STRUCTURAL INTEGRITY Associates, Inc.	CALCULATION PACKAGE	FILE No.: PBCH-07Q-301 PROJECT No.: PBCH-07Q

PROJECT NAME: Point Beach Unit 2 CRDM Top Head Analysis

CLIENT: Nuclear Management Company, LLC (Point Beach U2)

CALCULATION TITLE: Fracture Mechanics Evaluation of Point Beach Unit 2 Top Head CRDM 43.5 Degree Azimuth Penetration Weld Repair

Document Revision	Affected Pages	Revision Description	Project Mgr. Approval Signature & Date	Preparer(s) & Checker(s) Signatures & Date
0	1-18 A1 – A2 Project Computer Files	Initial Issue	H. L. Gustin [signature] 10/4/03	C. R. Limpus [signature] CRL 10/2/03 K. K. Fujikawa [signature] KKF 10/2/03

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1.0 INTRODUCTION

The purpose of this calculation is to evaluate the nozzle weld repair configuration for the Point Beach Unit 2 43.5° top head CRDM penetration. The nozzle weld repair process removes a portion of the existing CRDM nozzle and applying Alloy 52 weld material to attach the nozzle to the head. The repair weld that attaches the cut-off portion of the nozzle to the head is usually inside the hole region, away from the J-groove weld zone. For the 43.5° top head CRDM penetration, the geometry of the head and nozzle is such that a repair weld will overlap a portion of the original J-groove weld. Section 4.0 contains a description of the CRDM nozzle repair sequence.

This calculation determines the stress intensity factors for an assumed axial crack in the original J-groove weld region on the uphill side for a 43.5° top head CRDM penetration using finite element analysis. The downhill side is not susceptible since the repair weld would be located on the low alloy head material.

2.0 METHODOLOGY

- Build a three-dimensional finite element model representing the 43.5° CRDM penetration nozzle with the assumed flawed geometry and repair weld configuration.
- Apply the appropriate loads to the finite element model and use the fracture mechanics features of ANSYS [2] to calculate the stress intensity factor at the tip of the flaw.

3.0 ASSUMPTIONS

The fracture mechanics evaluation for the nozzle repair weld is performed with the following assumptions:

- The entire J-groove and weld butter are assumed to be cracked up to the vessel-butter interface. The axial flaw is not within any portion of the CRDM nozzle body.
- Although the J-groove/repair weld overlap condition only occurs for a peripheral nozzle (43.5°), a simplifying assumption was made to model the overlap condition using a 0° nozzle geometry. The stresses in the 0° repair weld model are representative of those present in the uphill side of the actual repaired 43.5° nozzle, where the repair weld overlaps the J-groove weld.

4.0 ANALYSIS

The nozzle weld repair configuration evaluated in this analysis is described in the Dominion Engineering, Inc. (DEI) Calculation "Point Beach Unit 2 CRDM Nozzle Repair Weld Analysis" [1b]. The finite element model developed from [1b] will be modified for the fracture mechanics evaluation performed herein this calculation. The DEI finite element model is for the top-dead center or 0° nozzle geometry with the weld repair configuration simulated for the most peripheral nozzle, the 43.5°

nozzle CRDM. The J-groove/repair weld overlap geometry occurs on the uphill side of the 43.5° nozzle. The J-groove weld and weld butter are assumed completely cracked. A more refined finite element model is produced using the DEI model. Crack tip elements are incorporated to represent the axial flaw to be analyzed.

4.1 Finite Element Model

The CRDM nozzle is a 4-inch nominal diameter nozzle, which penetrates the hemispherical closure head at multiple locations. The dimensions of the top head CRDM nozzle penetration are obtained from the finite element model constructed by Dominion Engineering, Inc. [1]. The CRDM nozzle at the 43.5° location is considered in this evaluation and Figure 4-1 shows the DEI developed finite element model.

The finite element model constructed in Reference 1b is modified to include a finer mesh at and near the J-groove weld and nozzle in order to perform the fracture mechanics evaluation. Modifications include mesh refinement, crack tip element creation, as well as application of appropriate boundary conditions. Figure 4-2 shows the coarse DEI finite element model that was obtained from Reference [1b]. The refined finite element model of the nozzle penetration developed in this calculation is shown in Figure 4-3 and is built using ANSYS [2]. The model reflects the nozzle repair weld and chamfer configuration. The crack tip mesh refinement occurs everywhere around the J-groove weld; i.e. at the vessel interface and nozzle interface. The postulated crack in the J-groove and weld butter is located at the uphill side of the penetration. The edges of the hemispherical closure head finite element model are set far from the nozzle penetration in order to prevent any end effects.

Taking advantage of symmetry, only one half (180°) of the closure head and nozzle penetration is modeled. The finite element model is constructed such that the crack tip region is sufficiently detailed for the stress intensity factor calculation. Quadratic 20-node triangular brick finite elements (SOLID95) from the ANSYS element library are used for the elements at the crack fronts and 8-node structural solid elements (SOLID45) are used for the remainder of the model. In order to more closely represent the singularity at the crack tip, the mid-side nodes of the crack front elements are moved to the quarter point. Furthermore, point-to-point contact gap elements (CONTAC52) are applied to the nodes of the crack face in order to prevent overlap of the crack face under compressive stress loading. Refer to Figure 4-5 for a plot of the crack tip elements surrounding the uphill side flaw in the J-groove weld region.

The material properties used in the analysis are the modulus of elasticity and Poisson's ratio. The modulus of elasticity is taken at 300°F from the ASME Code [3]. The material and corresponding modulus of elasticity for each of the different components of the CRDM assembly are as follows:

Component	Material	Modulus of Elasticity, E (10^6 psi)
Nozzle	Alloy 600	29.9
RPV Top Head Shell	Low alloy Steel (SA-302, Grade B)	28.0
Cladding	Stainless Steel (Type 304 assumed)	27.0
J-Groove Weld	Alloy 182 (Equivalent to Alloy 600)	29.9
Weld Butter	Alloy 182 (Equivalent to Alloy 600)	29.9
Weld Repair	Alloy 52 (Equivalent to Alloy 690)	29.1

A constant Poisson's ratio of 0.3 is used for all the materials.

4.2 Loads and Boundary Conditions

4.2.1 Loads

The finite element model is not used to generate stresses from basic loads. Stresses obtained from another nearly identical geometric finite element model of the nozzle, which does not contain the crack, are input as pressures on the crack face using a standard fracture mechanics superposition technique.

Stresses in the CRDM penetration were obtained from analyses performed by DEI [1b] for the following load cases:

Load Case 1. Original J-groove weld sequence (2 passes)
Load Case 2. Code Hydrotest + Operating temperature and pressure loads
Load Case 3. Removal of operating temperature and pressure loads
Load Case 4. Removal of nozzle material for repair weld prep
Load Case 5. Simulation of repair weld sequence (8 passes)
Load Case 6. Removal of J-groove material to simulate chamfer
Load Case 7. Operating temperature and pressure on post-repair model

The hoop stresses are obtained at Time step 20012, which is the end of Load Case 7. Since the postulated crack to be analyzed is an axial crack (with respect to the CRDM nozzle penetration axis), the hoop stresses on the elements representing the crack face are extracted from the stress results [1b] and applied in the form of pressure loading. The stresses obtained from the nozzle repair weld model of the DEI analysis is for the 0° CRDM nozzle geometry. Although the nozzle repair weld configuration is representative of the 43.5° CRDM nozzle geometry. Per Reference [1a], the operating plus residual stress results [1a] shows that the maximum uphill inside diameter (ID) hoop stresses are

49.2 ksi and 56.1 ksi for the 0° and 43.5° nozzles, respectively. This corresponds to an increase of 56.1 – 49.2 ksi = 6.9 ksi in the operating stresses between the 0° and 43.5° nozzles pre-nozzle repair weld implementation. Since the DEI nozzle repair weld analysis [1b] was performed using a 0° configuration to simulate the uphill side of the 43.5° nozzle, the stresses from the nozzle repair weld analysis [1b] need to be increased to account for the difference in the operating stresses between the 0° CRDM and the 43.5° CRDM results. Thus, the applied pressure loading for the fracture mechanics analysis is the nozzle weld repair results [1b] conservatively increased by 10 ksi. Figure 4-6 shows the pressure load applied to the fracture mechanics model crack face developed herein for the actual post-weld repair plus chamfer process and operating stresses of the DEI analysis. Figure 4-7 reflects that described in Figure 4-6 plus the additional 10 ksi described above as the resultant applied pressure load.

4.2.2 Boundary Conditions

Symmetry boundary conditions were imposed on the uncracked regions of the crack plane. Translational constraints are applied at the ends of the hemispherical top head. Refer to Figure 4-4 for the boundary conditions that are applied to the finite element model for the nozzle repair weld configuration.

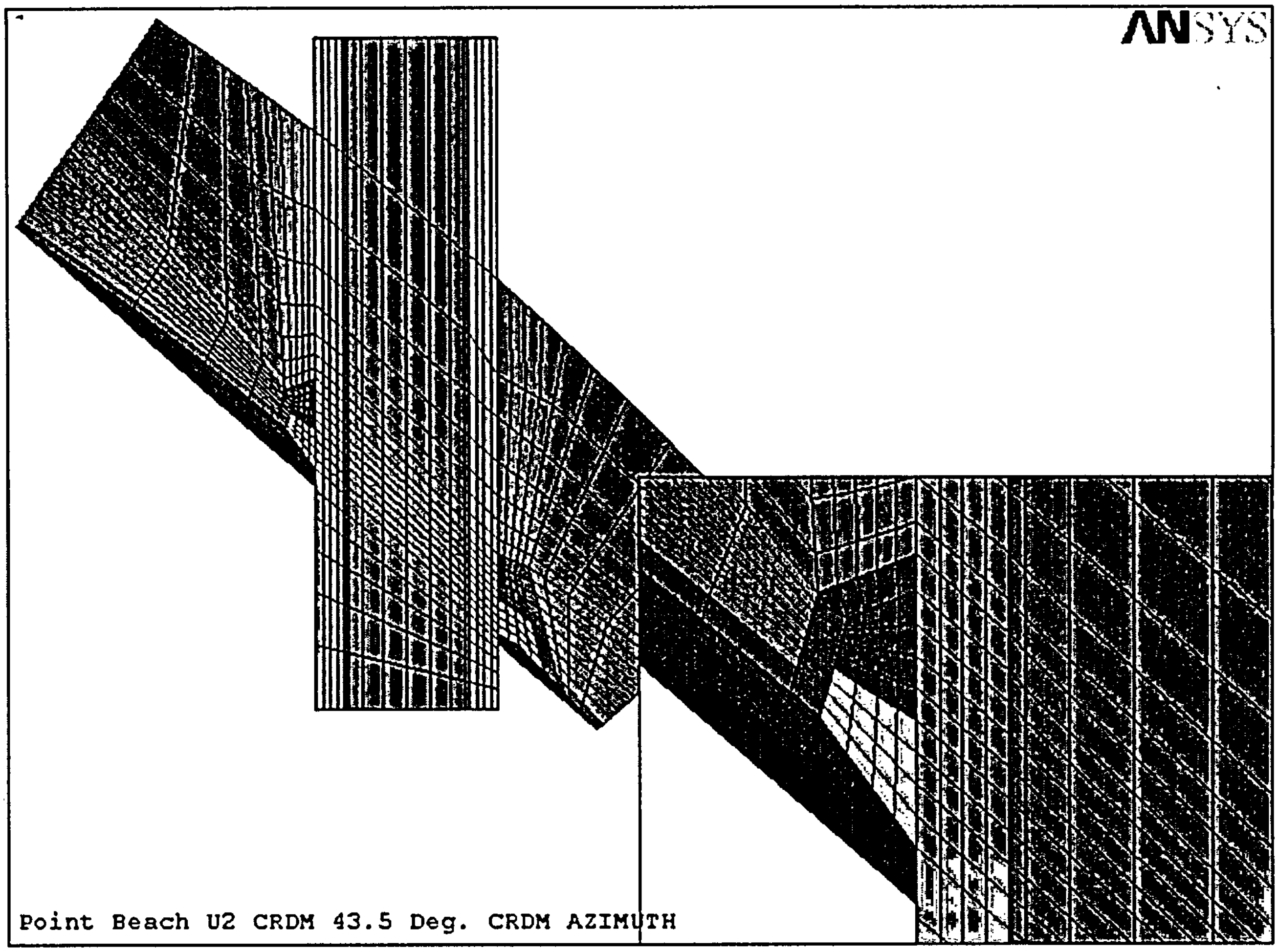

Figure 4-1: DEI Coarse 43.5° CRDM Finite Element Model

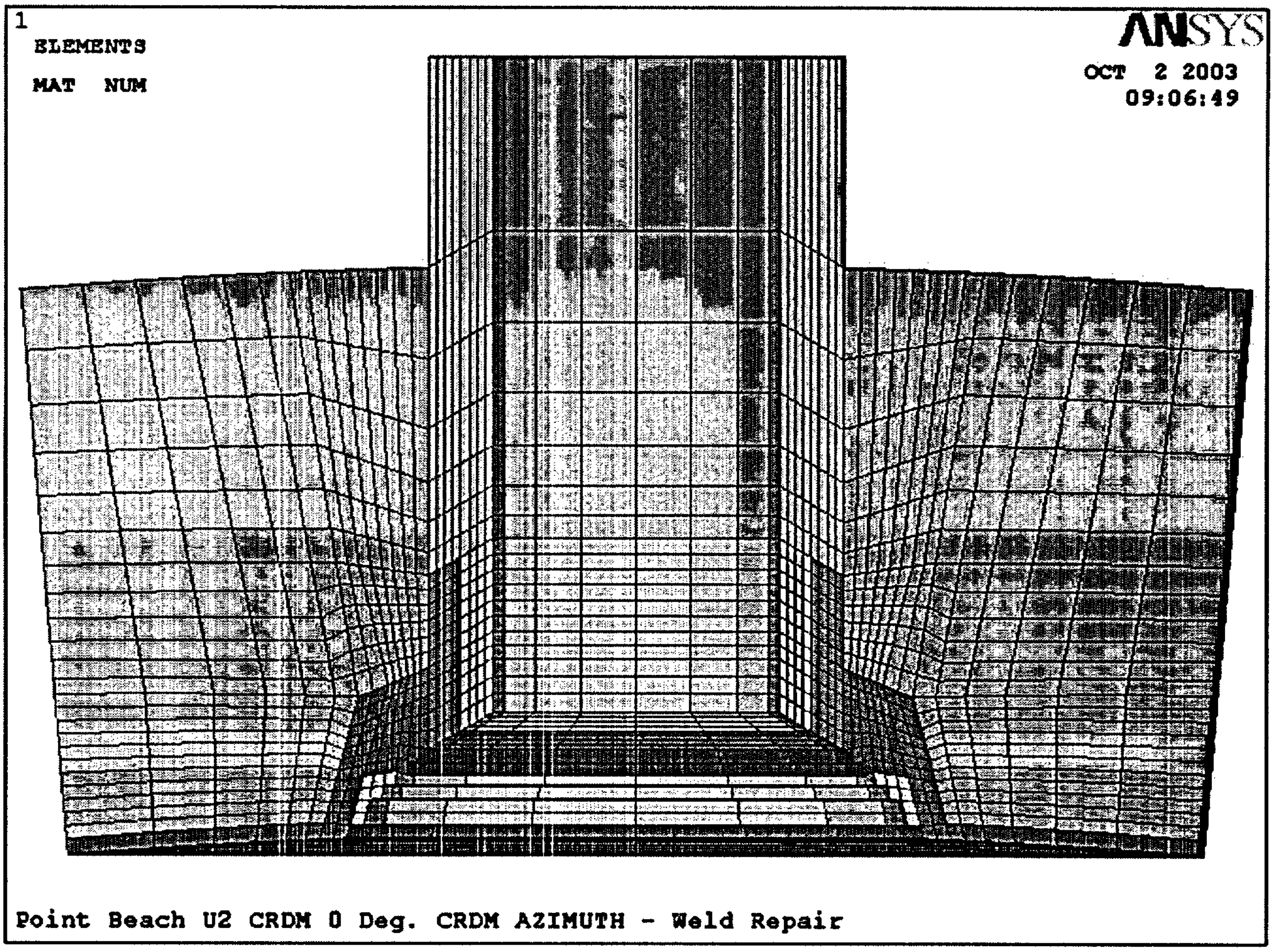

Figure 4-2: DEI Coarse Post-Nozzle Repair Weld Plus Chamfer CRDM Finite Element Model

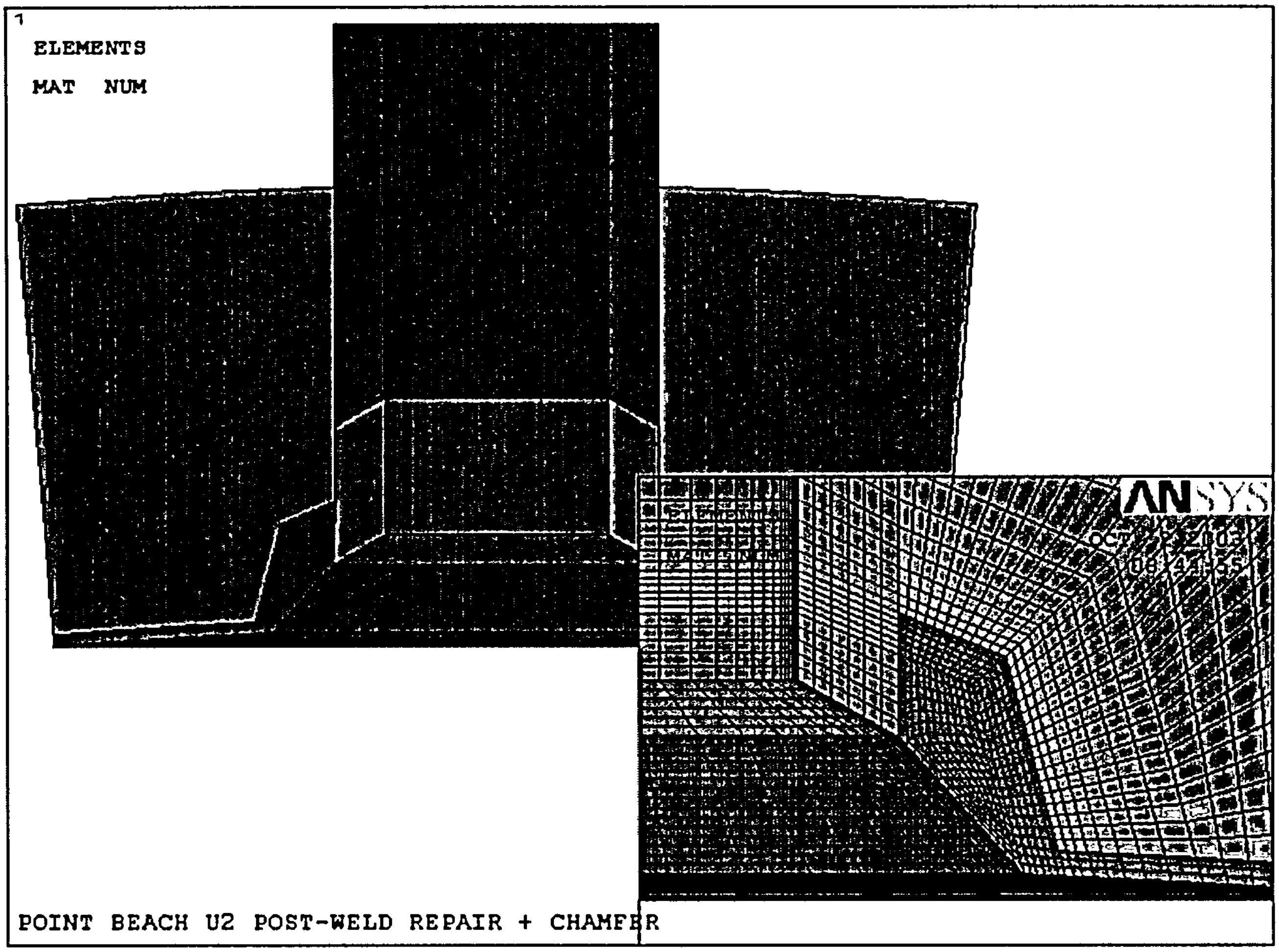

Figure 4-3: Refined Post-Nozzle Repair Weld Plus Chamfer CRDM Finite Element Model

Revision	0				
Preparer/Date	CRL 10/02/03				
Checker/Date	KKF 10/02/03				

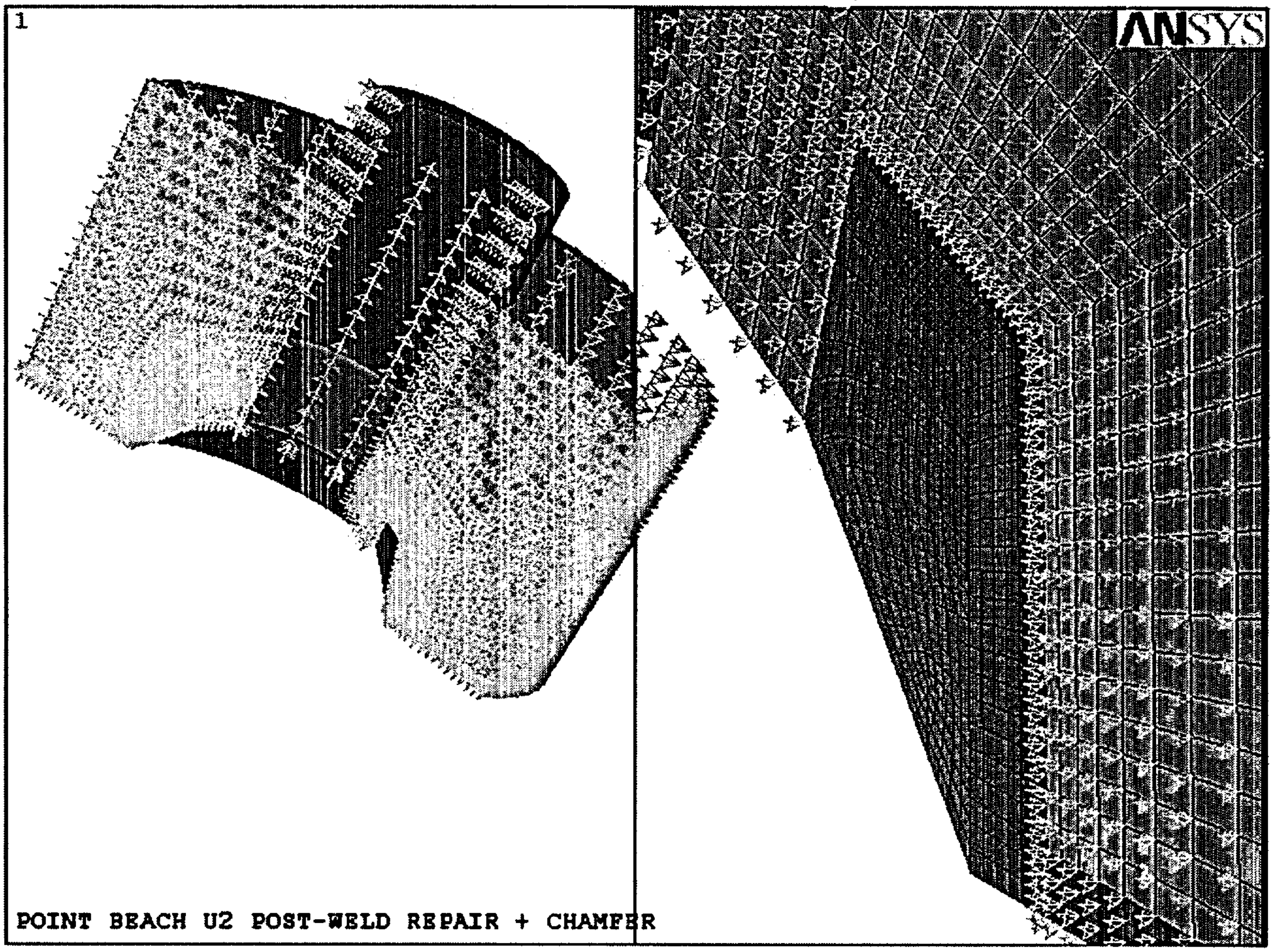

Figure 4-4: Boundary Conditions for CRDM Finite Element Model

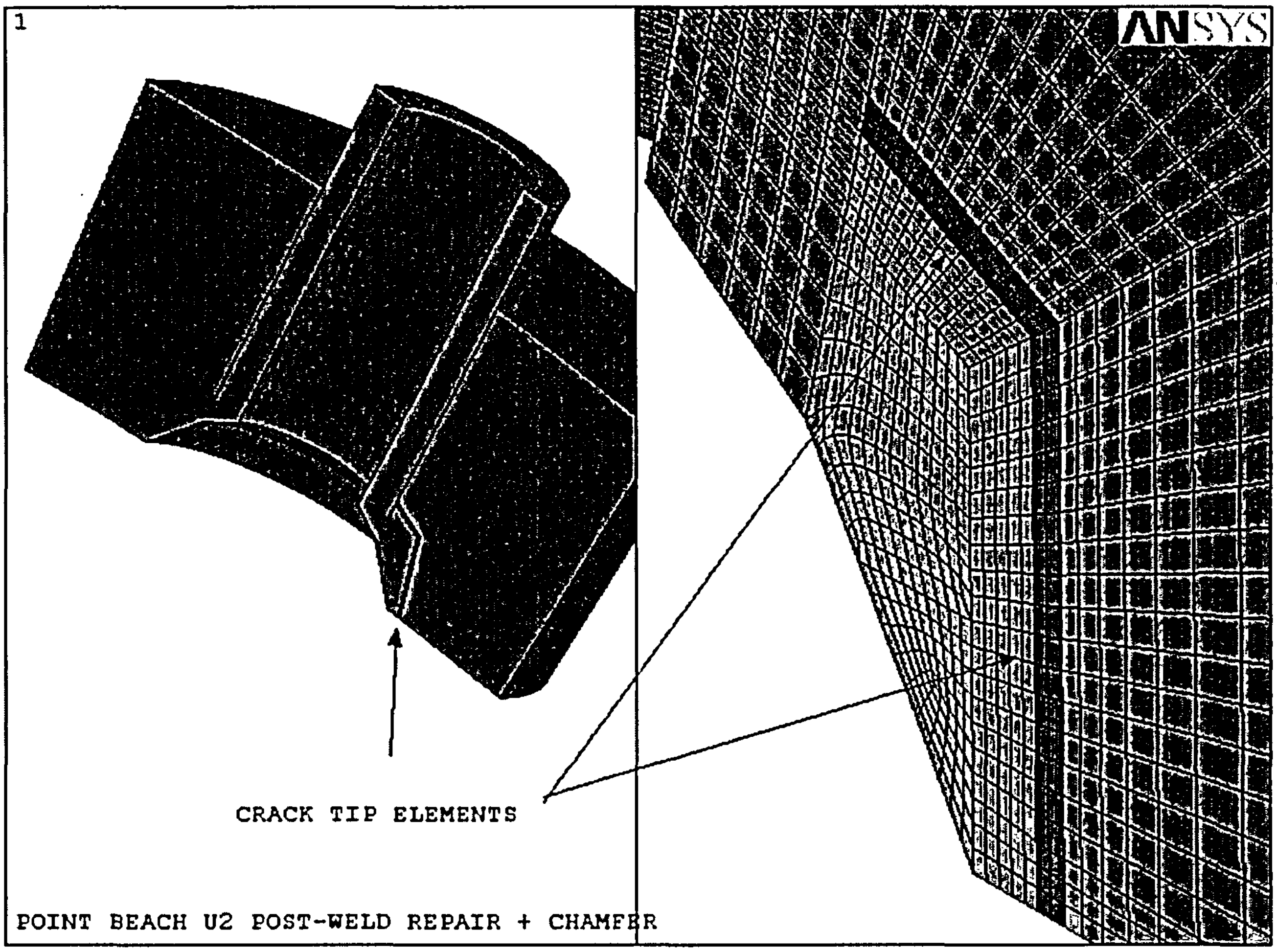

Figure 4-5: Crack Tip Elements of CRDM Finite Element Model

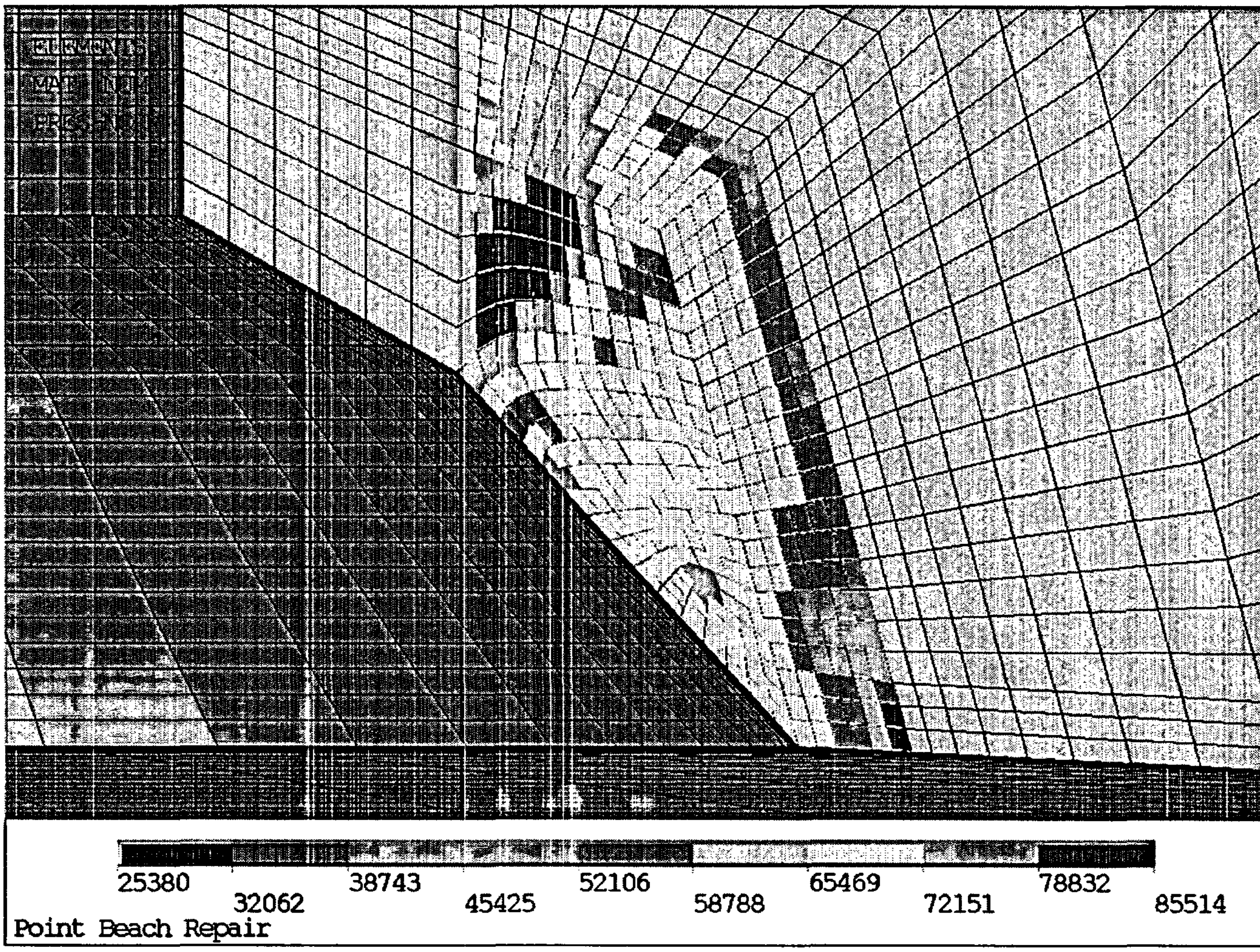

Figure 4-6: DEI Stress Distribution on Crack Surface, Post-Weld Repair + Chamfer

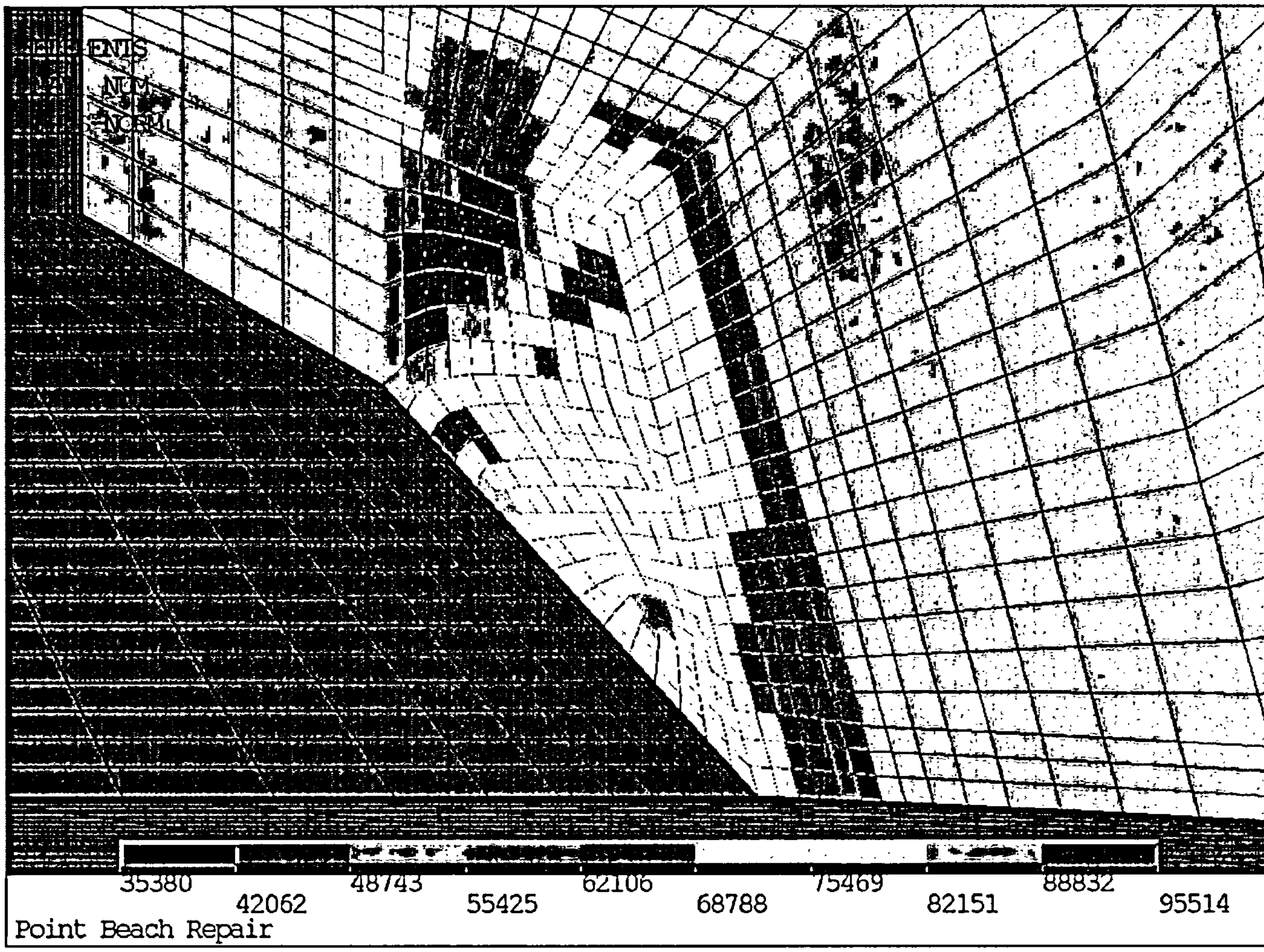

Figure 4-7: Resultant Applied Pressure Loading to Crack Face, DEI + 10 ksi

5.0 RESULTS OF ANALYSIS

Using KCALC, the built-in feature of ANSYS for stress intensity factor calculations, the results of the stress analysis are post-processed and the stress intensity factor is determined at multiple locations along the crack tip. Those locations are shown in Figure 5-1. The stress intensity factors are computed at each location along the crack front on the weld butter-vessel interface. The crack tip locations depicted in Figure 5-1 correspond to the local coordinate system numbers that are tabulated in Table 5-1. Figure 5-2 plots the K distributions along the embedded uphill side flaw. All stress intensity factor results are tabulated in Table 5-1 for the uphill flaw.

Table 5-1: Stress Intensity Factor Results (psi-√in)

Uphill Nozzle Interface K Results (psi-in$^{1/2}$)	
Local Coord. System	Post-Repair Weld + Chamfer
101	47128
102	60323
103	64819
104	67813
105	71780
106	74626
107	76574
108	78808
109	80507
110	80953
111	80508
112	79939
113	78930
114	77454
115	76024
116	74345
117	72097
118	68965
119	63737
120	55895
121	34376
122	53826
123	60236
124	63998
125	66542
126	68484
127	69957
128	69422
129	66671
130	63118
131	59012
132	54644
133	43200

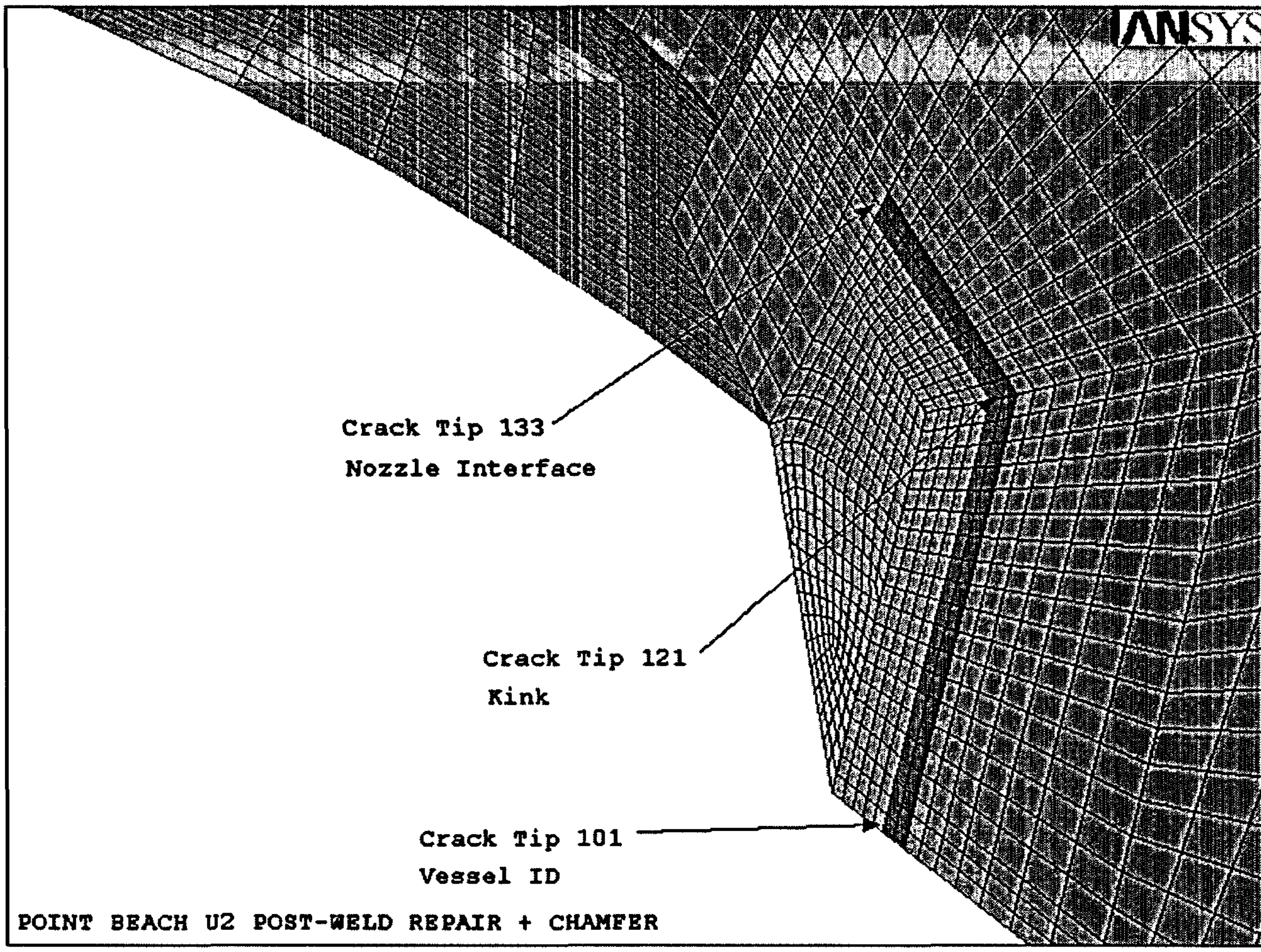

Figure 5-1: Location of Stress Intensity Factor Calculation Points

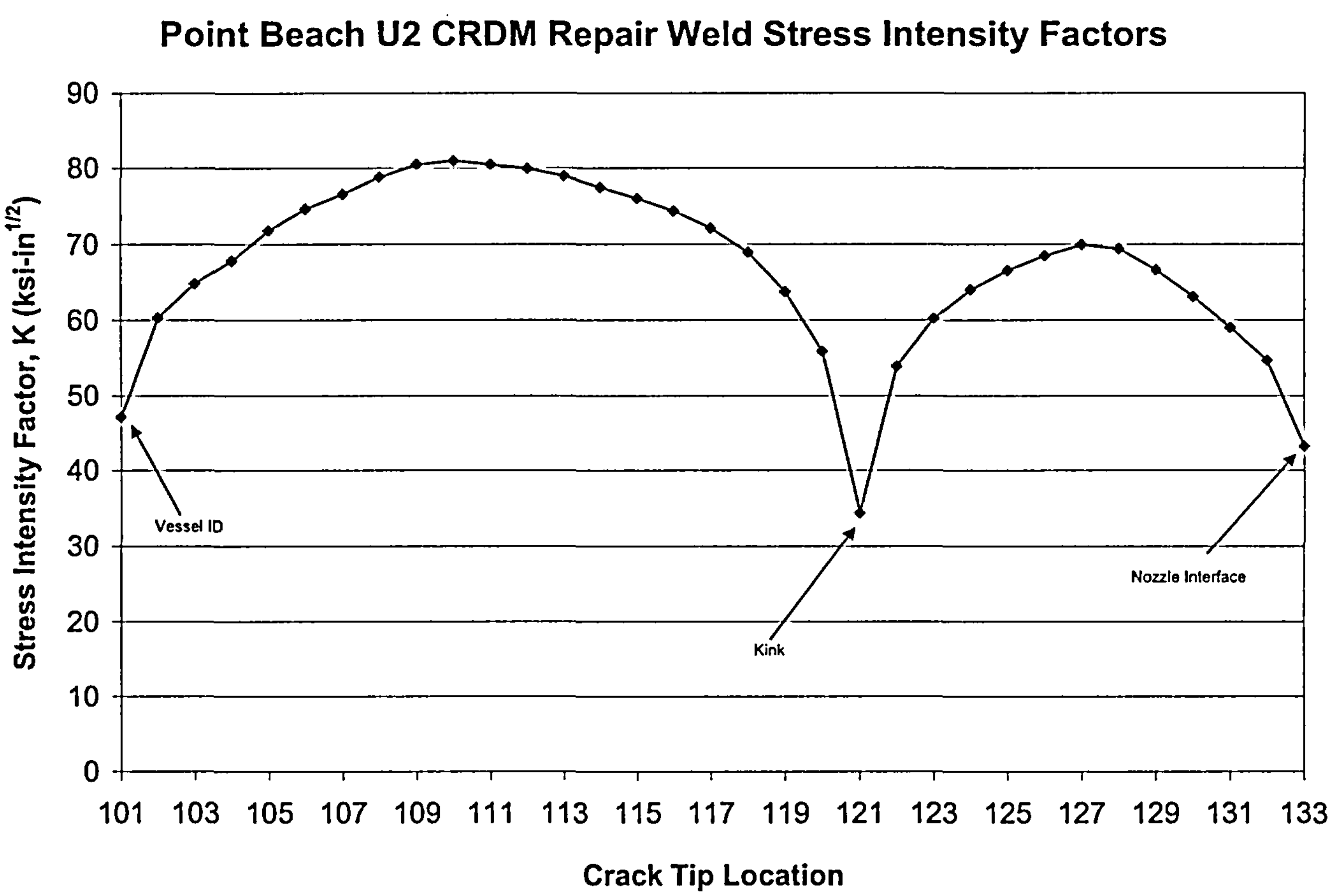

Figure 5-2: Stress Intensity Factor Distribution on Uphill Flaw of 43.5 Degree CRDM Nozzle

6.0 REFERENCES

1. Dominion Engineering, Inc. Calculations, SI File No. PBCH-07Q-201:
   a. No. C-4429-00-1, "Point Beach Unit 2 CRDM Stress Analysis," Revision 0.
   b. No. C-4429-00-2, "Point Beach Unit 2 CRDM Nozzle Repair Weld Analysis," Revision 0.

2. ANSYS/Mechanical, Revision 6.1 (w/Service Packs 2 & 3), ANSYS, Inc., April, 2002.

3. ASME Boiler and Pressure Vessel Code, Section II, Part D, 1998 Edition with no addenda.

APPENDIX A

FILE LISTING

The following list of electronic files is included in the project files:

FILENAME	DESCRIPTION
DEI_MODEL.INP	Generates original DEI finite element model.
GET_COORD.INP	Obtains node/element connectivity from DEI model.
COORD.INP	Output of GET_COORD.INP and used for refined model.
REFINED_MODEL.INP	Generates refined fracture mechanics finite element model.
FM_MODEL.INP	Adds crack tip elements and applies pressure loading to crack face.
STRESS_MACRO.INP	Contains pressure loading input.
FM_RUN.INP	Performs fracture mechanics finite element analysis.
KCALC.INP	Calculates and extracts stress intensity factors.

STRUCTURAL INTEGRITY Associates, Inc.	**CALCULATION PACKAGE**	**FILE No.: PBCH-07Q-302** **PROJECT No.:** PBCH-07Q

PROJECT NAME: Point Beach Unit 2 CRDM Top Head Analysis

CLIENT: NMC Point Beach Nuclear Plant

CALCULATION TITLE: PWSCC Crack Growth Correlations and Crack Growth Calculations for Point Beach Unit 2

Document Revision	Affected Pages	Revision Description	Project Mgr. Approval Signature & Date	Preparer(s) & Checker(s) Signatures & Date
0	1-6 A1 – A17	Original Issue	H. L. GUSTIN H L Gustin 10/9/03	H. L. GUSTIN H L Gustin 10/9/03 G. L. STEVENS Gary L. Stevens 10/9/03

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1.0 STATEMENT OF PROBLEM

In order to evaluate repair options for the Point Beach Unit 2 Top Head CRDM penetrations, it is necessary to evaluate growth of hypothetical flaws in the proposed weld repair fusion line with the low alloy steel base material. The industry Materials Reliability Program (MRP) has prepared a document that predicts PWSCC growth in components such as the CRDM penetration tubes [1]. This approach has been presented to the NRC, and has generally been accepted. The MRP correlation of available crack growth data is normalized in [1] to a service temperature of 617 °F. The reported top head temperature for Point Beach Unit 2 is 592 °F [2]. The crack growth rate is a strong function of temperature, and so to reasonably represent the Point Beach condition, it is necessary to adjust the MRP crack growth correlation for the lower temperature.

In the following, a temperature-adjusted crack growth correlation is developed. This correlation is then used to predict the crack growth of bounding assumed flaws as a function of time.

2.0 METHODOLOGY

MRP-55 [1, page 13] presents a general form of the PWSCC crack growth correlation, based on the data collected:

$$da/dt = \exp[-Q_g/R\,(1/T - 1/T_{ref})]\ \alpha(K-K_{th})^{\beta}$$

where:

da/dt	= crack growth rate at temperature T in in/yr
Q_g	= thermal activation for crack growth
	= 31.0 kcal/mole
R	= universal gas constant
	= 1.103×10^{-3} kcal/mole °R
T	= absolute operating temperature at location of crack. °R
T_{ref}	= absolute reference temperature used to normalize data
	= 598.15 K (1076.67 °R)
α	= crack growth amplitude
	= 3.69×10^{-3} at 617 °F for da/dt in units of in/yr and K in units of ksi-√in
K	= crack tip stress intensity factor
K_{th}	= crack tip stress intensity factor threshold
	= 8.19 ksi-√in
β	= exponent = 1.16

To adjust this correlation for Point Beach 2 operating conditions, the operating temperature of 592°F (1051.67 °R) [2] is used for the operating temperature T, above. This gives a plant specific PWSCC growth correlation of:

$$da/dt = 1.98 \times 10^{-3} \ (K-K_{th})^{1.16} \text{ in/yr}$$
$$= 2.26 \times 10^{-7} \ (K-K_{th})^{1.16} \text{ in/hour}$$

The above rates assume that the plant is operating 100% of the time (8760 hours/year).

This correlation is applicable to evaluating the growth of ID connected axial flaws in the CRDM penetration tube material.

3.0 CRACK GROWTH CALCULATIONS

The objective of the calculation is to determine the time that would be required for a crack at the interface of the Alloy 52 repair material, the low alloy steel head material, and the underlying J-groove material to propagate parallel to the repair weld by a PWSCC mechanism through a distance defined by the repair weld ligament. If the time for such propagation is greater than the remaining service life of the head, no penetration of the pressure boundary due to such a crack would be predicted.

The above crack growth correlation was used with the SI program pc-CRACK [3] to perform PWSCC crack growth calculations. Two hypothetical flaw types were considered, which represent the bounds on geometries that may be encountered. These were:

1. A flaw in the axial-radial plane, across the entire remaining J-groove + butter. Such a flaw would be opened by hoop stress, resulting in a tunnel crack under the repair weld.
2. A flaw in the axial-circumferential plane, parallel to tube wall, which would be opened by radial stress (which are comparatively small). The resulting crack would be "laminar", or parallel to the tube OD.

PWSCC is driven by both applied and weld residual stresses. Based on analyses performed by Dominion Engineering [2], as summarized in another SI calculation [4], the normal operating stresses plus the weld residual stresses in the hoop direction can reasonably be represented by a constant through wall stress intensity factor of 45 ksi - √inch, at the junction of the Alloy 52 repair weld and the low alloy steel head material.

The analysis assumed that the entire remaining J-groove weld material was degraded (cracked), so no credit was taken for any flaw initiation or growth time in the remaining J-groove material. Because a constant applied K is assumed, starting flaw size has no effect on crack growth. For the purpose of this analysis, an arbitrary starting flaw depth of 0.1 inch is used, and a final depth of 0.36 inch therefore represents growth through the minimum ligament

The flaw located in the axial-radial plane (opened by hoop stresses) was determined to be the governing flaw case, since the applied plus residual stresses in the hoop direction, as determined in the Dominion analysis [2] are greater than those in the radial direction by a factor of two to four. As a result, crack growth in this plane would be slower by a comparable factor.

The pc-CRACK output follows the reference section of this calculation (Appendix A).

3.1 Fatigue crack growth

Fatigue crack growth is driven by cyclic stresses. For the present case, the stress state for the assumed flaws is dominated by weld residual stresses, which are steady state secondary stresses. These residual stresses will not vary with heat-up/cooldown and other plant cycles, and will therefore have only a limited effect on fatigue crack growth (that is, they will have some effect on R-ratio, but none on cyclic delta K values due to cyclic plant operation. For the limited period of remaining plant operation with the current vessel head (estimated at less than 100 heat-up/cooldown cycles), propagation of the hypothetical cracks considered herein by a fatigue mechanism is estimated at approximately 0.0002 inch, and is therefore considered negligible compared to PWSCC propagation. The pc-CRACK fatigue crack growth results are attached.

4.0 RESULTS

The above analysis produces the following results:

1. An axial-radial crack tunnel would propagate through the worst case remaining ligament (0.26 inch) in about 1.5 EFPY (13,900 EFPH)
2. An axial-radial crack tunnel would propagate through the best estimate remaining ligament (0.75 inch) in about 4.5 EFPY
3. A laminar (axial-circumferential plane) crack would propagate through the worst case remaining ligament in more than twice the time

A crack would have to propagate through the remaining ligament before leakage and possible wastage could occur.
Using the as-found weld measurements it will be demonstrated that no leakage will occur.

5.0 REFERENCES

1. Materials Reliability Program (MRP), "Crack Growth Rates for Evaluating Primary Water Stress Corrosion Cracking (PWSCC) of Thick-Wall Alloy 600 Material", MRP-55. EPRI Proprietary.

2. Dominion Engineering , "Point Beach Unit 2 CRDM Nozzle Repair Weld Analysis" Calculation C-4429-00-2, Revision 0, April 2002

3. Structural Integrity Associates, pc-CRACK for Windows, version 3.1-98348.

4. SI Calculation, "Fracture Mechanics Evaluation of Point Beach Unit 2 Top Head CRDM 43.5 Degree Azimuth Penetration Weld Repair," PBCH-07Q-301, Revision 0.

APPENDIX A
FLAW GROWTH CALCULATIONS PC-CRACK OUTPUT

pc-CRACK for Windows
Version 3.1-98348
(C) Copyright '84 - '98
Structural Integrity Associates, Inc.

Linear Elastic Fracture Mechanics

Date: Fri Oct 03 08:48:17 2003
Input Data and Results File: TUNNEL1.LFM

Title: Growth of tunnel crack in axial-radial plane, constant 45 ksi -(in)^0.5

Load Cases:

Case ID: constant 45 --- K vs a

Depth	K
0.0000	45.0000
0.1000	45.0000
0.5000	45.0000
1.5000	45.0000
2.5000	45.0000

Case ID	Stress Coefficients C0	C1	C2	C3	Type
constant 45	0	0	0	0	K vs a

Crack Model: User Input K Versus Crack Size

Crack Parameters:
Max. crack size: 1.5000

--------------------Stress Intensity Factor--------------------

Crack Size	Case constant 4
0.0300	45
0.0600	45
0.0900	45
0.1200	45
0.1500	45

0.1800	45
0.2100	45
0.2400	45
0.2700	45
0.3000	45
0.3300	45
0.3600	45
0.3900	45
0.4200	45
0.4500	45
0.4800	45
0.5100	45
0.5400	45
0.5700	45
0.6000	45
0.6300	45
0.6600	45
0.6900	45
0.7200	45
0.7500	45
0.7800	45
0.8100	45
0.8400	45
0.8700	45
0.9000	45
0.9300	45
0.9600	45
0.9900	45
1.0200	45
1.0500	45
1.0800	45
1.1100	45
1.1400	45
1.1700	45
1.2000	45
1.2300	45
1.2600	45
1.2900	45
1.3200	45
1.3500	45
1.3800	45
1.4100	45
1.4400	45
1.4700	45
1.5000	45

Crack Growth Laws:

Law ID: MRP55-592
Type: Corrosion
Model: Paris

da/dN = c * (dK)^n
where
dK = Kmax - Kmin
dK > Kthres
Kmax < K1c

Material parameters:
c = 2.2600e-007
n = 1.1600
Kthres = 8.1900

Material Fracture Toughness KIc:

Material ID: Limit

Depth	KIc
0.0000	200.0000
1.5000	200.0000
3.0000	200.0000

Initial crack size= 0.1000
Max. crack size= 1.5000

Number of blocks= 1
Print increment of block= 1

Subblock	Cycles /Time	Calc. incre.	Print incre.	Crk. Grw. Law	Mat. K1c
axradial1	30000	100	100	MRP55-592	Limit

Subblock	Kmax Case ID	Kmax Scale Factor	Kmin Case ID	Kmin Scale Factor
axradial1	constant 45	1.0000		

Crack growth results:

Total Subblock
Cycles Cycles DaDn

/Time	/Time	Kmax	Kmin	DeltaK	R	/DaDt	Da	a	a/thk

Block: 1

100	100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1019	0.00
200	200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1037	0.00
300	300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1056	0.00
400	400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1075	0.00
500	500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1093	0.00
600	600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1112	0.00
700	700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1131	0.00
800	800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.115	0.00
900	900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1168	0.00
1000	1000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1187	0.00
1100	1100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1206	0.00
1200	1200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1224	0.00
1300	1300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1243	0.00
1400	1400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1262	0.00
1500	1500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.128	0.00
1600	1600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1299	0.00
1700	1700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1318	0.00
1800	1800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1337	0.00
1900	1900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1355	0.00
2000	2000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1374	0.00
2100	2100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1393	0.00
2200	2200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1411	0.00
2300	2300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.143	0.00
2400	2400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1449	0.00
2500	2500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1467	0.00
2600	2600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1486	0.00
2700	2700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1505	0.00
2800	2800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1524	0.00
2900	2900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1542	0.00
3000	3000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1561	0.00
3100	3100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.158	0.00
3200	3200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1598	0.00
3300	3300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1617	0.00
3400	3400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1636	0.00
3500	3500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1654	0.00
3600	3600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1673	0.00
3700	3700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1692	0.00
3800	3800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1711	0.00
3900	3900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1729	0.00
4000	4000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1748	0.00
4100	4100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1767	0.00
4200	4200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1785	0.00
4300	4300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1804	0.00
4400	4400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1823	0.00
4500	4500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1841	0.00

	Revision	0			
	Preparer/Date	HLG 10/9/03			
	Checker/Date	GLS 10/9/03			

4600	4600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.186	0.00
4700	4700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1879	0.00
4800	4800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1898	0.00
4900	4900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1916	0.00
5000	5000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1935	0.00
5100	5100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1954	0.00
5200	5200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1972	0.00
5300	5300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.1991	0.00
5400	5400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.201	0.00
5500	5500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2028	0.00
5600	5600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2047	0.00
5700	5700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2066	0.00
5800	5800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2085	0.00
5900	5900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2103	0.00
6000	6000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2122	0.00
6100	6100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2141	0.00
6200	6200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2159	0.00
6300	6300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2178	0.00
6400	6400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2197	0.00
6500	6500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2215	0.00
6600	6600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2234	0.00
6700	6700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2253	0.00
6800	6800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2272	0.00
6900	6900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.229	0.00
7000	7000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2309	0.00
7100	7100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2328	0.00
7200	7200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2346	0.00
7300	7300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2365	0.00
7400	7400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2384	0.00
7500	7500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2402	0.00
7600	7600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2421	0.00
7700	7700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.244	0.00
7800	7800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2459	0.00
7900	7900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2477	0.00
8000	8000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2496	0.00
8100	8100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2515	0.00
8200	8200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2533	0.00
8300	8300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2552	0.00
8400	8400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2571	0.00
8500	8500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2589	0.00
8600	8600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2608	0.00
8700	8700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2627	0.00
8800	8800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2646	0.00
8900	8900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2664	0.00
9000	9000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2683	0.00
9100	9100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2702	0.00
9200	9200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.272	0.00
9300	9300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2739	0.00
9400	9400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2758	0.00

9500	9500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2776	0.00	
9600	9600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2795	0.00	
9700	9700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2814	0.00	
9800	9800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2833	0.00	
9900	9900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2851	0.00	
10000	10000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.287	0.00	
10100	10100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2889	0.00	
10200	10200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2907	0.00	
10300	10300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2926	0.00	
10400	10400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2945	0.00	
10500	10500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2963	0.00	
10600	10600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.2982	0.00	
10700	10700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3001	0.00	
10800	10800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.302	0.00	
10900	10900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3038	0.00	
11000	11000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3057	0.00	
11100	11100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3076	0.00	
11200	11200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3094	0.00	
11300	11300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3113	0.00	
11400	11400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3132	0.00	
11500	11500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.315	0.00	
11600	11600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3169	0.00	
11700	11700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3188	0.00	
11800	11800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3207	0.00	
11900	11900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3225	0.00	
12000	12000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3244	0.00	
12100	12100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3263	0.00	
12200	12200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3281	0.00	
12300	12300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.33	0.00	
12400	12400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3319	0.00	
12500	12500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3337	0.00	
12600	12600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3356	0.00	
12700	12700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3375	0.00	
12800	12800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3394	0.00	
12900	12900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3412	0.00	
13000	13000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3431	0.00	
13100	13100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.345	0.00	
13200	13200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3468	0.00	
13300	13300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3487	0.00	
13400	13400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3506	0.00	
13500	13500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3524	0.00	
13600	13600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3543	0.00	
13700	13700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3562	0.00	
13800	13800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3581	0.00	
13900	13900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3599	0.00	Ligament Depth + 0.1 Start Flaw
14000	14000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3618	0.00	
14100	14100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3637	0.00	
14200	14200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3655	0.00	
14300	14300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3674	0.00	

14400	14400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3693	0.00
14500	14500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3711	0.00
14600	14600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.373	0.00
14700	14700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3749	0.00
14800	14800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3768	0.00
14900	14900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3786	0.00
15000	15000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3805	0.00
15100	15100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3824	0.00
15200	15200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3842	0.00
15300	15300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3861	0.00
15400	15400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.388	0.00
15500	15500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3898	0.00
15600	15600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3917	0.00
15700	15700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3936	0.00
15800	15800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3955	0.00
15900	15900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3973	0.00
16000	16000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.3992	0.00
16100	16100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4011	0.00
16200	16200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4029	0.00
16300	16300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4048	0.00
16400	16400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4067	0.00
16500	16500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4085	0.00
16600	16600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4104	0.00
16700	16700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4123	0.00
16800	16800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4142	0.00
16900	16900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.416	0.00
17000	17000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4179	0.00
17100	17100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4198	0.00
17200	17200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4216	0.00
17300	17300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4235	0.00
17400	17400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4254	0.00
17500	17500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4272	0.00
17600	17600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4291	0.00
17700	17700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.431	0.00
17800	17800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4329	0.00
17900	17900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4347	0.00
18000	18000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4366	0.00
18100	18100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4385	0.00
18200	18200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4403	0.00
18300	18300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4422	0.00
18400	18400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4441	0.00
18500	18500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4459	0.00
18600	18600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4478	0.00
18700	18700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4497	0.00
18800	18800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4516	0.00
18900	18900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4534	0.00
19000	19000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4553	0.00
19100	19100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4572	0.00
19200	19200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.459	0.00

19300	19300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4609	0.00
19400	19400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4628	0.00
19500	19500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4646	0.00
19600	19600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4665	0.00
19700	19700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4684	0.00
19800	19800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4703	0.00
19900	19900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4721	0.00
20000	20000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.474	0.00
20100	20100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4759	0.00
20200	20200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4777	0.00
20300	20300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4796	0.00
20400	20400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4815	0.00
20500	20500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4833	0.00
20600	20600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4852	0.00
20700	20700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4871	0.00
20800	20800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.489	0.00
20900	20900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4908	0.00
21000	21000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4927	0.00
21100	21100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4946	0.00
21200	21200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4964	0.00
21300	21300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.4983	0.00
21400	21400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5002	0.00
21500	21500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.502	0.00
21600	21600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5039	0.00
21700	21700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5058	0.00
21800	21800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5077	0.00
21900	21900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5095	0.00
22000	22000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5114	0.00
22100	22100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5133	0.00
22200	22200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5151	0.00
22300	22300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.517	0.00
22400	22400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5189	0.00
22500	22500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5207	0.00
22600	22600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5226	0.00
22700	22700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5245	0.00
22800	22800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5264	0.00
22900	22900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5282	0.00
23000	23000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5301	0.00
23100	23100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.532	0.00
23200	23200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5338	0.00
23300	23300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5357	0.00
23400	23400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5376	0.00
23500	23500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5394	0.00
23600	23600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5413	0.00
23700	23700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5432	0.00
23800	23800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5451	0.00
23900	23900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5469	0.00
24000	24000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5488	0.00
24100	24100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5507	0.00

24200	24200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5525	0.00
24300	24300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5544	0.00
24400	24400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5563	0.00
24500	24500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5581	0.00
24600	24600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.56	0.00
24700	24700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5619	0.00
24800	24800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5638	0.00
24900	24900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5656	0.00
25000	25000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5675	0.00
25100	25100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5694	0.00
25200	25200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5712	0.00
25300	25300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5731	0.00
25400	25400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.575	0.00
25500	25500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5768	0.00
25600	25600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5787	0.00
25700	25700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5806	0.00
25800	25800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5825	0.00
25900	25900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5843	0.00
26000	26000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5862	0.00
26100	26100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5881	0.00
26200	26200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5899	0.00
26300	26300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5918	0.00
26400	26400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5937	0.00
26500	26500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5955	0.00
26600	26600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5974	0.00
26700	26700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.5993	0.00
26800	26800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6012	0.00
26900	26900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.603	0.00
27000	27000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6049	0.00
27100	27100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6068	0.00
27200	27200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6086	0.00
27300	27300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6105	0.00
27400	27400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6124	0.00
27500	27500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6142	0.00
27600	27600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6161	0.00
27700	27700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.618	0.00
27800	27800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6199	0.00
27900	27900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6217	0.00
28000	28000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6236	0.00
28100	28100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6255	0.00
28200	28200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6273	0.00
28300	28300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6292	0.00
28400	28400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6311	0.00
28500	28500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6329	0.00
28600	28600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6348	0.00
28700	28700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6367	0.00
28800	28800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6386	0.00
28900	28900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6404	0.00
29000	29000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6423	0.00

29100	29100	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6442	0.00
29200	29200	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.646	0.00
29300	29300	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6479	0.00
29400	29400	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6498	0.00
29500	29500	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6516	0.00
29600	29600	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6535	0.00
29700	29700	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6554	0.00
29800	29800	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6573	0.00
29900	29900	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.6591	0.00
30000	30000	4.50e+001	0.00e+000	4.50e+001	0.00	1.87e-005	1.87e-003	0.661	0.00

End of pc-CRACK Output

tm
pc-CRACK for Windows
Version 3.1-98348

Linear Elastic Fracture Mechanics

Date: Wed Oct 08 15:47:58 2003
Input Data and Results File: FATIGUE.LFM

Title: fatigue crack growth analysis for Point Beach repair

Load Cases:

Case ID	Stress Coefficients C0	C1	C2	C3	Type
Applied	20	0	0	0	Coeff
residual	60	0	0	0	Coeff

------Through Wall Stresses for Load Cases With Stress Coeff-------

Wall Depth	Case Applied	Case residual
0.0000	20	60
0.1000	20	60
0.2000	20	60
0.3000	20	60
0.4000	20	60
0.5000	20	60
0.6000	20	60
0.7000	20	60
0.8000	20	60
0.9000	20	60
1.0000	20	60

Crack Model: Single Edge Cracked Plate

Crack Parameters:
Plate width: 2.0000
Max. crack size: 1.0000

	--------------------Stress Intensity Factor--------------------	
Crack Size	Case Applied	Case residual
0.0200	5.42685	16.2806
0.0400	7.7279	23.1837
0.0600	9.52983	28.5895
0.0800	11.0793	33.2379
0.1000	12.4711	37.4133
0.1200	13.7535	41.2605
0.1400	14.955	44.8649
0.1600	16.0939	48.2816
0.1800	17.1829	51.5488
0.2000	18.2313	54.6939
0.2200	19.4953	58.4858
0.2400	20.7529	62.2586
0.2600	22.007	66.021
0.2800	23.2598	69.7794
0.3000	24.513	73.5391
0.3200	25.7681	77.3044
0.3400	27.0263	81.0788
0.3600	28.2884	84.8651
0.3800	29.5552	88.6656
0.4000	30.8275	92.4824
0.4200	32.3354	97.0061
0.4400	33.8605	101.582
0.4600	35.4029	106.209
0.4800	36.9626	110.888
0.5000	38.5394	115.618
0.5200	40.1334	120.4
0.5400	41.7446	125.234
0.5600	43.3727	130.118
0.5800	45.0179	135.054
0.6000	46.6799	140.04
0.6200	48.7773	146.332
0.6400	50.9049	152.715
0.6600	53.0621	159.186
0.6800	55.2486	165.746
0.7000	57.464	172.392
0.7200	59.7079	179.124
0.7400	61.98	185.94
0.7600	64.2799	192.84
0.7800	66.6073	199.822
0.8000	68.9619	206.886
0.8200	72.3064	216.919
0.8400	75.7008	227.102
0.8600	79.1444	237.433

0.8800	82.6366	247.91
0.9000	86.1767	258.53
0.9200	89.7641	269.292
0.9400	93.3982	280.195
0.9600	97.0783	291.235
0.9800	100.804	302.412
1.0000	104.575	313.724

Crack Growth Laws:

Law ID: PB-1
Model: ASME Section XI - austenitic stainless steel in air environment

da/dN = C * 10^F * S * dK^3.3
where
S = 1.0 for R < 0
= 1.0 + 1.8 * R for 0 < R < 0.79
= -43.5 + 57.97 * R for 0.79 < R < 1
F = code specified function of temperature
dK = Kmax - Kmin
R = Kmin / Kmax
where:
C * 10^F = 1.9352e-010
is for the currently selected units of:
force: kip
length: inch
temperature: 592.0000 Fahrenheit

Material Fracture Toughness KIc:

Material ID: Shell

Depth	KIc
0.0000	200.0000
1.0000	200.0000
2.0000	200.0000

Initial crack size= 0.1000
Max. crack size= 1.0000

Number of blocks= 1
Print increment of block= 1

Subblock	Cycles /Time	Calc. incre.	Print incre.	Crk. Grw. Law	Mat. K1c
PB Fatigue	100	1	1	PB-1	Shell

Subblock	Kmax Case ID	Kmax Scale Factor	Kmin Case ID	Kmin Scale Factor
PB Fatigue	Applied	1.0000	residual	1.0000
	residual	1.0000		

Crack growth results:

Total Cycles /Time	Subblock Cycles /Time	Kmax	Kmin	DeltaK	R	DaDn /DaDt	Da	a	a/thk
Block: 1									
1	1	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
2	2	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
3	3	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
4	4	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
5	5	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
6	6	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
7	7	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
8	8	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
9	9	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
10	10	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
11	11	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
12	12	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
13	13	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
14	14	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
15	15	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
16	16	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
17	17	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
18	18	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
19	19	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
20	20	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
21	21	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
22	22	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
23	23	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
24	24	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
25	25	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
26	26	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1	0.05
27	27	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
28	28	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05

29	29	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
30	30	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
31	31	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
32	32	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
33	33	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
34	34	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
35	35	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
36	36	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
37	37	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
38	38	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
39	39	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
40	40	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
41	41	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
42	42	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
43	43	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
44	44	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
45	45	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
46	46	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
47	47	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
48	48	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
49	49	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
50	50	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
51	51	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
52	52	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
53	53	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
54	54	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
55	55	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
56	56	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
57	57	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
58	58	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
59	59	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
60	60	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
61	61	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
62	62	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
63	63	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
64	64	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
65	65	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
66	66	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
67	67	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
68	68	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
69	69	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
70	70	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
71	71	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
72	72	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
73	73	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
74	74	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
75	75	4.99e+001	3.74e+001	1.25e+001	0.75	1.88e-006	1.88e-006	0.1001	0.05
76	76	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1001	0.05
77	77	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1001	0.05

78	78	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1001	0.05
79	79	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1001	0.05
80	80	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
81	81	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
82	82	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
83	83	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
84	84	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
85	85	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
86	86	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
87	87	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
88	88	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
89	89	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
90	90	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
91	91	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
92	92	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
93	93	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
94	94	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
95	95	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
96	96	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
97	97	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
98	98	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
99	99	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05
100	100	4.99e+001	3.74e+001	1.25e+001	0.75	1.89e-006	1.89e-006	0.1002	0.05

End of pc-CRACK Output