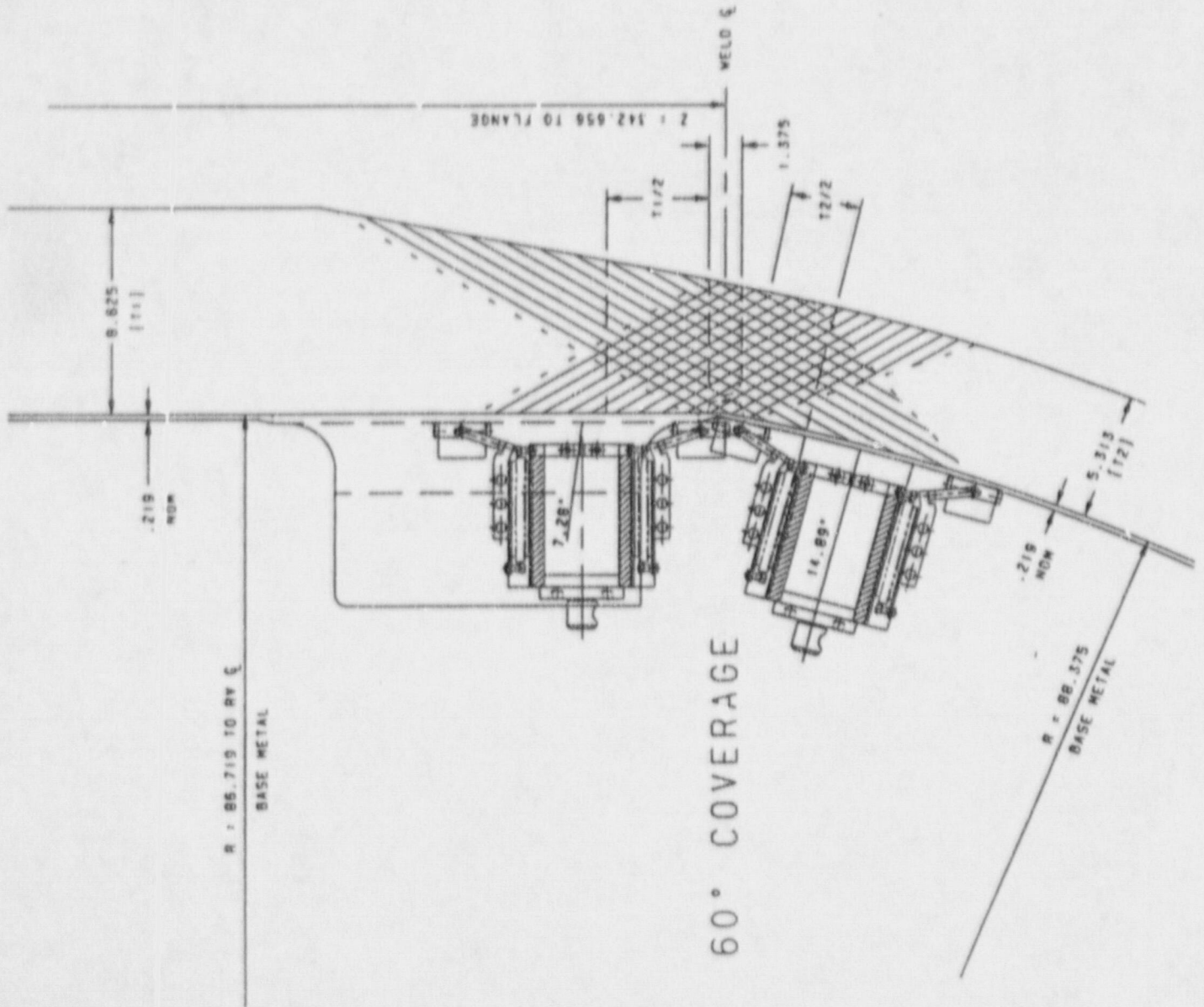




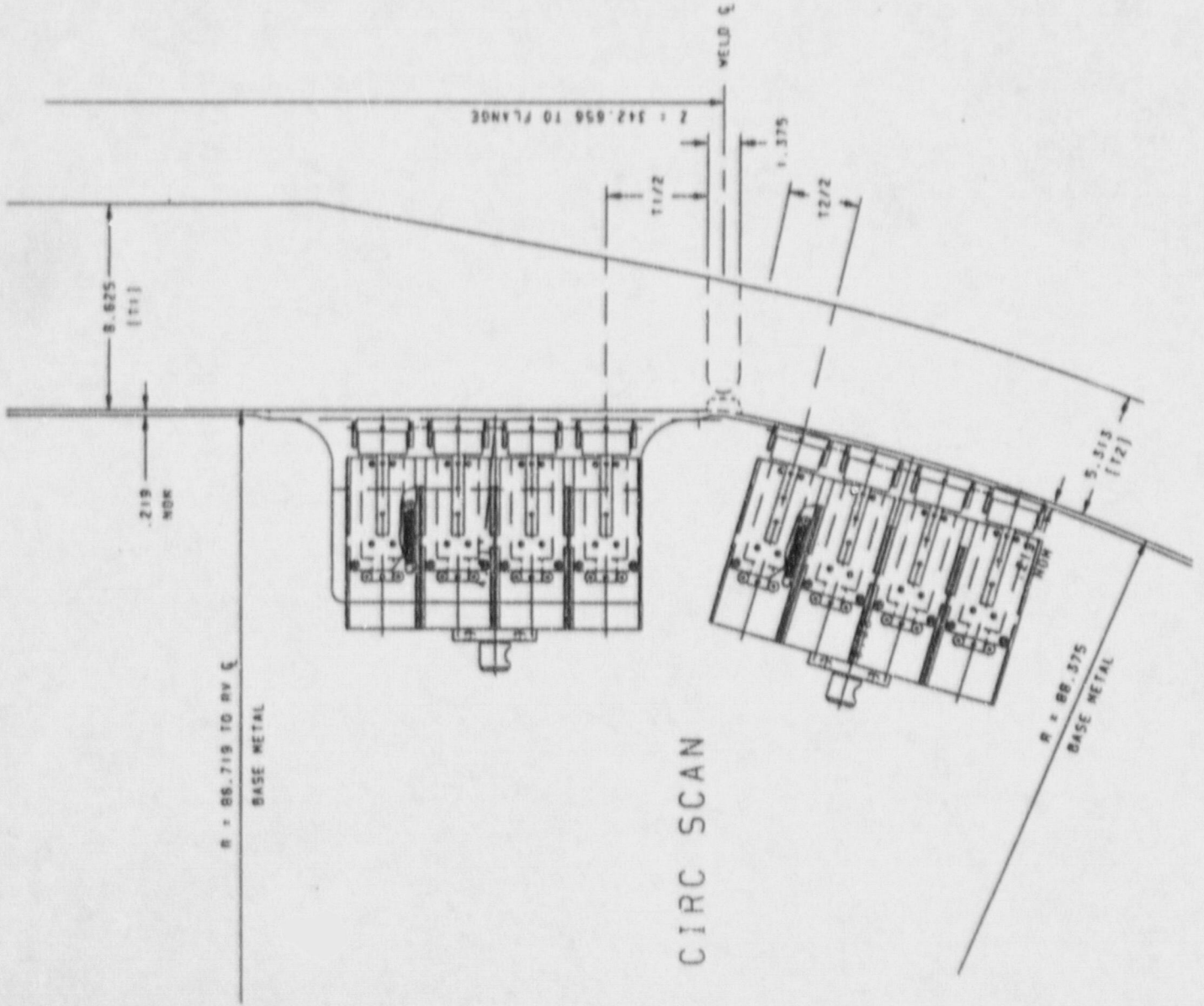
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SER NO. 97-004
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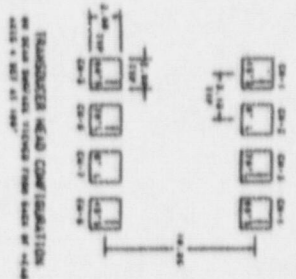


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 B01.011.003
 1RPV10-442
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CIRC SCAN

REVISIONS		DATE	BY
1	REVISION TO REFLECT DESIGN		
2	REVISION TO REFLECT DESIGN		
3	REVISION TO REFLECT DESIGN		



NO.	DESCRIPTION	QUANTITY	UNIT	AMOUNT
1	CONCRETE	1.0	CU YD	1.0
2	STEEL	1.0	TON	1.0
3	INSULATION	1.0	SQ YD	1.0
4	FORMWORK	1.0	SQ YD	1.0
5	PAINT	1.0	GA	1.0
6	LABOR	1.0	HOUR	1.0
7	TRUCK	1.0	TRIP	1.0
8	WATER	1.0	CU YD	1.0

ITEM NO.	DESCRIPTION	QUANTITY		UNIT	PRICE	TOTAL
		AMOUNT	PER UNIT			
001-011-001	CONCRETE	1.0	1.0	CU YD	1.0	1.0
001-011-002	STEEL	1.0	1.0	TON	1.0	1.0
001-011-003	INSULATION	1.0	1.0	SQ YD	1.0	1.0
001-011-004	FORMWORK	1.0	1.0	SQ YD	1.0	1.0
001-011-005	PAINT	1.0	1.0	GA	1.0	1.0
001-011-006	LABOR	1.0	1.0	HOUR	1.0	1.0
001-011-007	TRUCK	1.0	1.0	TRIP	1.0	1.0
001-011-008	WATER	1.0	1.0	CU YD	1.0	1.0

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 ATTACHMENT 2
 B01.011.003
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1. Refer to drawings, notes and specifications for details.
2. Refer to drawings, notes and specifications for details.
3. Refer to drawings, notes and specifications for details.
4. Refer to drawings, notes and specifications for details.
5. Refer to drawings, notes and specifications for details.
6. Refer to drawings, notes and specifications for details.
7. Refer to drawings, notes and specifications for details.
8. Refer to drawings, notes and specifications for details.

MCDONNELL DUNN
 CIVIL ENGINEERING
 12139229 0 2
 583-5881

EXAMINATION COVERAGE FOR WELD: 1-442 A,C

UPPER LONGITUDINAL WELD

AGGREGATE COVERAGE OBTAINED: 90%

SCAN PLAN DRAWING: 1213936D-02

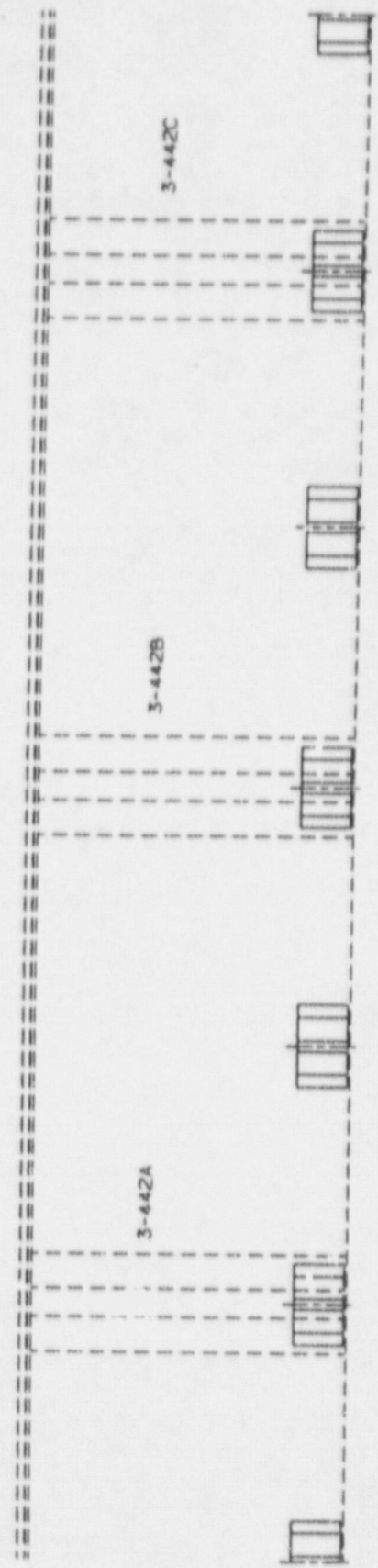
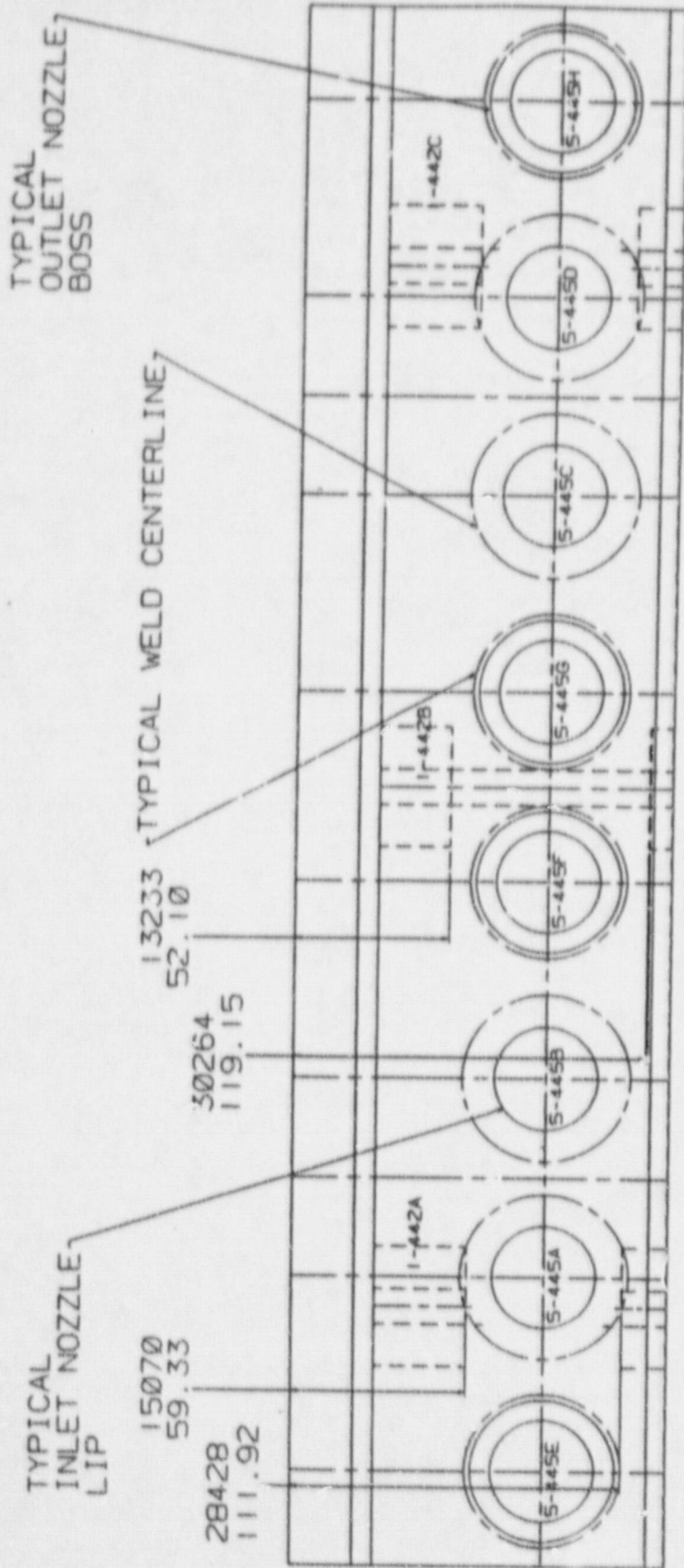
Zone Coverage Obtained							
Weld: 89%		Adjacent Base Metal 90%			Near (ID) Surface: 88%		
Examination Volume Definition							
Weld Length: 24.54 in.							
Area Measurement				Volume Calculation			
Weld	14.78 sq. in.			Weld	364.1792 cu. in.		
Adjacent Base Met	124.08 sq. in.			Adjacent Base Metal	3057.331 cu. in.		
Near Surface	12.23 sq. in.			Near Surface	301.3472 cu. in.		
Examination Coverage Calculations							
Weld							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	14.8	24.6	364.2	364.2	100%
2	45	1	14.8	18.7	276.5	276.5	100%
3	45	2	14.8	18.7	276.5	276.5	100%
4	45	1	0.0	5.9	0.0	87.6	0%
5	45	2	0.0	5.9	0.0	87.6	0%
6	45	3	14.8	24.6	364.2	364.2	100%
7	45	4	14.8	24.6	364.2	364.2	100%
8	60	1	14.8	18.7	276.5	276.5	100%
9	60	2	14.8	18.7	276.5	276.5	100%
10	60	1	0.0	5.9	0.0	87.6	0%
11	60	2	0.0	5.9	0.0	87.6	0%
12	60	3	14.8	24.6	364.2	364.2	100%
13	60	4	14.8	24.6	364.2	364.2	100%
Totals:					2927.0	3277.6	89%
Adjacent Base Metal							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	124.1	24.6	3057.3	3057.3	100%
2	45	1&2	115.7	18.7	2164.0	2321.5	93%
3	45	1&2	0.0	5.9	0.0	735.8	0%
4	45	3	124.1	24.6	3057.3	3057.3	100%
5	45	4	124.1	24.6	3057.3	3057.3	100%
6	60	1&2	115.7	18.7	2164.0	2321.5	93%
7	60	1&2	0.0	5.9	0.0	735.8	0%
8	60	3	115.7	24.6	2849.9	3057.3	93%
9	60	4	115.7	24.6	2849.9	3057.3	93%
Totals:					19199.7	21401.3	90%
Near Surface							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	70	axial	12.2	18.7	223.8	228.8	100%
2	70	axial	0.0	5.9	0.0	72.5	0%
3	70	circ.	12.2	24.6	301.3	301.3	100%
Totals:					530.2	602.7	88%

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 B01.012.001, B01.012.003
 1RPV1-442A, 1RPV1-442C
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EXAMINATION COVERAGE FOR WELD: 1-442 B
UPPER LONGITUDINAL WELD
AGGREGATE COVERAGE OBTAINED: 31%
SCAN PLAN DRAWING: 1213936D-02

Zone Coverage Obtained							
Weld: 28%		Adjacent Base Metal: 31%			Near (ID) Surface: 43%		
Examination Volume Definition							
Weld Length: 74.265 in.							
Area Measurement				Volume Calculation			
Weld		14.78	sq. in.	Weld		1097.637	cu. in.
Adjacent Base Metal		124.08	sq. in.	Adjacent Base Metal		9214.801	cu. in.
Near Surface		12.23	sq. in.	Near Surface		908.261	cu. in.
Examination Coverage Calculations							
Weld							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	14.8	20.4	302.0	302.0	100%
2	0	n/a	0.0	53.8	0.0	795.7	0%
3	45	1	14.8	20.4	302.0	302.0	100%
4	45	1	0.0	53.8	0.0	795.7	0%
5	45	2	14.8	20.4	302.0	302.0	100%
6	45	2	0.0	53.8	0.0	795.7	0%
7	45	3	14.8	20.4	302.0	302.0	100%
8	45	3	0.0	53.8	0.0	795.7	0%
9	45	4	14.8	20.4	302.0	302.0	100%
10	45	4	0.0	53.8	0.0	795.7	0%
11	60	1	14.8	20.4	302.0	302.0	100%
12	60	1	0.0	53.8	0.0	795.7	0%
13	60	2	14.8	20.4	302.0	302.0	100%
14	60	2	0.0	53.8	0.0	795.7	0%
15	60	3	14.8	20.4	302.0	302.0	100%
16	60	3	0.0	53.8	0.0	795.7	0%
17	60	4	14.8	20.4	302.0	302.0	100%
18	60	4	0.0	53.8	0.0	795.7	0%
Totals:					2113.7	7683.5	28%
Adjacent Base Metal							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	124.1	20.4	2535.0	2535.0	100%
2	0	n/a	0.0	53.8	0.0	6679.8	0%
3	45	1&2	124.1	20.4	2535.0	2535.0	100%
4	45	1&2	0.0	53.8	0.0	6679.8	0%
5	45	3	124.1	20.4	2535.0	2535.0	100%
6	45	3	0.0	53.8	0.0	6679.8	0%
7	45	4	124.1	20.4	2535.0	2535.0	100%
8	45	4	0.0	53.8	0.0	6679.8	0%
9	60	1&2	124.1	20.4	2535.0	2535.0	100%
10	60	1&2	0.0	53.8	0.0	6679.8	0%
11	60	3	124.1	20.4	2535.0	2535.0	100%
12	60	3	0.0	53.8	0.0	6679.8	0%
13	60	4	124.1	20.4	2535.0	2535.0	100%
14	60	4	0.0	53.8	0.0	6679.8	0%
Totals:					17744.7	57823.8	31%
Near Surface							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	70	axial	12.2	20.4	249.9	249.9	100%
2	70	axial	0.0	53.8	0.0	658.4	0%
3	70	circ	12.2	20.4	249.9	249.9	100%
4	70	circ	0.0	53.8	0.0	658.4	0%
Totals:					499.7	1158.1	43%

LONG SEAM LIMITED COVERAGE



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 ATTACHMENT 2
 B01.012.001, B01.012.002, B01.012.003
 1RPV1-442A, 1RPV1-442B, 1RPV1-442C
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TABLE 1

FIGURE NO.	WELD NO.	FILE NAME	CHM COORDINATE RANGES		INDEX INCREMENT	SCAN DIRECTION	SETUP	CHANNEL
			EXTENSION INCHES	ROTATION DEGREES				
B01.012.005	IRPV 2-442B	MIDLONG1Y	138.29 Z 225.12	113.42 @ 126.58	.37"	AXIAL	4	1 - B
B01.012.005	IRPV 2-442B	MIDLONG1X	136.87 Z 226.48	114.70 @ 125.30	.56"	CIRC	4	1 - B
B01.012.006	IRPV 2-442C	MIDLONG2Y	138.29 Z 225.12	233.42 @ 246.58	.37"	AXIAL	4	1 - B
B01.012.006	IRPV 2-442C	MIDLONG2X	136.87 Z 226.48	234.70 @ 245.30	.56"	CIRC	4	1 - B
B01.012.004	IRPV 2-442A	MIDLONG3Y	138.29 Z 225.12	353.42 @ 366.58	.37"	AXIAL	4	1 - B
B01.012.004	IRPV 2-442A	MIDLONG3X	136.87 Z 226.48	354.70 @ 365.30	.56"	CIRC	4	1 - B
B01.012.001	IRPV 1-442A	UPPRLONG1YA	43.06 Z 59.33	52.68 @ 67.32	.37"	AXIAL	2	1 - B
B01.012.001	IRPV 1-442A	UPPRLONG1XA	38.90 Z 59.33	53.09 @ 66.91	.56"	CIRC	2	1 - B
B01.012.001	IRPV 1-442A	UPPRLONG1YB	111.92 Z 114.36	52.68 @ 67.32	.37"	AXIAL	2	1 - B
B01.012.001	IRPV 1-442A	UPPRLONG1XB	111.92 Z 116.13	53.09 @ 66.91	.56"	CIRC	2	1 - B
B01.012.002	IRPV 1-442B	UPPRLONG2YA	43.06 Z 52.10	172.68 @ 187.32	.37"	AXIAL	2	1 - B
B01.012.002	IRPV 1-442B	UPPRLONG2XA	38.90 Z 52.10	173.19 @ 186.91	.56"	CIRC	2	1 - B
B01.012.003	IRPV 1-442C	UPPRLONG3YA	43.06 Z 59.33	292.68 @ 307.32	.37"	AXIAL	2	1 - B
B01.012.003	IRPV 1-442C	UPPRLONG3XA	38.90 Z 59.33	293.09 @ 306.91	.56"	CIRC	2	1 - B
B01.012.003	IRPV 1-442C	UPPRLONG3YB	111.92 Z 114.36	292.68 @ 307.32	.37"	AXIAL	2	1 - B
B01.012.003	IRPV 1-442C	UPPRLONG3XB	111.92 Z 116.13	293.09 @ 306.91	.56"	CIRC	2	1 - B
B01.012.007	IRPV 3-442A	LOWRLONG1Y	247.13 Z 336.66	53.42 @ 66.58	.37"	AXIAL	4	1 - B
B01.012.007	IRPV 3-442A	LOWRLONG1X	245.78 Z 333.69	54.70 @ 65.30	.56"	CIRC	4	1 - B
B01.012.008	IRPV 3-442B	LOWRLONG2Y	247.13 Z 336.66	173.42 @ 186.58	.37"	AXIAL	4	1 - B
B01.012.008	IRPV 3-442B	LOWRLONG2X	245.78 Z 333.69	174.70 @ 185.30	.56"	CIRC	4	1 - B
B01.012.009	IRPV 3-442C	LOWRLONG3Y	247.13 Z 336.66	293.42 @ 306.58	.37"	AXIAL	4	1 - B
B01.012.009	IRPV 3-442C	LOWRLONG3X	245.78 Z 333.69	294.70 @ 305.30	.56"	CIRC	4	1 - B

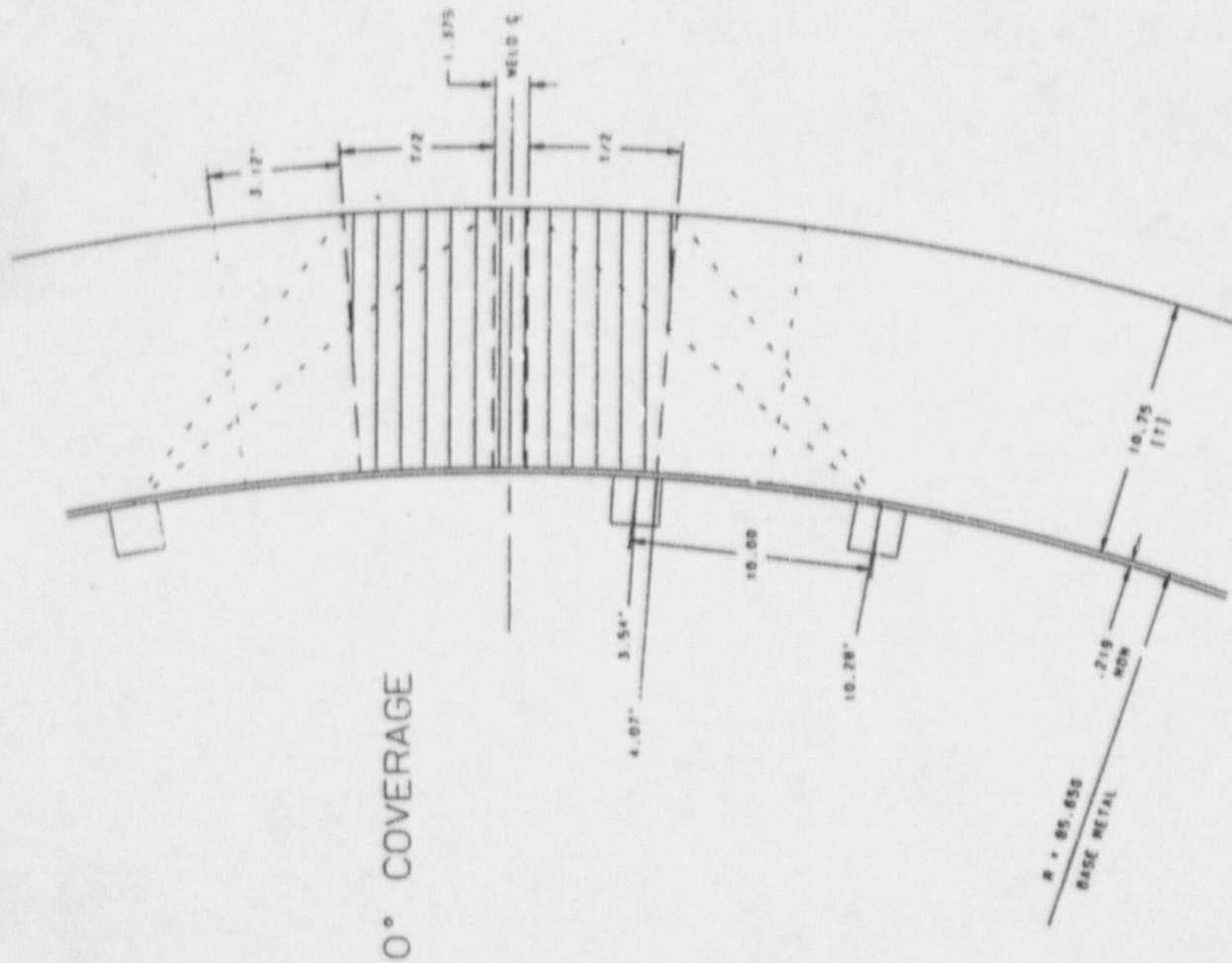
SER NO. 97-004

ATTACHMENT 2

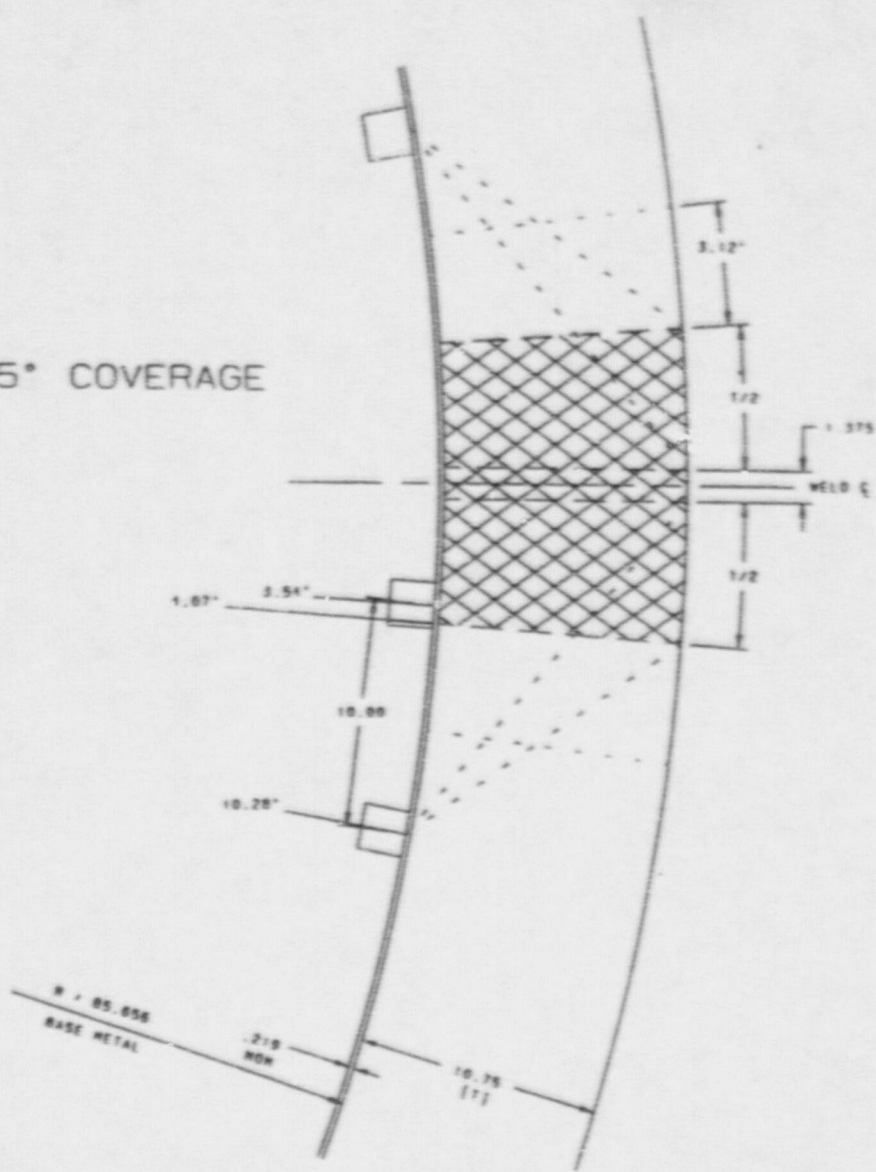
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IRPV1-442A, IRPV1-442B, IRPV1-442C

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45° COVERAGE



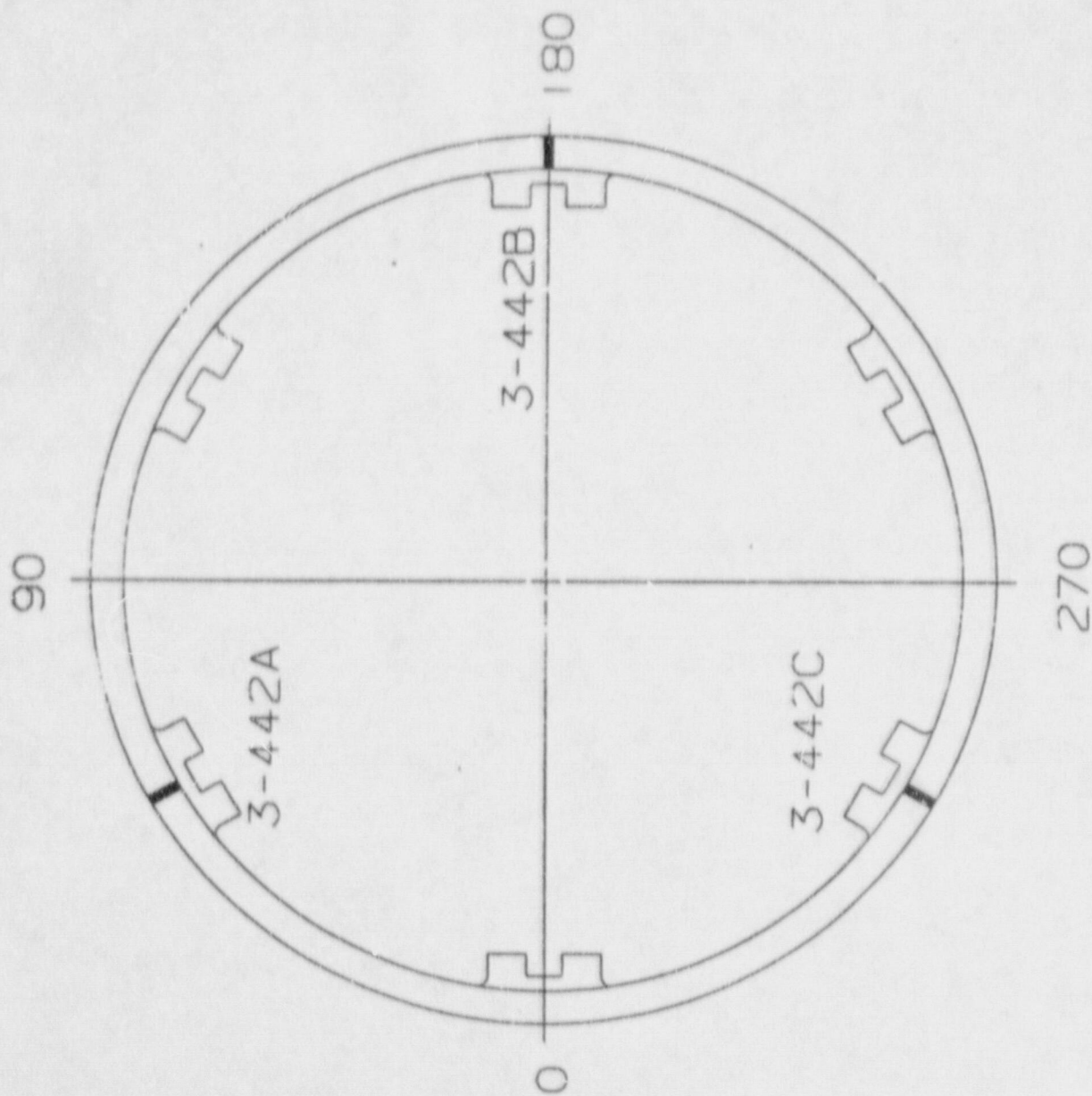
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1-442

SER NO. 97-004
ATTACHMENT 2
B01.012.001, B01.012.002, B01.012.003
IRPV1-442A, IRPV1-442B, IRPV1-442C
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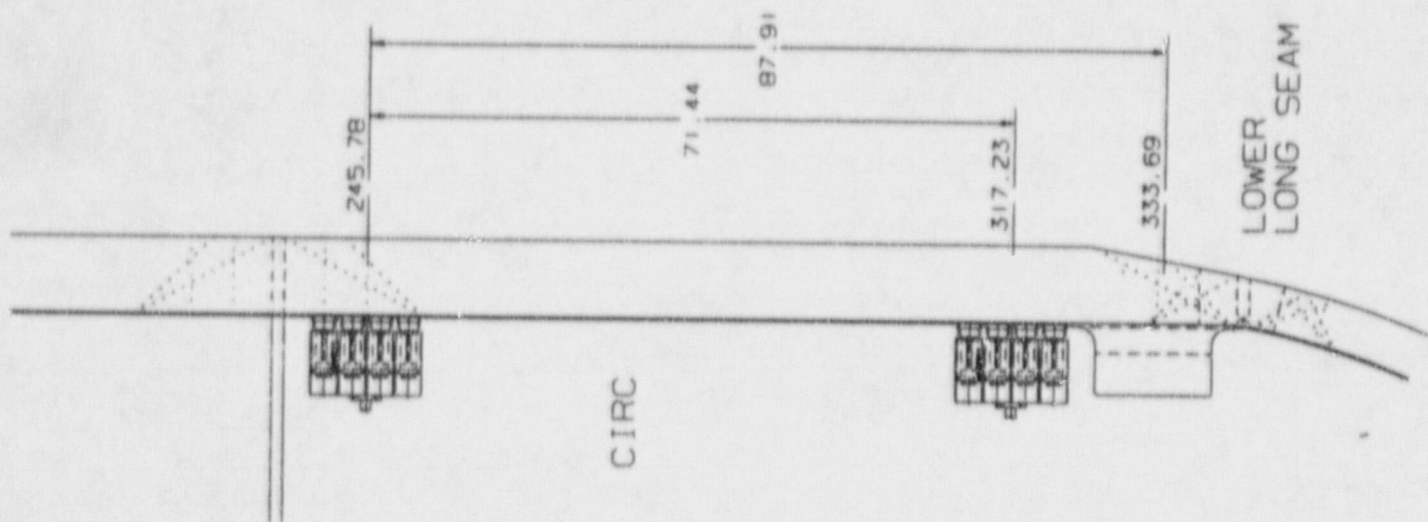
EXAMINATION COVERAGE FOR WELD: 3-442 A,B,C
LOWER LONGITUDINAL WELD
AGGREGATE COVERAGE OBTAINED: 84%
SCAN PLAN DRAWING: 1213926D-02

Zone Coverage Obtained							
Weld: 84%		Adjacent Base Metal: 84%			Near (ID) Surface: 84%		
Weld Length: 95.53 in.							
Area Measurement				Volume Calculation			
Weld	11.86 sq. in.			Weld	1144.846 cu. in.		
Adjacent Base Metal	78.69 sq. in.			Adjacent Base Metal	7595.946 cu. in.		
Near Surface	10.06 sq. in.			Near Surface	971.0918 cu. in.		
Weld Examination Coverage Calculations							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	11.9	80.8	957.7	957.7	100%
2	0	n/a	0.0	15.8	0.0	187.2	0%
3	45	1	11.9	80.8	957.7	957.7	100%
4	45	2	11.9	80.8	957.7	957.7	100%
5	45	1	0.0	15.8	0.0	187.2	0%
6	45	2	0.0	15.8	0.0	187.2	0%
7	45	3	11.9	80.8	957.7	957.7	100%
8	45	4	11.9	80.8	957.7	957.7	100%
9	45	3	0.0	15.8	0.0	187.2	0%
10	45	4	0.0	15.8	0.0	187.2	0%
11	60	1	11.9	80.8	957.7	957.7	100%
12	60	2	11.9	80.8	957.7	957.7	100%
13	60	1	0.0	15.8	0.0	187.2	0%
14	60	2	0.0	15.8	0.0	187.2	0%
15	60	3	11.9	80.8	957.7	957.7	100%
16	60	4	11.9	80.8	957.7	957.7	100%
17	60	3	0.0	15.8	0.0	187.2	0%
18	60	4	0.0	15.8	0.0	187.2	0%
Totals:					8619.3	10303.6	84%
Adjacent Base Metal Examination Coverage Calculations							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	78.7	80.8	6354.2	6354.2	100%
2	0	n/a	0.0	15.8	0.0	1241.7	0%
3	45	1&2	78.7	80.8	6354.2	6354.2	100%
4	45	1&2	0.0	15.8	0.0	1241.7	0%
5	45	3	78.7	80.8	6354.2	6354.2	100%
6	45	4	78.7	80.8	6354.2	6354.2	100%
7	45	3	0.0	15.8	0.0	1241.7	0%
8	45	4	0.0	15.8	0.0	1241.7	0%
9	60	1&2	78.7	80.8	6354.2	6354.2	100%
10	60	1&2	0.0	15.8	0.0	1241.7	0%
11	60	3	78.7	80.8	6354.2	6354.2	100%
12	60	4	78.7	80.8	6354.2	6354.2	100%
13	60	3	0.0	15.8	0.0	1241.7	0%
14	60	4	0.0	15.8	0.0	1241.7	0%
Totals:					44479.5	53171.6	84%
Near Surface Examination Coverage Calculations							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	70	axial	10.1	80.8	812.3	812.3	100%
2	70	axial	0.0	15.8	0.0	158.7	0%
3	70	circ	10.1	80.8	812.3	812.3	100%
4	70	circ	0.0	15.8	0.0	158.7	0%
Totals:					1624.7	1942.2	84%

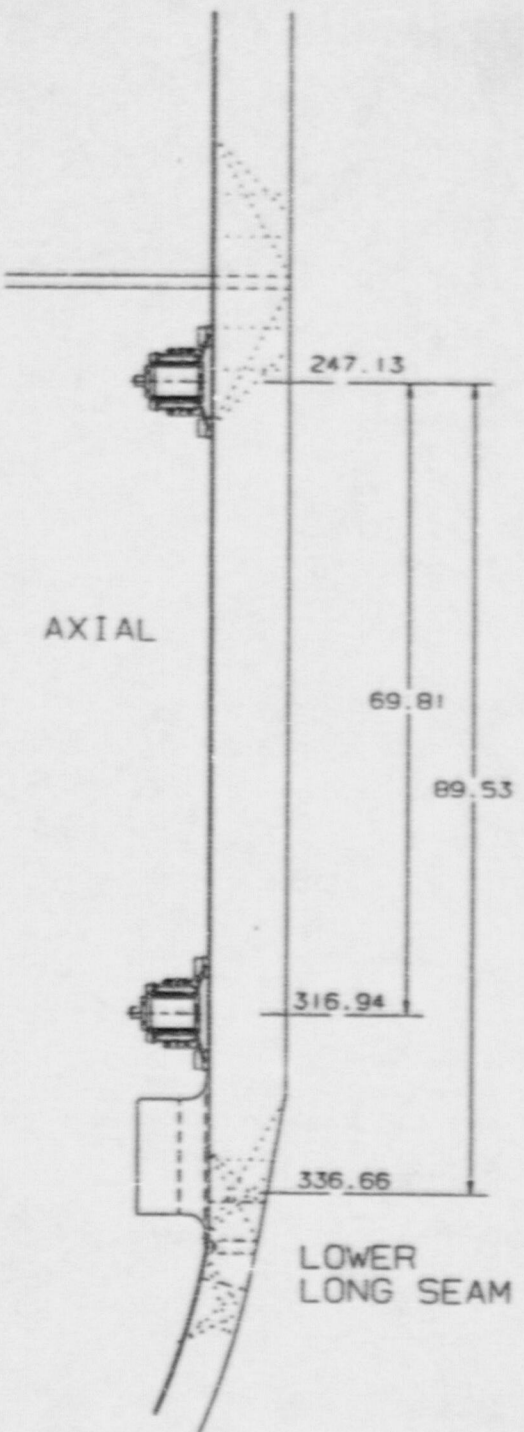
SER NO. 97-004
 ATTACHMENT 2
 B01.012.007, B01.012.008, B01.012.009
 IRPV3-442A, IRPV3-442P, IRPV3-442C
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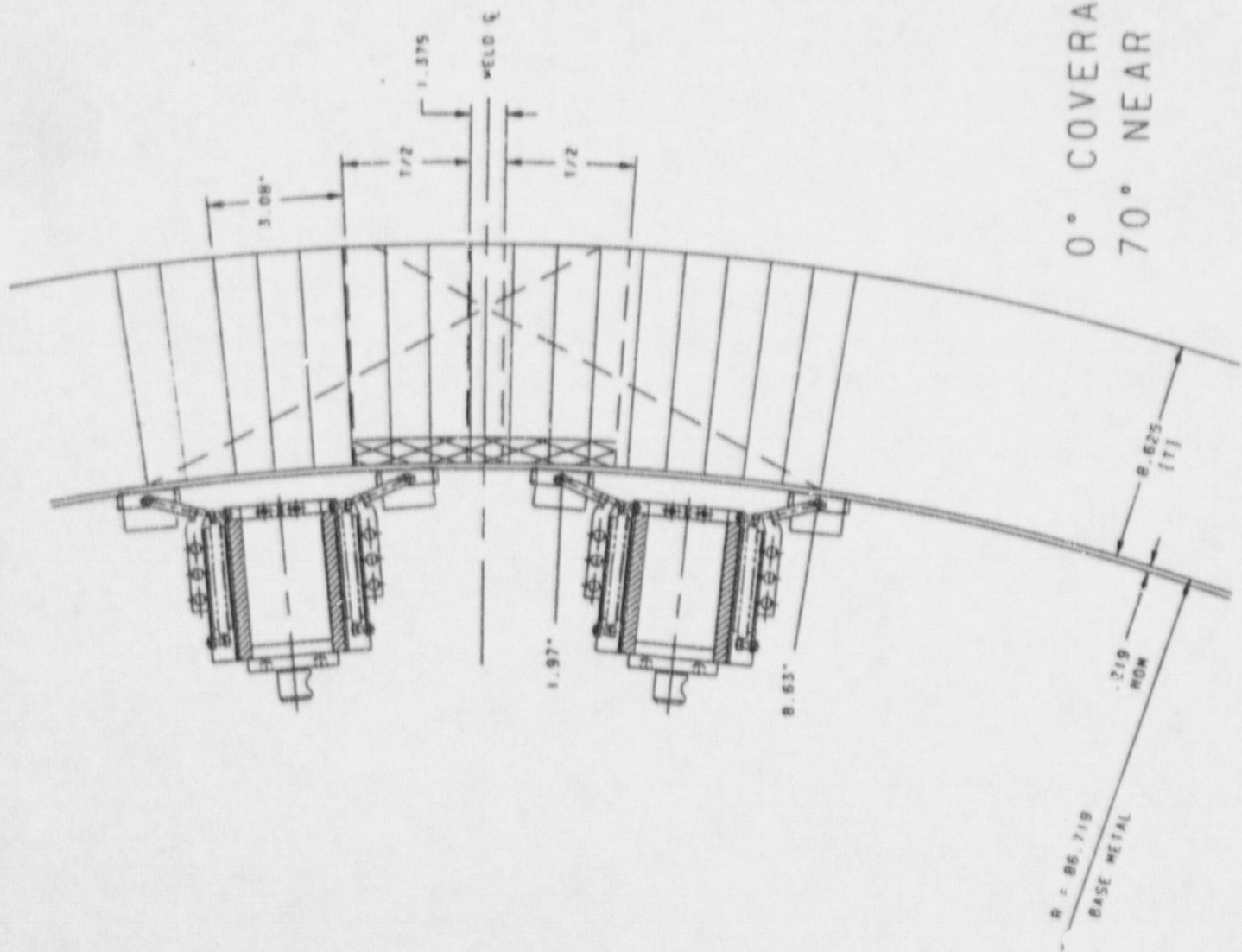
LOWER LONGITUDINAL WELD



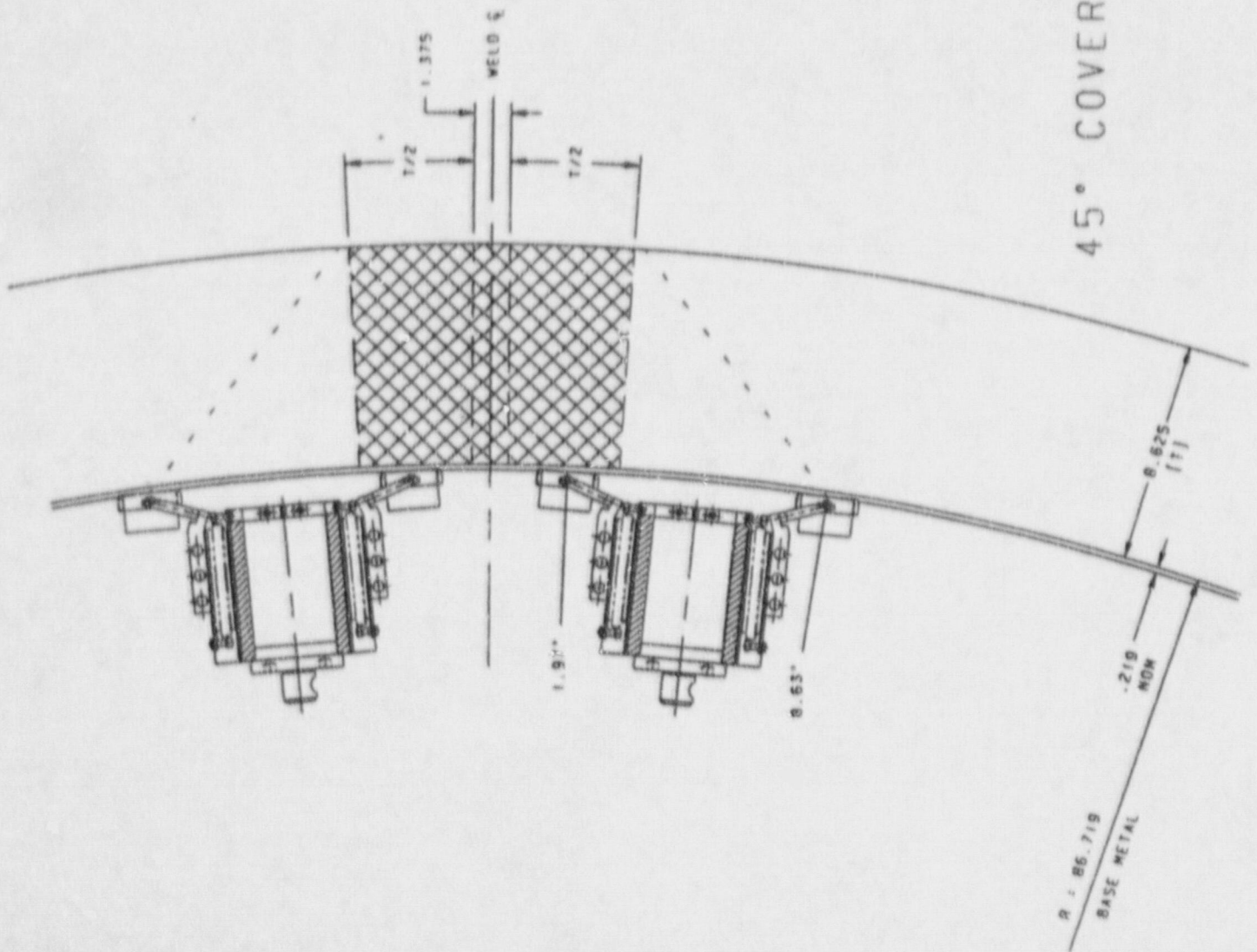
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 B01.012.007, B01.012.008, B01.012.009
 1RPV3-442A, 1RPV3-442B, 1RPV3-442C
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SER NO. 97-004
 ATTACHMENT 2
 B01.012.007, B01.012.008, B01.012.009
 IRPV3-442A, IRPV3-442B, IRPV3-442C
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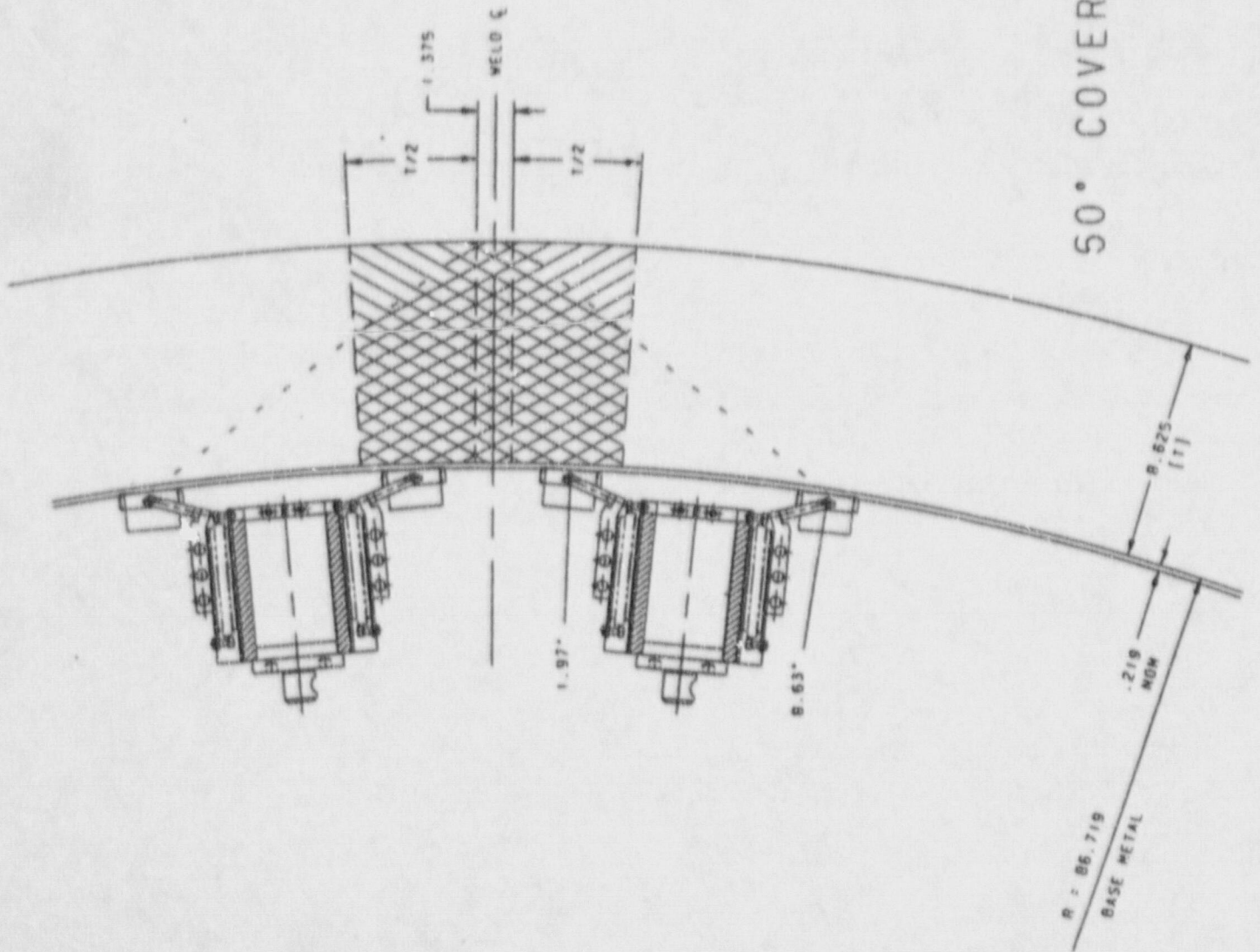


0° COVERAGE
 70° NEAR SURFACE

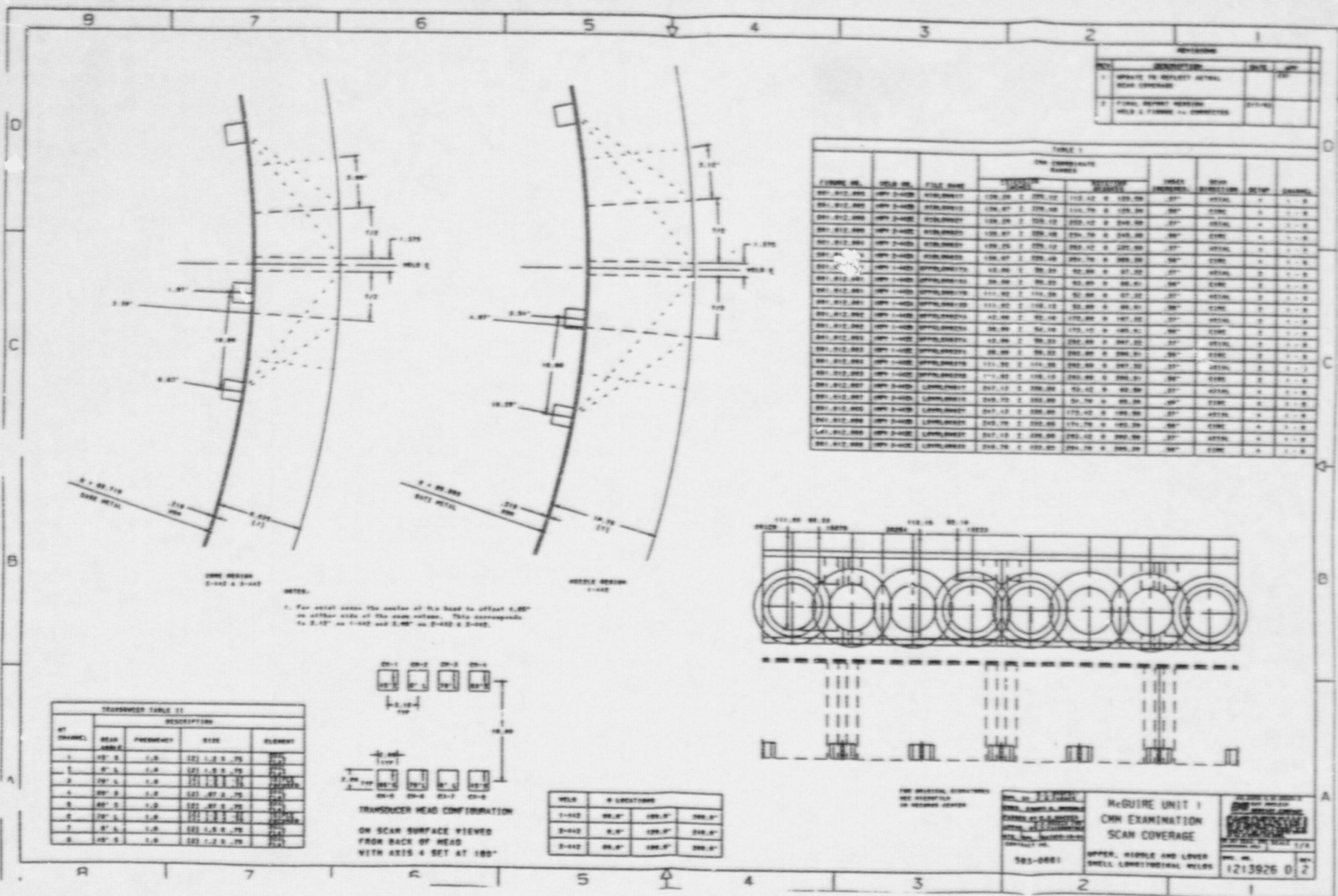


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 ATTACHMENT 2
 B01.012.007, B01.012.008, B01.012.009
 1RPV3-442A, 1RPV3-442B, 1RPV3-442C
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50° COVERAGE



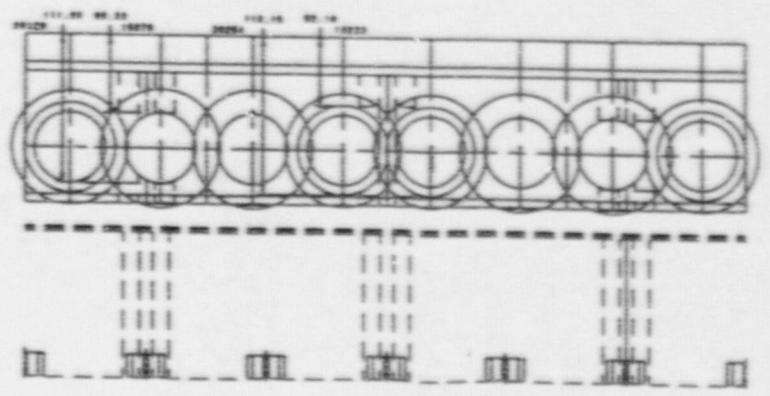
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1RPV3-442A, 1RPV3-442B, 1RPV3-442C
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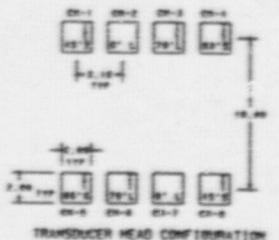
REVISIONS			
NO.	DESCRIPTION	DATE	BY
1	UPDATE TO REFLECT METAL SCAR COVERAGE		
2	FINAL REPORT REVISION WELD S FORMS TO COMPLETE		

TRANS. NO.	WELD NO.	FILE NAME	T-SCAN		S-SCAN		WELD NUMBER	WELD DESCRIPTION	WELD	ORIENT.
			START	STOP	START	STOP				
B01.012.000	WV 3-442	WV3-442-1	128.28	2 221.12	112.42	0 129.59	37"	HTAL	0	1-0
B01.012.000	WV 3-442	WV3-442-2	128.27	2 220.49	114.79	0 129.59	36"	HTAL	0	1-0
B01.012.000	WV 3-442	WV3-442-3	128.28	2 221.12	222.42	0 249.59	37"	HTAL	0	1-0
B01.012.000	WV 3-442	WV3-442-4	128.27	2 220.49	224.79	0 249.59	36"	HTAL	0	1-0
B01.012.000	WV 3-442	WV3-442-5	128.28	2 221.12	222.42	0 221.59	37"	HTAL	0	1-0
B01.012.000	WV 3-442	WV3-442-6	128.27	2 220.49	224.79	0 221.59	36"	HTAL	0	1-0
B01.012.001	WV 1-442	WV1-442-1	12.28	2 92.33	92.49	0 97.33	37"	HTAL	2	1-0
B01.012.001	WV 1-442	WV1-442-2	28.28	2 98.33	98.49	0 98.33	36"	HTAL	2	1-0
B01.012.001	WV 1-442	WV1-442-3	111.22	2 114.28	92.49	0 97.33	37"	HTAL	2	1-0
B01.012.001	WV 1-442	WV1-442-4	111.22	2 114.28	92.49	0 98.33	36"	HTAL	2	1-0
B01.012.002	WV 1-442	WV1-442-5	42.28	2 92.49	172.49	0 181.33	37"	HTAL	2	1-0
B01.012.002	WV 1-442	WV1-442-6	28.28	2 98.33	172.49	0 181.33	36"	HTAL	2	1-0
B01.012.003	WV 1-442	WV1-442-7	42.28	2 98.33	232.49	0 241.33	37"	HTAL	2	1-0
B01.012.003	WV 1-442	WV1-442-8	28.28	2 98.33	232.49	0 241.33	36"	HTAL	2	1-0
B01.012.004	WV 1-442	WV1-442-9	111.22	2 114.28	232.49	0 241.33	37"	HTAL	2	1-0
B01.012.004	WV 1-442	WV1-442-10	111.22	2 114.28	232.49	0 241.33	36"	HTAL	2	1-0
B01.012.007	WV 3-442	WV3-442-1	247.12	2 250.09	92.42	0 42.99	37"	HTAL	0	1-0
B01.012.007	WV 3-442	WV3-442-2	248.72	2 250.09	92.42	0 42.99	36"	HTAL	0	1-0
B01.012.008	WV 3-442	WV3-442-3	247.12	2 250.09	172.42	0 181.33	37"	HTAL	0	1-0
B01.012.008	WV 3-442	WV3-442-4	248.72	2 250.09	172.42	0 181.33	36"	HTAL	0	1-0
B01.012.009	WV 3-442	WV3-442-5	247.12	2 250.09	232.42	0 241.33	37"	HTAL	0	1-0
B01.012.009	WV 3-442	WV3-442-6	248.72	2 250.09	232.42	0 241.33	36"	HTAL	0	1-0

1. For metal areas the center of the head to offset 0.80" on either side of the seam return. This corresponds to 2.12" on 1-442 and 3.90" on 2-442 & 3-442.



TRANSDUCER TABLE 21				
DESCRIPTION				
WT CHANNEL	HEAD ASSEMBLY	FREQUENCY	SIZE	ELEMENT
1	45° S	1.0	121 1-2 0 .75	221
1	45° L	1.0	121 1-3 0 .75	222
2	70° L	1.0	121 1-3 0 .75	223
4	80° S	1.2	121 .87 0 .75	224
5	80° S	1.2	121 .87 0 .75	225
6	70° L	1.0	121 1-3 0 .75	226
7	45° L	1.0	121 1-3 0 .75	227
8	45° S	1.0	121 1-2 0 .75	228



WELD	S LOCATIONS
1-442	80.0" 100.0" 200.0"
2-442	0.0" 120.0" 210.0"
3-442	80.0" 100.0" 200.0"

ON SCAR SURFACE VIEWED FROM BACK OF HEAD WITH AXIS 4 SET AT 180°

McGUIRE UNIT 1
 CMH EXAMINATION
 SCAN COVERAGE

583-0001

1213926 0 2

EXAMINATION COVERAGE FOR WELD: 4-469 (FULL NODE)
LOWER HEAD-TO-BOTTOM HEAD
AGGREGATE COVERAGE OBTAINED: 29%
SCAN PLAN DRAWING NO.: 1213927D-02

Zone Coverage Obtained									
Weld: 31%			Adjacent Base Metal 29%				Near (ID) Surface: 29%		
Examination Volume Definition									
Weld Length: 425.57 in.									
Area Measurement					Volume Calculation				
Weld 7.41 sq. in.					Weld 3151.992 cu. in.				
Adjacent Base Metal 29.65 sq. in.					Adjacent Base Metal 12697.29 cu. in.				
Near Surface 6.65 sq. in.					Near Surface 2913.765 cu. in.				
Examination Coverage Calculations									
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined		
1	0	n/a	7.4	6.8	65.5	65.5	100%	SCAN "A"	
2	0	n/a	7.4	7.2	53.2	53.2	100%	SCAN "B"	
3	0	n/a	7.4	6.8	65.5	65.5	100%	SCAN "C"	
4	0	n/a	7.4	18.9	139.8	139.8	100%	SCAN "D"	
5	0	n/a	7.4	9.9	73.2	73.2	100%	SCAN "E"	
6	0	n/a	7.4	21.9	162.1	162.1	100%	SCAN "F"	
7	0	n/a	7.4	36.1	262.1	262.1	100%	SCAN "G"	
8	0	n/a	7.4	6.8	65.5	65.5	100%	SCAN "H"	
9	0	n/a	0.0	303.0	0.0	2245.1	0%	NOT USED	
10	45	1	7.4	6.8	65.5	65.5	100%	SCAN "A"	
11	45	1	7.4	7.2	53.2	53.2	100%	SCAN "B"	
12	45	1	7.4	6.8	65.5	65.5	100%	SCAN "C"	
13	45	1	7.4	18.9	139.8	139.8	100%	SCAN "D"	
14	45	1	7.4	9.9	73.2	73.2	100%	SCAN "E"	
15	45	1	7.4	21.9	162.1	162.1	100%	SCAN "F"	
16	45	1	7.4	36.1	262.1	262.1	100%	SCAN "G"	
17	45	1	7.4	6.8	65.5	65.5	100%	SCAN "H"	
18	45	1	7.4	6.8	65.5	65.5	100%	SCAN "I"	
19	45	1	0.0	303.0	0.0	2245.1	0%	NOT USED	
20	45	2	7.4	6.8	65.5	65.5	100%	SCAN "A"	
21	45	2	7.4	7.2	53.2	53.2	100%	SCAN "B"	
22	45	2	7.4	6.8	65.5	65.5	100%	SCAN "C"	
23	45	2	7.4	18.9	139.8	139.8	100%	SCAN "D"	
24	45	2	7.4	9.9	73.2	73.2	100%	SCAN "E"	
25	45	2	7.4	21.9	162.1	162.1	100%	SCAN "F"	
26	45	2	7.4	36.1	262.1	262.1	100%	SCAN "G"	
27	45	2	7.4	6.8	65.5	65.5	100%	SCAN "H"	
28	45	2	0.0	303.0	0.0	2245.1	0%	NOT USED	
29	45	3	7.4	6.8	65.5	65.5	100%	SCAN "A"	
30	45	3	7.4	7.2	53.2	53.2	100%	SCAN "B"	
31	45	3	7.4	6.8	65.5	65.5	100%	SCAN "C"	
32	45	3	7.4	18.9	139.8	139.8	100%	SCAN "D"	
33	45	3	7.4	9.9	73.2	73.2	100%	SCAN "E"	
34	45	3	7.4	21.9	162.1	162.1	100%	SCAN "F"	
35	45	3	7.4	36.1	262.1	262.1	100%	SCAN "G"	
36	45	3	7.4	6.8	65.5	65.5	100%	SCAN "H"	
37	45	3	0.0	303.0	0.0	2245.1	0%	NOT USED	
38	45	4	0.0	6.8	0.0	65.5	0%	SCAN "A"	
39	45	4	7.4	7.2	53.2	53.2	100%	SCAN "B"	
40	45	4	7.4	6.8	65.5	65.5	100%	SCAN "C"	
41	45	4	7.4	18.9	139.8	139.8	100%	SCAN "D"	
42	45	4	7.4	9.9	73.2	73.2	100%	SCAN "E"	
43	45	4	7.4	21.9	162.1	162.1	100%	SCAN "F"	
44	45	4	7.4	36.1	262.1	262.1	100%	SCAN "G"	

45	45	4	7.4	8.8	65.5	65.5	100%	SCAN "I"
46	45	4	0.0	303.0	0.0	2245.1	0%	NOT USED
47	60	1	7.4	8.8	65.5	65.5	100%	SCAN "A"
48	60	1	7.4	7.2	53.2	53.2	100%	SCAN "B"
49	60	1	7.4	8.8	65.5	65.5	100%	SCAN "C"
50	60	1	7.4	18.9	139.8	139.8	100%	SCAN "D"
51	60	1	7.4	9.9	73.2	73.2	100%	SCAN "E"
52	60	1	7.4	21.9	162.1	162.1	100%	SCAN "F"
53	60	1	7.4	38.1	282.1	282.1	100%	SCAN "G"
54	60	1	7.4	8.8	65.5	65.5	100%	SCAN "I"
55	60	1	0.0	303.0	0.0	2245.1	0%	NOT USED
56	60	2	7.4	8.8	65.5	65.5	100%	SCAN "A"
57	60	2	7.4	7.2	53.2	53.2	100%	SCAN "B"
58	60	2	7.4	8.8	65.5	65.5	100%	SCAN "C"
72	60	2	7.4	18.9	139.8	139.8	100%	SCAN "D"
59	60	2	7.4	9.9	73.2	73.2	100%	SCAN "E"
60	60	2	7.4	21.9	162.1	162.1	100%	SCAN "F"
61	60	2	7.4	38.1	282.1	282.1	100%	SCAN "G"
62	60	2	7.4	8.8	65.5	65.5	100%	SCAN "I"
63	60	2	0.0	303.0	0.0	2245.1	0%	NOT USED
64	60	3	7.4	8.8	65.5	65.5	100%	SCAN "A"
65	60	3	7.4	7.2	53.2	53.2	100%	SCAN "B"
66	60	3	7.4	8.8	65.5	65.5	100%	SCAN "C"
67	60	3	7.4	18.9	139.8	139.8	100%	SCAN "D"
68	60	3	7.4	9.9	73.2	73.2	100%	SCAN "E"
69	60	3	7.4	21.9	162.1	162.1	100%	SCAN "F"
70	60	3	7.4	38.1	282.1	282.1	100%	SCAN "G"
71	60	3	7.4	8.8	65.5	65.5	100%	SCAN "I"
72	60	3	0.0	303.0	0.0	2245.1	0%	NOT USED
73	60	4	7.4	8.8	65.5	65.5	100%	SCAN "A"
74	60	4	7.4	7.2	53.2	53.2	100%	SCAN "B"
75	60	4	7.4	8.8	65.5	65.5	100%	SCAN "C"
76	60	4	7.4	18.9	139.8	139.8	100%	SCAN "D"
77	60	4	7.4	9.9	73.2	73.2	100%	SCAN "E"
78	60	4	7.4	21.9	162.1	162.1	100%	SCAN "F"
79	60	4	7.4	38.1	282.1	282.1	100%	SCAN "G"
80	60	4	7.4	8.8	65.5	65.5	100%	SCAN "I"
81	60	4	0.0	303.0	0.0	2245.1	0%	NOT USED
			Totals:		7189.8	22970.9	31%	

Adjacent Base Metal

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined	
1	0	n/a	29.9	8.8	263.9	263.9	100%	SCAN "A"
2	0	n/a	29.9	7.2	214.3	214.3	100%	SCAN "B"
3	0	n/a	29.9	8.8	263.9	263.9	100%	SCAN "C"
4	0	n/a	29.9	18.9	563.0	563.0	100%	SCAN "D"
5	0	n/a	29.9	9.9	294.9	294.9	100%	SCAN "E"
6	0	n/a	29.9	21.9	653.1	653.1	100%	SCAN "F"
7	0	n/a	29.9	38.1	1136.4	1136.4	100%	SCAN "G"
8	0	n/a	29.9	8.8	263.9	263.9	100%	SCAN "I"
9	0	n/a	0.0	303.0	0.0	9044.0	0%	NOT USED
10	45	1&2	29.9	8.8	263.9	263.9	100%	SCAN "A"
11	45	1&2	29.9	7.2	214.3	214.3	100%	SCAN "B"
12	45	1&2	29.9	8.8	263.9	263.9	100%	SCAN "C"
13	45	1&2	29.9	18.9	563.0	563.0	100%	SCAN "D"
14	45	1&2	29.9	9.9	294.9	294.9	100%	SCAN "E"
15	45	1&2	29.9	21.9	653.1	653.1	100%	SCAN "F"
16	45	1&2	29.9	38.1	1136.4	1136.4	100%	SCAN "G"
17	45	1&2	29.9	8.8	263.9	263.9	100%	SCAN "I"
18	45	1&2	0.0	303.0	0.0	9044.0	0%	NOT USED
19	45	3	29.9	8.8	263.9	263.9	100%	SCAN "A"
20	45	3	29.9	7.2	214.3	214.3	100%	SCAN "B"
21	45	3	29.9	8.8	263.9	263.9	100%	SCAN "C"
22	45	3	29.9	18.9	563.0	563.0	100%	SCAN "D"
23	45	3	29.9	9.9	294.9	294.9	100%	SCAN "E"
24	45	3	29.9	21.9	653.1	653.1	100%	SCAN "F"
25	45	3	29.9	38.1	1136.4	1136.4	100%	SCAN "G"
26	45	3	29.9	8.8	263.9	263.9	100%	SCAN "I"
27	45	3	0.0	303.0	0.0	9044.0	0%	NOT USED

28	45	4	29.9	8.8	263.9	263.9	100%	SCAN "A"
29	45	4	29.9	7.2	214.3	214.3	100%	SCAN "B"
30	45	4	29.9	8.8	263.9	263.9	100%	SCAN "C"
31	45	4	29.9	18.9	563.0	563.0	100%	SCAN "D"
32	45	4	29.9	9.9	294.9	294.9	100%	SCAN "E"
33	45	4	29.9	21.9	653.1	653.1	100%	SCAN "F"
34	45	4	29.9	38.1	1136.4	1136.4	100%	SCAN "G"
35	45	4	29.9	8.8	263.9	263.9	100%	SCAN "I"
36	45	4	0.0	303.0	0.0	9044.0	0%	NOT USED
37	60	1&2	29.9	8.8	263.9	263.9	100%	SCAN "A"
38	60	1&2	29.9	7.2	214.3	214.3	100%	SCAN "B"
39	60	1&2	29.9	8.8	263.9	263.9	100%	SCAN "C"
40	60	1&2	29.9	18.9	563.0	563.0	100%	SCAN "D"
41	60	1&2	29.9	9.9	294.9	294.9	100%	SCAN "E"
42	60	1&2	29.9	21.9	653.1	653.1	100%	SCAN "F"
43	60	1&2	29.9	38.1	1136.4	1136.4	100%	SCAN "G"
44	60	1&2	29.9	8.8	263.9	263.9	100%	SCAN "I"
45	60	1&2	0.0	303.0	0.0	9044.0	0%	NOT USED
46	60	3	29.9	8.8	263.9	263.9	100%	SCAN "A"
47	60	3	29.9	7.2	214.3	214.3	100%	SCAN "B"
48	60	3	29.9	8.8	263.9	263.9	100%	SCAN "C"
49	60	3	29.9	18.9	563.0	563.0	100%	SCAN "D"
50	60	3	29.9	9.9	294.9	294.9	100%	SCAN "E"
51	60	3	29.9	21.9	653.1	653.1	100%	SCAN "F"
52	60	3	29.9	38.1	1136.4	1136.4	100%	SCAN "G"
53	60	3	29.9	8.8	263.9	263.9	100%	SCAN "I"
54	60	3	0.0	303.0	0.0	9044.0	0%	NOT USED
55	60	4	29.9	8.8	263.9	263.9	100%	SCAN "A"
56	60	4	29.9	7.2	214.3	214.3	100%	SCAN "B"
57	60	4	29.9	8.8	263.9	263.9	100%	SCAN "C"
58	60	4	29.9	18.9	563.0	563.0	100%	SCAN "D"
59	60	4	29.9	9.9	294.9	294.9	100%	SCAN "E"
60	60	4	29.9	21.9	653.1	653.1	100%	SCAN "F"
61	60	4	29.9	38.1	1136.4	1136.4	100%	SCAN "G"
62	60	4	29.9	8.8	263.9	263.9	100%	SCAN "I"
62	90	4	0.0	303.0	0.0	9044.0	0%	NOT USED
			Totals:		25573.4	88881.1	29%	

Near Surface

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined	
1	70	axial	6.9	8.8	60.6	60.6	100%	SCAN "A"
2	70	axial	6.9	7.2	49.2	49.2	100%	SCAN "B"
3	70	axial	6.9	8.8	60.6	60.6	100%	SCAN "C"
4	70	axial	6.9	18.9	129.2	129.2	100%	SCAN "D"
5	70	axial	6.9	9.9	67.7	67.7	100%	SCAN "E"
6	70	axial	6.9	21.9	149.9	149.9	100%	SCAN "F"
7	70	axial	6.9	38.1	260.8	260.8	100%	SCAN "G"
8	70	axial	6.9	8.8	60.6	60.6	100%	SCAN "I"
9	70	axial	0.0	303.0	0.0	2075.4	0%	NOT USED
10	70	circ.	6.9	8.8	60.6	60.6	100%	SCAN "A"
11	70	circ.	6.9	7.2	49.2	49.2	100%	SCAN "B"
12	70	circ.	6.9	8.8	60.6	60.6	100%	SCAN "C"
13	70	circ.	6.9	18.9	129.2	129.2	100%	SCAN "D"
14	70	circ.	6.9	9.9	67.7	67.7	100%	SCAN "E"
15	70	circ.	6.9	21.9	149.9	149.9	100%	SCAN "F"
16	70	circ.	6.9	38.1	260.8	260.8	100%	SCAN "G"
17	70	circ.	6.9	8.8	60.6	60.6	100%	SCAN "I"
18	70	circ.	0.0	303.0	0.0	2075.4	0%	NOT USED
			Totals:		1676.7	5027.6	29%	

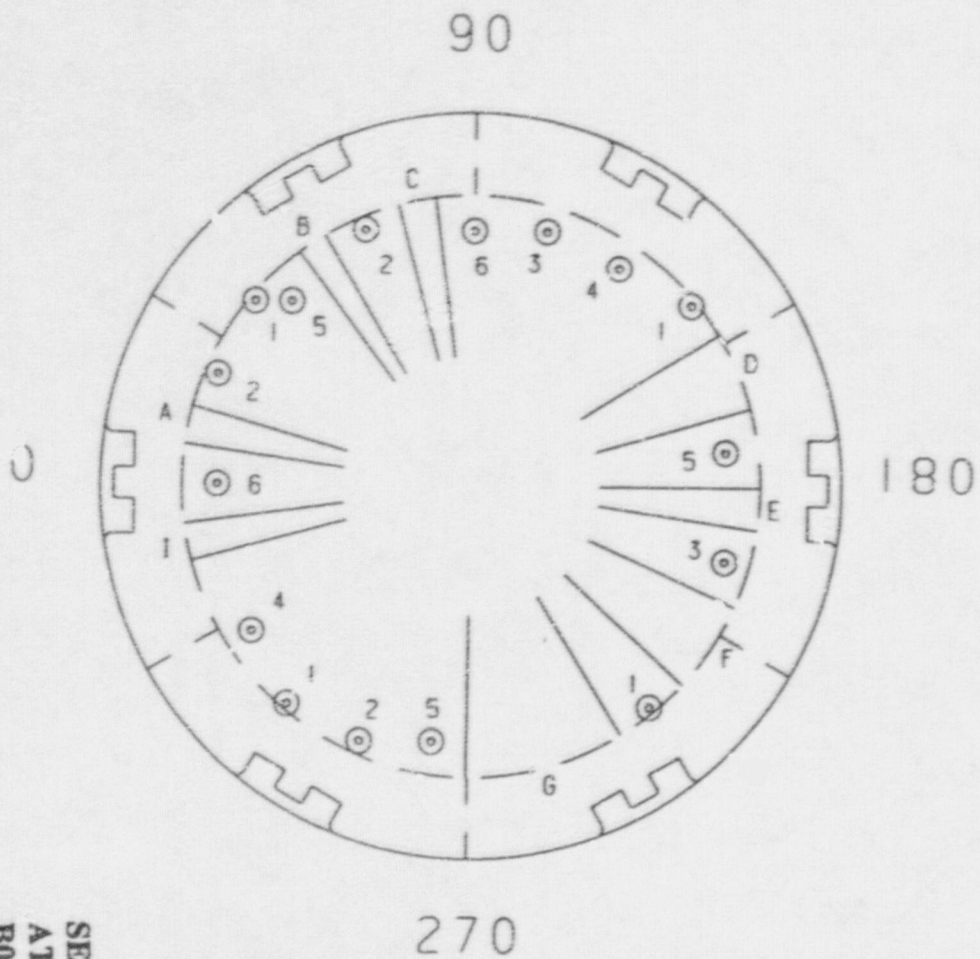
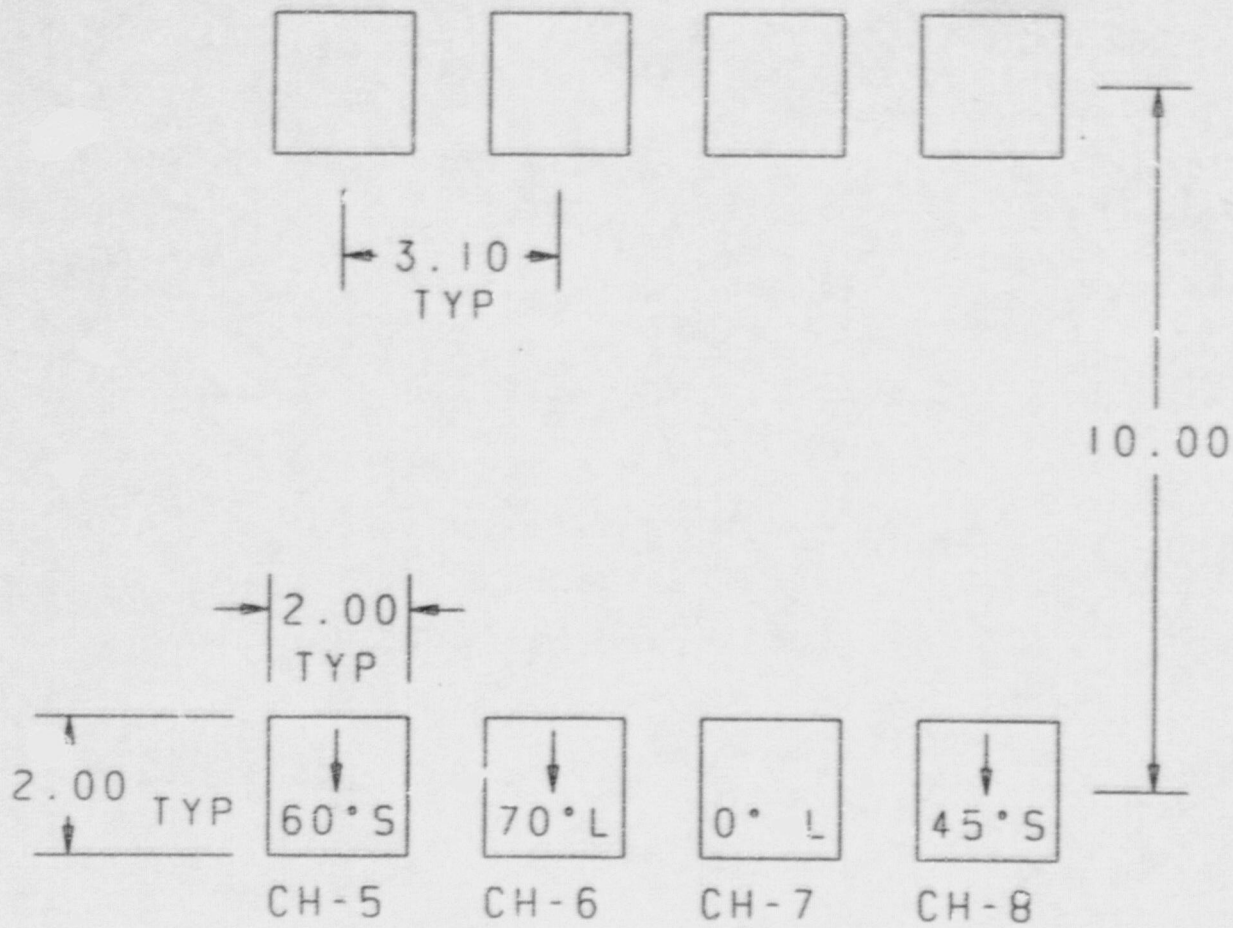


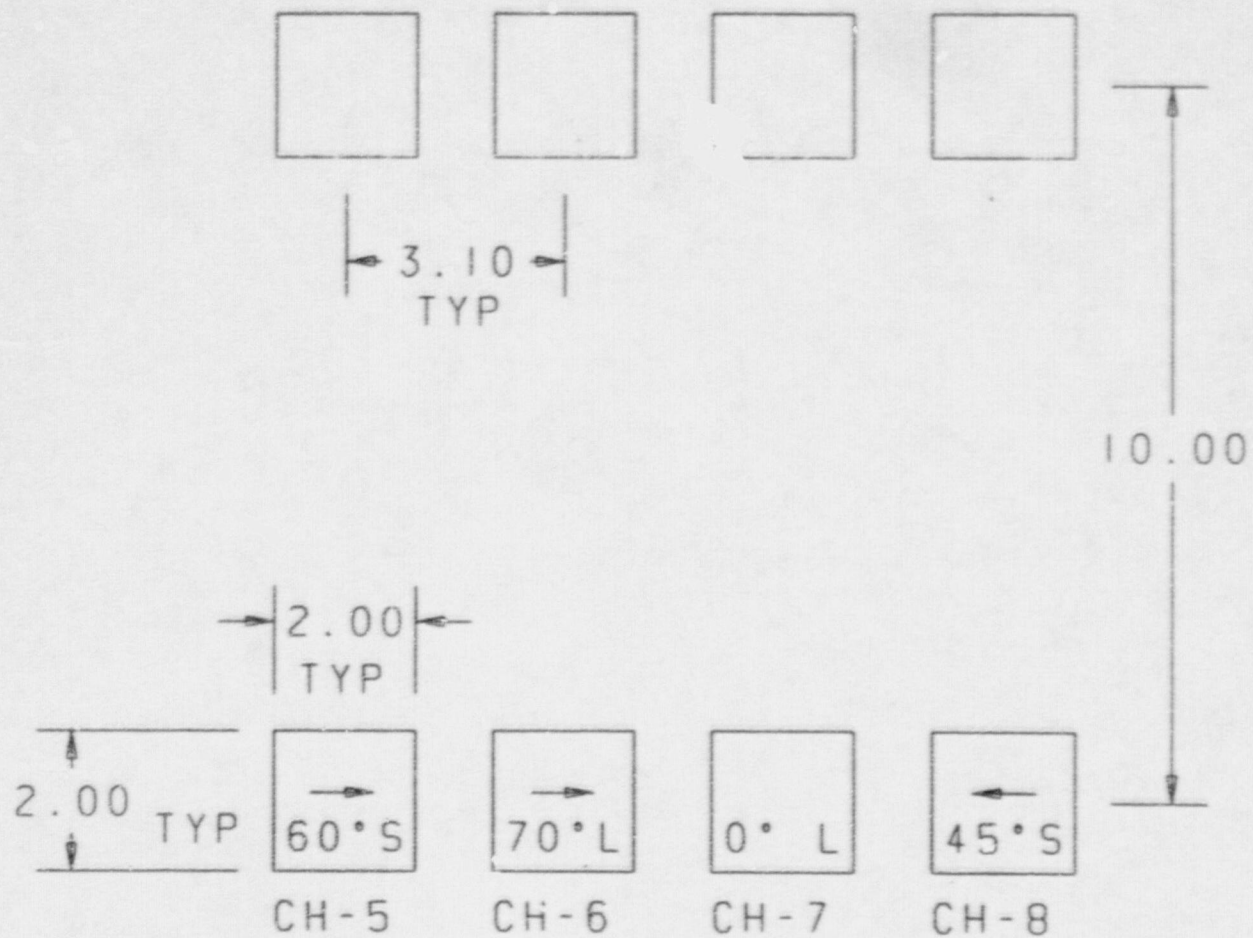
TABLE I	
CMM COORDINATE RANGES	
EXTENSION DEGREES	ROTATION DEGREES
SCAN "A"	7.86 @ 15.34
SCAN "B"	52.86 @ 58.94
SCAN "C"	74.66 @ 82.14
SCAN "D"	148.05 @ 164.01
SCAN "E"	179.73 @ 188.09
SCAN "F"	203.81 @ 222.33
SCAN "G"	238.05 @ 270.27
SCAN "I"	344.66 @ 352.14

00°)



TRANSDUCER HEAD CONFIGURATION (AXIAL SCANS)

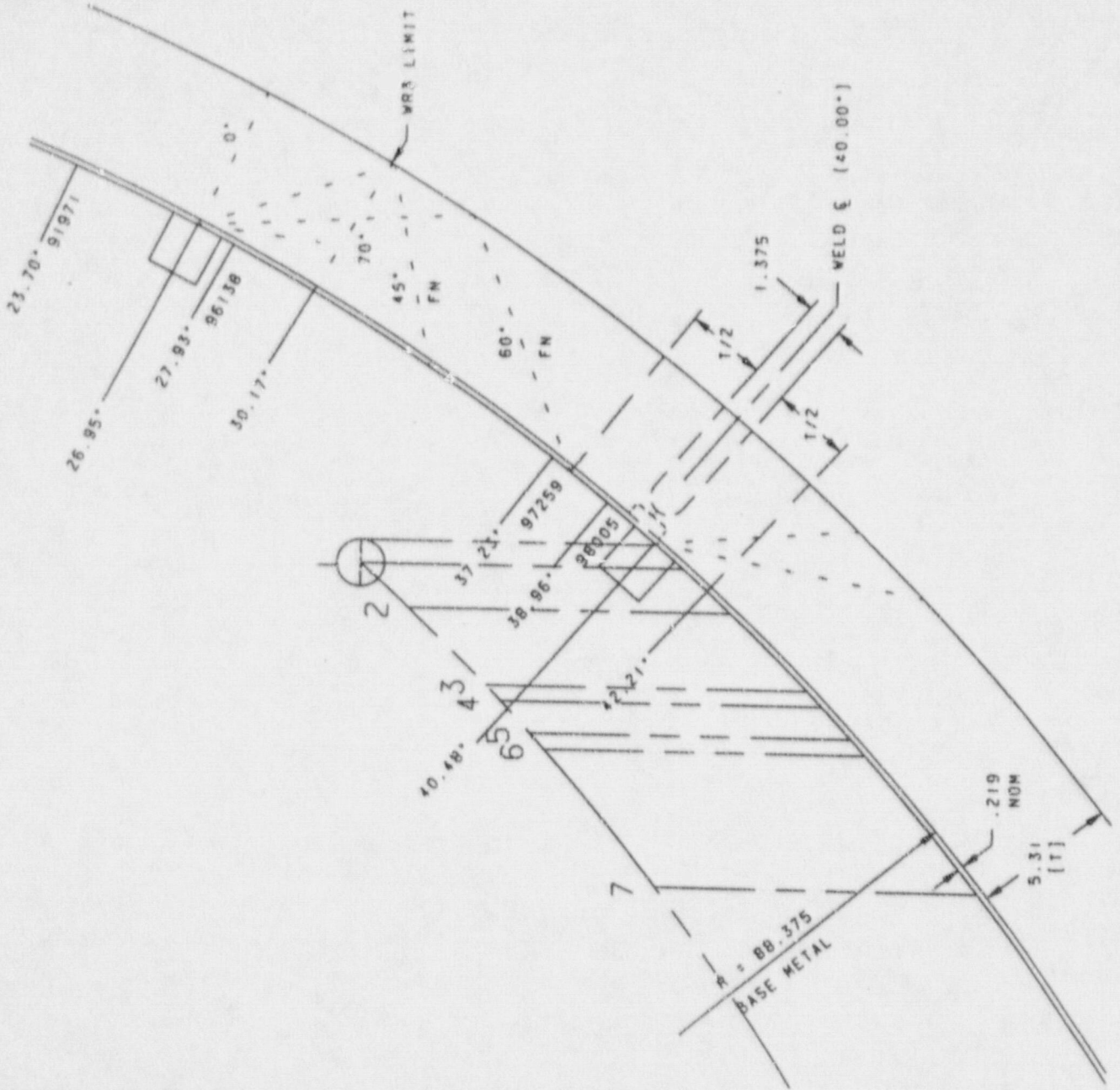
ON SCAN SURFACE VIEWED FROM BACK OF HEAD
AXIS 4 SET AT 180°

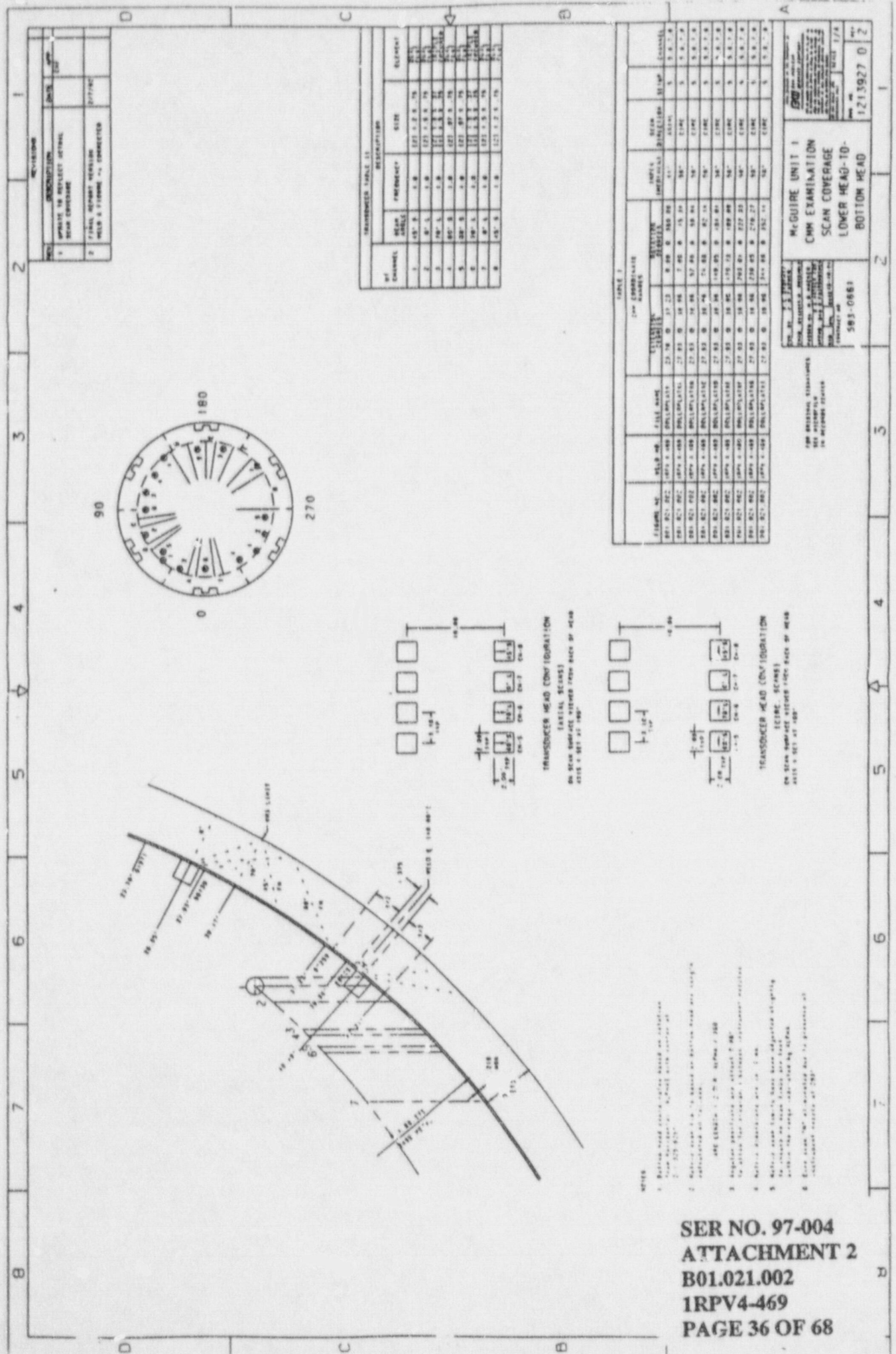


TRANSDUCER HEAD CONFIGURATION

(CIRC. SCANS)

ON SCAN SURFACE VIEWED FROM BACK OF HEAD
 AXIS 4 SET AT 180°





REVISIONS	
NO.	DESCRIPTION
1	APPROXIMATE REFLECTOR DETAIL FROM CONSTRUCTION
2	FINAL REARWARD VIEWING AFTER 4-11-68 - 4-11-68

TRANS-DUCER TABLE 11

WT CHANNEL	WAVELENGTH	FREQUENCY	SIZE	ELEMENT
1	487.5	1.0	123 1.2 2.8 78	87.1
2	487.5	1.0	123 1.2 2.8 78	87.1
3	487.5	1.0	123 1.2 2.8 78	87.1
4	487.5	1.0	123 1.2 2.8 78	87.1
5	487.5	1.0	123 1.2 2.8 78	87.1
6	487.5	1.0	123 1.2 2.8 78	87.1
7	487.5	1.0	123 1.2 2.8 78	87.1
8	487.5	1.0	123 1.2 2.8 78	87.1

TABLE 1

ELEMENT NO.	WAVELENGTH	WAVELENGTH	WAVELENGTH		WAVELENGTH	WAVELENGTH	WAVELENGTH	WAVELENGTH
			WAVELENGTH	WAVELENGTH				
1	487.5	1.0	123 1.2 2.8 78	87.1	87.1	87.1	87.1	87.1
2	487.5	1.0	123 1.2 2.8 78	87.1	87.1	87.1	87.1	87.1
3	487.5	1.0	123 1.2 2.8 78	87.1	87.1	87.1	87.1	87.1
4	487.5	1.0	123 1.2 2.8 78	87.1	87.1	87.1	87.1	87.1
5	487.5	1.0	123 1.2 2.8 78	87.1	87.1	87.1	87.1	87.1
6	487.5	1.0	123 1.2 2.8 78	87.1	87.1	87.1	87.1	87.1
7	487.5	1.0	123 1.2 2.8 78	87.1	87.1	87.1	87.1	87.1
8	487.5	1.0	123 1.2 2.8 78	87.1	87.1	87.1	87.1	87.1

McGUIRE UNIT 1

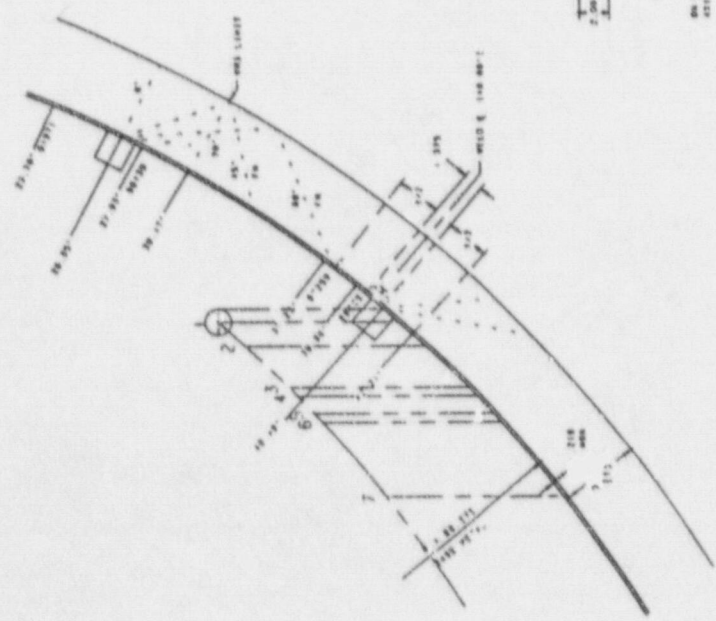
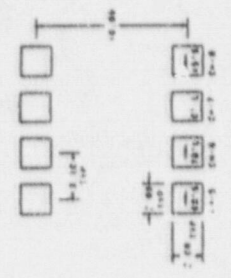
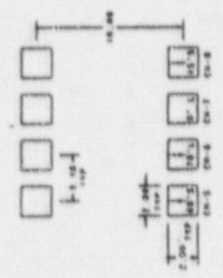
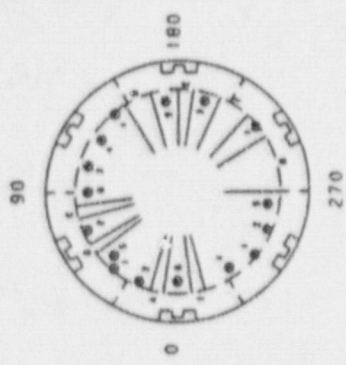
COMMON EXAMINATION

SCAN COVERAGE

LOWER HEAD-TO-BOTTOM HEAD

583-0163

1213927 0 2



NOTES

- Bottom head scan coverage based on operation of 1-11-68.
- Reference to "1" is based on bottom head scan coverage of 1-11-68.
- Bottom head scan coverage based on operation of 1-11-68.
- Bottom head scan coverage based on operation of 1-11-68.
- Bottom head scan coverage based on operation of 1-11-68.
- Bottom head scan coverage based on operation of 1-11-68.

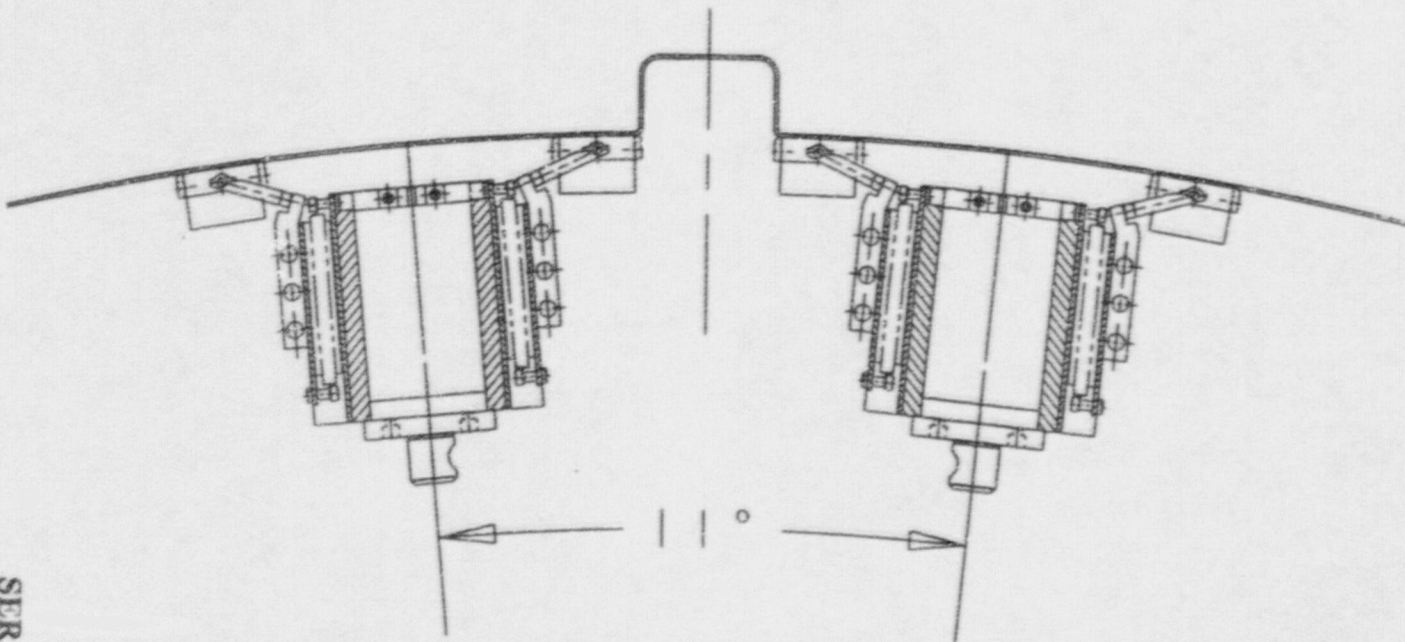
EXAMINATION COVERAGE FOR WELD: 7-442
FLANGE TO UPPER SHELL CIRC WELD
AGGREGATE COVERAGE OBTAINED: 82%
SCAN PLAN DRAWING NO.: 1213923D-02

Zone Coverage Obtained									
Weld: 73%	Adjacent Base Metal: 84%	Near (ID) Surface:				76%			
Weld Length: 538.193 in.									
Area Measurement				Volume Calculation					
Adjacent Base Metal	13.46 sq. in.	Weld	7244.078 cu. in.	Adjacent Base Metal	70006.16 cu. in.	Near Surface	6625.186 cu. in.		
Near Surface	12.31 sq. in.								
Weld									
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined		
1	0	n/a	13.5	406.6	5473.3	5473.3	100%	B.O. & AT KEYWAYS	
2	0	n/a	0.0	131.6	0.0	1770.8	0%	AT SPECIMEN CUT-OUTS	
3	45	1	12.7	340.9	4315.3	4586.0	94%	BETWEEN OBSTRUCTIONS	
4	45	2	13.5	340.9	4586.0	4586.0	100%	BETWEEN OBSTRUCTIONS	
5	45	1	7.8	65.8	515.7	885.4	58%	AT KEYWAYS	
6	45	2	12.0	65.8	786.7	885.4	89%	AT KEYWAYS	
7	45	1	0.0	131.6	0.0	1770.8	0%	AT SPECIMEN CUT-OUTS	
8	45	2	0.1	131.6	17.4	1770.8	1%	AT SPECIMEN CUT-OUTS	
9	45	3	13.5	349.8	4706.6	4706.6	100%	BETWEEN OBSTRUCTIONS	
10	45	4	13.5	349.8	4706.6	4706.6	100%	BETWEEN OBSTRUCTIONS	
11	45	3	13.5	62.8	845.2	845.2	100%	AT KEYWAYS	
12	45	4	13.5	62.8	845.2	845.2	100%	AT KEYWAYS	
13	45	3	0.0	125.6	0.0	1690.3	0%	AT SPECIMEN CUT-OUTS	
14	45	4	0.0	125.6	0.0	1690.3	0%	AT SPECIMEN CUT-OUTS	
15	60	1	6.1	340.9	2072.4	4586.0	45%	BETWEEN OBSTRUCTIONS	
16	60	2	13.5	340.9	4586.0	4586.0	100%	BETWEEN OBSTRUCTIONS	
17	60	1	3.3	65.8	215.8	885.4	24%	AT KEYWAYS	
18	60	2	12.7	65.8	836.7	885.4	94%	AT KEYWAYS	
19	60	1	0.0	131.6	0.0	1770.8	0%	AT SPECIMEN CUT-OUTS	
20	60	2	5.7	131.6	752.5	1770.8	42%	AT SPECIMEN CUT-OUTS	
21	60	3	13.5	349.8	4706.6	4706.6	100%	BETWEEN OBSTRUCTIONS	
22	60	4	13.5	349.8	4706.6	4706.6	100%	BETWEEN OBSTRUCTIONS	
23	60	3	13.5	62.8	845.2	845.2	100%	AT KEYWAYS	
24	60	4	13.5	62.8	845.2	845.2	100%	AT KEYWAYS	
25	60	3	0.0	125.6	0.0	1690.3	0%	AT SPECIMEN CUT-OUTS	
26	60	4	0.0	125.6	0.0	1690.3	0%	AT SPECIMEN CUT-OUTS	
					Totals:	34518.7	47167.2	73%	
Adjacent Base Metal									
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined		
1	0	n/a	130.1	406.6	52894.8	52894.8	100%	B.O. & AT KEYWAYS	
2	0	n/a	52.9	131.6	6961.6	17116.6	41%	AT SPECIMEN CUT-OUTS	
3	45	1&2	130.1	340.9	44339.1	44339.1	100%	BETWEEN OBSTRUCTIONS	
4	45	1&2	118.2	65.8	7772.8	8556.7	91%	AT KEYWAYS	
5	45	1&2	29.3	131.6	3857.3	17113.3	23%	AT SPECIMEN CUT-OUTS	
6	45	3	130.1	349.8	45504.6	45504.6	100%	BETWEEN OBSTRUCTIONS	
7	45	4	130.1	349.8	45504.6	45504.6	100%	BETWEEN OBSTRUCTIONS	
8	45	3	130.1	62.8	8167.7	8167.7	100%	AT KEYWAYS	
9	45	4	130.1	62.8	8167.7	8167.7	100%	AT KEYWAYS	
10	45	3	52.9	125.6	6643.2	16335.4	41%	AT SPECIMEN CUT-OUTS	
11	45	4	52.9	125.6	6643.2	16335.4	41%	AT SPECIMEN CUT-OUTS	
12	60	1&2	122.3	340.9	41890.6	44339.1	94%	BETWEEN OBSTRUCTIONS	
13	60	1&2	112.7	65.8	7411.4	8556.7	87%	AT KEYWAYS	
14	60	1&2	56.4	131.6	7423.9	17113.3	43%	AT SPECIMEN CUT-OUTS	
15	60	3	130.1	349.8	45504.6	45504.6	100%	BETWEEN OBSTRUCTIONS	
16	60	4	130.1	349.8	45504.6	45504.6	100%	BETWEEN OBSTRUCTIONS	
17	60	3	130.1	62.8	8167.7	8167.7	100%	AT KEYWAYS	
18	60	4	130.1	62.8	8167.7	8167.7	100%	AT KEYWAYS	
19	60	3	52.9	125.6	6643.2	16335.4	41%	AT SPECIMEN CUT-OUTS	
20	60	4	52.9	125.6	6643.2	16335.4	41%	AT SPECIMEN CUT-OUTS	
					Totals:	292982.4	350017.0	84%	
Near Surface									
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined		
1	70	axial	12.3	406.6	5005.7	5005.7	100%	BETWEEN OBSTRUCTIONS	
2	70	axial	6.9	406.6	3606.6	5005.7	72%	AT KEYWAYS	
3	70	axial	3.0	406.6	1199.8	5005.7	24%	AT SPECIMEN CUT-OUTS	
4	70	circ	12.3	538.193	6625.2	6625.2	100%	B.O. & AT KEYWAYS	
5	70	circ	4.9	538.193	7647.0	6625.2	40%	AT SPECIMEN CUT-OUTS	
					Totals:	16437.2	21842.1	76%	

AXIAL

(4) KEYWAYS @ $11^\circ = 44^\circ$
LENGTH = 65.78"

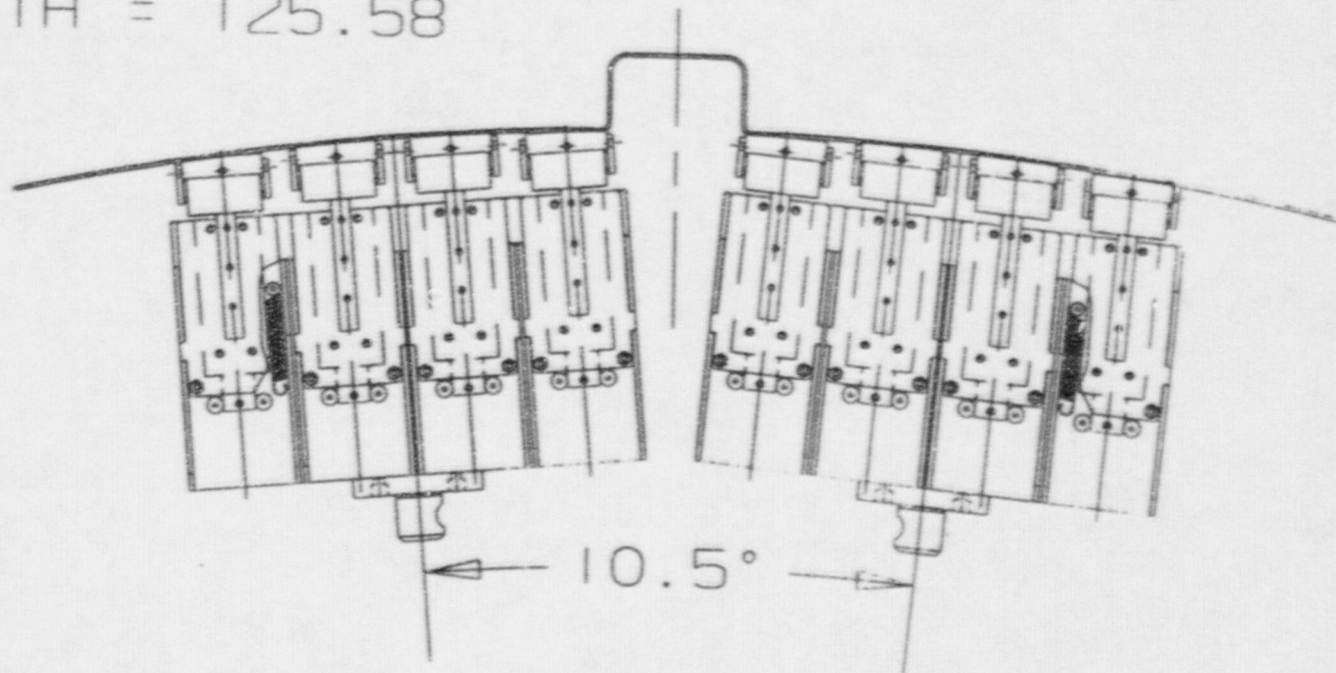
(8) SPECIMEN TUBE CUTOUTS @ $11^\circ = 88^\circ$
LENGTH = 131.56"

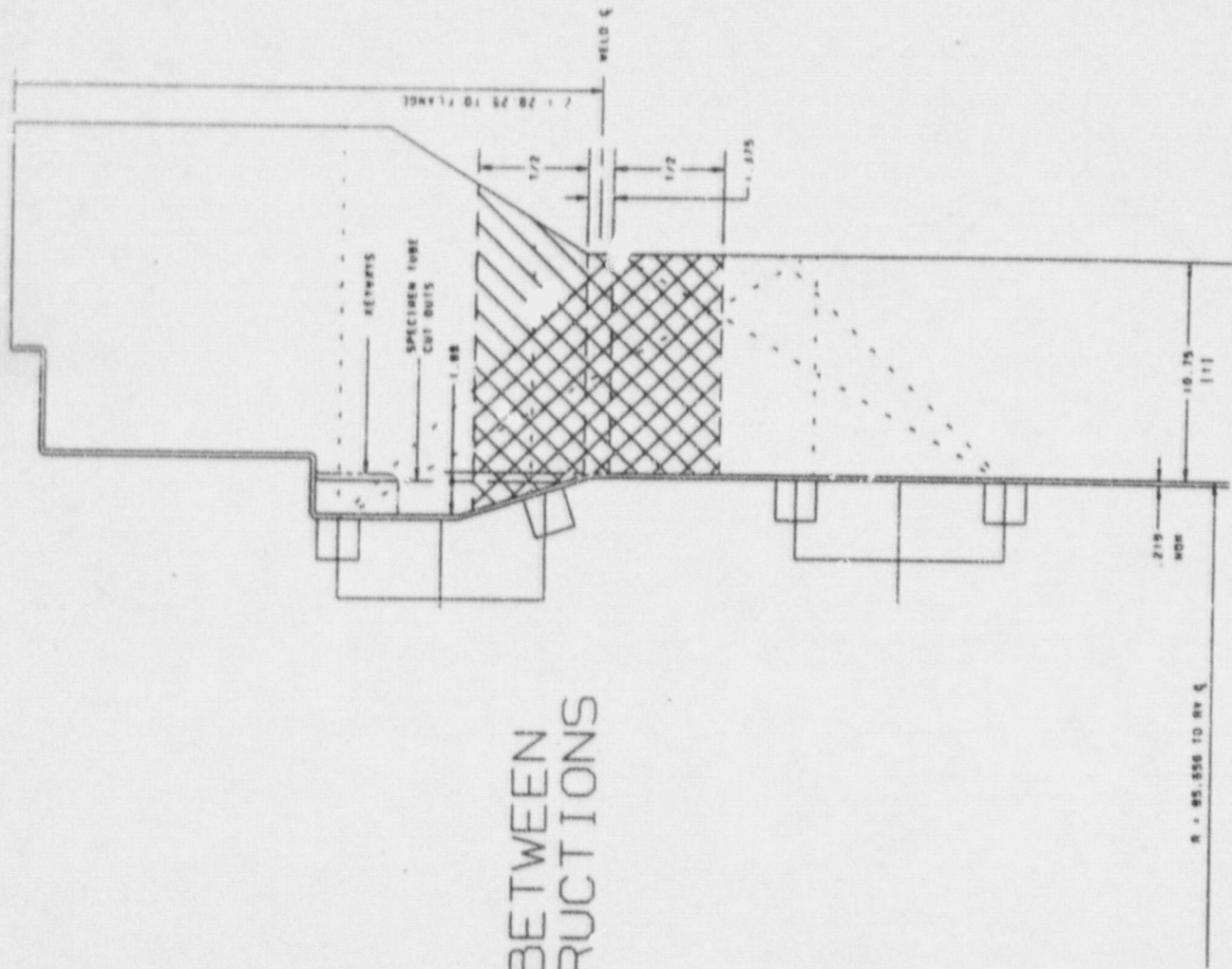


CIRC

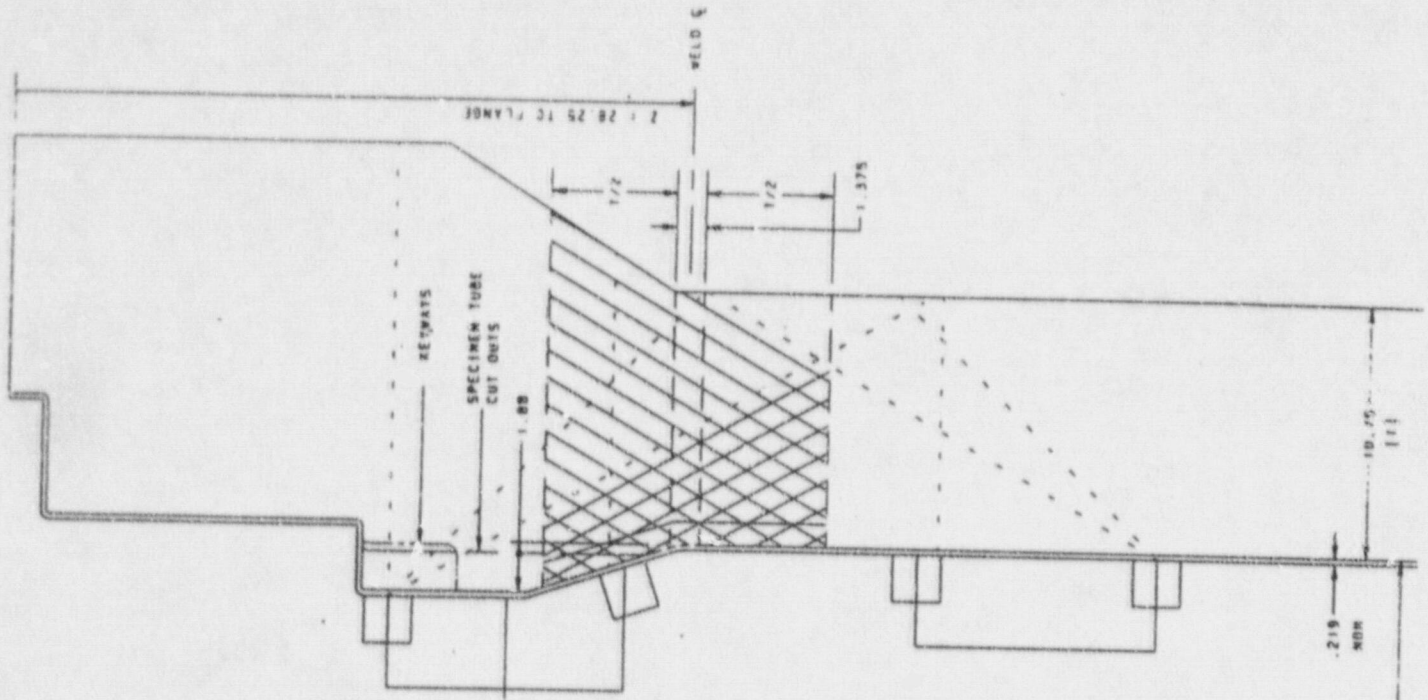
(4) KEYWAYS @ $10.5^\circ = 42^\circ$
LENGTH = 62.79"

(8) SPECIMEN TUBE CUTOUTS @ $10.5^\circ = 84^\circ$
LENGTH = 125.58



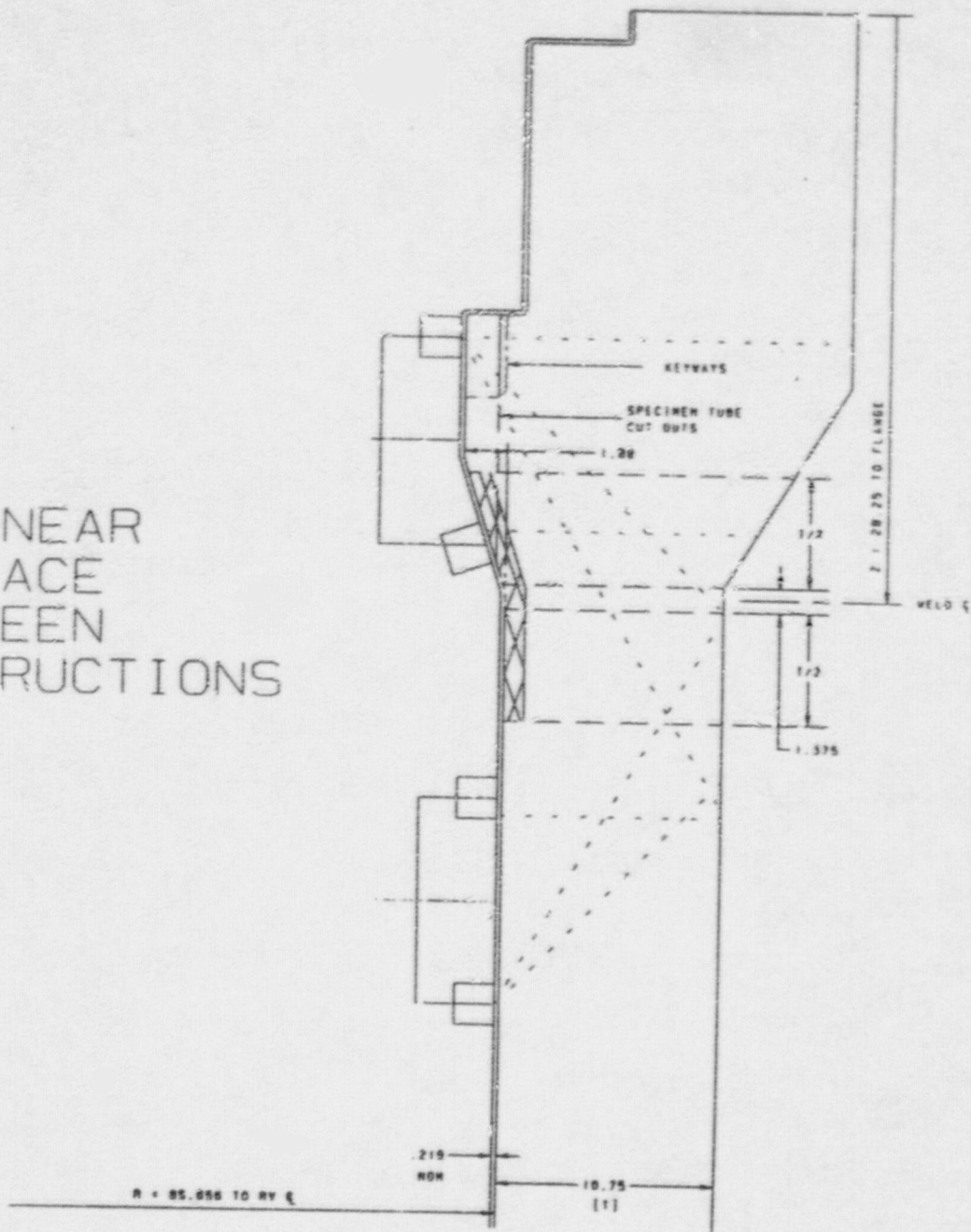


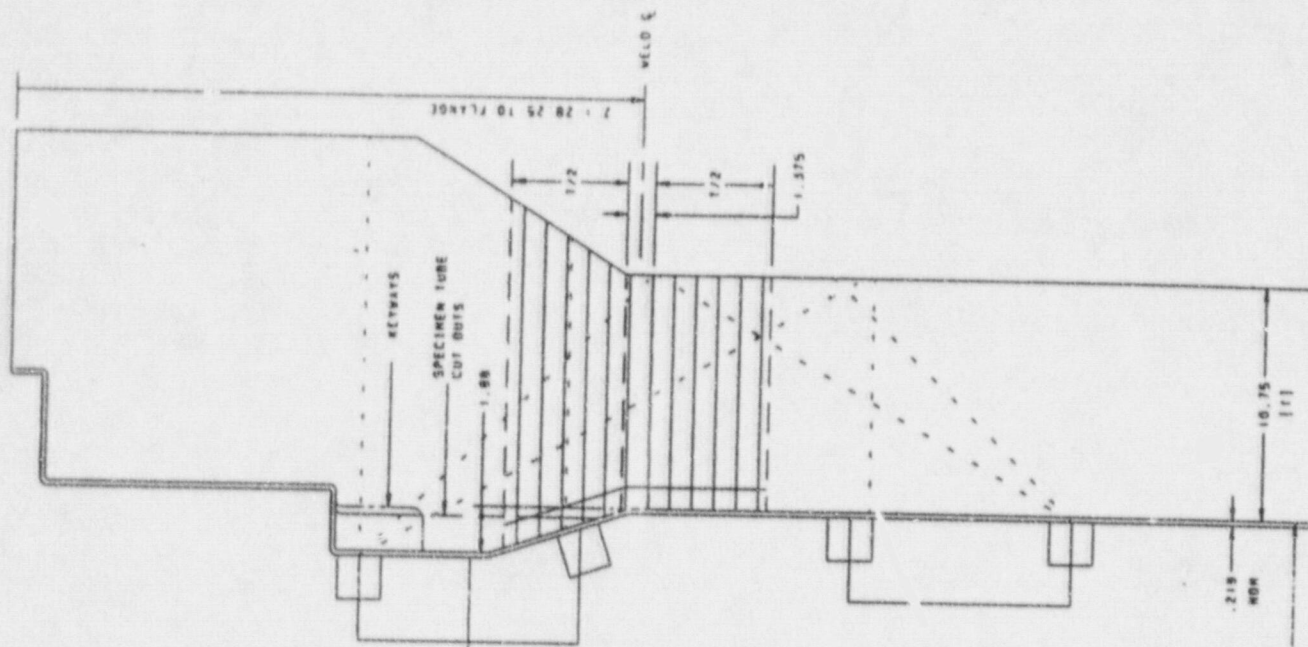
45° BETWEEN OBSTRUCTIONS



60° BETWEEN
OBSTRUCTIONS

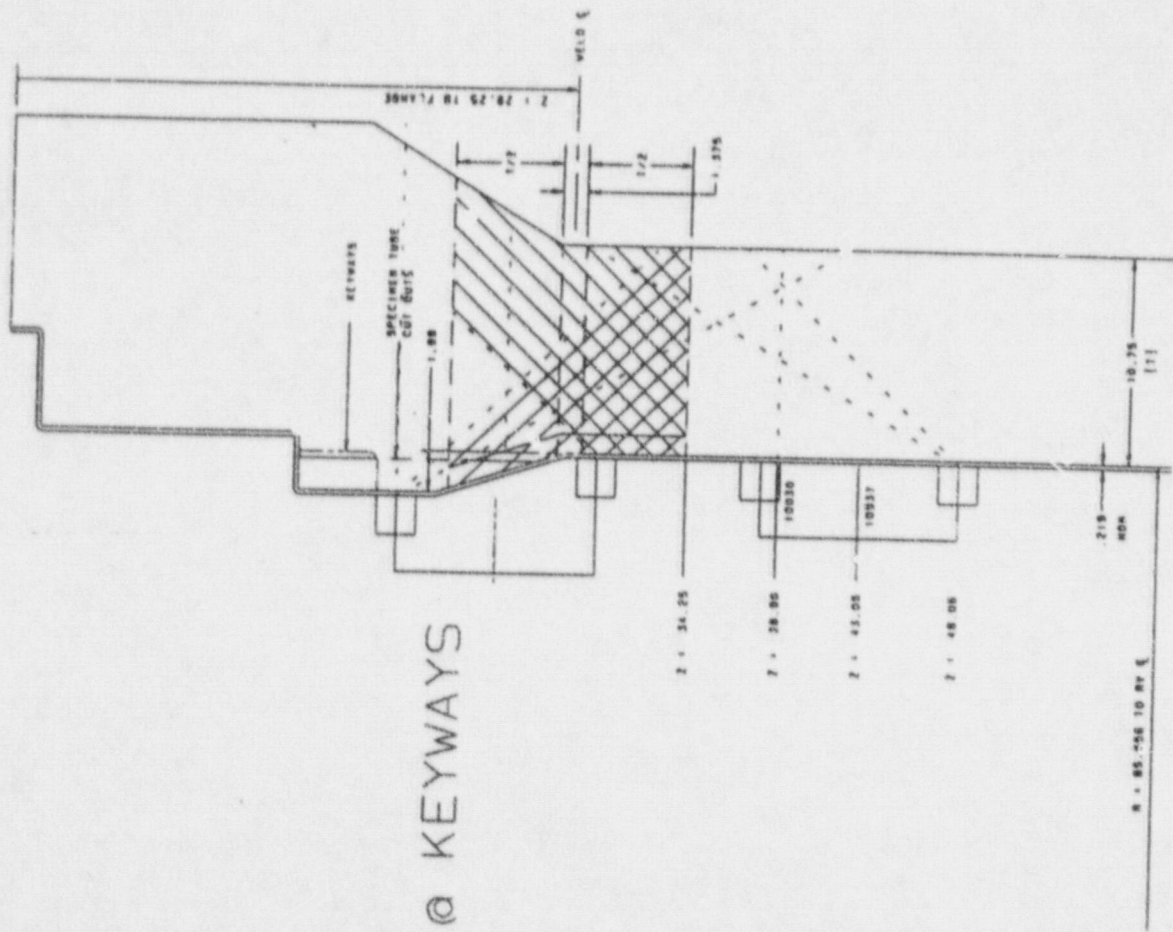
70° NEAR
SURFACE
BETWEEN
OBSTRUCTIONS



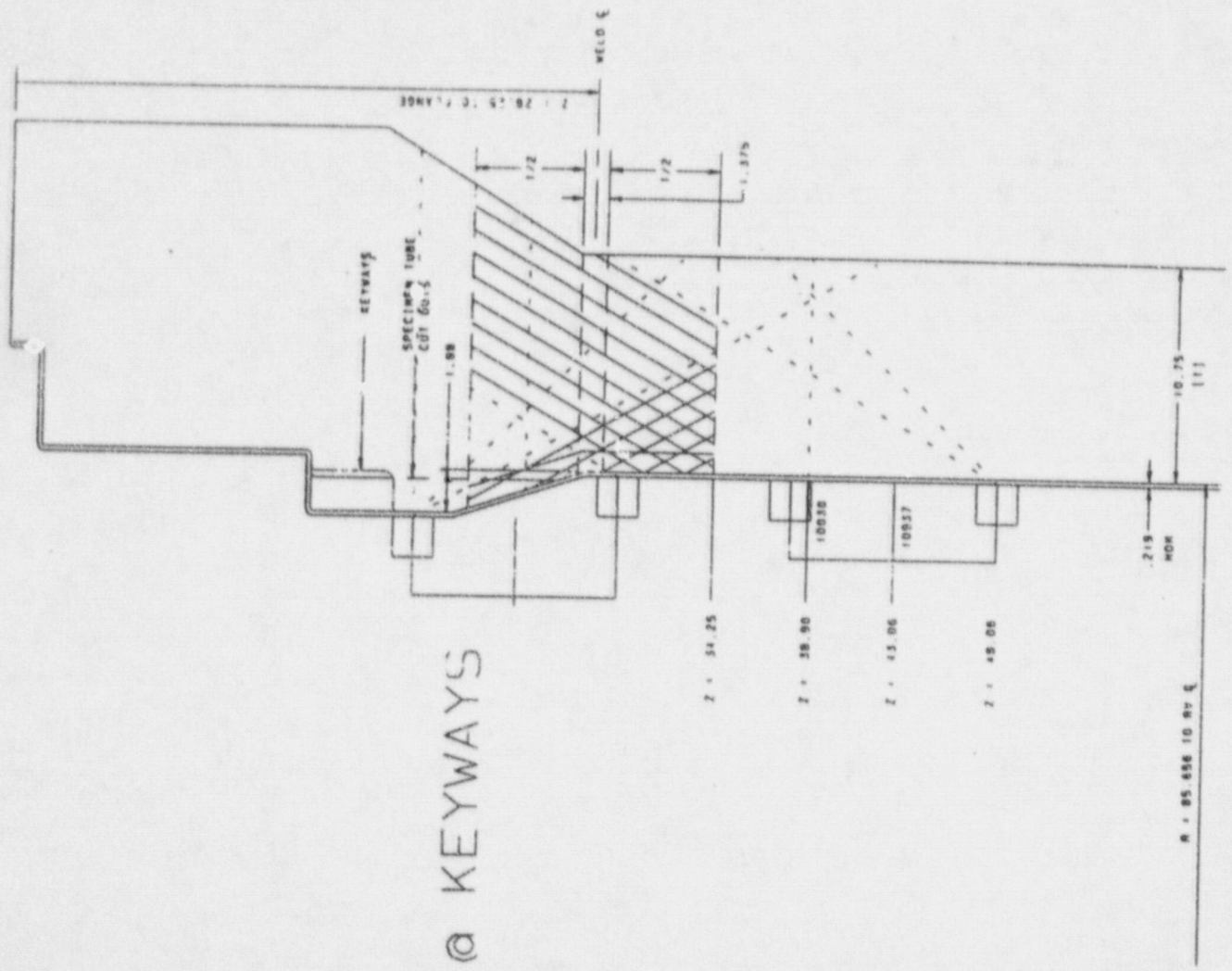


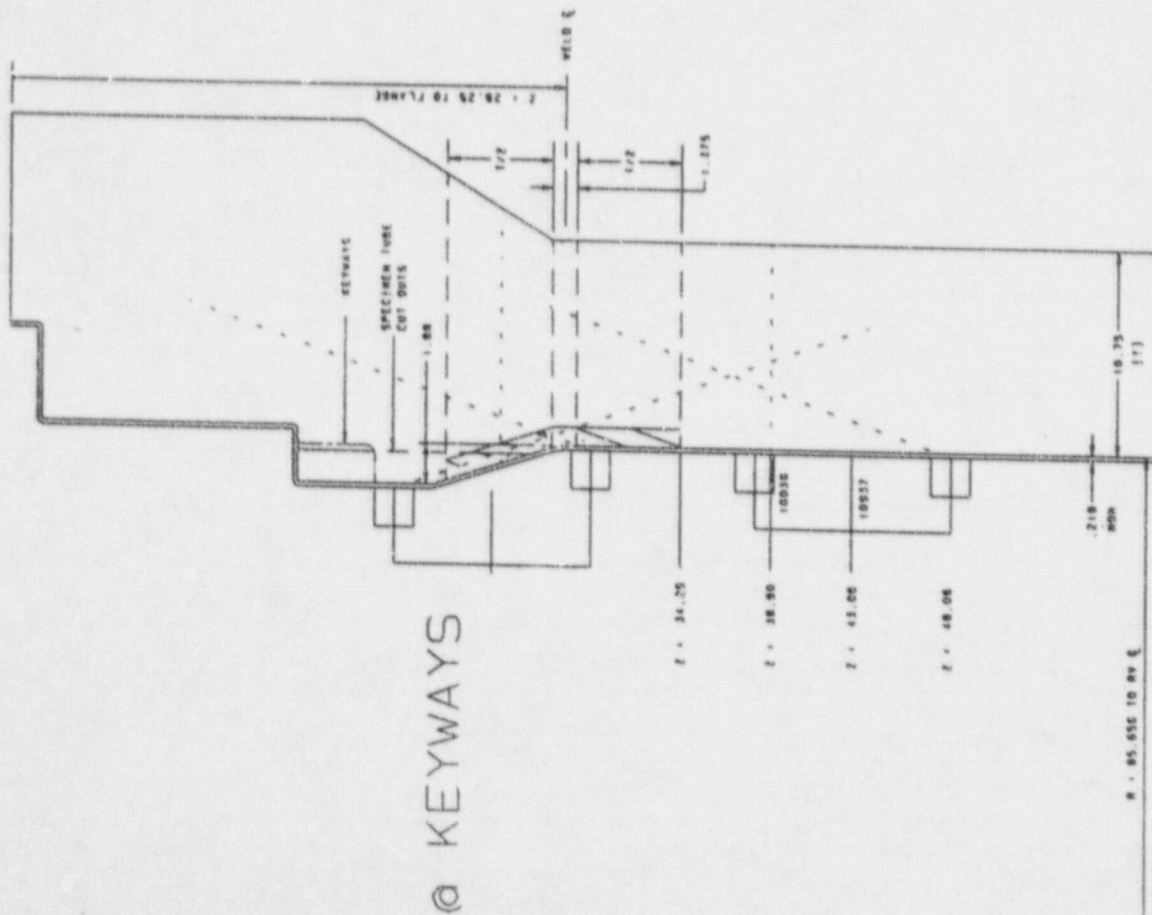
0° BETWEEN
OBSTRUCTIONS

R - 85.656 TO RV 6

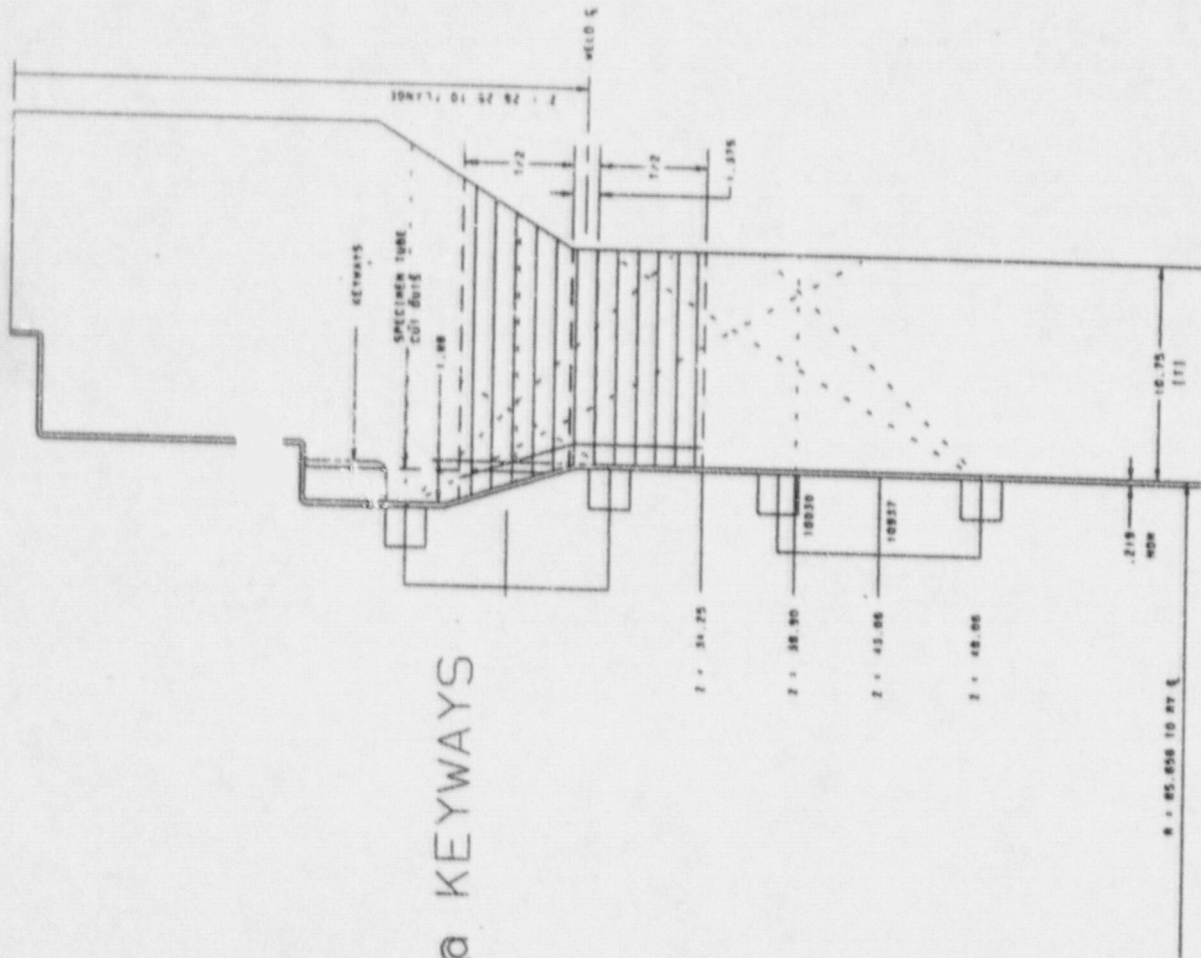


60° @ KEYWAYS

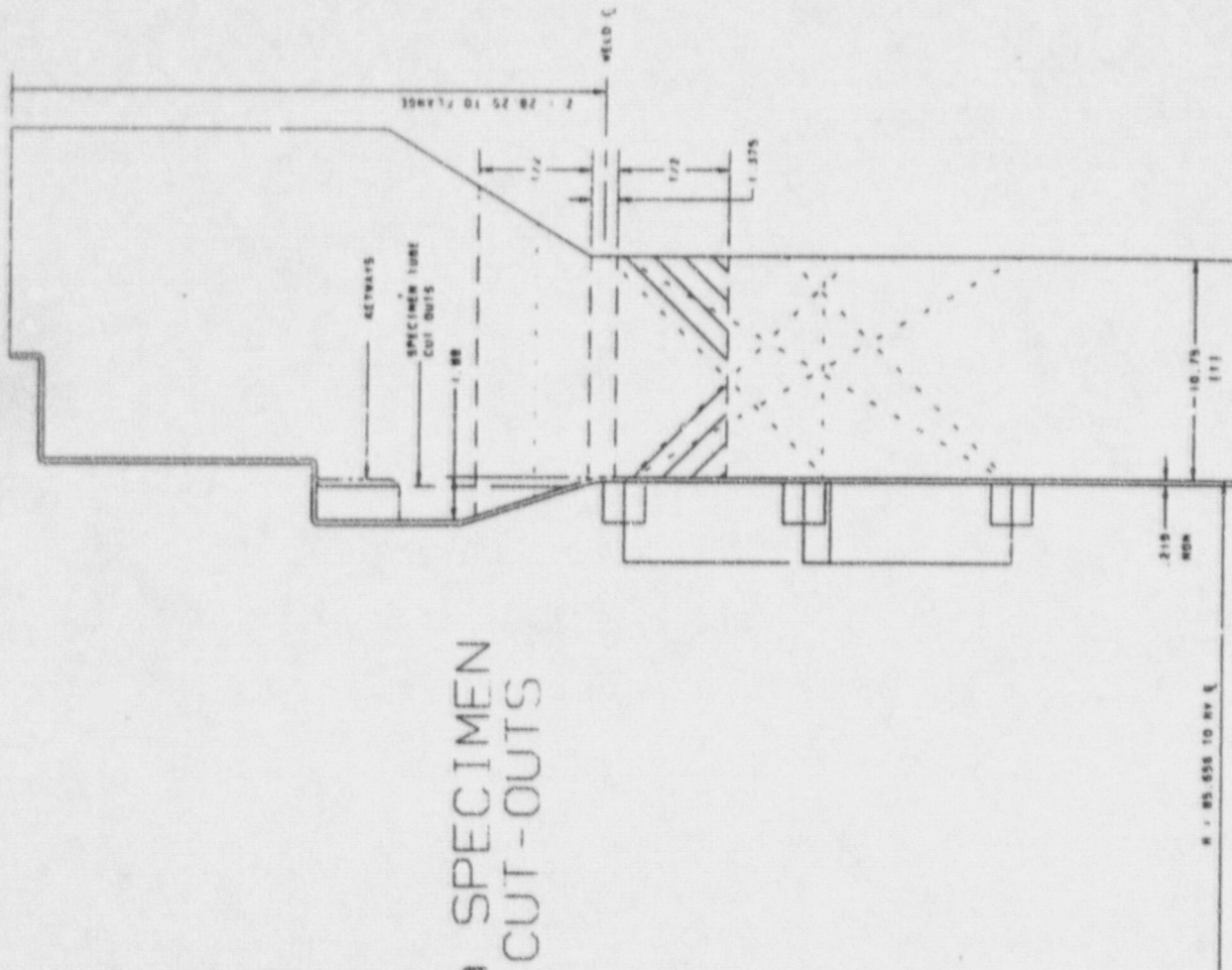




70° @ KEYWAYS

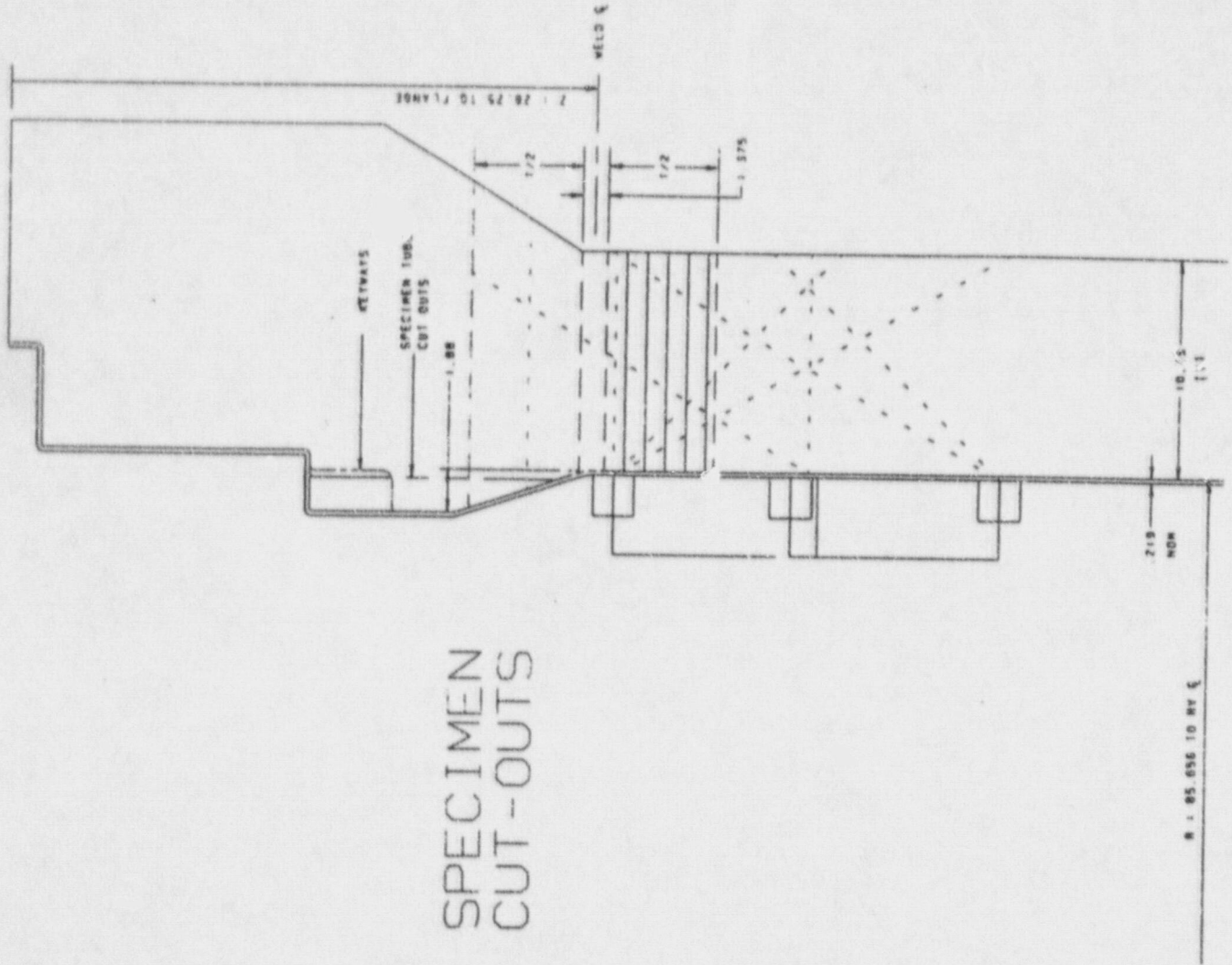


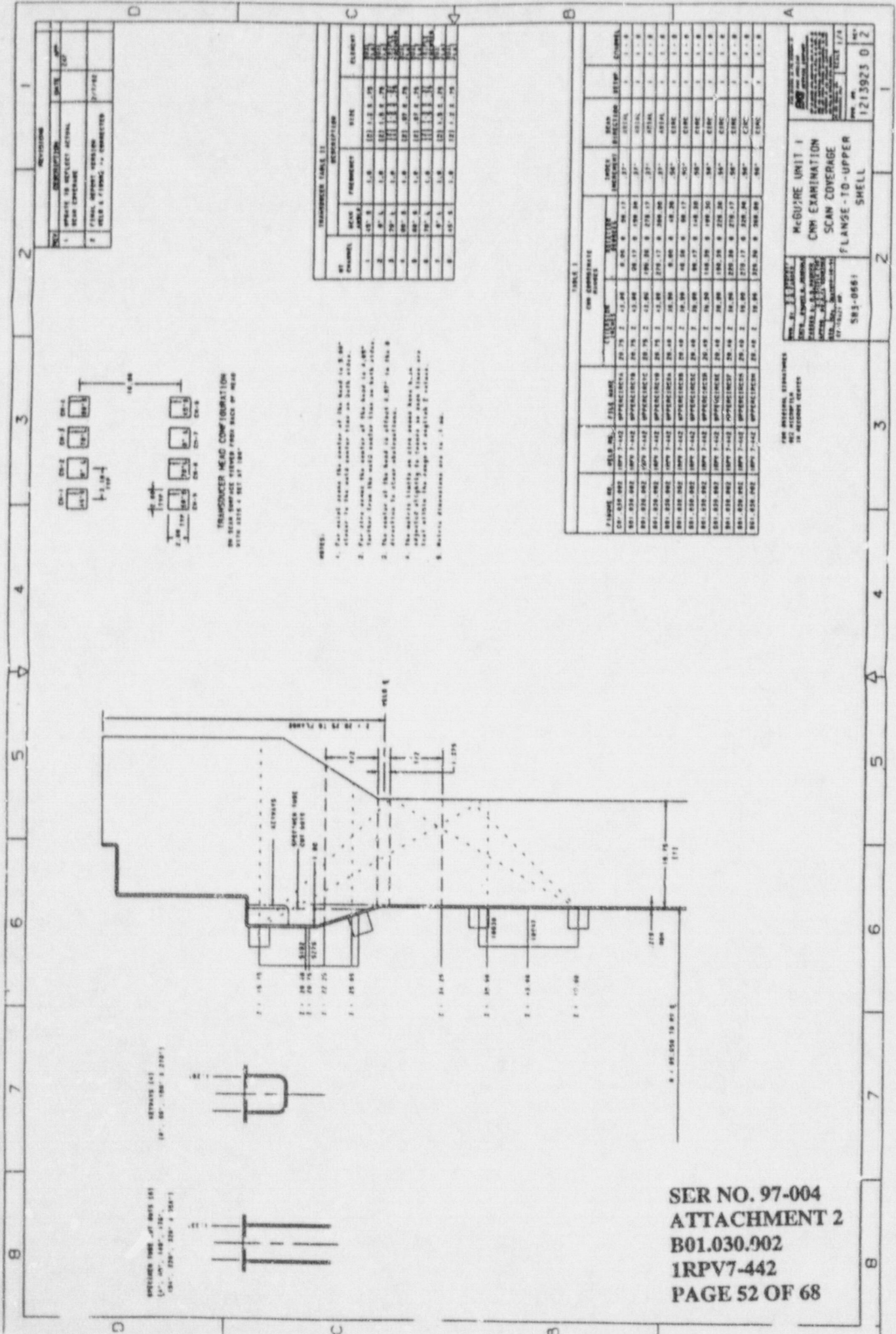
0° @ KEYWAYS



45° @ SPECIMEN
TUBE CUT-OUTS

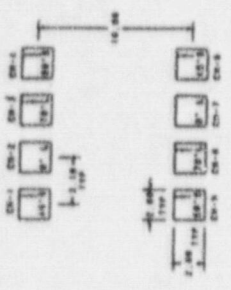
0° @ SPECIMEN
TUBE CUT-OUTS





REVISIONS

NO.	DESCRIPTION	DATE	BY
1	ISSUE TO REFLECT ACTUAL SCAN EXTENT	10/1/00	...
2	FINAL REPORT VERSION	11/1/00	...
3	WELD & TYPING -- CORRECTED		



TRANSDUCER MISC. COMP. (ORIENTATION)
 ON SCAN SURFACE TYPING FROM BACK OF PIPE
 WITH DATA SET AT 180°

TRANSDUCER TABLE II
 DESCRIPTION

WT CHANNEL	BEAM ANGLE	FREQUENCY	SIZE	ELEMENT
1	10°	5.0	101.1 x 2.8 x .75	...
2	10°	5.0	101.1 x 2.8 x .75	...
3	10°	5.0	101.1 x 2.8 x .75	...
4	10°	5.0	101.1 x 2.8 x .75	...
5	10°	5.0	101.1 x 2.8 x .75	...
6	10°	5.0	101.1 x 2.8 x .75	...
7	10°	5.0	101.1 x 2.8 x .75	...
8	10°	5.0	101.1 x 2.8 x .75	...

- NOTES:
1. The angle across the center of the head is 5.0°.
 2. The angle across the width center line is both sides.
 3. The angle across the center of the head is 4.80°.
 4. The angle from the weld center line on both sides.
 5. The angle of the head is offset 8.87° to the B direction to clear obstructions.
 6. The matrix limits on this scan have been adjusted slightly to ensure no scan lines are lost within the range of angle of 2°.
 7. Matrix dimensions are 1.00.

TABLE I
 CW CHANNELS

J-CHANNEL NO.	WELD NO.	FILE NAME	STARTING POINT	STOPPING POINT	STARTING POINT	STOPPING POINT	STARTING POINT	STOPPING POINT
CW-1	001	001-1-1	0.00	1.00	0.00	1.00	0.00	1.00
CW-2	002	002-1-1	0.00	1.00	0.00	1.00	0.00	1.00
CW-3	003	003-1-1	0.00	1.00	0.00	1.00	0.00	1.00
CW-4	004	004-1-1	0.00	1.00	0.00	1.00	0.00	1.00
CW-5	005	005-1-1	0.00	1.00	0.00	1.00	0.00	1.00
CW-6	006	006-1-1	0.00	1.00	0.00	1.00	0.00	1.00
CW-7	007	007-1-1	0.00	1.00	0.00	1.00	0.00	1.00
CW-8	008	008-1-1	0.00	1.00	0.00	1.00	0.00	1.00

FOR PROBABILISTIC ESTIMATES
 NOT ACCURATE
 IF RECORDS CENTER

581-0861

McGURE UNIT 1
 CNR EXAMINATION
 SCAN COVERAGE
 FLANGE - TO-UPPER
 SHELL

1215923 0 2

EXAMINATION COVERAGE FOR INLET NOZZLES 5-445A,B,C,&D INNER RADIUS 5-445AR,BR,CR,& DR

SCAN PLAN DRAWING NO.: 1213931D-02

AGGREGATE COVERAGE OBTAINED FOR WELD 85%

AGGREGATE COVERAGE OBTAINED FOR INSIDE RADIUS: 58%

Zone Coverage Obtained		
Weld and Adjacent Base Metal: 83%	Near (ID) Surface: 86%	Inside Radius: 58%

HORIZONTAL SECTION EVALUATION									
Area Measurement					Volume Calculation				
Weld Diameter:		57 in.			Nozzle Bore Diameter:		27.5		
Weld	18.19 sq. in.	Weld	1828.8 cu. in.		Adjacent Base Metal	14442.1 cu. in.		Near Surface	1301.8 cu. in.
Adjacent Base Metal	181.3 sq. in.	Adjacent Base Metal	14442.1 cu. in.		Near Surface	1301.8 cu. in.		Inside Radius	247.1 cu. in.
Near Surface	11.54 sq. in.	Near Surface	1301.8 cu. in.		Inside Radius	247.1 cu. in.			
Inside Radius	5.72 sq. in.	Inside Radius	247.1 cu. in.						
Weld and Adjacent Base Metal									
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined		
1	0/45	bore	178.5	105.8	9391.3	9448.0	99%		
2	0/45	bore	0.0	74.2	0.0	8824.7	0%		
3	45/80	shell/3	179.5	105.8	9448.0	9448.0	100%		
4	45/80	shell/3	0.0	74.2	0.0	8824.7	0%		
5	45/80	shell/4	179.5	105.8	9448.0	9448.0	100%		
6	45/80	shell/4	0.0	74.2	0.0	8824.7	0%		
7	0	shell	179.5	105.8	9448.0	9448.0	100%		
8	0	shell	0.0	74.2	0.0	8824.7	0%		
Totals:					37729.3	67858.1	68%		
Near Surface									
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined		
1	70	shell/3,4	14.5	105.8	785.2	785.2	100%	(PERPENDICULAR)	
2	70	shell/3,4	0.0	74.2	0.0	538.6	0%	(PERPENDICULAR)	
3	45	bore	13.5	105.8	710.5	735.2	93%	(PARALLEL)	
4	45	bore	0.0	74.2	0.0	538.6	0%	(PARALLEL)	
Totals:					1478.7	2067.0	71%		
Inside Radius									
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined		
1	70	axial	4.2	105.8	107.1	145.2	74%		
2	70	axial	0.0	74.2	0.0	101.9	0%		
3	70	circ	3.8	105.8	90.9	145.2	63%		
4	70	circ	0.0	74.2	0.0	101.9	0%		
Totals:					198.0	392.3	50%		

Note: The horizontal section coverage requirement is considered to be 180° total; 45° each side of 90° and 270°.

VERTICAL SECTION EVALUATION									
Area Measurement					Volume Calculation				
Weld Diameter:		57			Nozzle Bore Diameter:		27.5 in.		
Weld	19.68 sq. in.	Weld	1782.1 cu. in.		Adjacent Base Metal	18235.3 cu. in.		Near Surface	1380.6 cu. in.
Adjacent Base Metal	181.34 sq. in.	Adjacent Base Metal	1782.1 cu. in.		Near Surface	18235.3 cu. in.		Inside Radius	321.0 cu. in.
Near Surface	15.4 sq. in.	Near Surface	1782.1 cu. in.		Inside Radius	321.0 cu. in.			
Inside Radius	7.43 sq. in.	Inside Radius	321.0 cu. in.						
Weld and Adjacent Base Metal									
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined		
1	0/45	bore	201.0	180.0	17998.4	17998.4	100%		
2	45/80	shell/3	201.0	180.0	17998.4	17998.4	100%		
3	45/80	shell/4	201.0	180.0	17998.4	17998.4	100%		
4	0	shell	201.0	180.0	17998.4	17998.4	100%		
Totals:					71993.6	71993.6	100%		
Near Surface									
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined		
1	70	shell/3,4	15.4	180.0	1380.6	1380.6	100%	(PERPENDICULAR)	
2	45	bore	15.4	180.0	1380.6	1380.6	100%	(PARALLEL)	
Totals:					2761.3	2761.3	100%		
Inside Radius									
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined		
1	70	axial	5.4	180.0	232.0	321.0	72%		
2	70	circ	4.4	180.0	188.3	321.0	59%		
Totals:					420.3	641.9	65%		

Note: The vertical section coverage requirement is considered to be 180° total; 45° each side of 0° and 180°.

SER NO. 97-004

ATTACHMENT 2

B03.090.001, 1A; B03.090.002, 2A

B03.090.003, 3A; B03.090.004, 4A

1RPV5-445A, 445B, 445C, 445D

B03.100.001, .002, .003, .004

1RPV5-445AR, 445BR, 445CR, 445DR

PAGE 53 OF 68

EXAMINATION COVERAGE FOR INLET TO SAFE END WELD:

SCAN PLAN DRAWING NO.: 1213931D-02

AGGREGATE COVERAGE OBTAINED: 100%

Zone Coverage Obtained							
Weld & Adjacent Base Metal: 100%				Near (ID) Surface: 100%			
Examination Volume Definition							
Weld Length: 86.39 in.							
Area Measurement				Volume Calculation			
Weld & Adjacent Base Metal		1.9 sq. in.		Weld & Adjacent Base Metal:		164.141 cu. in.	
Near Surface		1.9 sq. in.		Near Surface		164.141 cu. in.	
Examination Coverage Calculations							
Weld & Adjacent Base Metal							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	1.9	86.4	164.1	164.1	100%
2	45	1&2	1.9	86.4	164.1	164.1	100%
3	45	3	1.9	86.4	164.1	164.1	100%
4	45	4	1.9	86.4	164.1	164.1	100%
Totals:					656.6	656.6	100%
Near Surface							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	70	axial	1.9	86.4	164.1	164.1	100%
2	70	circ	1.9	86.4	164.1	164.1	100%
Totals:					328.3	328.3	100%

SER NO. 97-004

ATTACHMENT 2

B03.090.001, 1A; B03.090.002, 2A

B03.090.003, 3A; B03.090.004, 4A

1RPV5-445A, 445B, 445C, 445D

B03.100.001, .002, .003, .004

1RPV5-445AR, 445BR, 445CR, 445DR

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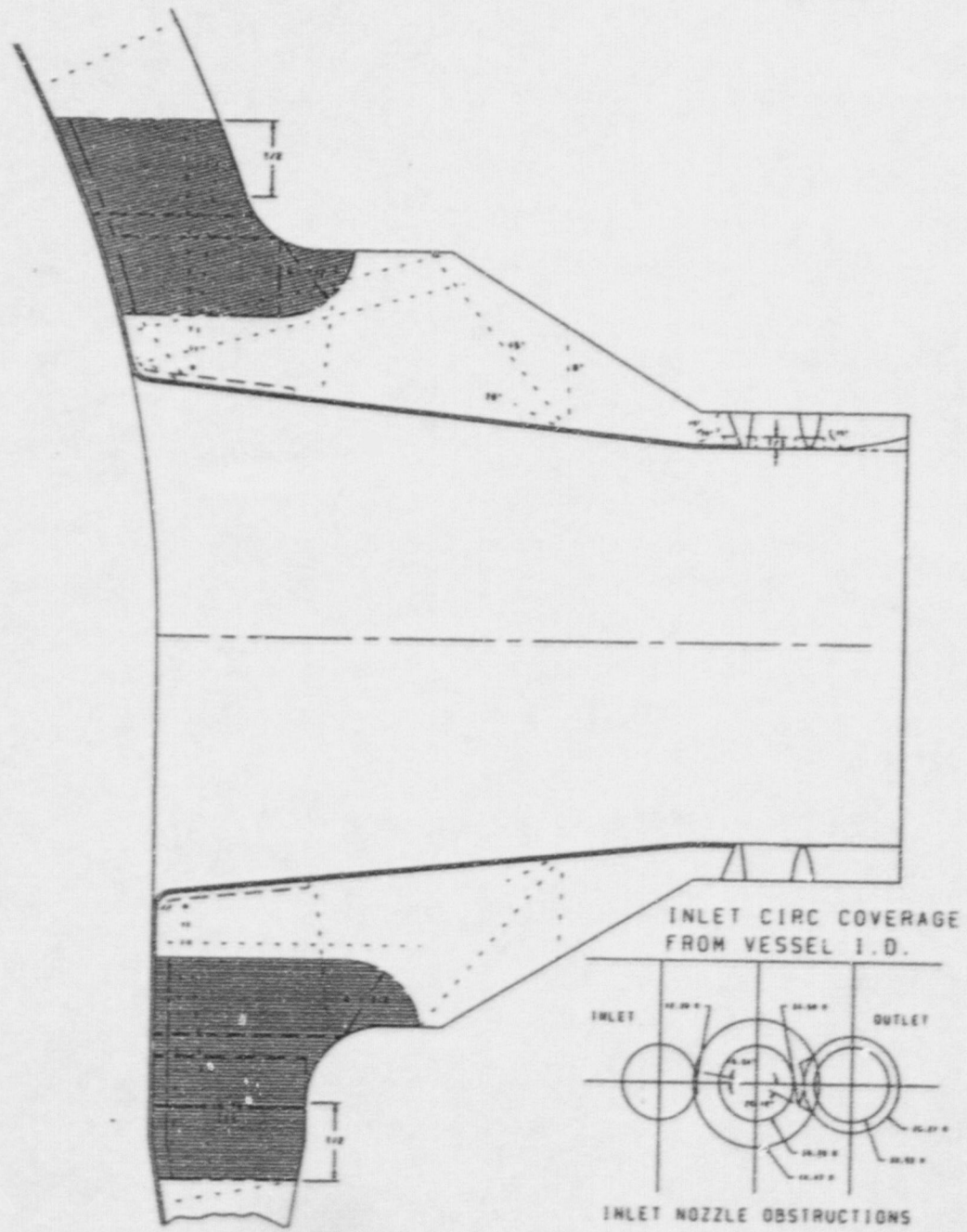
EXAMINATION COVERAGE FOR INLET SAFE END TO PIPE WELD:

SCAN PLAN DRAWING NO.: 1213931D-02

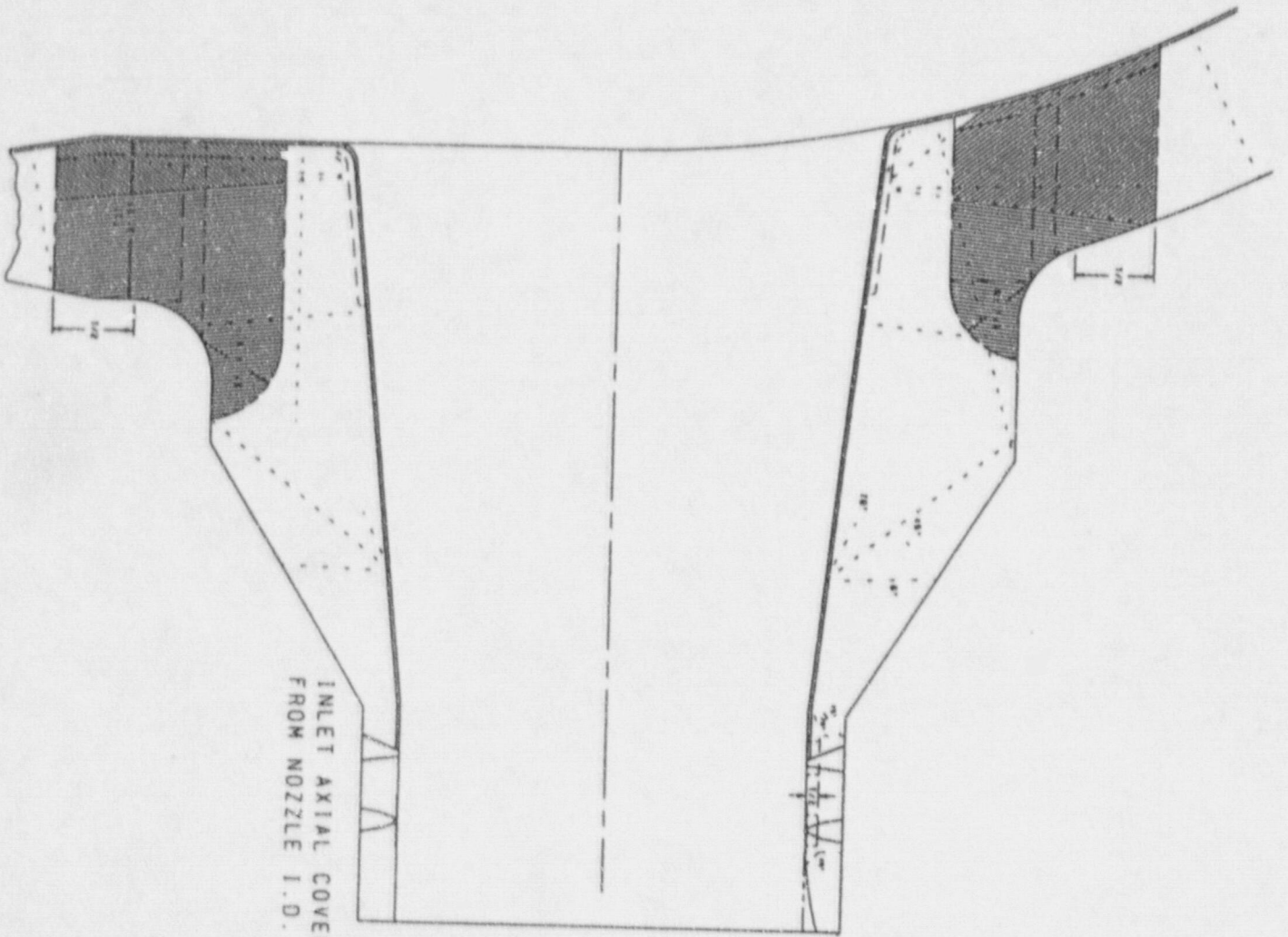
AGGREGATE COVERAGE OBTAINED: 100%

Zone Coverage Obtained							
Weld & Adjacent Base Metal: 100%				Near (ID) Surface: 100%			
Examination Volume Definition							
Weld Length: 86.39 in.							
Area Measurement				Volume Calculation			
Weld & Adjacent Base Metal		1.73 sq. in.		Weld & Adjacent Base Metal:		149.4547 cu. in.	
Near Surface		1.73 sq. in.		Near Surface		149.4547 cu. in.	
Examination Coverage Calculations							
Weld & Adjacent Base Metal							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	1.7	86.4	149.5	149.5	100%
2	45	1&2	1.7	86.4	149.5	149.5	100%
3	45	3	1.7	86.4	149.5	149.5	100%
4	45	4	1.7	86.4	149.5	149.5	100%
<i>Totals:</i>					597.8	597.8	100%
Near Surface							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	70	axial	1.7	86.4	149.5	149.5	100%
2	70	circ	1.7	86.4	149.5	149.5	100%
<i>Totals:</i>					298.9	298.9	100%

SER NO. 97-004
 ATTACHMENT 2
 B03.090.001, 1A; B03.090.002, 2A
 B03.090.003, 3A; B03.090.004, 4A
 1RPV5-445A, 445B, 445C, 445D
 B03.100.001, .002, .003, .004
 1RPV5-445AR, 445BR, 445CR, 445DR
 PAGE 55 OF 68

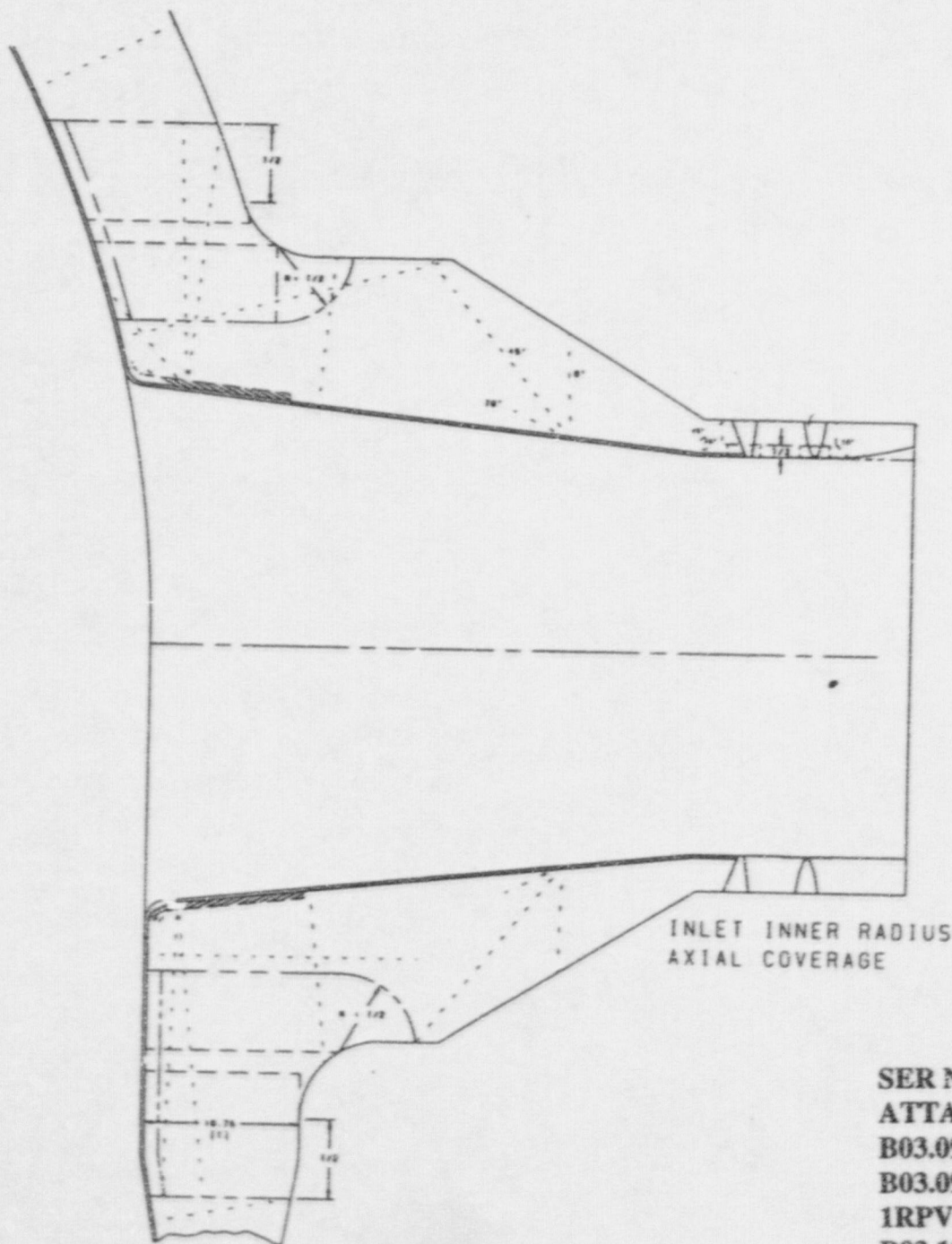


SER NO. 97-004
 ATTACHMENT 2
 B03.090.001, 1A; B03.090.002, 2A
 B03.090.003, 3A; B03.090.004, 4A
 IRPV5-445A, 445B, 445C, 445D
 B03.100.001, .002, .003, .004
 IRPV5-445AR, 445BR, 445/CR, 445DR
 PAGE 56 OF 68



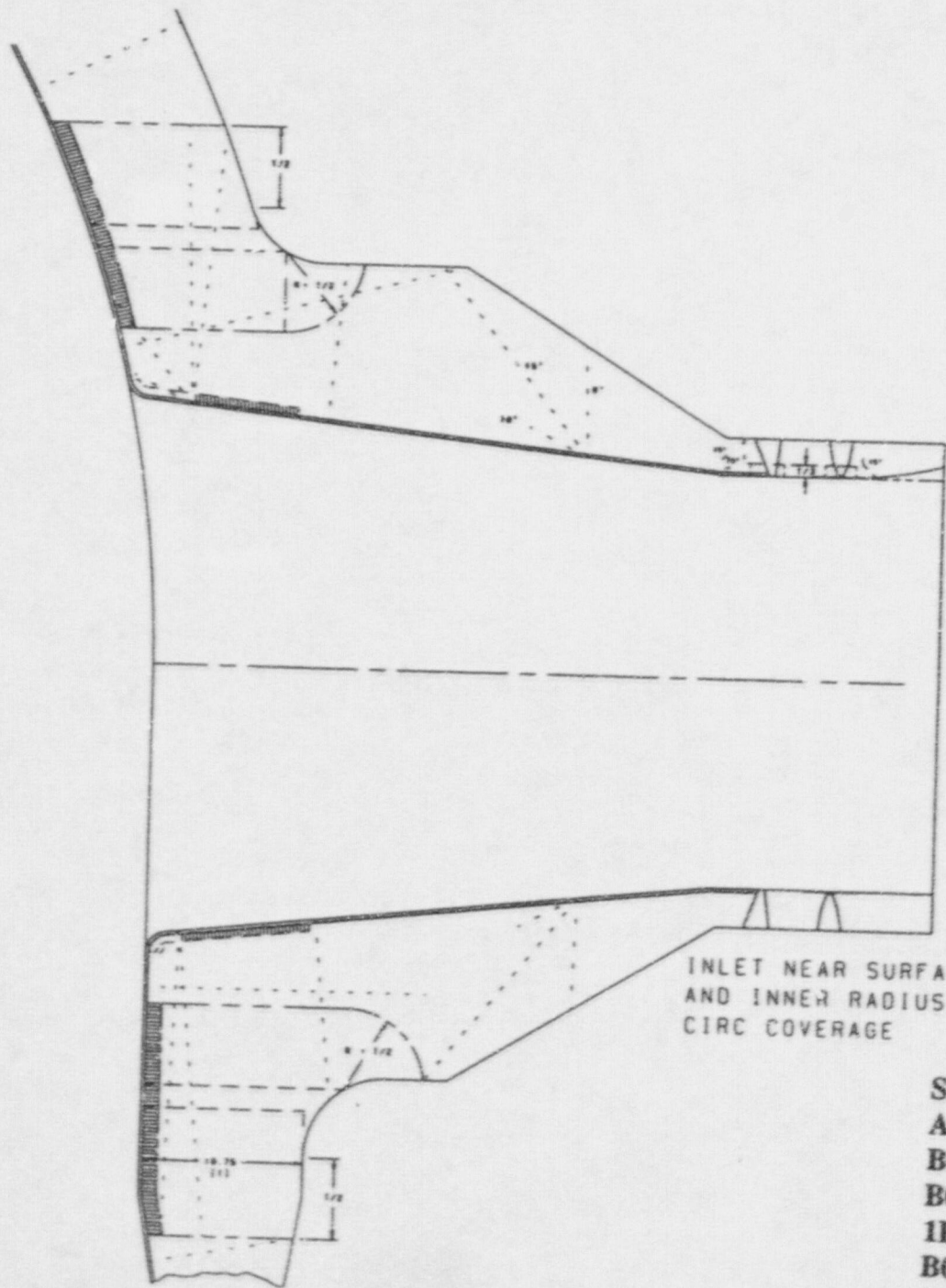
INLET AXIAL COVERAGE
FROM NOZZLE I. D.

SER NO. 97-004
 ATTACHMENT 2
 B03.090.001, 1A; B03.090.002, 2A
 B03.090.003, 3A; B03.090.004, 4A
 IRPV5-445A, 445B, 445C, 445D
 B03.100.001, .002, .003, .004
 IRPV5-445AR, 445BR, 445CR, 445DR
 PAGE 57 OF 68



INLET INNER RADIUS
AXIAL COVERAGE

SER NO. 97-004
ATTACHMENT 2
B03.090.001, 1A; B03.090.002, 2A
B03.090.003, 3A; B03.090.004, 4A
1RPV5-445A, 445B, 445C, 445D
B03.100.001, .002, .003, .004
1RPV5-445AR, 445BR, 445CR, 445DR
PAGE 58 OF 68



INLET NEAR SURFACE
AND INNER RADIUS
CIRC COVERAGE

SER NO. 97-004
ATTACHMENT 2
B03.090.001, 1A; B03.090.002, 2A
B03.090.003, 3A; B03.090.004, 4A
IRPV5-445A, 445B, 445C, 445D
B03.100.001, .002, .003, .004
IRPV5-445AR, 445BR, 445CR, 445DR
PAGE 59 OF 68

B03.090.001, 1A; B03.090.002, 2A
 B03.090.003, 3A; B03.090.004, 4A
 IRPV5-445A, 445B, 445C, 445D
 B03.100.001, .002, .003, .004
 IRPV5-445AR, 445BR, 445CR, 445DR
 PAGE 60 OF 68

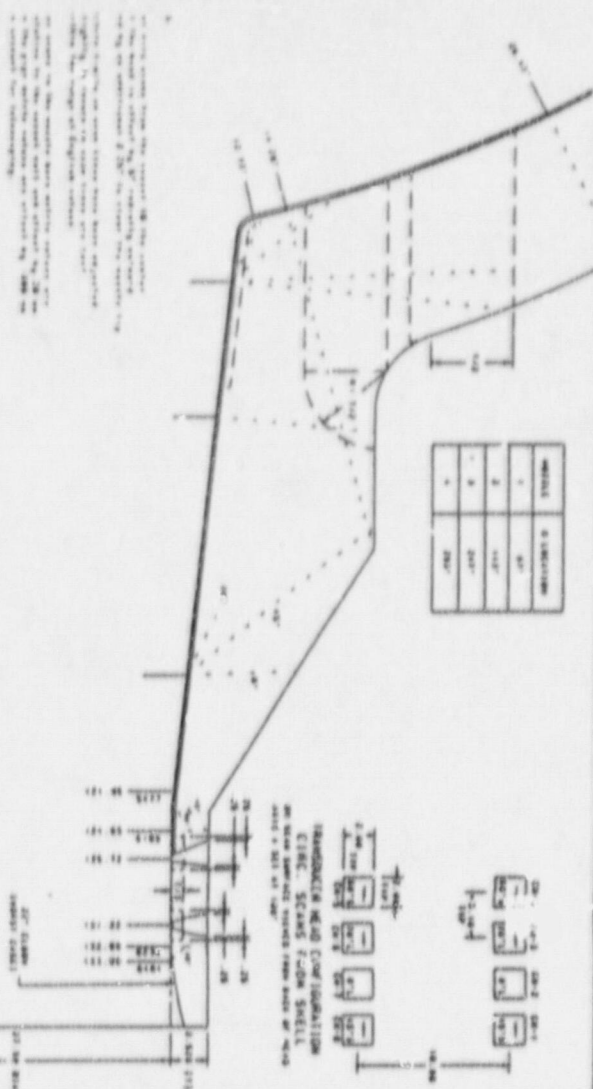


TABLE 11
 TRANSVERSE TABLE 111

NO.	ORIFICE	ORIFICE DIA.	ORIFICE DIA. (IN)	CLINIC
1	1	1/16"	0.0625	1001
2	2	1/16"	0.0625	1002
3	3	1/16"	0.0625	1003
4	4	1/16"	0.0625	1004

TABLE 12
 TRANSVERSE TABLE 112

NO.	ORIFICE	ORIFICE DIA.	ORIFICE DIA. (IN)	CLINIC
1	1	1/16"	0.0625	1001
2	2	1/16"	0.0625	1002
3	3	1/16"	0.0625	1003
4	4	1/16"	0.0625	1004

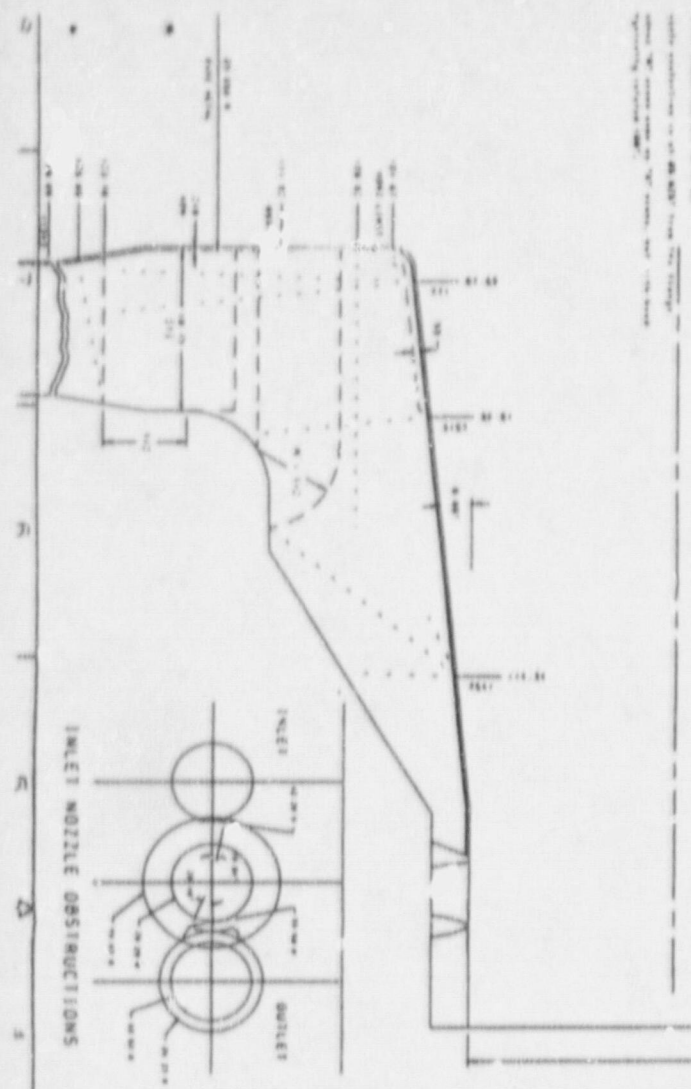
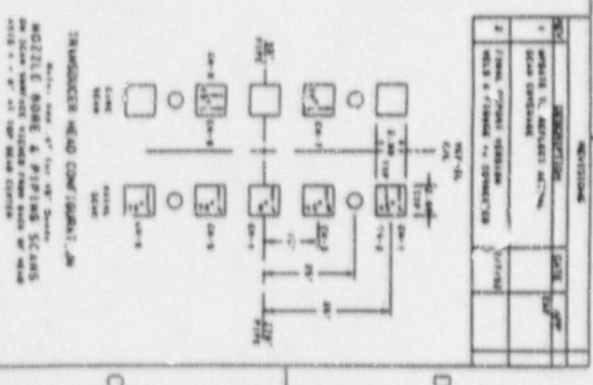


TABLE 13
 INLET NOZZLES

NO.	ORIFICE	ORIFICE DIA.	ORIFICE DIA. (IN)	CLINIC
1	1	1/16"	0.0625	1001
2	2	1/16"	0.0625	1002
3	3	1/16"	0.0625	1003
4	4	1/16"	0.0625	1004

EXAMINATION COVERAGE FOR OUTLET NOZZLES 5-445E,F,G,&H INNER RADIUS 5-445ER, FR, GR & HR

SCAN PLAN DRAWING NO.: 1213930D-02

AGGREGATE COVERAGE OBTAINED FOR WELD: 43%
COVERAGE FROM BORE AND SK. LL

AGGREGATE COVERAGE OBTAINED FOR INSIDE RADIUS: 74%

Zone Coverage Obtained		
Weld and Adjacent Base Metal:	41%	
Near (ID) Surface:	58%	
Inside Radius:	74%	

HORIZONTAL SECTION EVALUATION									
Examination Volume Definition					Examination Volume Definition				
Area Measurement		Volume Calculation		Area Measurement		Volume Calculation		Examination Coverage Calculations	
Weld Diameter:	53 in. <th>Nozzle Bore Diameter:</th> <td>29 in. <th>Weld</th> <td>18.18 sq. in.</td> <th>Weld</th> <td>1513.5 cu. in.</td> <th>Adjacent Base Metal</th> <td>171.07 sq. in.</td> </td>	Nozzle Bore Diameter:	29 in. <th>Weld</th> <td>18.18 sq. in.</td> <th>Weld</th> <td>1513.5 cu. in.</td> <th>Adjacent Base Metal</th> <td>171.07 sq. in.</td>	Weld	18.18 sq. in.	Weld	1513.5 cu. in.	Adjacent Base Metal	171.07 sq. in.
Near Surface	15.12 sq. in.	Near Surface	1258.8 cu. in.	Adjacent Base Metal	14242.7 cu. in.	Inside Radius	6.99 sq. in.	Inside Radius	318.0 cu. in.
Weld and Adjacent Base Metal									
Entry #	Exam. Angle (deg)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined		
1	0/45	bore	184.7	106.1	9075.4	6288.7	69%		
2	0/45	bore	0.0	73.9	0.0	6466.7	0%		
3	45/90	shell/3	49.6	106.1	2433.5	9288.7	26%		
4	45/90	shell/3	0.0	73.9	0.0	6466.7	0%		
5	45/90	shell/4	49.6	106.1	2433.5	9288.7	26%		
6	45/90	shell/4	0.0	73.9	0.0	6466.7	0%		
7	0	shell	49.6	106.1	2433.5	9288.7	26%		
8	0	shell	0.0	73.9	0.0	6466.7	0%		
Totals:					1*365.8	6655.2	29%		
Near Surface									
Entry #	Exam. Angle (deg)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined		
1	70	shell/3,4	6.3	106.1	111.4	742.1	42%	(PERPENDICULAR)	
2	70	shell/3,4	0.0	73.9	0.0	516.7	0%	(PERPENDICULAR)	
3	45	bore	12.1	106.1	595.7	742.1	80%	(PARALLEL)	
4	45	bore	0.0	73.9	0.0	516.7	0%	(PARALLEL)	
Totals:					907.1	2000.9	48%		
Inside Radius									
Entry #	Exam. Angle (deg)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined		
1	70	axial	5.7	106.1	163.6	187.5	82%		
2	70	axial	0.0	73.9	0.0	130.5	0%		
3	70	circ	5.8	106.1	155.0	187.5	83%		
4	70	circ	0.0	73.9	0.0	130.5	0%		
Totals:					308.6	605.4	81%		

VERTICAL SECTION EVALUATION									
Examination Volume Definition					Examination Volume Definition				
Area Measurement		Volume Calculation		Area Measurement		Volume Calculation		Examination Coverage Calculations	
Weld Diameter:	53 in. <th>Nozzle Bore Diameter:</th> <td>29 in. <th>Weld</th> <td>19.68 sq. in.</td> <th>Weld</th> <td>1638.4 cu. in.</td> <th>Adjacent Base Metal</th> <td>190.57 sq. in.</td> </td>	Nozzle Bore Diameter:	29 in. <th>Weld</th> <td>19.68 sq. in.</td> <th>Weld</th> <td>1638.4 cu. in.</td> <th>Adjacent Base Metal</th> <td>190.57 sq. in.</td>	Weld	19.68 sq. in.	Weld	1638.4 cu. in.	Adjacent Base Metal	190.57 sq. in.
Near Surface	16.89 sq. in.	Near Surface	1406.1 cu. in.	Adjacent Base Metal	15865.4 cu. in.	Inside Radius	6.80 sq. in.	Inside Radius	309.8 cu. in.
Weld and Adjacent Base Metal									
Entry #	Exam. Angle (deg)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined		
1	0/45	bore	210.4	180.0	17512.9	17503.8	100%		
2	45/90	shell/3	77.8	180.0	6474.5	17503.8	37%		
3	45/90	shell/4	77.8	180.0	6474.5	17503.8	37%		
4	0	shell	77.8	180.0	6474.5	17503.8	37%		
Totals:					36936.6	70016.1	82%		
Near Surface									
Entry #	Exam. Angle (deg)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined		
1	70	shell/3,4	7.2	180.0	142.7	1406.1	43%	(PERPENDICULAR)	
2	45	bore	16.9	180.0	1406.1	1406.1	100%	(PARALLEL)	
Totals:					2008.9	2812.3	11%		
Inside Radius									
Entry #	Exam. Angle (deg)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined		
1	70	axial	6.7	180.0	303.8	309.8	98%		
2	70	circ	5.1	180.0	231.4	309.8	75%		
Totals:					835.2	619.6	88%		

Note: The horizontal section coverage requirement is considered to be 180° total; 45° each side of 90° and 270°.

Note: The vertical section coverage requirement is considered to be 180° total; 45° each side of 0° and 180°.

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ATTACHMENT 2
B03.090.005, 5A; B03.090.006, 6A
B03.090.007, 7A; B03.090.008, 8A

B03.100.005, .006, .007, .008
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EXAMINATION COVERAGE FOR OUTLET NOZZLE TO SAFE END WELD:

SCAN PLAN DRAWING NO.: 1213930D-02

AGGREGATE COVERAGE OBTAINED: 100%

Zone Coverage Obtained							
Weld & Adjacent Base Metal: 100%				Near (ID) Surface: 100%			
Examination Volume Definition							
Weld Length: 91.11 in.							
Area Measurement				Volume Calculation			
Weld & Adjacent Base Metal		1.94 sq. in.		Weld & Adjacent Base Metal:		176.7534 cu. in.	
Near Surface		1.94 sq. in.		Near Surface		176.7534 cu. in.	
Examination Coverage Calculations							
Weld & Adjacent Base Metal							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	1.94	91.11	176.8	176.8	100%
2	45	1&2	1.94	91.11	176.8	176.8	100%
3	45	3	1.94	91.11	176.8	176.8	100%
4	45	4	1.94	91.11	176.8	176.8	100%
<i>Totals:</i>					707.0	707.0	100%
Near Surface							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	70	axial	1.94	91.11	176.8	176.8	100%
2	70	circ	1.94	91.11	176.8	176.8	100%
<i>Totals:</i>					353.5	353.5	100%

SER NO. 97-004

ATTACHMENT 2

B03.090.005, 5A; B03.090.006, 6A

B03.090.007, 7A; B03.090.008, 8A

1RPV5-445E, 445F, 445G, 445H

B03.100.005, .006, .007, .008

1RPV5-445ER, 445FR, 445GR, 445HR

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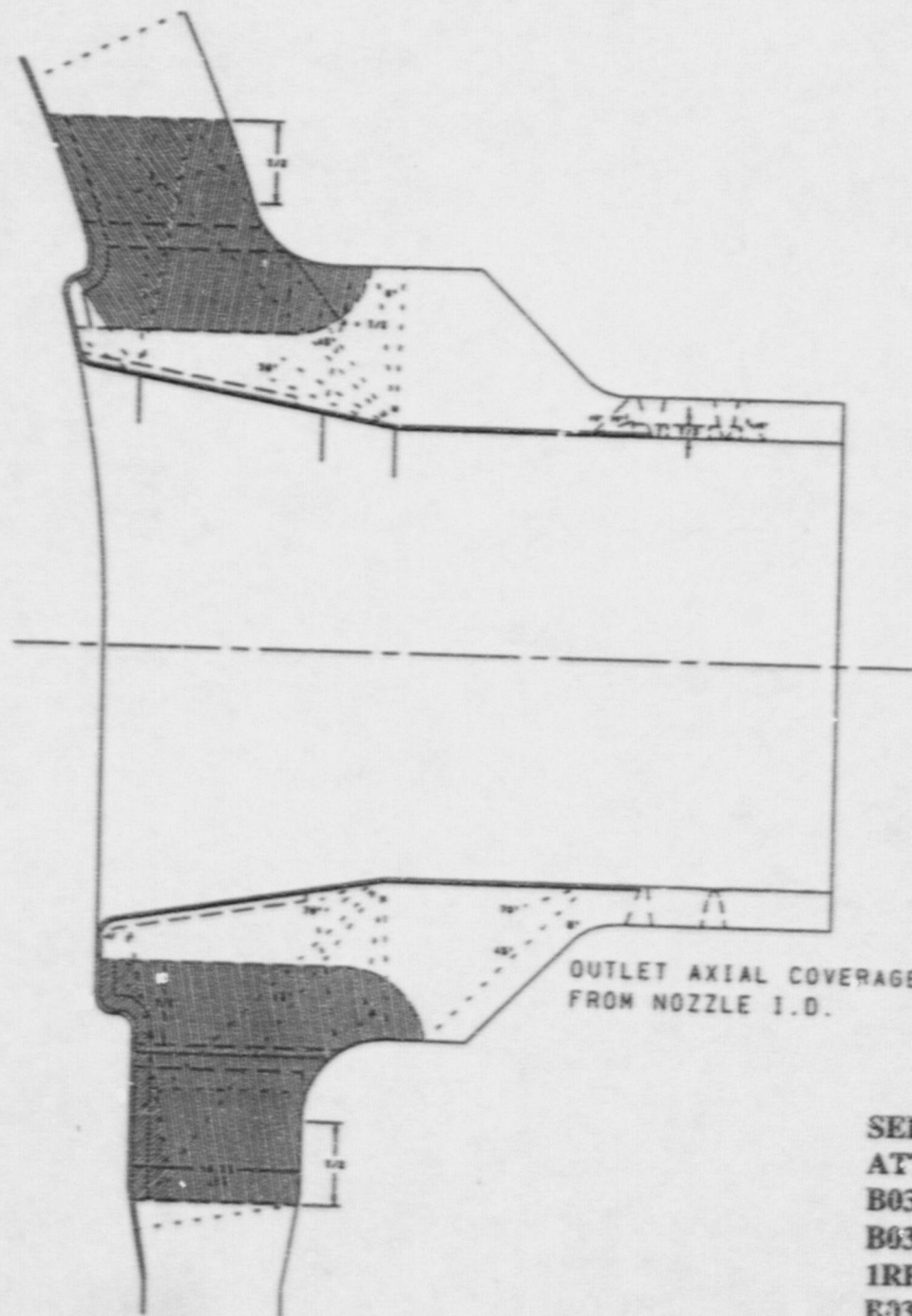
EXAMINATION COVERAGE FOR OUTLET SAFE END TO PIPE WELD:

SCAN PLAN DRAWING NO.: 1213930D-02

AGGREGATE COVERAGE OBTAINED: 100%

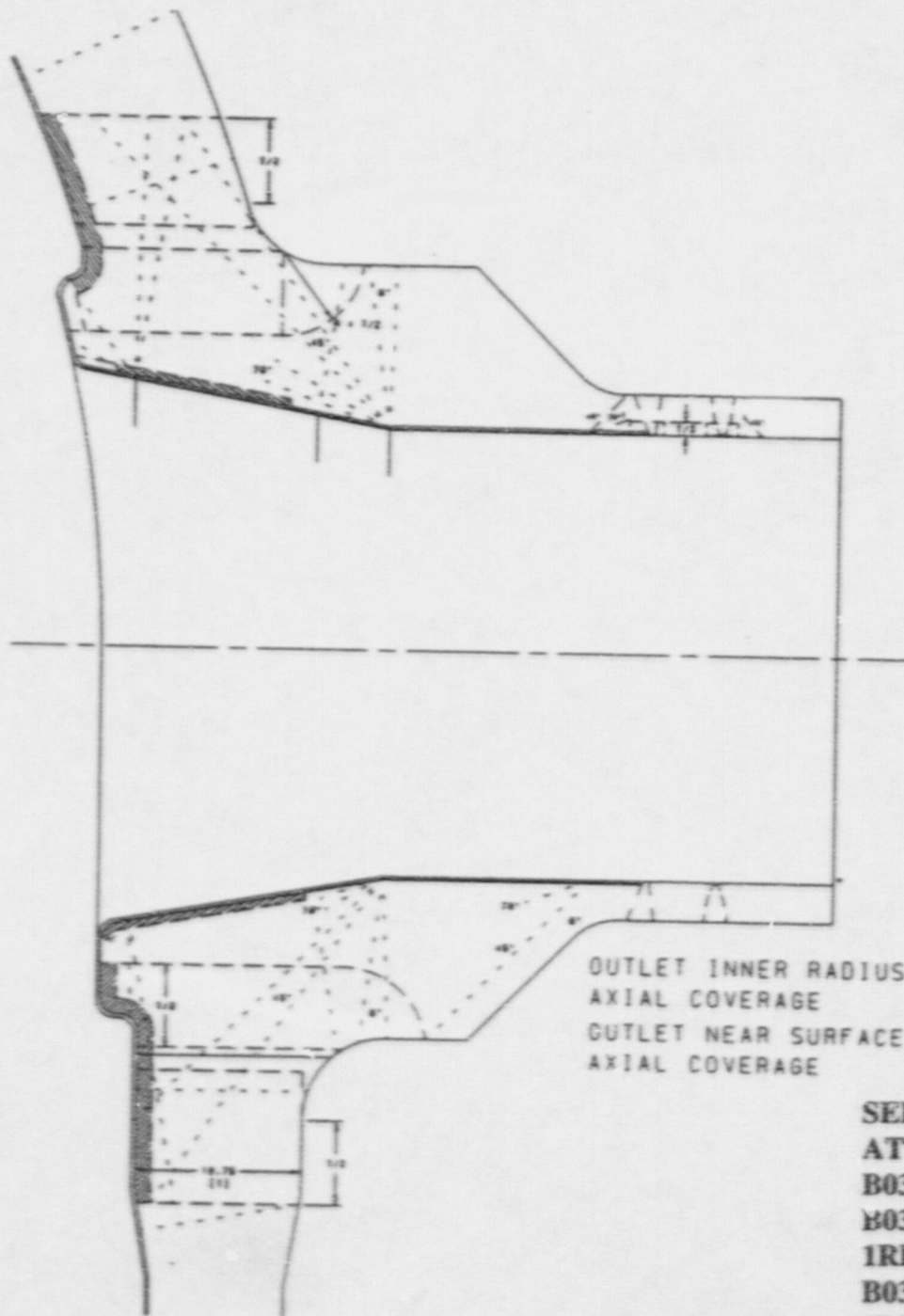
Zone Coverage Obtained							
Weld & Adjacent Base Metal: 100%				Near (ID) Surface: 100%			
Examination Volume Definition							
Weld Length: 91.11 in.							
Area Measurement				Volume Calculation			
Weld & Adjacent Base Metal				Weld & Adjacent Base Metal: 176.7534 cu. in.			
Near Surface				Near Surface: 176.7534 cu. in.			
Examination Coverage Calculations							
Weld & Adjacent Base Metal							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	1.9	91.11	176.8	176.8	100%
2	45	1&2	1.9	91.11	176.8	176.8	100%
3	45	3	1.9	91.11	176.8	176.8	100%
4	45	4	1.9	91.11	176.8	176.8	100%
Totals:					707.0	707.0	100%
Near Surface							
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	70	axial	1.9	91.11	176.8	176.8	100%
2	70	circ	1.9	91.11	176.8	176.8	100%
Totals:					353.5	353.5	100%

SER NO. 97-004
 ATTACHMENT 2
 B03.090.005, 5A; B03.090.006, 6A
 B03.090.007, 7A; B03.090.008, 8A
 1RPV5-445E, 445F, 445G, 445H
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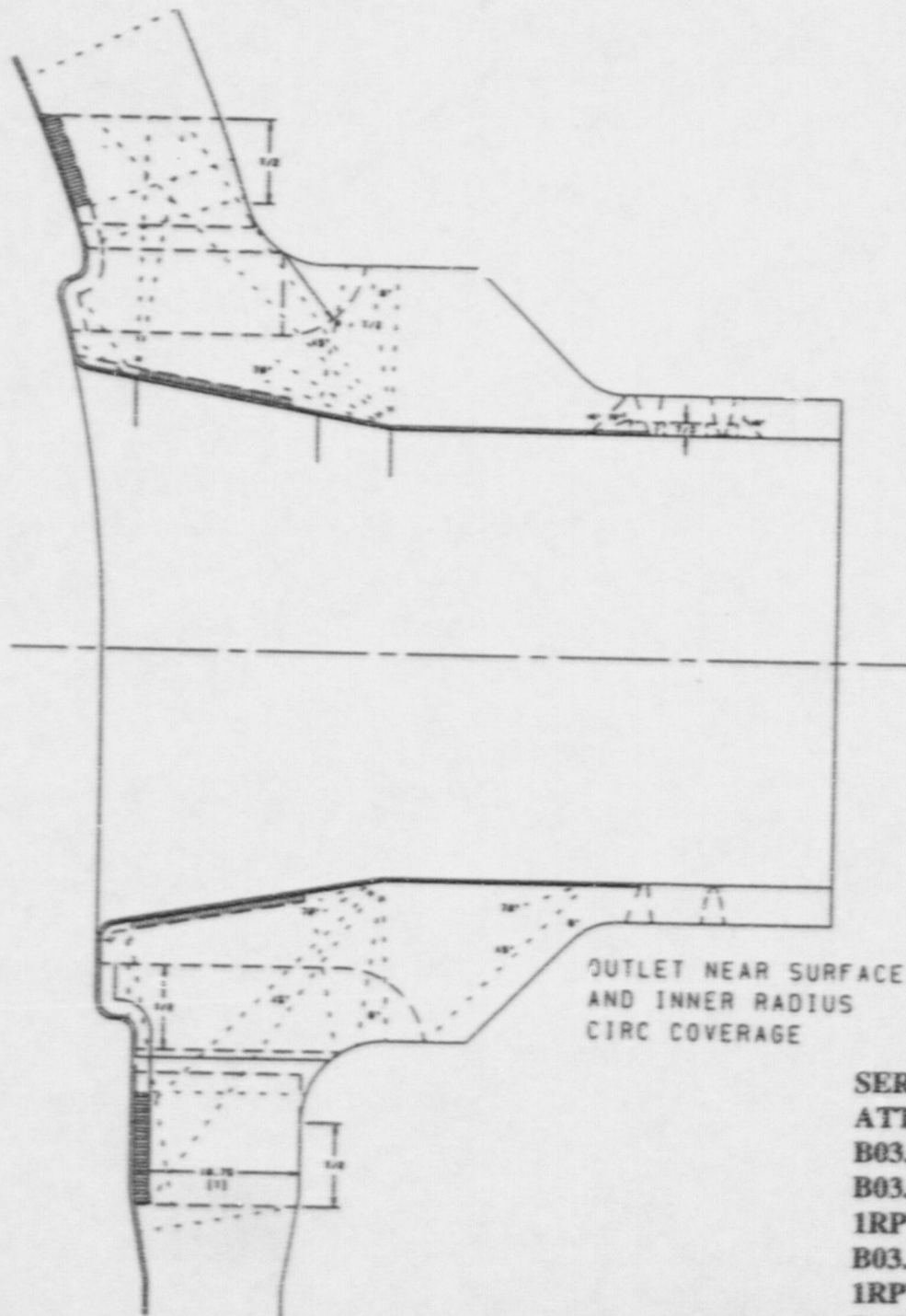


OUTLET AXIAL COVERAGE
FROM NOZZLE I.D.

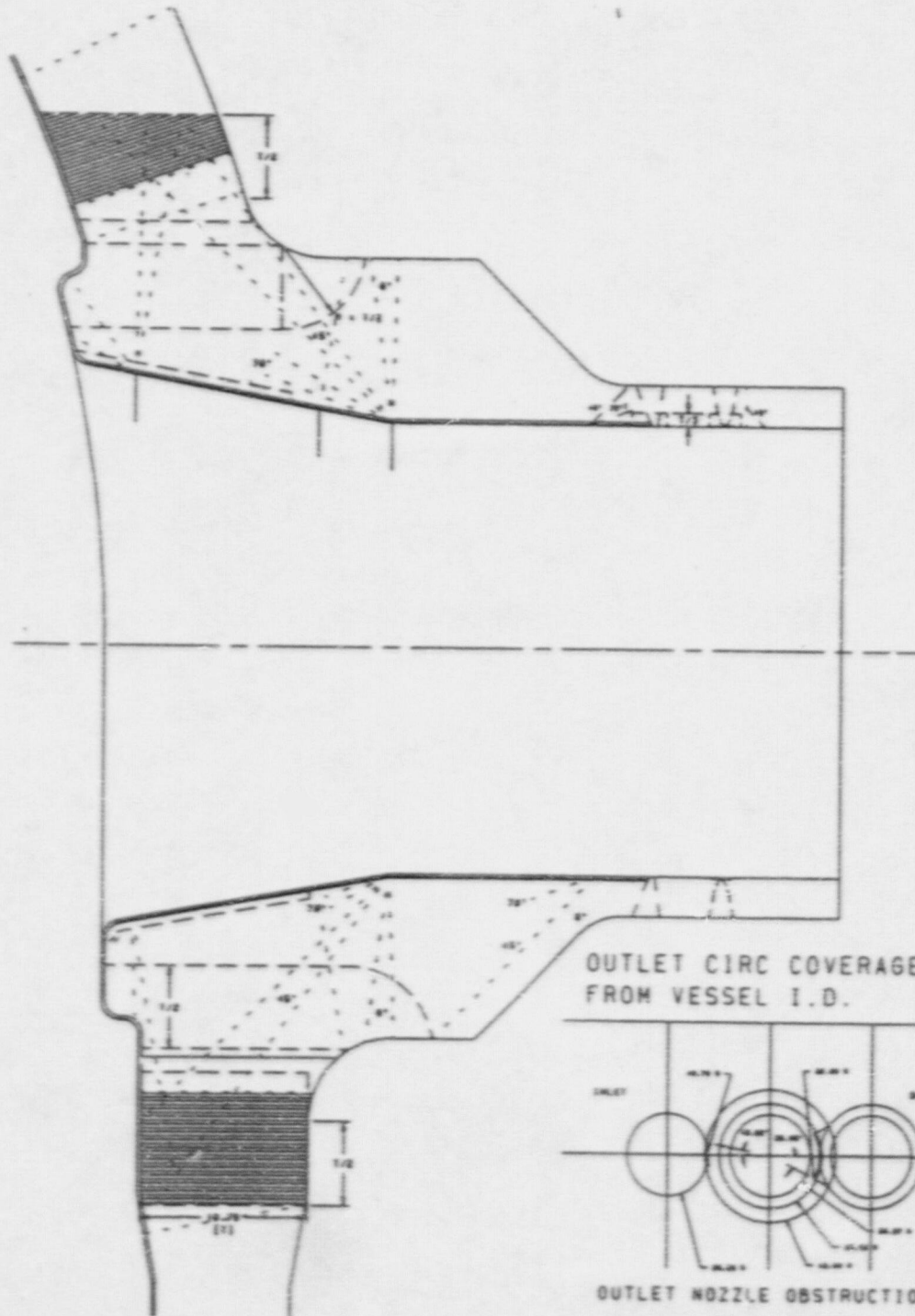
SER NO. 97-004
 ATTACHMENT 2
 B03.090.005, 5A; B03.090.006, 6A
 B03.090.007, 7A; B03.090.008, 8A
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 B03.100.005, .006, .007, .008
 IRPV5-445ER, 445FR, 445GR, 445HR
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September 9, 1997

Subject: Duke Power Company
McGuire Unit 1, First Inservice Inspection Interval
History of Limited Ultrasonic Examination of Reactor Vessel Welds

During the first Inservice Inspection (ISI) interval at McGuire and Catawba, and the second ISI interval at Oconee, welds that had 90% and less Ultrasonic (UT) coverage were not identified on a Request for Relief to the NRC. Welds that had limited UT coverage were indicated on ISI reports as limited, but the actual percentages of coverage obtained were not provided.

The practice of documenting the UT coverage as limited, but not documenting the actual percentage of coverage obtained, was based on an interpretation of a note in ASME Code Section XI, Tables IWB-2500 and IWC-2500, which requires volumetric inspection of "essentially 100%" of weld length. When only a limited inspection was possible, Duke Power (DPC) interpreted this note to mean that a best effort must be made to cover as much of the weld as possible with the techniques and technology available at the time. If coverage was less than 100%, the inspection was reported as limited. The percentage of coverage obtained was not recorded in ISI Reports prior to January 1993.

ASME Code Case N-460 was published on July 27, 1988 and approved by the NRC in Revision 8 to Regulatory Guide 1.147 in November 1990. This Code Case defines the statement "Includes essentially 100% of weld length" as obtaining at least 90% examination coverage of the weld. Based on Code Case N-460, coverage of 90% and less is a deviation from the Code and requires a Request for Relief.

Generic Request for Relief 93-GO-001 which requested relief for all welds identified as limited for Oconee, McGuire and Catawba was submitted to the NRC on December 2, 1993 and it was subsequently denied. (Reference NRC letter dated October 26, 1994 to M.S. Tuckman). On January 11, 1995 a conference call was held between the NRC and DPC representatives for the purpose of discussing Request for Relief 93-GO-001 and to clarify differences of interpretation pertaining to limited welds as defined by Code Case N-460.

Based on discussion with NRC staff representatives during the January 11, 1995 conference call, the NRC felt this issue could be best handled through the NRC Enforcement/Inspection program pending concurrence by appropriate NRC management. On February 8, 1995 the acceptability of the proposed approach was confirmed to J. S. Warren, Duke Power by V. Nerses, ONRR during a phone conference. (Reference February 28, 1995 Duke letter M. S. Tuckman to S. D. Ebnetter, Regional Administrator, Region II).

During the week of March 20, 1995, Mr. N. Economos, USNRC Region II Inspector, made a site visit to McGuire. (Reference McGuire Inspection Report No. 95-09). During this visit, a meeting was held with Mr. Economos and DPC representatives, where it was agreed that Duke Power would provide a listing of limited welds examined during the first ISI interval for McGuire and Catawba and the second ISI interval for Oconee. The limited weld information for McGuire, Catawba and Oconee was sent to Mr. Economos on March 30, 1995.

ASME Class 1 NDE Inservice Inspection
Request for Relief Serial No. 97-004
For McGuire Unit 1 Based on ASME XI
1980 Code Through Winter 1980 Addenda

Attachment 3

September 9, 1997

Included in the March 30, 1995 submittal were the McGuire Unit 1 reactor vessel welds. During the NRC review of the reactor vessel welds, it was determined that additional information was necessary for the technical justification. A meeting was held on April 6, 1995 between B&W Nuclear Technologies (BWNT) and DPC, and at this time DPC requested additional information in order to address the limited welds on the reactor vessel. In response to this request, BWNT completed their Reactor Vessel Limited Examination Evaluation Reports for McGuire, Catawba and Oconee in late August, 1995. On September 5, 1995, DPC notified BWNT that corrections were necessary to their reports. On January 12, 1996 Framatome Technologies, (formerly BWNT), provided additional information in response to DPC's concerns of September 5, 1995 relating to the Reactor Vessel Examination Evaluation Reports.

During Mr. Economos' visit to McGuire on January 16, 1996, a meeting was held to discuss the evaluation status of the limited examination welds on the Reactor Vessel for Unit 1. It was determined at that time that the reports provided to DPC by BWNT did not contain sufficient information to describe the percentage of coverage of the limited examinations. DPC contracted Framatome Technologies to provide the percentage of coverage for all welds determined to have limited coverage for Unit 1. This report was received by DPC on May 30, 1996. On January 9, 1997 a meeting was held with Mr. Economos to review the results of the Reactor Vessel welds, the conclusion reached during this meeting was that this issue could now be closed with the issuance of this request for relief.

Gary Underwood
QA Technical Services Section
Station Support Division
Nuclear General Office