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November 27, 2006

U. S. Nuclear Regulatory Commission
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SUBJECT: Duke Power Company LLC d/b/a Duke Energy Carolinas, LLC (Duke)
Oconee Nuclear Station, Unit 1
Docket Number 50-269
Relief Request 06-ON-004

On August 24, 2006 Duke submitted Relief Request 06-ON-004 pursuant to 10 CFR 50.55a(a)(3)(i), requesting NRC approval to use alternatives to the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI inservice inspection (ISI) requirements for the Oconee Nuclear Station, Unit 1, 2, & 3. This proposed alternative approach is to support application of full structural weld overlays on various pressurizer nozzle-to-safe end welds, nozzle to flange welds and safe end to pipe welds, and will provide an acceptable level of quality and safety.

By letters dated September 11, 2006, October 5, 2006, and October 26, 2006 Duke responded to e-mail requests from the NRC Staff for additional information regarding several issues contained within the relief request. As part of this information, Duke withdrew the applicability of the request to Units 2 and 3.

The NRC granted temporary verbal approval for relief request 06-ON-004 for Unit 1 only on October 30, 2006.

On November 3, 2006 Duke determined that a statement in a similar relief request submitted for McGuire and Catawba Nuclear Stations could be misinterpreted. Duke notified the NRC by phone and submitted a letter dated November 16, 2006 as follow-up clarification of the issue for that request. The August 24, 2006 submittal for relief request 06-ON-004 contained the same statement in Table 3, Modifications to Code Case N-638-1. Accordingly, Enclosure 1 to this letter is provided as follow-up clarification for relief request 06-ON-004.

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In addition, the August 24, 2006 submittal contained a commitment that a summary of the results of the stress analyses demonstrating that the preemptive full structural weld overlay will not hinder the components from performing their design function will be submitted to the NRC prior to Oconee Unit 1 entry into Mode 4 during the current outage. The committed summary report is included as Enclosure 2.

The October 5, 2006 Duke response to a request for additional information from the NRC Staff contained an additional commitment to provide to the NRC Staff the results of ultrasonic testing (UT) performed on the weld overlays within 14 days after completion of the final UT on those welds. Accordingly, these results are included as Enclosure 3.

If you have any questions or require additional information, please contact Randy Todd at (864)-885-3418.

Sincerely,

R. Michael Glover / for

Bruce H. Hamilton
Site Vice President
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Enclosures (3)

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ISI Relief Request File
ONS MasterFile ON-801.01 (ON03DM)
ELL

Duke Power Company, LLC
Oconee Nuclear Station
Unit 1
Request for Relief 06-ON-004

November 27, 2006

Enclosure 1

Clarification to
Table 3, “Modifications to Code Case N-638-1”

It has been determined that in Table 3 "Modifications to Code Case N-638-1" of the subject relief request, the reference to modification of section 1.0(a) (located on page 23 of 24 of the submittal) could be interpreted in a way not intended by the author or original internal Duke reviewers. The phrase "and the depth of the WOL shall not be greater than one-half of the ferritic base m*etal thickness"* could be interpreted to mean that the thickness of the weld overlay would not exceed one-half the thickness of the ferritic substrate. The words in the original submittal were copied from N-638-1 with no intent to apply such a limit to the overlay thickness. The reasons for not applying this limit to the overlay thickness are more fully described below.

In the context of Code Case N-638-1, paragraph 1, the term depth refers to a depth of preparation for a repair weld that will be implemented using the temperbead process described in the code case. Since no analysis is required by the code case, it is our understanding that the one-half thickness limit was included in the code case as a conservative measure to assure that there would be sufficient material to support the weld shrinkage stresses that would be generated by the constraint of a deep cavity in a component. The code case was not written for overlay type applications and is not specific enough to be used without modification for this type application.

In the context of the current Duke application, depth of preparation is not applicable because the overlay requires no preparation other than surface clean-up prior to application of the overlay. In the case of the pressurizer overlays at all the Duke units, the overlay configuration has been modeled and the residual stresses in the weld calculated. These calculations show that stresses generated by the overlay will not have any detrimental effect on the performance of the component for the life of the overlay. The temperbead process was qualified in accordance with the requirements of the code case and tested to show there would not be detrimental effects on the strength and toughness of the material. Therefore the qualification and analysis has demonstrated the acceptability of the overlay for the intended pressure retaining service.

To clarify the intent of the relief request, this entry in Table 3 has been modified as shown below.

Table 3
Modifications to Code Case N-638-1

Code Case N-638-1	Modification/Basis
Weld Area 1.0(a) The maximum area of an individual weld based on the finished surface shall be 100 sq. inch, and the depth of the weld shall not be greater than one-half of the ferritic base metal thickness.	**Modification:** The maximum area of an individual weld based on the finished surface ***over the ferritic material*** will not exceed 500 square inches. The depth of the weld is not applicable to the WOL configuration and is not addressed in this request. ***Basis:*** *The maximum area of the WOL for the surge line nozzle will be approximately 125 sq-inch over the ferritic material. Code Case N-638-3 and the associated white paper have been approved by the ASME Code Committees, and provide technical justification for extending the area limitation to 500 sq. inch.*

Duke Power Company, LLC
Oconee Nuclear Station
Unit 1
Request for Relief 06-ON-004

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Enclosure 2

Summary of Design and Analyses of Preemptive Weld Overlays for Nozzle Locations Containing Alloy 600 Materials

1.0 INTRODUCTION

Duke Energy has applied full structural weld overlays (WOLs) on dissimilar metal welds (DMWs) of three 2.5" pressurizer safety/relief valve nozzles, one pressurizer 4" spray line nozzle, one 10" hot leg surge line nozzle and one 10" pressurizer surge line nozzle at the Oconee Nuclear Station, Unit 1. The purpose of these overlays is to eliminate dependence on the primary water stress corrosion cracking (PWSCC) susceptible Alloy 82/182 welds as pressure boundary welds and to mitigate any potential future PWSCC in these welds. The overlays were installed using a PWSCC resistant weld filler material, Alloy 52M [1].

The requirements for design of weld overlay repairs are defined in ASME Code Case N-504-2 [2], supplemented for this application by the Relief Request [3]. Weld overlay repairs are considered to be acceptable long-term repairs for PWSCC susceptible weldments if they meet a conservative set of design assumptions which qualify them as "full structural" weld overlays. The design basis flaw assumption for full structural weld overlays is a circumferentially oriented flaw that extends 360° around the component, completely through the original component wall. A combination of internal pressure, deadweight, seismic and mechanical load stresses is applied to the overlaid nozzles containing this assumed design basis flaw, and they must meet the requirements of ASME Code, Section XI, IWB-3641 [4].

ASME Code, Section III stress and fatigue usage evaluations are also performed that supplement existing piping, safe end, and nozzle stress reports, to demonstrate that the overlaid components continue to meet ASME Code, Section III. The original construction Code for the pressurizer was ASME Boiler and Pressure Vessel Code, Section III, Subsection A, 1965 Edition through 1967 Addenda. However, as allowed by ASME Code, Section XI, Code Editions and Addenda later than the original construction Code may be used. ASME Code, Section III, 1989 Edition with no Addenda [5] was used for these analyses.

In addition to providing structural reinforcement to the PWSCC susceptible locations with a resistant material, weld overlays have also been shown to produce beneficial residual stresses that mitigate PWSCC in the underlying DMWs. The weld overlay approach has been used to repair stress corrosion cracking in U.S. nuclear plants on hundreds of welds, and there have been no reports of subsequent crack extension after application of weld overlays. Thus, the compressive stresses caused by the weld overlay have been effective in mitigating new crack initiation and/or growth of existing cracks. In addition, the weld residual stresses from the overlays act as compressive mean stresses in fatigue crack growth assessments.

Finally, evaluations are performed, based on as-built measurements taken after the overlays are applied, to demonstrate that the overlays meet their design basis requirements, and that they will not have an adverse effect on the balance of the piping systems. These include comparison of overlay dimensions to design dimensions, and evaluation of shrinkage stresses and added weight effects on the piping systems.

2.0 ANALYSIS SUMMARY AND RESULTS

2.1 Weld Overlay Structural Sizing Calculations

Detailed sizing calculations for weld overlay thickness were performed using the "Codes and Standards" module of the **pc-CRACK** computer program [6], which incorporates ASME Code, Section XI, IWB-3640 evaluation methodology. Loads and stress combinations were provided by Duke Energy. Both normal operating/upset (Level A/B) and faulted (Level D) load combinations were considered in this evaluation, and the design was based on the more limiting results. The resulting minimum required overlay thicknesses are summarized in Table 2-1. Because of weld metal dilution concerns over the carbon steel nozzle, a dilution weld layer is specified, in addition to the thickness required for structural reinforcement, to allow for the possibility that the minimum required chromium content for PWSCC resistance (24%) may not be achieved in the first layer.

The weld overlay length must consider: (1) length required for structural reinforcement, (2) length required for access for preservice and inservice examinations of the overlaid weld, and (3) residual stress improvement. In accordance with ASME Code Case N-504-2, the minimum weld overlay length required for structural reinforcement was established by evaluating the axial-radial shear stress due to transfer of primary axial loads from the pipe into the overlay and back into the nozzle, on either side of the weld(s) being overlaid. Axial weld overlay lengths were established such that this stress is less than the ASME Code, Section III limit for pure shear stress. The resulting minimum length requirements are summarized in Table 2-1.

The overlay length and profile must also be such that the required post-WOL examination volume can be inspected using Performance Demonstration Initiative (PDI) qualified nondestructive examination (NDE) techniques. This requirement can cause required overlay lengths to be longer than the minimums for structural reinforcement. The weld overlay designs for the Oconee Unit 1 pressurizer nozzles are illustrated in Figures 2-1 through 2-4. The designs were reviewed by qualified NDE personnel to ensure that they meet inspectability requirements. Note that, in Figure 2-2, the spray nozzle overlay was designed to cover the nozzle-to-safe end weld, the entire safe-end length and the adjacent safe end-to-pipe weld. This was necessitated because the spray nozzle safe-end was fabricated from Alloy 600 material and the adjacent safe end-to-pipe weld is Alloy 82/182, both of which are PWSCC susceptible.

Table 2-1: Weld Overlay Structural Thickness and Length Requirements

		Safety/Relief Valve Nozzle	Spray Nozzle-to-Safe End Weld	Spray Safe End-to-Pipe Weld	Hot Leg Surge Nozzle	PZR Surge Nozzle
Minimum* Thickness (in.)	Nozzle Side	0.271	0.208	NA	0.396	0.375
	Safe End/ Pipe Side	0.271	NA	0.146	0.333	0.354
Minimum** Length (in.)	Nozzle Side	NA	0.600	NA	0.890	0.987
	Safe End/Pipe Side	NA	NA	0.631	0.906	1.028

* - Weld dilution layer (0.08") must be added

** - Additional length requirements apply for inspectability

2.2 Section III Stress Analyses

Stress intensities for the weld overlaid nozzles were determined from finite element analyses for the various specified load combinations and transients using the ANSYS software package [8]. Three-dimensional models were developed for the hot leg surge and safety/relief valve nozzles (Figure 2-5 for example), to address the three-dimensional nature of their interfaces with the hot leg piping and pressurizer head, respectively. Two-dimensional models were deemed adequate for the pressurizer spray and surge nozzles (Figure 2-7 for example), since their geometries are axisymmetric. Linearized stresses were evaluated at a total of six stress paths for the three-dimensional models (Figure 2-6) and at two stress paths for the two-dimensional models (Paths 1 and 2 in Figure 2-7).

The stress intensities at these locations were evaluated in accordance with ASME Code, Section III, Subarticles NB-3200 and NB-3600 [5], and compared to applicable Code limits. A summary of the stress and fatigue usage comparisons for the most limiting locations is provided in Table 2-2. The stresses and fatigue usage in the weld overlaid nozzles are within the applicable Code limits. In general, the limiting location for the Section III stress analyses was found to be the section of the original pipe at the end of the overlay (Path 1 in Figure 2-7).

Table 2-2: Limiting Stress Results for Weld Overlaid Nozzles

Nozzle	Load Combination	Type	Calculated	Allowable
Safety/ Relief	Level A/B	Primary + Secondary (P +Q) (ksi)*	44.41	52.20
	Fatigue	Cumulative Usage Factor	0.577	1.000
Spray	Level A/B	Primary + Secondary (P +Q) (ksi)*	49.74	49.8
	Fatigue	Cumulative Usage Factor	0.028	1.000
Hot Leg Surge	Level A/B	Primary + Secondary (P +Q) (ksi)*	73.80**	49.94
		Simplified Elastic-Plastic Analysis (P +Q) (ksi)	47.09	49.94
	Fatigue	Cumulative Usage Factor	0.971	1.000
PZR Surge	Level A/B	Primary + Secondary (P +Q) (ksi)*	55.17**	49.8
		Simplified Elastic-Plastic Analysis (P +Q) (ksi)	30.07	49.8
	Fatigue	Cumulative Usage Factor	0.625	1.000

* - Primary stress acceptance criteria are met via the sizing calculations discussed in Section 2.1.

** - Elastic analysis exceeds the allowable value of $3S_m$; however, criteria for simplified elastic-plastic analysis and thermal ratchet are met.

2.3 Residual Stress and Section XI Crack Growth Analyses

Weld residual stresses for the Oconee Unit 1 pressurizer nozzle weld overlays were determined by detailed elastic-plastic finite element analyses. The analysis approach has been previously documented to provide predictions of weld residual stresses that are in reasonable agreement with experimental measurements [7]. Two-dimensional, axisymmetric finite element models were developed for each of the nozzles. Modeling of weld nuggets used in the analysis to lump the combined effects of several weld beads is illustrated for the safety/relief valve nozzles in Figure 2-8. The models simulated an inside surface (ID) repair at the DMW location with a depth of approximately 50% of the original wall thickness. This assumption is considered to conservatively bound any weld repairs that may have been performed during plant construction from the standpoint of producing tensile residual stresses on the ID of the weld. The spray nozzle model also simulated the Alloy 82/182 pipe to safe-end weld.

The residual stress analysis approach consists of a thermal pass to determine the temperature response of the model to each individual lumped weld nugget as it is added in sequence, followed by an elastic-plastic stress pass to calculate the residual stress due to the temperature cycling from the application of each nugget. Since residual stress is a function of welding history, the stress passes for each nugget are performed sequentially, over the residual stress fields induced from all previously applied weld nuggets. The resulting residual stresses were evaluated on the inside surface of the original welds and safe-end components (Figure 2-9), as well as on several paths through the thickness (e.g. Paths 3, 4 and 5 in Figure 2-7).

The residual stress calculations were then utilized, along with stresses due to applied loadings and thermal transients, to demonstrate that assumed cracks will not exceed the overlay design basis during the ASME Code, Section XI inservice inspection interval due to fatigue and PWSCC. In the fatigue crack growth analyses, a uniform distribution of the design cycles of each applied transient was assumed to be applied in the 10 year interval. Initial flaw sizes for the crack growth assessments were assumed consistent with the post-overlay UT inspections performed. Crack growth results due to fatigue and PWSCC are summarized in Table 2-3 for initial flaw sizes of 25%, 50% and 75% of the original wall thickness. In all cases, the maximum crack depth at the end of the ten-year inspection interval is less than the weld overlay design basis flaw (the original wall thickness plus dilution layer for the DMWs or just the original wall thickness for the spray nozzle Alloy 82/182 weld, since no dilution layer was specified there), except for the 75% case for an axial flaw in the hot leg surge nozzle weld. For this case, the amount of time for the flaw to reach the weld overlay design basis flaw is 3.6 years instead of 10 years. Since the examination volume for the PDI qualified post-overlay UT inspections includes the weld overlay plus the outer 25% of the original wall thickness, a 75% through wall crack is the largest flaw that could escape detection by this examination.

Table 2-3: Limiting PWSCC and Fatigue Crack Growth Results for Weld Overlaid Nozzles

	Safety/Relief Valve Nozzles		**Spray Nozzle-to Safe End Weld**		**Spray Nozzle Safe End-to-Pipe Weld**	
Initial Flaw Size (% of Orig. Thick.)	Flaw Size (in.)		Flaw Size (in.)		Flaw Size (in.)	
	Initial	Final	Initial	Final	Initial	Final
Circumferential Flaws						
25%	0.250	0.252	0.1876	0.1877	0.1049	0.1049
50%	0.500	0.500	0.3753	0.3753	0.2098	0.2098
75%	0.750	0.750	0.5629	0.5629	0.3148	0.3148
Axial Flaws						
25%	0.250	0.250	0.1876	0.1876	0.1049	0.1049
50%	0.500	0.500	0.3753	0.3753	0.2098	0.2098
75%	0.750	0.750	0.5629	0.5629	0.3148	0.3148
Original thickness + dilution layer*	1.08		0.83		0.4996	

	Hot Leg Surge Nozzle		**Pressurizer Surge Nozzle**	
Initial Flaw Size (% of Orig. Thick.)	Flaw Size (in.)		Flaw Size (in.)	
	Initial	Final	Initial	Final
Circumferential Flaws				
25%	0.2309	0.2615	0.2695	0.3373
50%	0.4619	0.4903	0.5391	0.7197
75%	0.6928	0.7286	0.8086	1.0096**
Axial Flaws				
25%	0.2309	0.2365	0.2695	0.2705
50%	0.4619	0.4669	0.5391	0.5391
75%	0.6928	1.0037**	0.8086	0.8088
Original thickness + dilution layer*	1.0037		1.158	

* - Allowable crack depth at end of ten year inspection interval.

** - Limiting value due to PWSCC and fatigue for this nozzle. Other table entries for this nozzle are for fatigue crack growth only since they are not the limiting cases for combined PWSCC and fatigue crack growth. For the 75% initial flaw size case for the hot leg surge nozzle, the reported value corresponds to the final flaw size at the end of 3.6 years rather than 10 years.

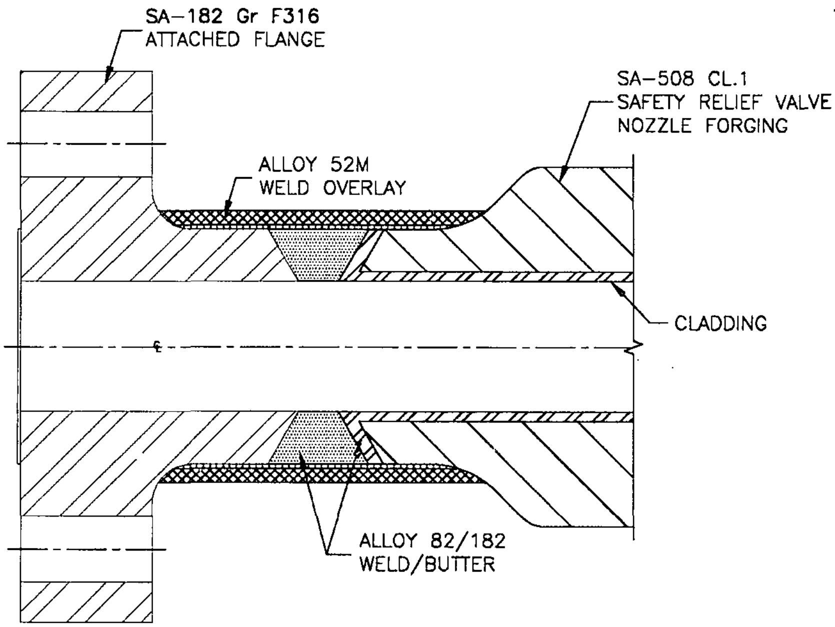


Figure 2-1: Pressurizer Safety/Relief Valve Nozzle Weld Overlay (Typical)

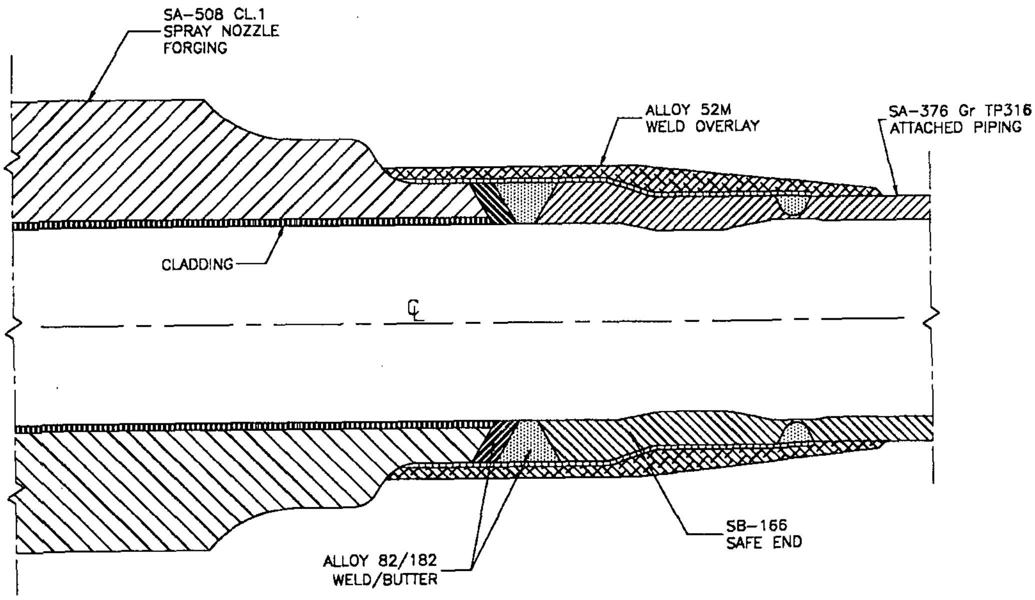


Figure 2-2: Pressurizer Spray Nozzle Weld Overlay

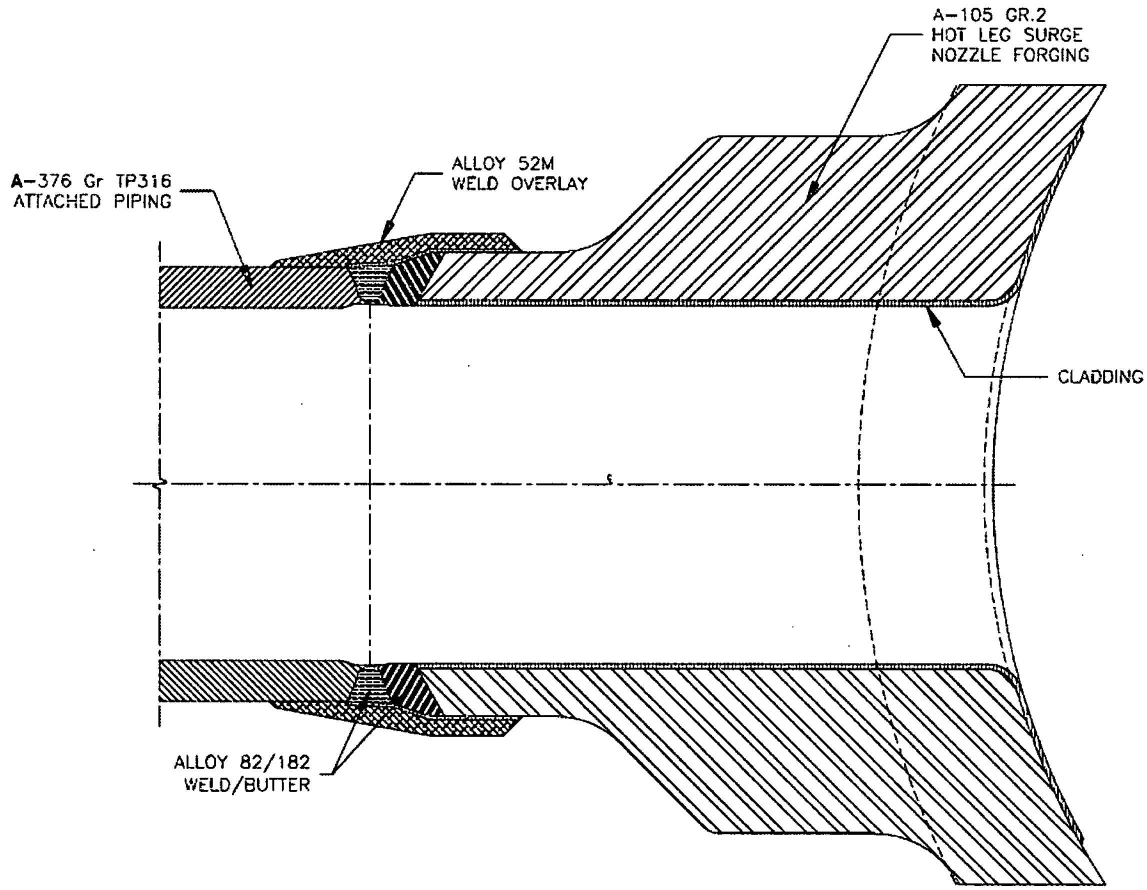


Figure 2-3: Hot Leg Surge Nozzle Weld Overlay

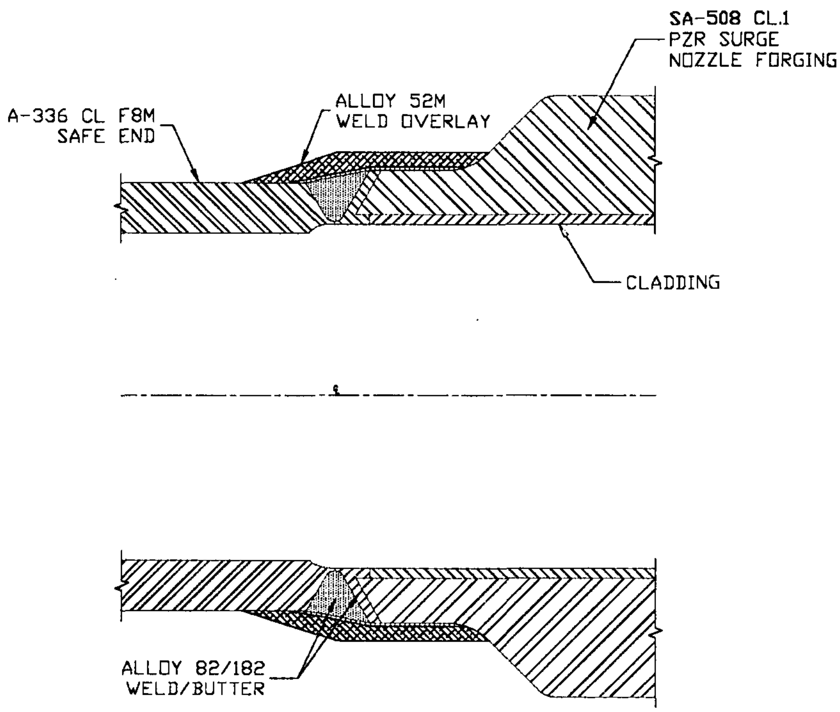


Figure 2-4: Pressurizer Surge Nozzle Weld Overlay

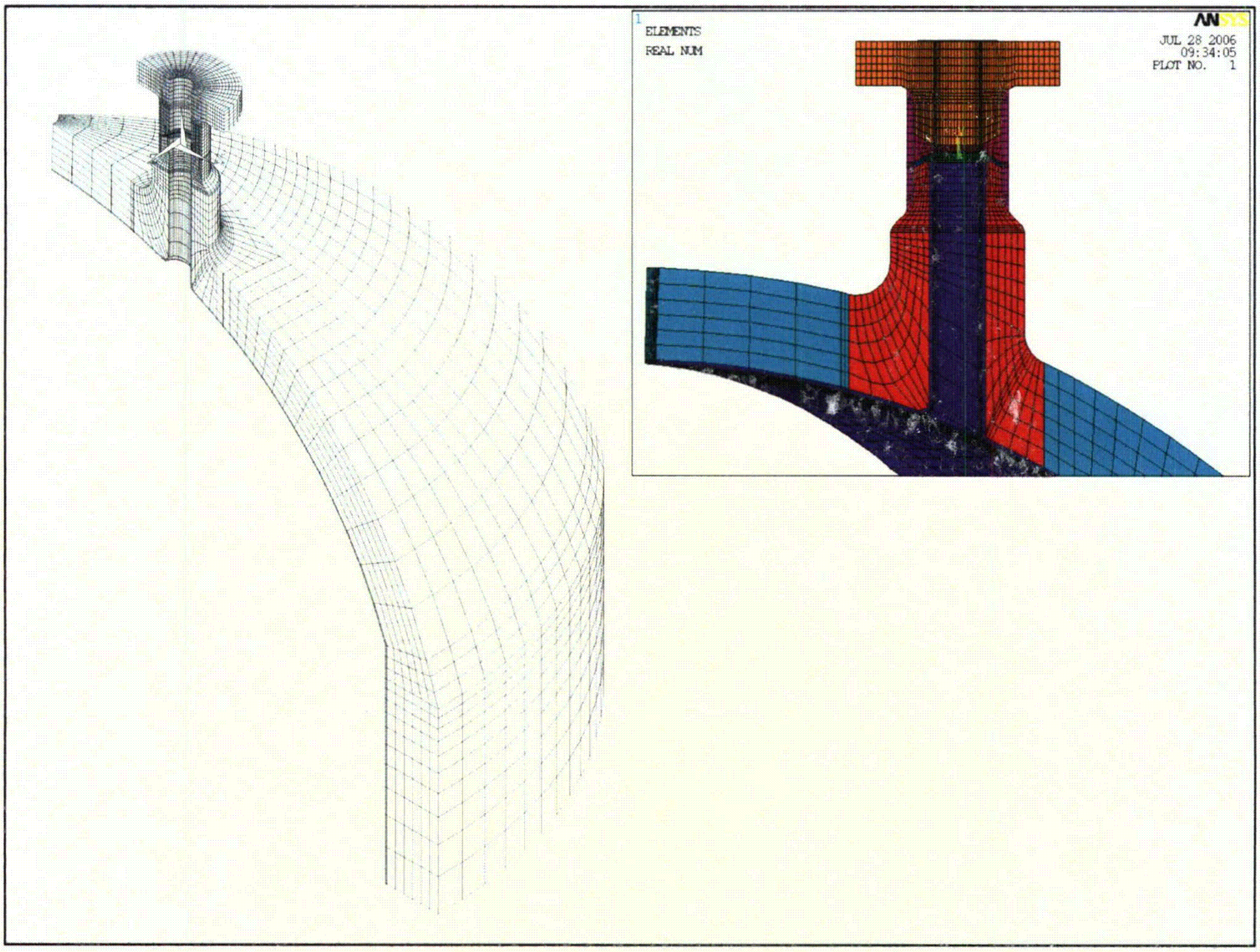


Figure 2-5: Safety/Relief Valve 3-Dimensional ANSYS Finite Element Model

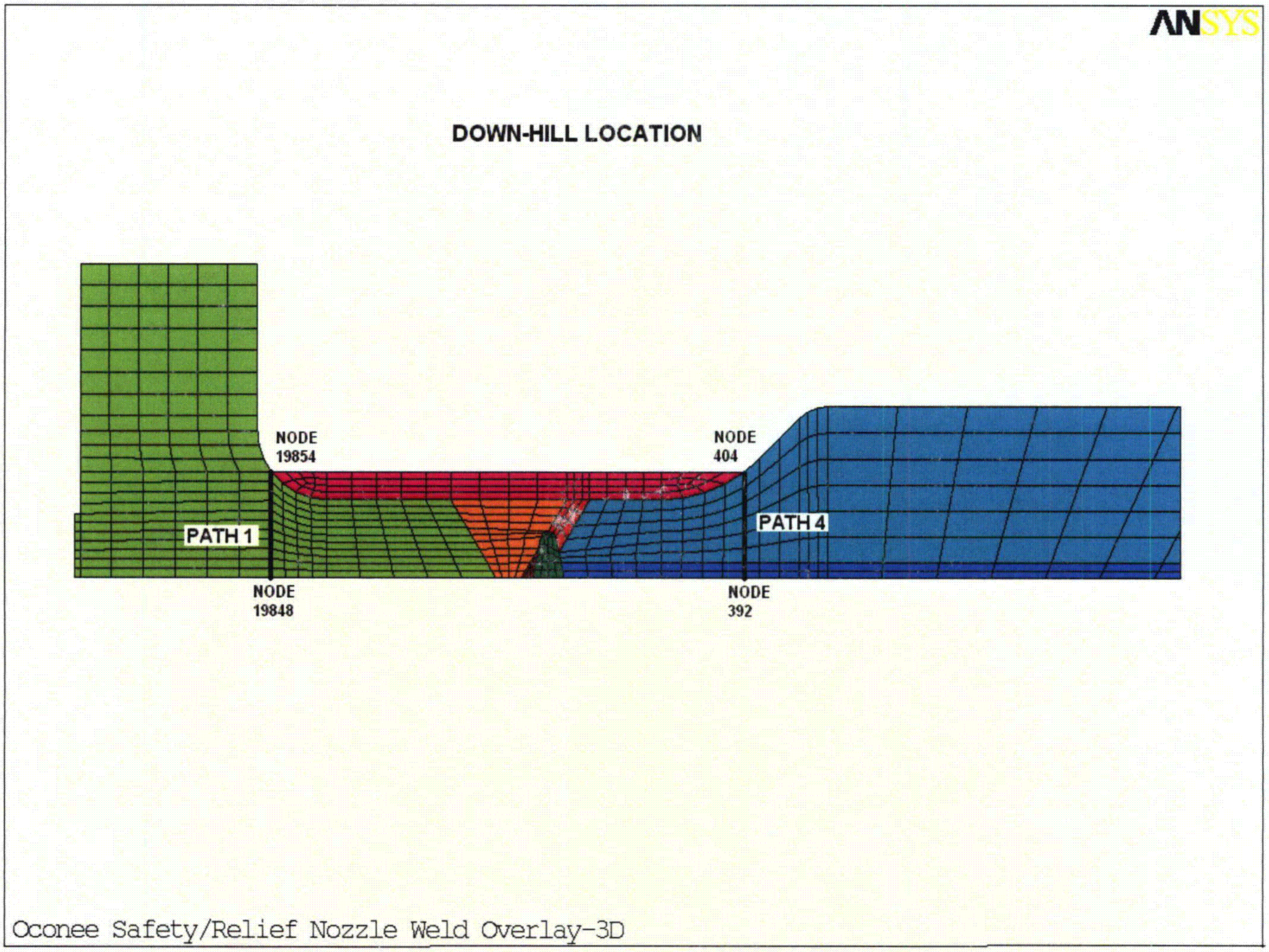


Figure 2-6: Stress Path Definitions for Section III Stress Analysis (Safety/Relief Valve Nozzles; Paths 1&4 = Down-Hill Location; Not shown: Paths 2 & 5 = Sidehill Locations and Paths 3&6 = Uphill Locations)

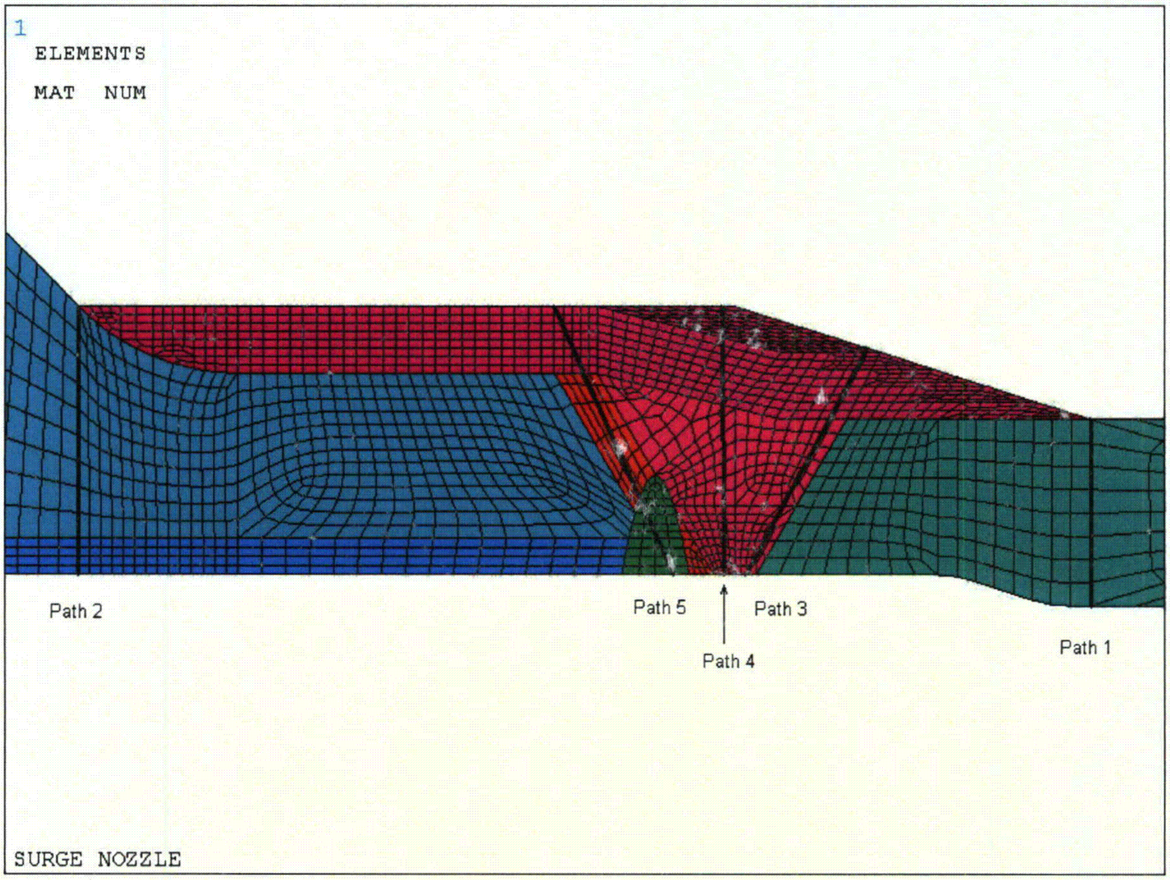


Figure 2-7: 2-Dimensional ANSYS Finite Element Model of Pressurizer Surge Nozzle Showing Stress Paths Selected for ASME Section III Analysis (Paths 1 and 2) and Crack Growth Analysis (Paths 3, 4 and 5)

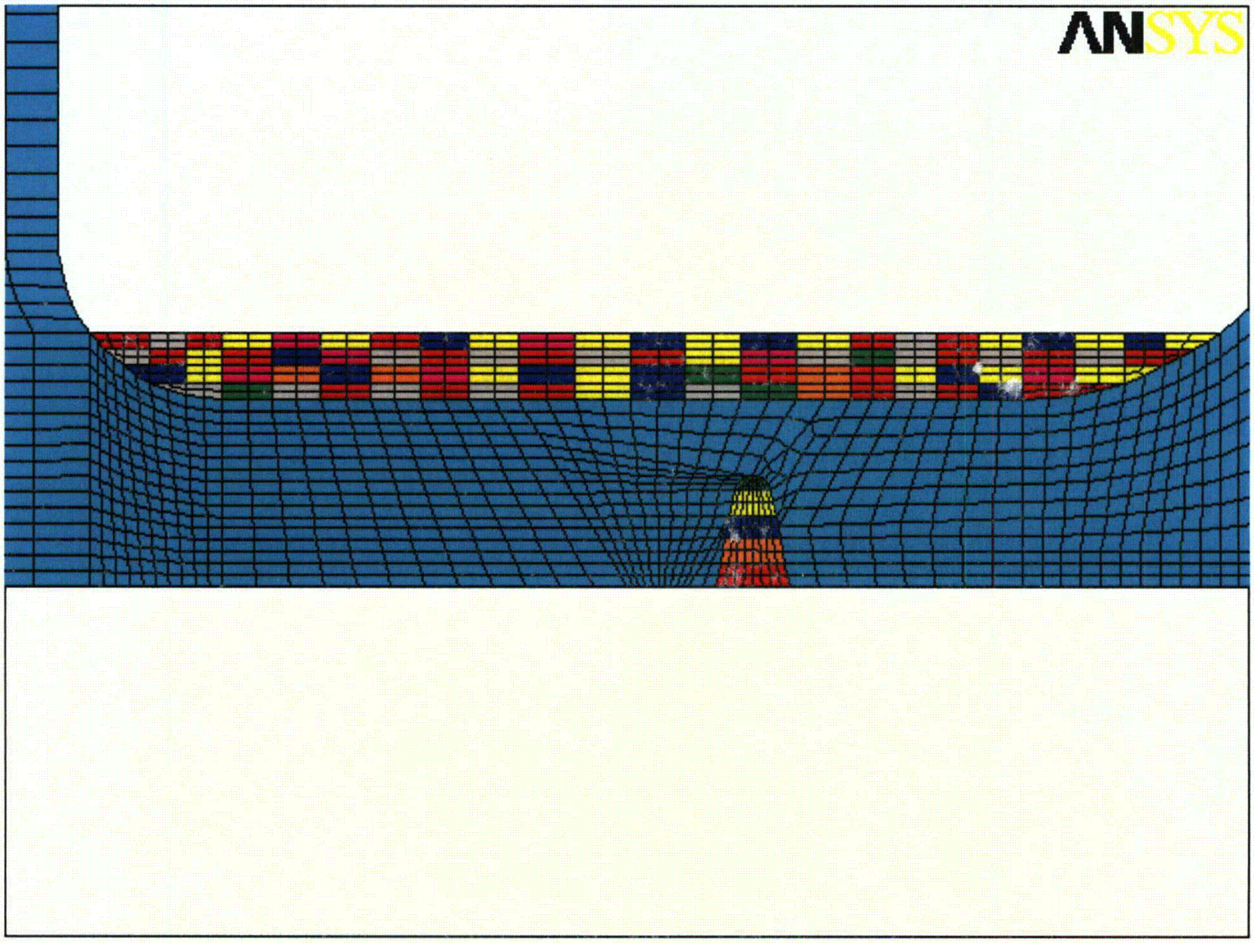
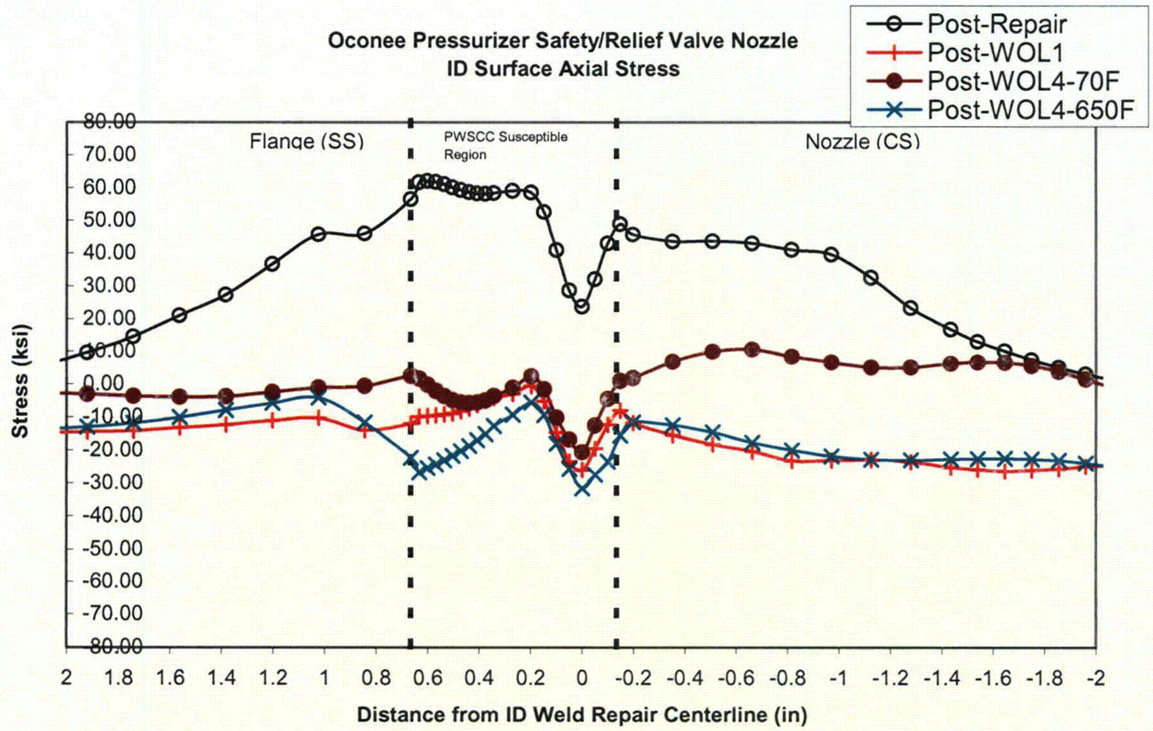


Figure 2-8: Typical Finite Element Model for Residual Stress Analysis Showing Nuggets used for Welding Simulation of Safety/Relief Valve Nozzle



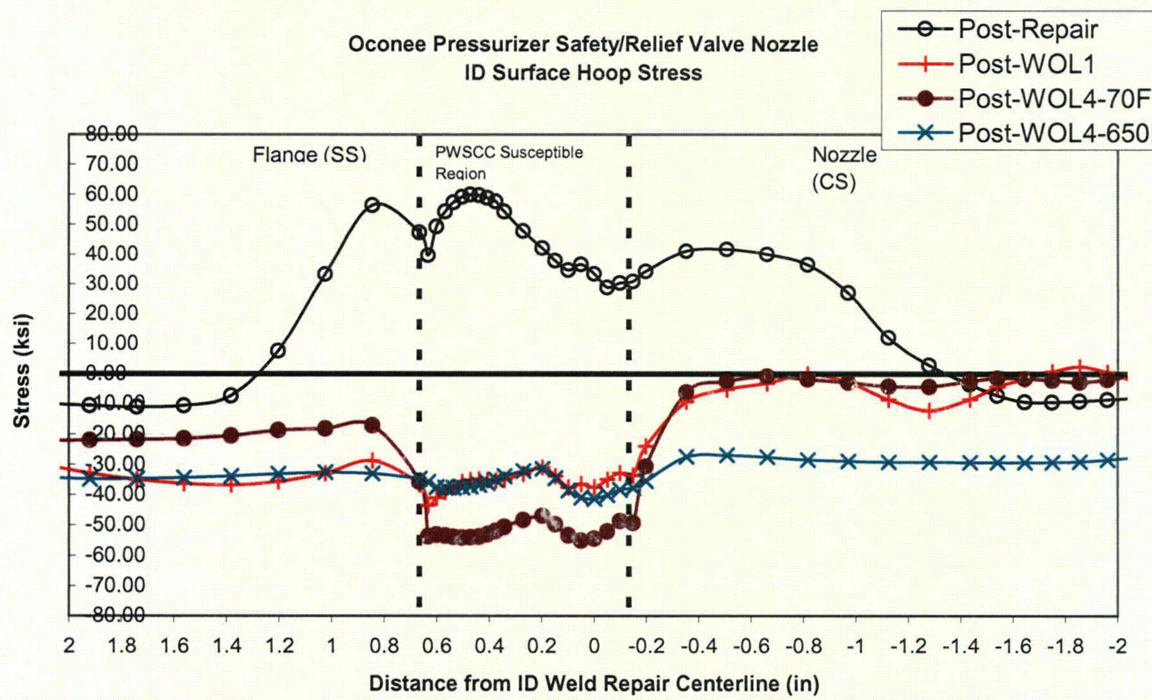


Figure 2-9: Typical Residual Stress Results along Inside Surface of Original Butt Weld and Safe-End – Safety/Relief Valve Nozzles

3.0 CONCLUSIONS

The design of the Oconee Unit 1 weld overlays was performed taking guidance from the requirements of ASME Code Case N-504-2 [2], amended in accordance with the Relief Request [3]. The weld overlays are demonstrated to be mitigation of PWSCC in these welds based on the following:

- In accordance with ASME Code Case N-504-2, structural design of the overlays was performed to meet the requirements of ASME Section XI, IWB-3640 based on an assumed flaw 100% through and 360° around the original welds. The resulting full structural overlays thus restore the original safety margins of the nozzles, with no credit taken for the underlying, PWSCC-susceptible material.
- The weld metal used for the overlay is Alloy 52M, which has been shown to be resistant to PWSCC [1], thus providing a PWSCC resistant barrier. Therefore, no PWSCC crack growth is expected into the overlay.
- In the case of the spray nozzle, the overlay was extended to cover the safe-end plus the adjacent Alloy 82/182 pipe to safe-end weld.
- No credit was taken in the overlay designs for the first overlay layer, which could have been diluted by the base metal during the welding process.
- Application of the weld overlays was shown to not impact the conclusions of the existing nozzle Stress Reports. Following application of the overlay, all ASME Code, Section III stress and fatigue criteria are met.
- Nozzle specific residual stress analyses were performed, after first simulating severe ID weld repairs in the nozzle to safe-end welds, prior to applying the weld overlays. The post weld overlay residual stresses were shown to result in beneficial compressive stresses on the inside surface of the components, and well into the thickness of the original DMWs, assuring that future PWSCC initiation or crack growth into the overlay is highly unlikely.
- Fracture mechanics analyses were performed to determine the amount of future crack growth which would be predicted in the nozzles, assuming that cracks exist that are equal to or greater than the thresholds of the NDE techniques used on the nozzles. Both fatigue and PWSCC crack growth were considered, and found to be acceptable.

Based on the above observations and the fact that similar nozzle-to-safe end weld overlays have been applied to other plants since 1986 with no subsequent problems identified, it is concluded that the Oconee Nuclear Station Unit 1 hot leg surge, pressurizer surge, safety/relief valve and spray nozzle dissimilar metal welds have received mitigation against PWSCC.

4.0 REFERENCES

1. "Materials Reliability Program (MRP): Resistance to Primary Water Stress Corrosion Cracking of Alloys 690, 52, and 152 in Pressurized Water Reactors (MRP-111)," EPRI, Palo Alto, CA: 2004, 1009801.
2. ASME Code, Code Case N-504-2, "Alternative Rules for Repair of Classes 1, 2, and 3 Austenitic Stainless Steel Piping, Section XI, Division 1."
3. Request for Alternative 06-ON-004, Duke Energy Corporation, Oconee Nuclear Station Units 1, 2 and 3, August 24, 2006 and Response to Request for Additional Information on Request for Alternative 06-ON-004, October 5, 2006.
4. ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition (with Addenda up to and including 2000).
5. ASME Boiler and Pressure Vessel Code, Section III, 1989 Edition with no Addenda.
6. **pc-CRACK** for Windows, Version 3.1-98348, Structural Integrity Associates, 1998.
7. Materials Reliability Program Report MRP-169, "Technical Basis for Preemptive Weld Overlays for Alloy 82/182 Butt Welds in PWRs," August 2005.
8. ANSYS/Mechanical, Release 8.1 (w/Service Pack 1), ANSYS Inc., June 2004.

Duke Power Company, LLC
Oconee Nuclear Station
Unit 1
Request for Relief 06-ON-004

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Enclosure 3

Ultrasonic Examination Summary Report

Ultrasonic Examination Procedure

SI-UT-126, Revision 0, *Procedure for the Phased Array Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds*, was used during the examinations. This procedure, and the examiners who applied the procedure, are qualified through the PDI Program at the EPRI NDE Center.

Safety/Relief Nozzle Weld Overlay Examination

Component Identification: 1-PZR-91-1
Examination Date: 10/31/06 Examination Time: 22:18 through 01:55
Examination Regions: Weld Overlay Material, Outer 25% Dissimilar Metal Weld & Adjacent Base Material

Axial Examination Angles: 0° through 83° - Circumferential Examination Angles: 0° through 65°

Examination Summary: No suspected flaw indications were observed during the examinations. The examination gain was adjusted to maintain the procedure-specified baseline noise level from 5% to 20% of full screen height. The lower range of examination angles detected responses from the inside surface of the component which were useful for monitoring search unit contact / coupling effectiveness during the examination.

Safety/Relief Nozzle Weld Overlay Examination

Component Identification: 1-PZR-91-2
Examination Date: 10/31/06 Examination Time: 22:18 through 01:55
Examination Regions: Weld Overlay Material, Outer 25% Dissimilar Metal Weld & Adjacent Base Material

Axial Examination Angles: 0° through 83° - Circumferential Examination Angles: 0° through 65°

Examination Summary: No suspected flaw indications were observed during the examinations. The examination gain was adjusted to maintain the procedure-specified baseline noise level from 5% to 20% of full screen height. The lower range of examination angles detected responses from the inside surface of the component which were useful for monitoring search unit contact / coupling effectiveness during the examination.

Safety/Relief Weld Overlay Examination

Component Identification: 1-PZR-91-3
Examination Date: 10/31/06 Examination Time: 22:18 through 01:55
Examination Regions: Weld Overlay Material, Outer 25% Dissimilar Metal Weld & Adjacent Base Material

Axial Examination Angles: 0° through 83° - Circumferential Examination Angles: 0° through 65

Examination Summary: No suspected flaw indications were observed during the examinations. The examination gain was adjusted to maintain the procedure-specified baseline noise level from 5% to 20% of full screen height. The lower range of examination angles detected responses from the inside surface of the component which were useful for monitoring search unit contact / coupling effectiveness during the examination.

Spray Nozzle (1-PZR-WP-45 & 1-PSP-1) Weld Overlay Examination

Component Identification: 1-RC-0230-57V-WOL
Examination Date: 10/22/06 Examination Time: 17:50 through 18:52
Examination Regions: Weld Overlay Material, Outer 25% Dissimilar Metal Weld & Adjacent Base Material and Outer 25% Safe End-to-Pipe Weld & Adjacent Base Material

Axial Examination Angles: 0° through 83° - Circumferential Examination Angles: 0° through 65°

Examination Summary: No suspected flaw indications were observed during the examinations. The examination gain was adjusted to maintain the procedure-specified baseline noise level from 5% to 20% of full screen height. The lower range of examination angles detected responses from the inside surface of the component which were useful for monitoring search unit contact / coupling effectiveness during the examination.

Pressurizer Surge (1-PZR-WP23) Nozzle Weld Overlay Examination

Component Identification: 1-RC-0229-68V
Examination Date: 11/14/06 Examination Time: 09:00 through 10:45
Examination Regions: Weld Overlay Material, Outer 25% Dissimilar Metal Weld & Adjacent Base Material

Axial Examination Angles: 0° through 83° - Circumferential Examination Angles: 0° through 65°

Examination Summary: No suspected flaw indications were observed during the examinations. The examination gain was adjusted to maintain the procedure-specified baseline noise level from 5% to 20% of full screen height. The lower range of examination angles detected responses from the inside surface of the component which were useful for monitoring search unit contact / coupling effectiveness during the examination.

Hot Leg (1-PSL-10 / 1-PHA-17) Surge Nozzle Weld Overlay Examination

Component Identification: 1-RC-0229-67V
Examination Date: 10/29/06 Examination Time: 18:10 through 19:52
Examination Regions: Weld Overlay Material, Outer 25% Dissimilar Metal Weld & Adjacent Base Material

Axial Examination Angles: 0° through 83° - Circumferential Examination Angles: 0° through 65°

Examination Summary: No suspected flaw indications were observed during the examinations. The examination gain was adjusted to maintain the procedure-specified baseline noise level from 5% to 20% of full screen height. The lower range of examination angles detected responses from the inside surface of the component which were useful for monitoring search unit contact / coupling effectiveness during the examination.