

10 CFR 50.55a

November 20, 2003  
5928-03-20234

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555

Three Mile Island, Unit 1  
Operating License No. DPR-50  
NRC Docket No. 50-289

Subject: Additional Information Concerning a Proposed Alternative Associated with the  
Use of a Weld Overlay

References: 1) Letter from Michael P. Gallagher (AmerGen Energy Company, LLC), to U. S.  
Nuclear Regulatory Commission, dated November 3, 2003

2) Letter from Michael P. Gallagher (AmerGen Energy Company, LLC), to U. S.  
Nuclear Regulatory Commission, dated November 7, 2003

3) Letter from Michael P. Gallagher (AmerGen Energy Company, LLC), to U. S.  
Nuclear Regulatory Commission, dated November 18, 2003

Dear Sir or Madam:

In the Referenced letters, AmerGen Energy Company (AmerGen) requested a proposed alternative in accordance with 10 CFR 50.55a, "Codes and standards," paragraph (a)(3)(i) and supplied additional information requested by the U. S. Nuclear Regulatory Commission. This proposed alternative would permit the use of a full structural weld overlay repair for an indication identified in the steam generator "A" hot leg surge line nozzle-to-safe end weld. In response to a conference call between AmerGen and the U. S. Nuclear Regulatory Commission staff on November 13, 2003, Attachment 1 contains responses to several questions discussed during the call. Also attached is a summary of the weld overlay design and analysis as requested in the November 13, 2003 call (Attachment 5). Framatome-ANP requests that the document be withheld from public disclosure in accordance with 10 CFR 2.790(a)(4). An affidavit supporting this request is contained in Attachment 4. Attachment 5 to this letter contains the proprietary version of the analysis.

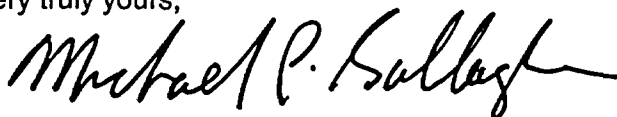
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Alternative Associated with the Use of a Weld Overlay  
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As requested in the Reference 1 letter, we request approval of the proposed alternative for the remainder of the ten-year interval.

If you have any questions, please contact us.

Very truly yours,

A handwritten signature in black ink, reading "Michael P. Gallagher". The signature is fluid and cursive, with a long horizontal stroke at the end.

Michael P. Gallagher  
Director, Licensing and Regulatory Affairs  
AmerGen Energy Company, LLC

Attachments

cc: H. J. Miller, Administrator, Region I, USNRC  
USNRC Senior Resident Inspector, TMI  
D. Skay, USNRC Senior Project Manager  
File No. 01086

**ATTACHMENT 1**  
**RESPONSE TO ADDITIONAL QUESTIONS**

- References:
- 1) Letter from Michael P. Gallagher (AmerGen Energy Company, LLC), to U. S. Nuclear Regulatory Commission, dated November 3, 2003
  - 2) Letter from Michael P. Gallagher (AmerGen Energy Company, LLC), to U. S. Nuclear Regulatory Commission, dated November 7, 2003
  - 3) Letter from Michael P. Gallagher (AmerGen Energy Company, LLC), to U. S. Nuclear Regulatory Commission, dated November 18, 2003

In the submittal dated November 3, 2003, the AmerGen Energy Company, LLC proposed a dissimilar metal weld overlay repair to the pressurizer line at Three Mile Island, Unit 1. On November 7, 2003, the licensee provided answers to questions the staff provided in a phone call on November 5, 2003. The staff is reviewing both submittals. In order to continue the review, the staff requests the following information:

Question:

- 1.0 In the November 3 submittal, Table 2 describes the acceptance standards for the completed weld overlay for complete bonding and minimum thickness as being per the weld overlay design. The weld overlay design is for minimum thickness. Provide the acceptance standards for bonding and construction flaws.

Response:

The acceptance standards for bonding are those provided in ASME Section XI, 1995 Edition, through 1996 Addenda, IWB-3514-3, "Allowable Laminar Flaws". "Lack-of-bonding", if identified, will also be evaluated to ensure that the outer 25% of the original pipe wall thickness above the identified axial flaw can be adequately interrogated by the required angle beam examination. Generally, the radiography process does not lend itself to the detection of indications that are oriented parallel to the component/piping surface (e.g., lack-of-bond). The ultrasonic testing (UT) method using a straight beam (0°L) is the process that would lend itself to the detection of lack-of-bonding indications. Therefore, the proposed UT acceptance standards of IWB-3514-3 are the appropriate acceptance standards to evaluate lack-of-bond indications for this weld overlay application.

The volumetric acceptance standards for "construction flaws" are those provided in ASME Section XI, 1995 Edition, through 1996 Addenda, IWB-3514-2, "Allowable Planar Flaws", applicable to Preservice Examination. Although the UT acceptance standards of IWB-3514-2 are different from those of Appendix B-1 (Draft ANSI B31.7, 1968 Errata) for radiography, the use of IWB-3514-2 UT acceptance standards are appropriate because UT is the proposed alternate examination method. This is consistent with the examination approach specified in paragraph (i) of Code Case N

504-2 as well as that of paragraph IWA-4600(a) of ASME Section XI, 1995 Edition, through 1996 Addenda.

Question:

2.0 In the November 3 submittal, Table 3 states that the examination volume will be the volume examined in the PDI demonstration. Provide a sketch showing cross-section with dimensions of the PDI inspection volume. Will the inspections include the ferritic base metal beneath the overlay? If not, explain why this area is not susceptible to crack growth?

Response:

For the preservice inspection as noted in Table 2 of the Reference 1 submittal, the entire length for the full circumference of the overlay will be examined. The outer 25% of the original pipe wall will also be examined to the maximum degree allowable by the weld overlay configuration. An estimated coverage map is provided in Attachment 1.

Future inspections will be covered as discussed in Table 3 including ½ inch on either side of the original weld. Inspection on either side of the original weld will find any postulated flaw extending into the stainless steel or carbon steel. The carbon steel is not expected to have any active degradation; therefore, interrogation of the ½ inch on either side of the original weld is conservative. This is based on past IGSCC experience in BWRs.

Question:

3.0 In the November 3 submittal, Table 3 states that the acceptance standards for the volumetric examination is that "No planar flaw extending into the structural weld overlay." In the November 7 submittal, the answer to question 3.0 states that Code required no flaw greater than 75% of the wall. In the sketch for question 2.0 above, (or separate sketch of the overlay and butt weld cross section) show the maximum height of the embedded flaw that would be within the Code acceptance.

Response:

The overlay replaces the pressure boundary as discussed in our response to question 3b of the Reference 2 submittal. The maximum extent of cracking can go through the original pipe wall and through the first two diluted layers of the overlay; this material is not considered or credited as part of the new pressure boundary (see Attachment 3, "Schematic Showing Basis for Determination of Weld Overlay Thickness"). There can be no crack penetration into the structural portion of the overlay. The weld overlay re-establishes the 75% criteria established by the Code. The November 7 response to Question 3.0 relates to the design of the overlay thickness based upon the ASME Section XI requirement that limits maximum flaw depth to 75% through-wall. The weld

overlay repair was designed to meet this code requirement assuming the flaw depth extended through the original wall thickness plus the first two (2) diluted layers of weld overlay material.

Question:

4.0 In the November 3 submittal, Table 3 states that re-examination frequency will be the next two refueling outages and re-evaluated based on inspection results. In the November 7 submittal Table 1 the basis for the proposed alternative to IWA-4530(a) states that re-inspections frequencies have been established based on historical BWR experience. BWR experience is provided in the Electric Power Research Institute proprietary report TR-113932, "BWR Vessel and Internals Project, Technical Basis for Revisions to Generic Letter 88-01 Inspection Schedules (BWRVIP-75)," dated October 1999 and the NRC staff's safety evaluation was issued on May 14, 2002. Will the inspection frequency described in BWRVIP-75 as supplemented by the NRC staff's safety evaluation be the minimum inservice inspection frequency? If not, provided the criteria for establishing the inservice inspection frequency.

Response:

Yes.

Question:

5.0 In the November 7 submittal, Table 1 states that all girth butt welds shall be examined 100% by radiography. The proposed examination is UT (November 3 submittal Table 1). Provide a discussion on the acceptability standards for construction flaws.

Response:

See answer to question #1 above.

**ATTACHMENT 2**  
**ESTIMATED COVERAGE MAP**



**SR0010BM Weld Overlay  
Proposed Scan Coverages & Plots based on Design Input  
TMI**

**Revision 0**

**11/18/03**

**Prepared by S.C. Mortenson**

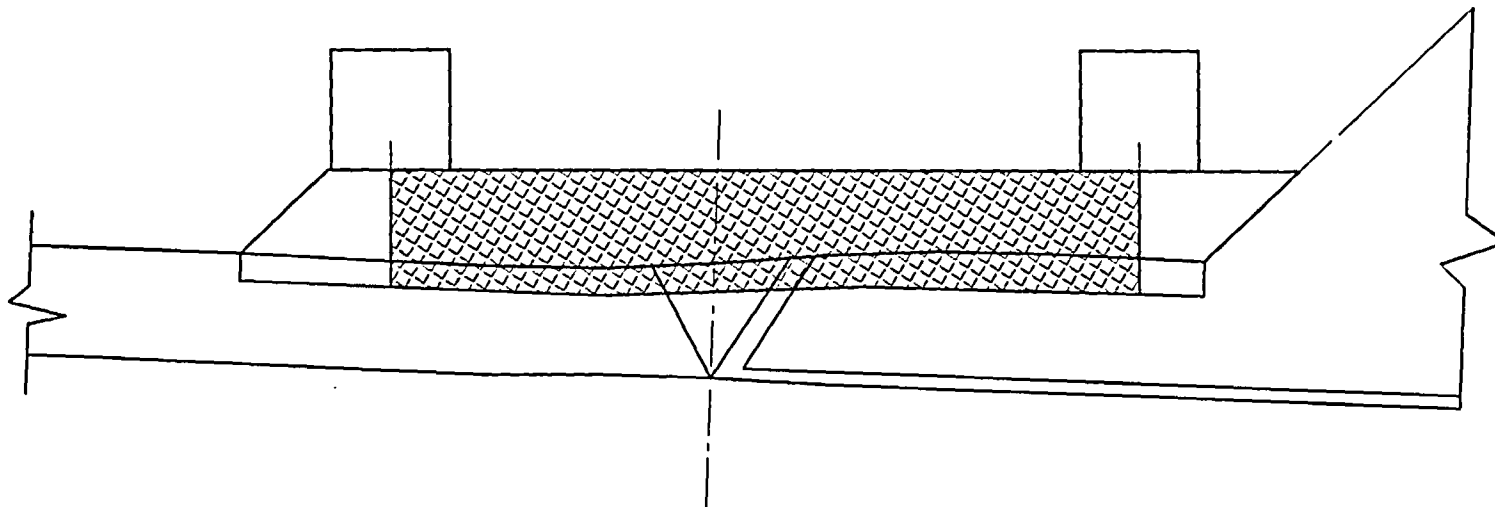


**Proposed Scan Coverages**

	<b>Scan Direction</b>	<b>Cross Sectionial Area in<sup>2</sup></b>	<b>Percentage</b>
Total	n/a	11.3	-
0 Lwave	Axial	8.8	78%
45 Upstream	Axial	8.7	77%
45 Downstream	Axial	8.7	77%
60 Upstream	Axial	8.3	73%
60 Downstream	Axial	8.6	76%
70 Upstream	Axial	7.7	68%
70 Downstream	Axial	8.1	72%
Circumferential Scans (ea)	Circumferential	8.8	78%

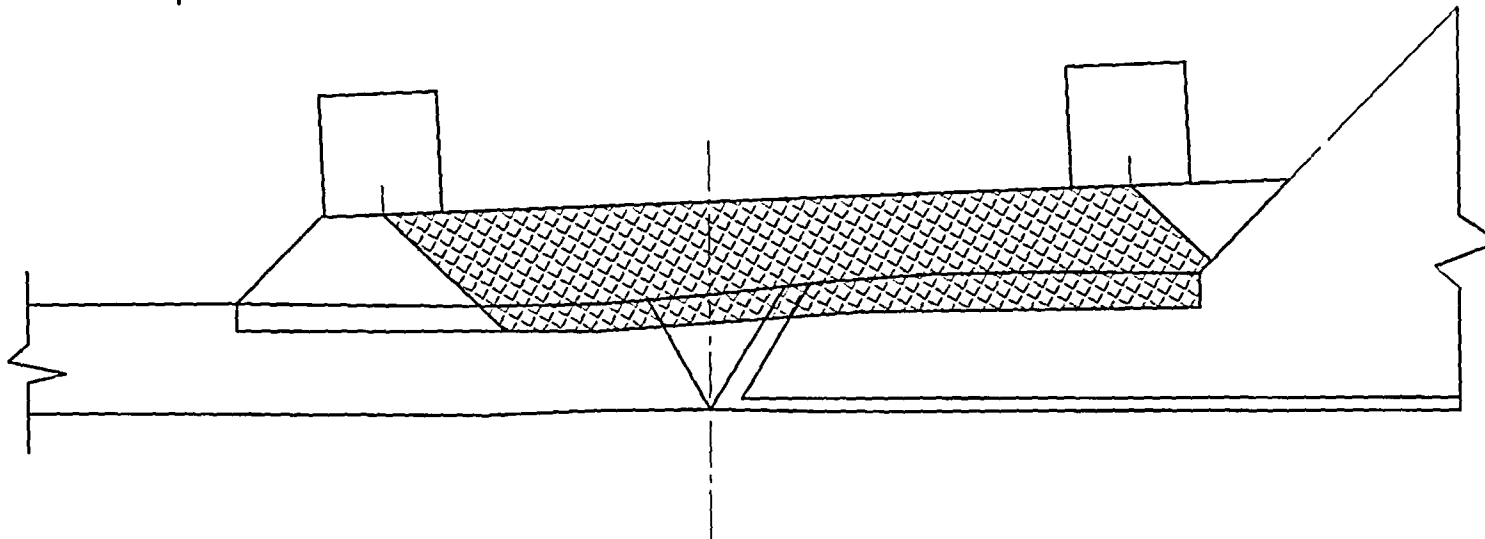


### 0 Lwave & Circumferential Scans



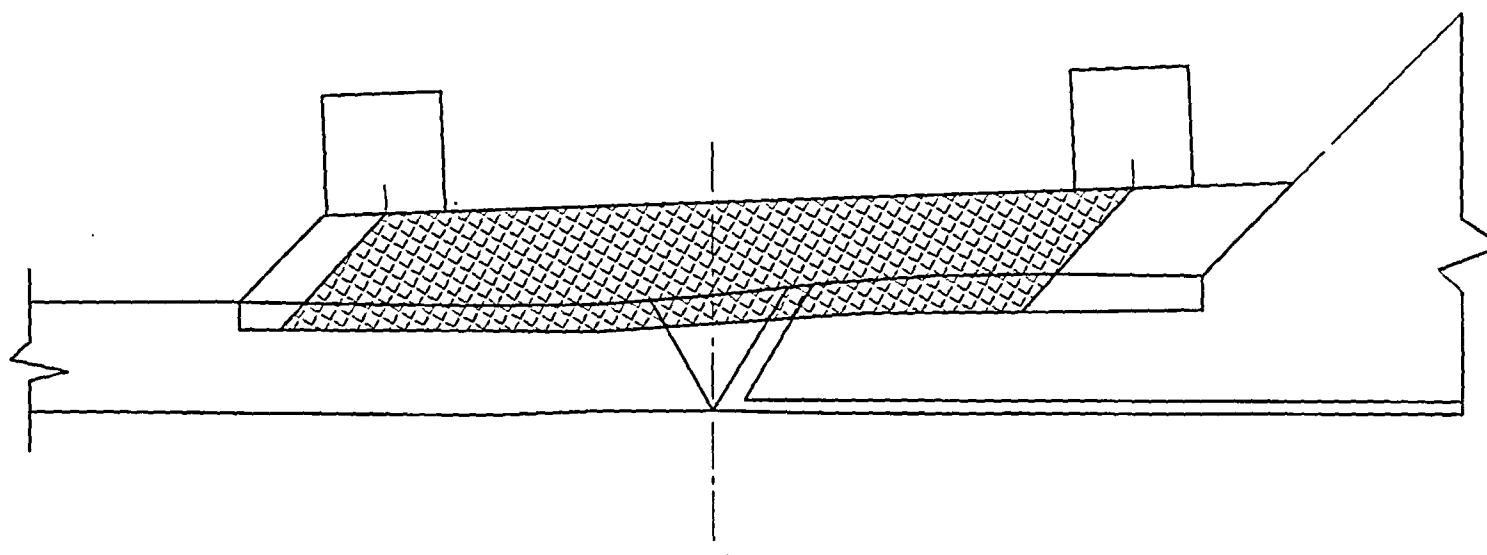


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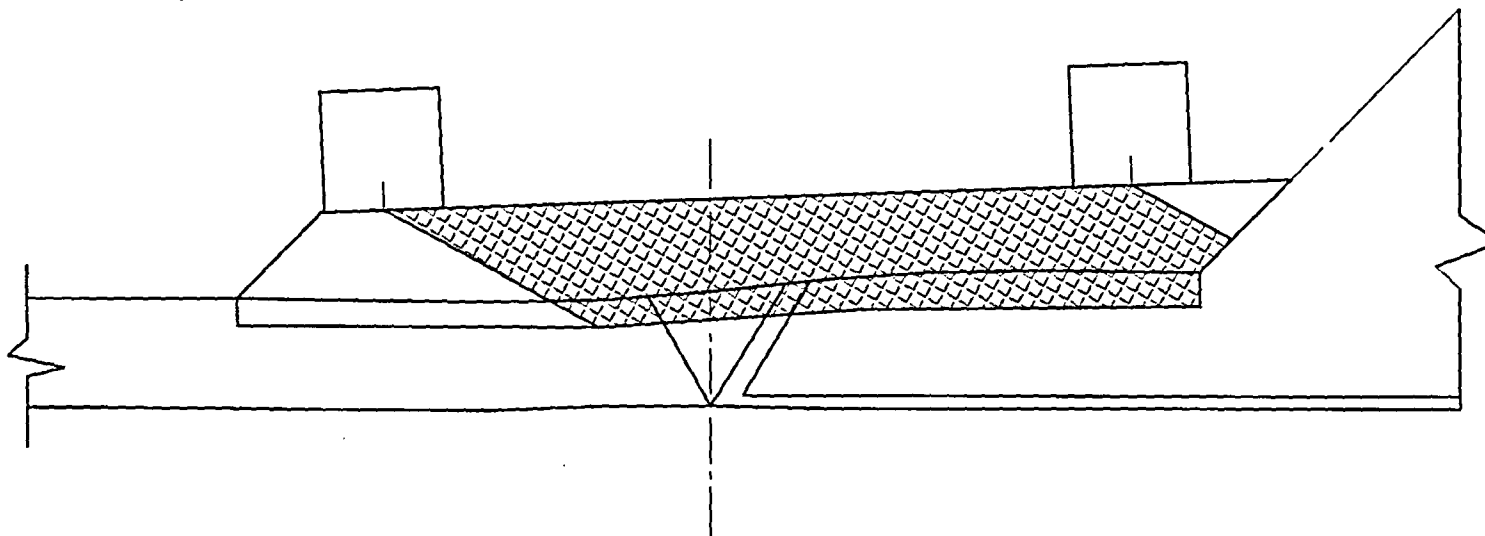


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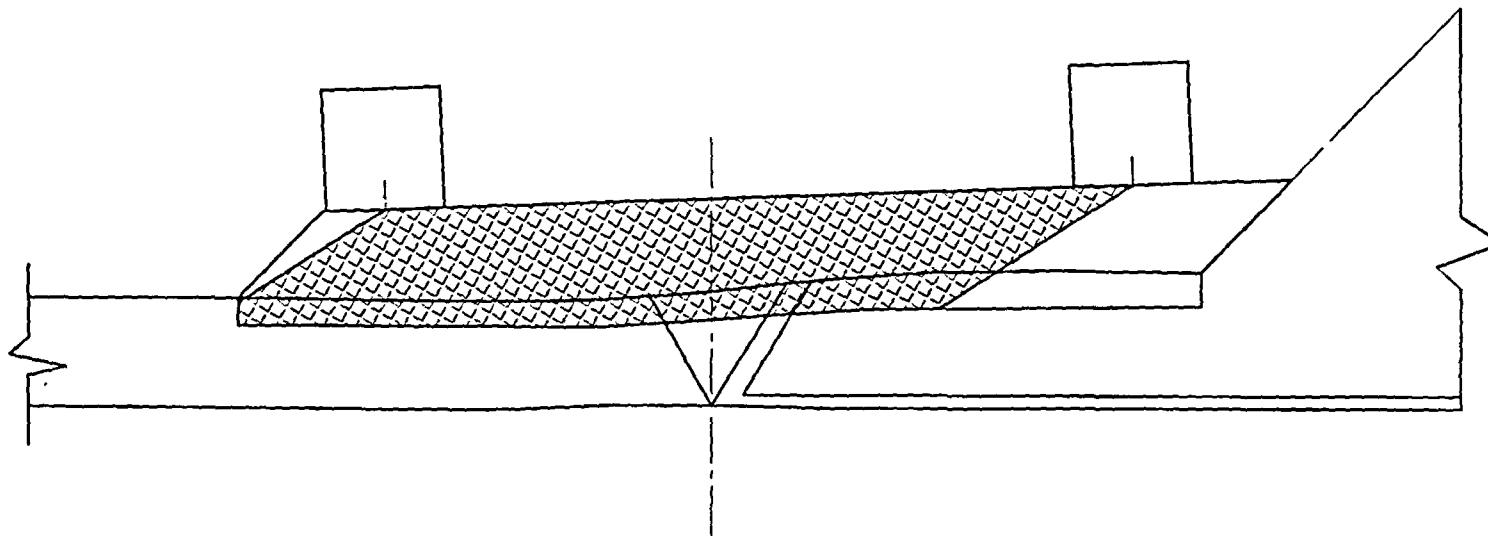


60 Upstream



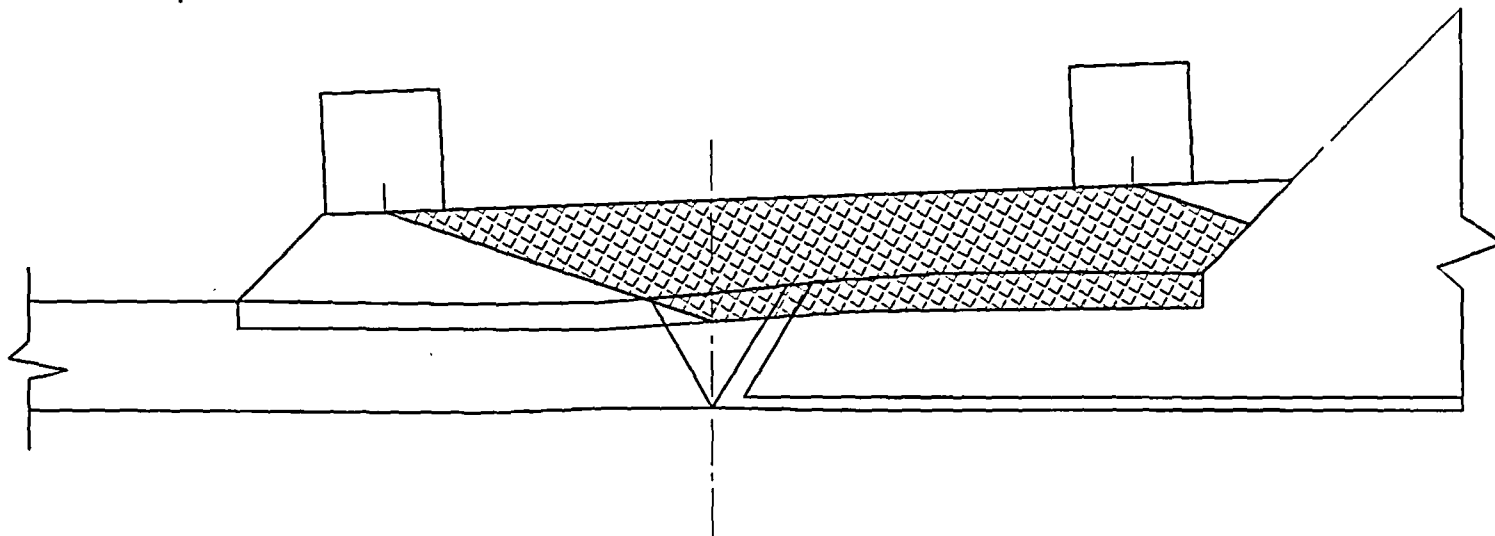


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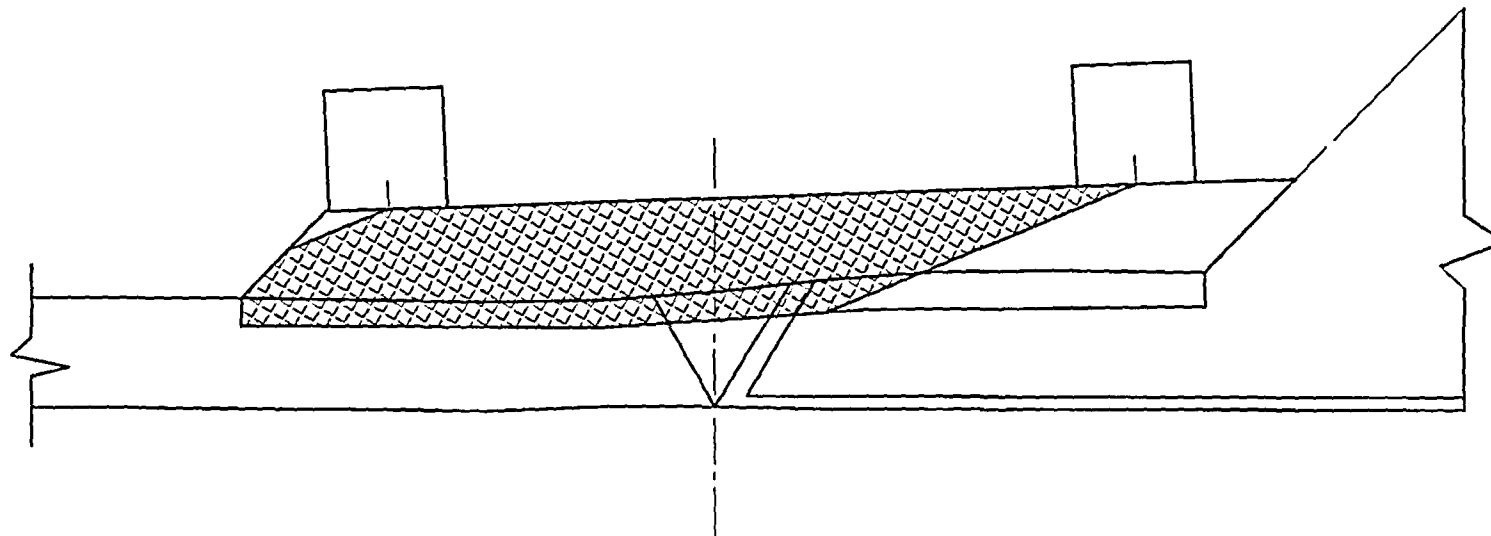


70 Upstream





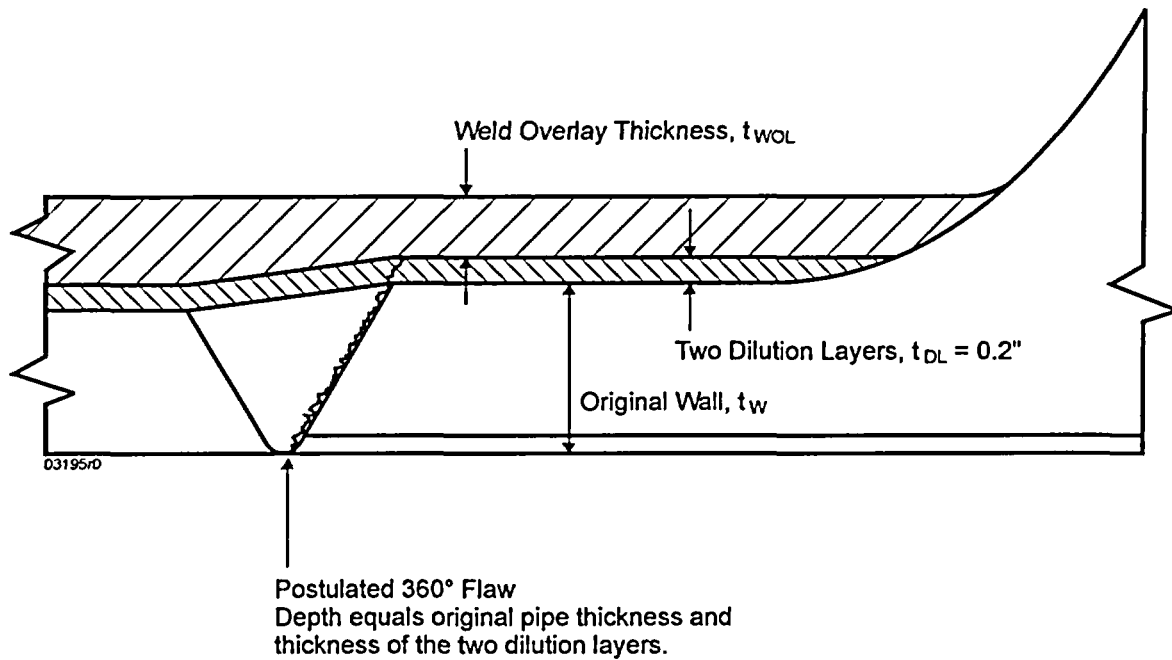
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**ATTACHMENT 3**

**SCHEMATIC SHOWING BASIS FOR DETERMINATION OF WELD  
OVERLAY THICKNESS**



Weld Overlay Thickness Defined by:

$$\frac{t_w + t_{DL}}{t_w + t_{DL} + t_{WOL}} = 0.75$$

**Schematic Showing Basis for Determination of Weld Overlay Thickness**

**ATTACHMENT 4**  
**FRAMATOME-ANP**  
**AFFIDAVIT**

## AFFIDAVIT

COMMONWEALTH OF VIRGINIA    )  
  ) ss.  
CITY OF LYNCHBURG            )

1. My name is Gayle F. Elliott. I am Manager, Product Licensing in Regulatory Affairs, for Framatome ANP ("FANP"), and as such I am authorized to execute this Affidavit.

2. I am familiar with the criteria applied by FANP to determine whether certain FANP information is proprietary. I am familiar with the policies established by FANP to ensure the proper application of these criteria.

3. I am familiar with the report, SIR-03-153, Revision 0, referenced in letter number 5928-03-20234 from Michael P. Gallagher, AmerGen Energy Company, LLC, to the U.S. Nuclear Regulatory Commission, dated November 20, 2003, entitled "Weld Overlay Design for the Hot Leg Nozzle to Surge Line Weld at Three Mile Island Unit 1" and referred to herein as "Document." Information contained in this Document has been classified by FANP as proprietary in accordance with the policies established by FANP for the control and protection of proprietary and confidential information.

4. This Document contains information of a proprietary and confidential nature and is of the type customarily held in confidence by FANP and not made available to the public. Based on my experience, I am aware that other companies regard information of the kind contained in this Document as proprietary and confidential.

5. This Document has been made available to the U.S. Nuclear Regulatory Commission in confidence with the request that the information contained in this Document be withheld from public disclosure.

6. The following criteria are customarily applied by FANP to determine whether information should be classified as proprietary:

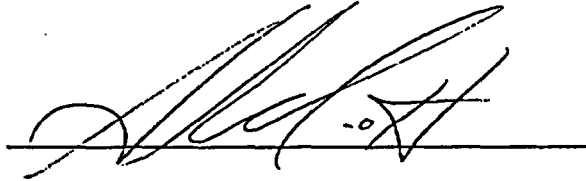
- (a) The information reveals details of FANP's research and development plans and programs or their results.
- (b) Use of the information by a competitor would permit the competitor to significantly reduce its expenditures, in time or resources, to design, produce, or market a similar product or service.
- (c) The information includes test data or analytical techniques concerning a process, methodology, or component, the application of which results in a competitive advantage for FANP.
- (d) The information reveals certain distinguishing aspects of a process, methodology, or component, the exclusive use of which provides a competitive advantage for FANP in product optimization or marketability.
- (e) The information is vital to a competitive advantage held by FANP, would be helpful to competitors to FANP, and would likely cause substantial harm to the competitive position of FANP.

7. In accordance with FANP's policies governing the protection and control of information, proprietary information contained in this Document have been made available, on a limited basis, to others outside FANP only as required and under suitable agreement providing for nondisclosure and limited use of the information.


8. FANP policy requires that proprietary information be kept in a secured file or area and distributed on a need-to-know basis.

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9. The foregoing statements are true and correct to the best of my knowledge, information, and belief.

A handwritten signature in black ink, appearing to be "M. H.", written over a horizontal line.

SUBSCRIBED before me this 20<sup>th</sup>  
day of November, 2003.

A handwritten signature in black ink, reading "Ella F. Carr-Payne", written over a horizontal line.

Ella F. Carr-Payne  
NOTARY PUBLIC, STATE OF VIRGINIA  
MY COMMISSION EXPIRES: 8/31/05

