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10CFR50.55a

Docket Number 50-346

License Number NPF-3

Serial Number 2798

August 1, 2002

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

Subject: 10 CFR 50.55a Request for Use of an Alternative to the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Requirements for the Davis-Besse Nuclear Power Station - Third Ten-Year Interval Inservice Inspection Program (RR-A2 Revision)

Ladies and Gentlemen:

The purpose of this letter is to revise 10CFR50.55a request RR-A2 for the Davis-Besse Nuclear Power Station, Unit 1 (DBNPS) Third Ten-Year Interval Inservice Inspection Program. This request was originally transmitted to the NRC by FirstEnergy Nuclear Operating Company (FENOC) letter Serial Number 2672, dated September 19, 2000. Additional information regarding request RR-A2 was provided to the NRC by letter Serial Number 2736 dated November 27, 2001.

As described by letter dated June 14, 2002 (DBNPS Serial Number 1-1276), the DBNPS is replacing its existing Reactor Vessel Closure Head (RVCH) with the unused Midland Plant RVCH. Accordingly, request RR-A2 is being revised in its entirety and the enclosed information replaces the original request RR-A2 to reflect the planned use of the Midland Plant RVCH.

Enclosure 1 provides the revised request RR-A2. NRC review and approval is requested by September 13, 2002.

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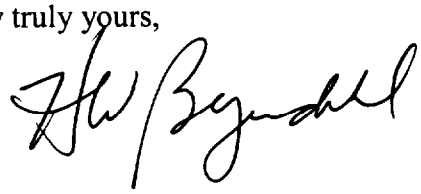
If you have any questions or require additional information, please contact Mr. Patrick J. McCloskey, Manager-Regulatory Affairs, at (419) 321-8450.

Very truly yours,



Enclosures

cc: J. E. Dyer, Regional Administrator, NRC Region III
D. V. Pickett, DB-1 NRC/NRR Project Manager
C. S. Thomas, DB-1 Senior Resident Inspector
Utility Radiological Safety Board

FIRSTENERGY NUCLEAR OPERATING COMPANY
DAVIS-BESSE UNIT 1
THIRD 10-YEAR INTERVAL
RELIEF REQUEST RR-A2

System/Component(s) for Which Relief is Requested:

Reactor Vessel Closure Head (RVCH) Head-to-Flange Weld (Weld WH-7) for the replacement reactor vessel head.

Code Requirement:

Subsection IWB, Table IWB-2500-1, Examination Category B-A, Item No. B1.40 of the 1995 Edition, 1996 Addenda of ASME Code Section XI requires a volumetric examination and surface examination of essentially 100% of the weld length.

Code Case N-460 states that when the entire examination volume or area cannot be examined due to interference by another component or part geometry, a reduction in examination coverage may be accepted provided the reduction in coverage for that weld is less than 10%.

Code Requirement from Which Relief is Requested:

Relief is requested from performing a volumetric examination of essentially 100% of the weld length. Although Code Case N-460 allows for less than 10% as acceptable, the reduction in examination coverage of the weld is greater than 10%.

Basis for Relief:

The ultrasonic examination of the Reactor Vessel Head-to-Flange Weld is conducted in accordance with Section XI, Appendix I of the ASME Code, 1995 Edition through the 1996 Addenda. Section XI, Appendix I states that the ultrasonic examination shall be conducted in accordance with Article 4 of Section V as supplemented by Table I-2000-1. The requirements of NRC Regulatory Guide 1.150 are also applicable to this weld.

Article 4, Section V of the ASME Code, 1995 Edition, 1996 Addenda requires the weld and adjacent base metal to be examined using nominal angles of 45 and 60 degrees, (deviation is permitted if geometry limits the coverage, however, separation of angles must be at least 10 degrees) and a straight beam. Four basic scan directions are required for the angle beams: two perpendicular to the weld axis (axial scan) from opposite directions and two parallel to the weld axis (circumferential scan) from opposite directions. These requirements apply for each of the angle beams used (i.e. 45 and 60 degrees). Each of the 45 and 60 degree angle beams is required to

pass through all of the weld volume in the four basic scan directions. However, the adjacent base metal scanning requirements allow the two beam angles to pass through in only one direction each for the axial and circumferential scans. In addition to the Code-required examinations, the weld is also scanned with a 65 degree transducer to provide examination perpendicular to the weld/base metal interface as required by NRC Regulatory Guide 1.150.

The examination volume for the Reactor Head-to-Flange Weld is defined in Figure IWB-2500-5. The examination volume can be scanned along the weld axis from two directions. However, due to the extreme angle of the transition from the curvature of the head base material to the flange, access for scanning perpendicular to the weld axis is restricted to only the head side of the weld. From the head side of the weld, the service structure support skirt restricts scanning a portion of the examination volume with one of the two required angle beams. Scanning with the other required angle beam is not affected by the service structure support skirt. The RVCH is a carbon steel vessel with stainless steel cladding on the inside surface. Due to this cladding, the ultrasonic beam cannot be "bounced" from the inside clad surface to increase the examination coverage. Therefore, a full-V examination from one side is not possible. Radiographic examination of this weld, following its use inservice, will not be feasible due to the projected radiation levels (approximately 1-2 R/hr) at the inside surface of the head.

In addition, three lifting lugs (see Attachment 1) and a directional arrow (see Attachment 2), intended for use as a reference in aligning the RVCH on the reactor vessel, cover approximately 35 inches of the weld, which limits access to approximately 7% of the weld area.

Attachment 3 illustrates the affect of these interferences on the examination coverage. The following methodology is used to determine the extent of examination coverage.

1. A scaled cross-sectional drawing of the component configuration, extent of coverage and the area of interest is drawn using a Computer Aided Design Drafting (CADD) program.

2. The examination of the RVCH Head-to-Flange Weld is divided into three zones. Zones 1 and 3 are the base material and require a minimum of five scans (2 angles in the axial direction, 2 angles in the circumferential direction, and 1 zero degree scan). Zone 2, the weld metal, requires a minimum of nine scans (2 angles from 2 axial and 2 circumferential directions and a straight beam). Based on these scan requirements, the following weighting factors were assigned to determine the overall examination coverage:

Zone 1 (5 Scans)	Zone 2 (9 Scans)	Zone 3 (5 Scans)
Axial = 40% (0.40)	Axial = 44% (0.44)	Axial = 40% (0.40)
Circ = 40% (0.40)	Circ = 44% (0.44)	Circ = 40% (0.40)
0 degrees = 20% (0.20)	0 degrees = 12% (0.12)	0 degrees = 20% (0.20)

3. The examination coverage (i.e., the amount of the sound beam that passes through each zone) is plotted on the CADD drawing for each of the ASME Code-required scans. The area covered in each zone by the axial, circumferential, and straight beam examinations is then measured by CADD. If the area coverage received all the required scans, it is considered 100% complete. If it received one-half of the required scans, it is considered 50% complete, etc. This area is then multiplied by the weld length to determine the examination volume covered.

4. The examination volume coverage in each zone by the axial, circumferential, and straight beam scans is multiplied by the weighting factor. After applying a weighting to each scan, they are added together and divided by the total volume for that zone to determine the percent complete for the zone. Then all the three zones are added together and divided by three to determine the total examination coverage.

As shown in Attachment 3, these limitations result in approximately 80% of the examination volume defined in Figure IWB-2500-5 being examined volumetrically.

With the exception of the lifting lugs and the directional arrow, the entire weld is available for a surface examination.

During the preservice examination conducted in June 2002, no indications were recorded during examination of this weld.

Approval is requested pursuant to 10 CFR 50.55a(a)(3)(i), as the alternative examination discussed below will provide an acceptable level of quality and safety. A similar relief request for the Reactor Vessel Head-to-Flange weld on the original DBNPS RVCH was previously approved for the Second 10-Year Interval in Relief Request RR-A2 (TAC Nos. M79034 and M77942).

Alternative Examination:

The Reactor Vessel Head-to-Flange weld will be examined along the weld axis in two directions, but will be examined perpendicular to the weld axis in only one direction to the extent permitted by the configuration of the RVCH.

Justification for the Granting of Relief:

The ultrasonic examination of the Reactor Vessel Head-to-Flange Weld has limitations due to the transition curvature of the head base material to the flange. Lifting lugs, the service structure support skirt, and a directional arrow also restrict access to the weld. The reactor vessel design makes the Code-required volumetric examination of the Head-to-Flange weld impractical to perform. In order to examine the Head-to-Flange weld to the extent required by the Code, the Reactor Vessel Closure Head would require significant design modifications. Approximately 80% of the required Code examinations will be completed for the weld. These examinations will use reflectors oriented both parallel and transverse to the weld. These examinations in conjunction with the required surface examination will provide assurance that the weld does not contain unacceptable flaws.

Implementation Schedule:

One-third of the Reactor Vessel Head-to-Flange Weld will be examined each period.

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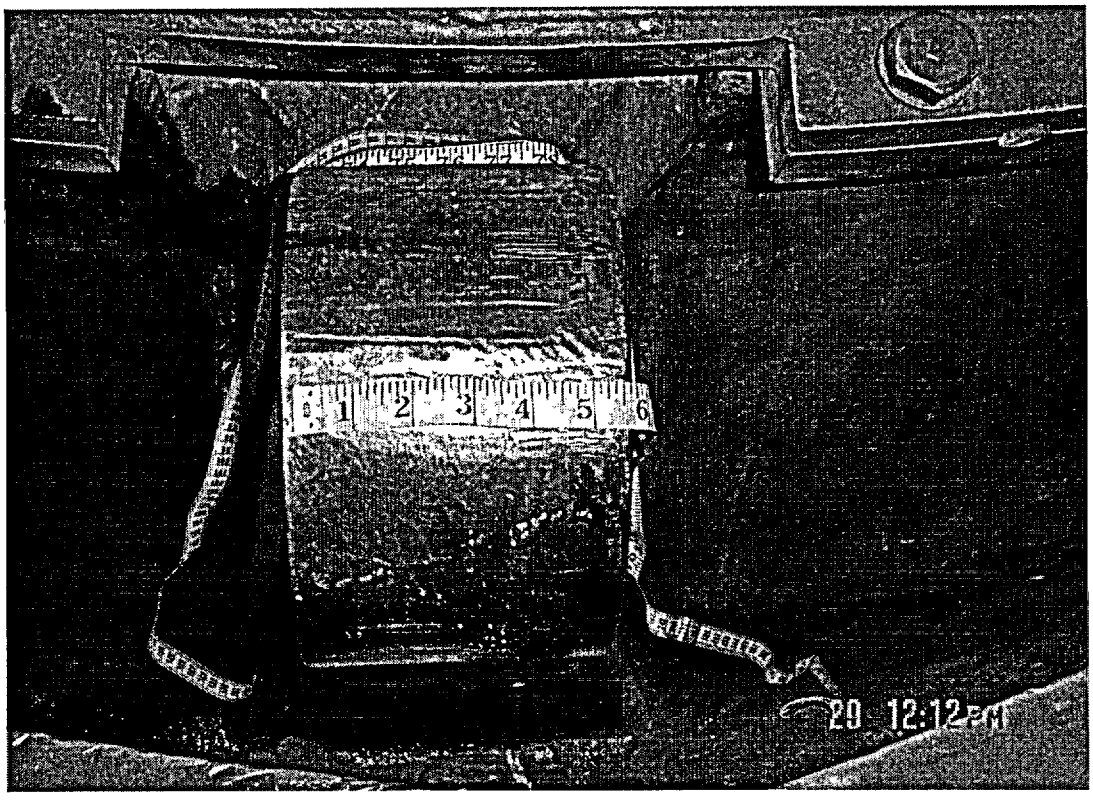
Enclosure 1
Attachment 1

Lifting Lugs Welded to RVCH



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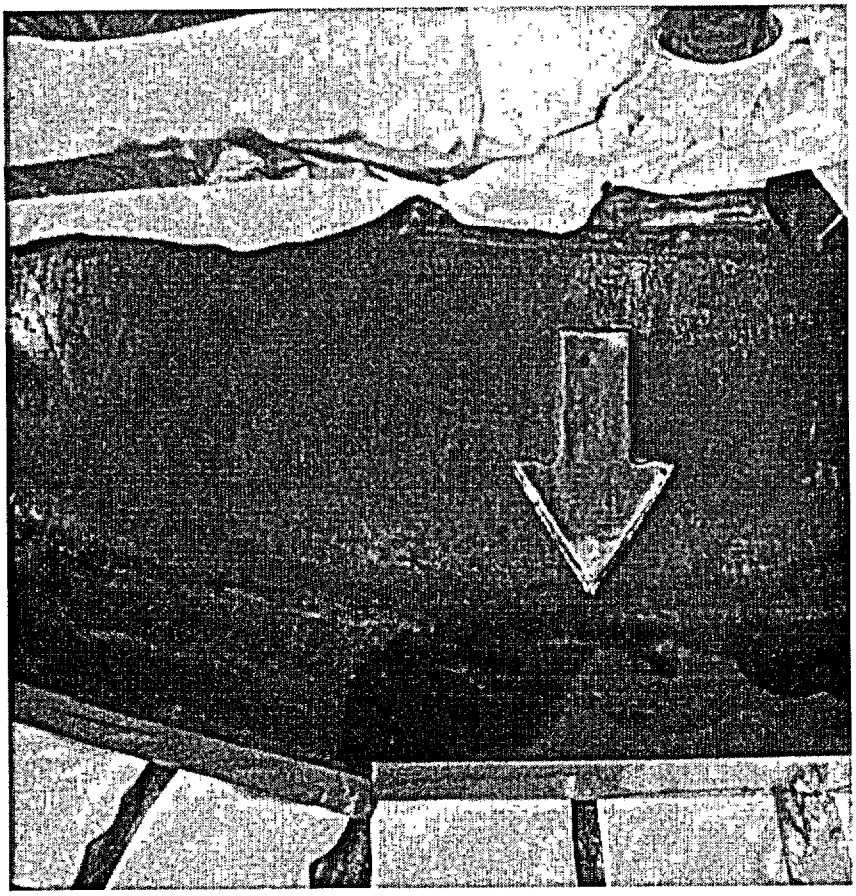
Enclosure 1
Attachment 2

Directional Arrow Welded to RVCH



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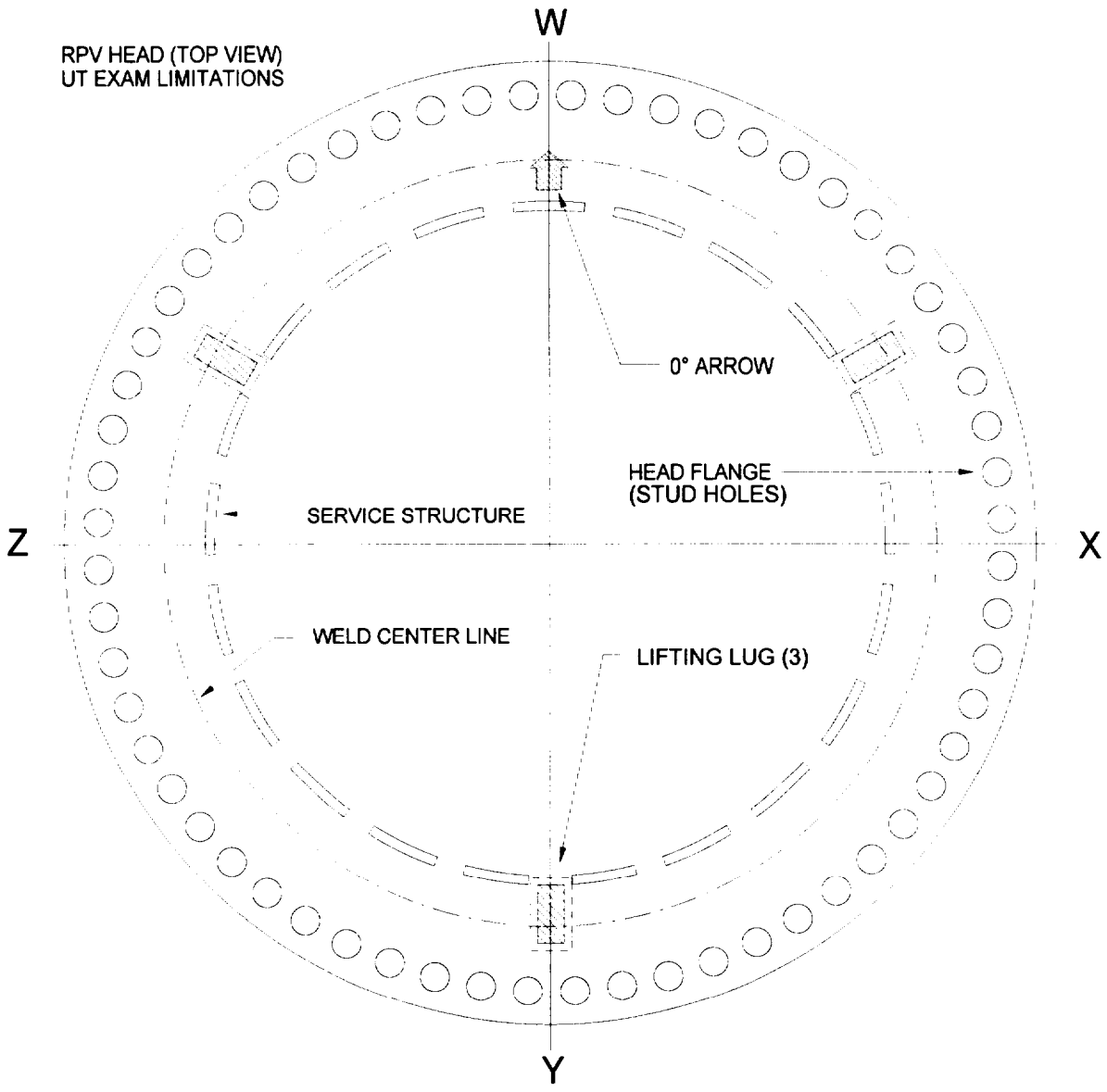
Attachment 3
Page 1



RV HEAD TO FLANGE WELD EXAMINATION COVERAGE

Limiting Conditions: Service Structure, Lifting lugs, Flange configuration & W-axis Arrow.

ZONE	TOTAL VOLUME	**	AXIAL (cubic inches)	CIRC (cubic inches)	0 Deg (cubic inches)	TOTAL COMPLETE
1	12287.7	Ve	10037.85	11426.70	11426.70	0.88
		WF	0.40	0.40	0.20	
		Vw	4015.14	4570.68	2285.34	
2	5424.57	Ve	2522.24	5044.47	5044.47	0.73
		WF	0.44	0.44	0.12	
		Vw	1109.78	2219.57	605.34	
3	14885.1	Ve	11765.79	13842.10	13842.10	0.87
		WF	0.40	0.40	0.20	
		Vw	4706.31	5536.84	2768.42	
					TOTAL COMPOSITE COVERAGE	82.81%

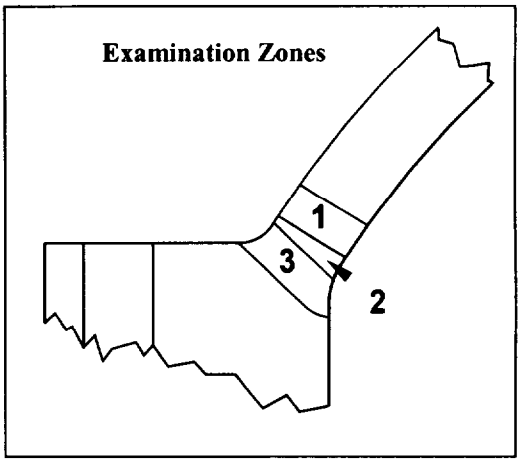
NOTES:

1) Total weld circumference is 499.5".
Circumference limited by the lifting lugs is 27" and 8" for the arrow. 35" Total.
Circumference not limited by the lugs and arrow is 464.5" (499.5" – 35").

2) See the following 3 pages of sketches and volume calculations of exam coverage.

3) Calculations performed per DBNPS Procedure No. DB-PF-05049

** Ve = Volume Examined.
WF = Weight Factor
Vw = Weighted Volume.



RPV HEAD TO FLG.

Axial Scan (45°, 60° & 65°)

Service Structure

* Weld Circumference = 499.5" - 35" (lug & arrow limitations) = 464.5"

ZONE 1 (24.6 in²)

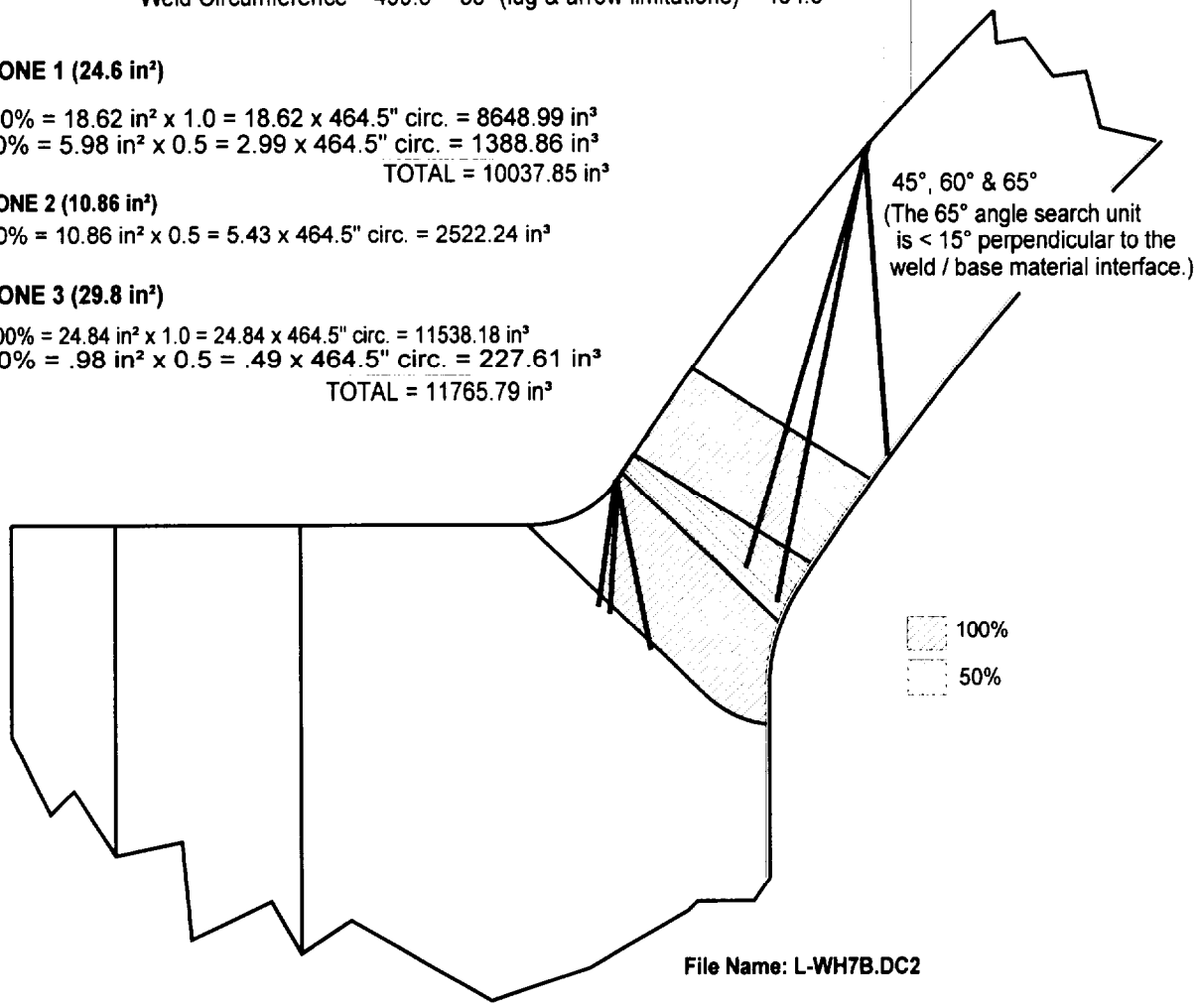
100% = 18.62 in² x 1.0 = 18.62 x 464.5" circ. = 8648.99 in³
50% = 5.98 in² x 0.5 = 2.99 x 464.5" circ. = 1388.86 in³
TOTAL = 10037.85 in³

ZONE 2 (10.86 in²)

50% = 10.86 in² x 0.5 = 5.43 x 464.5" circ. = 2522.24 in³

ZONE 3 (29.8 in²)

100% = 24.84 in² x 1.0 = 24.84 x 464.5" circ. = 11538.18 in³
50% = .98 in² x 0.5 = .49 x 464.5" circ. = 227.61 in³
TOTAL = 11765.79 in³



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RPV HEAD TO FLG.

CIRCUMFERENTIAL (45° & 60°) & ZERO SCANS

Service Structure

* Weld Circumference = 499.5" - 35" (lug & arrow limitations) = 464.5"

ZONE 1 (24.6 in²)

100% = 24.6 in² x 1.0 = 24.6 x 464.5" circ. = 11426.70 in³

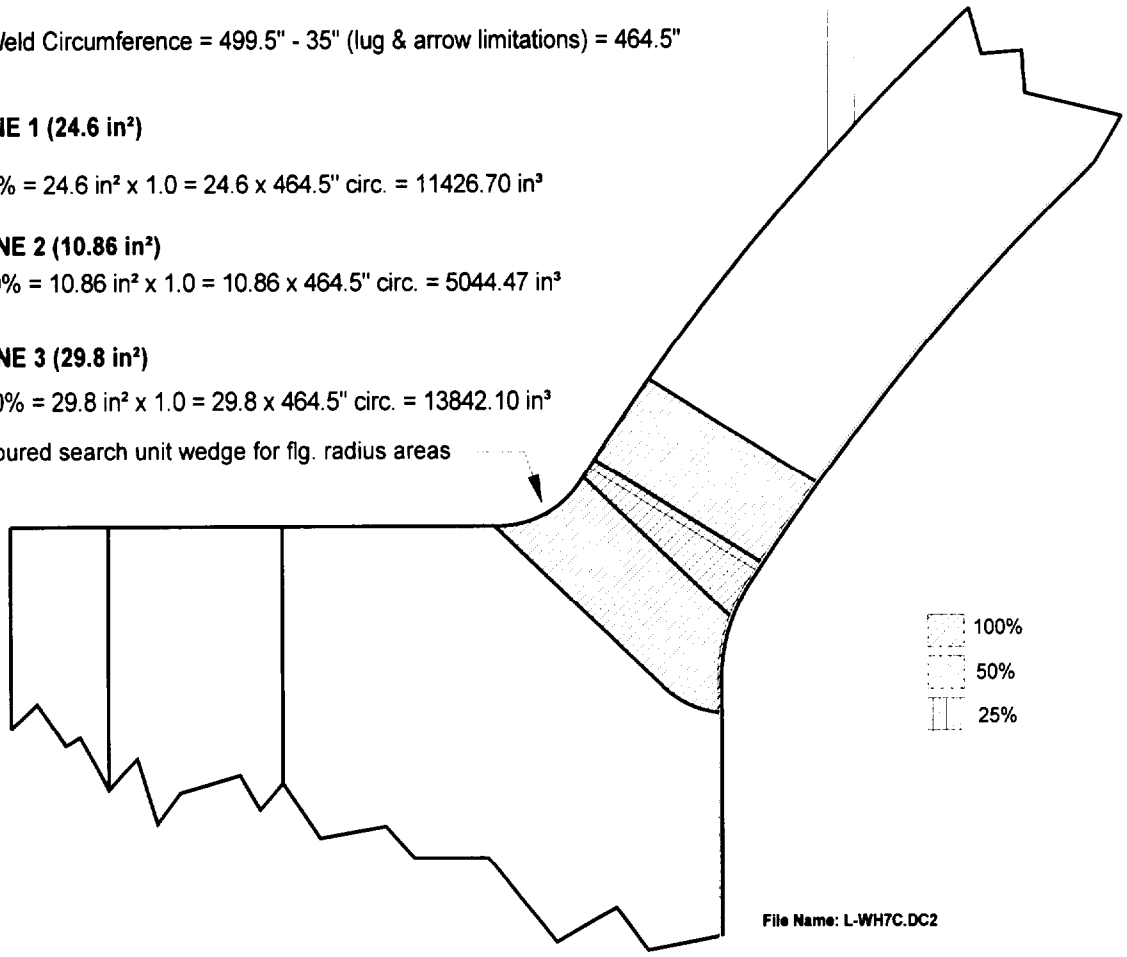
ZONE 2 (10.86 in²)

100% = 10.86 in² x 1.0 = 10.86 x 464.5" circ. = 5044.47 in³

ZONE 3 (29.8 in²)

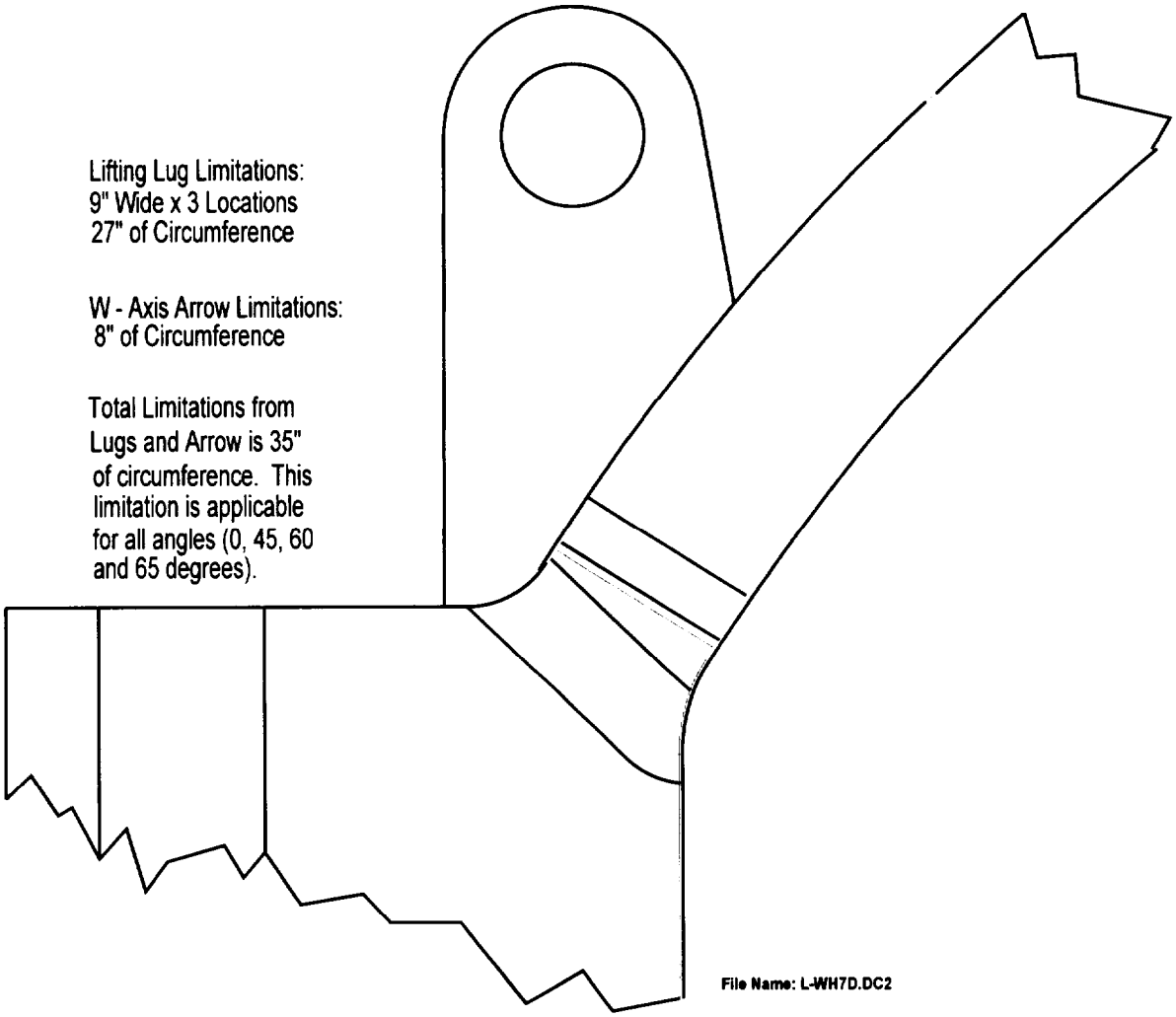
100% = 29.8 in² x 1.0 = 29.8 x 464.5" circ. = 13842.10 in³

Contoured search unit wedge for flg. radius areas



RPV HEAD TO FLG.

No Coverage under Lifting Lugs



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Enclosure 2

COMMITMENT LIST

The following list identifies those actions committed to by the Davis-Besse Nuclear Power Station (DBNPS) in this document. Any other actions discussed in the submittal represent intended or planned actions the DBNPS. They are described only for information and are not regulatory commitments. Please notify the Manager - Regulatory Affairs (419-321-8450) at the DBNPS of any questions regarding this document or associated regulatory commitments.

COMMITMENTS	DUE DATE
None	