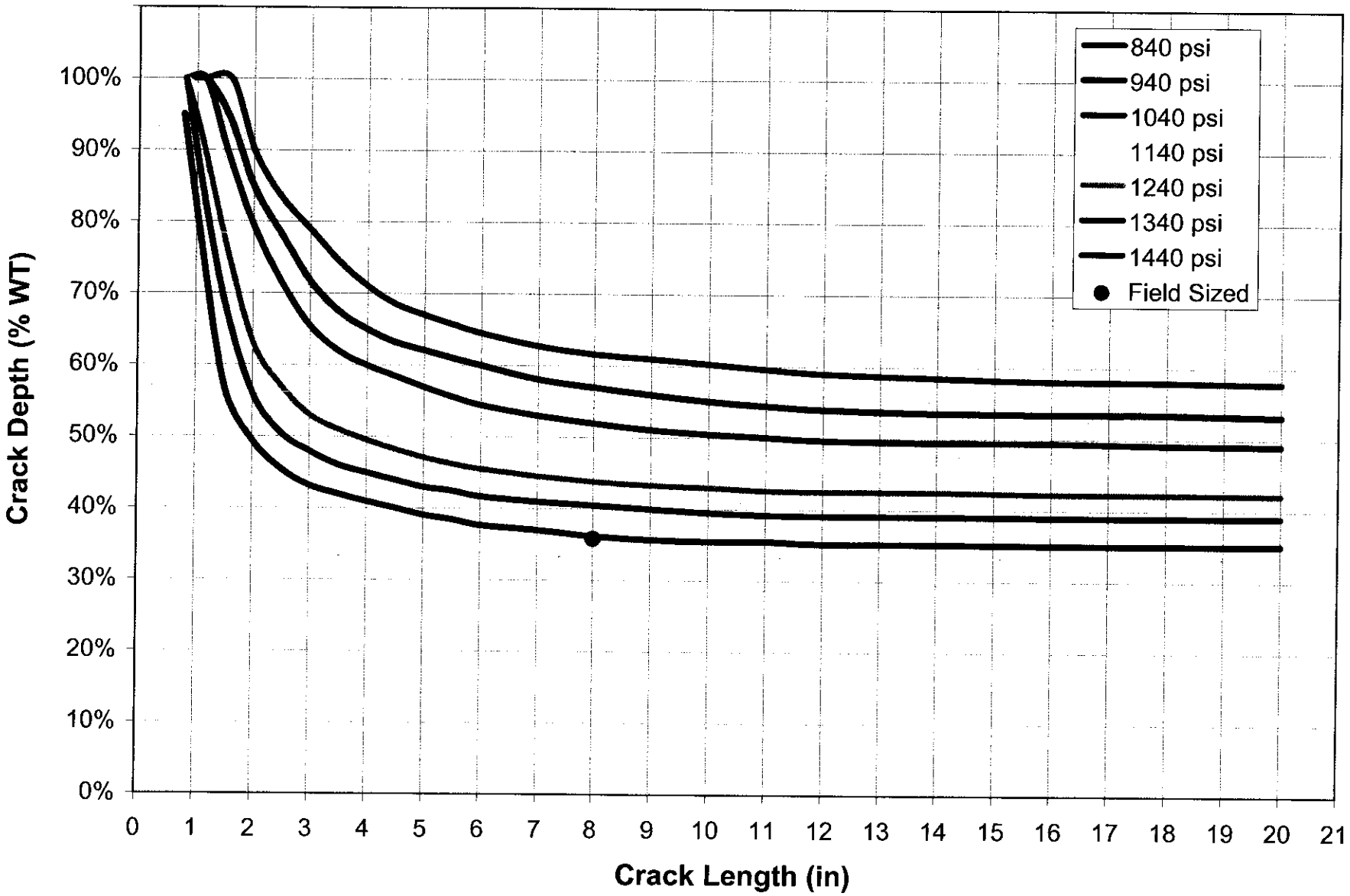
APPENDIX VIII

Excel Spreadsheet Created by GE for Dixie. (3+over sheet)

Appendix VIII

P 4-T

1440 psi			1340 psi			1240 psi			1140 psi			1040 psi			940 psi			840 psi		
Length (in)	Depth (in)	Depth (% WT)	Length (in)	Depth (in)	Depth (% WT)	Length (in)	Depth (in)	Depth (% WT)	Length (in)	Depth (in)	Depth (% WT)	Length (in)	Depth (in)	Depth (% WT)	Length (in)	Depth (in)	Depth (% WT)	Length (in)	Depth (in)	Depth (% WT)
0.8	0.238	95.0%	0.8	0.250	100.0%	0.8	0.250	100.0%	0.8	0.250	100.0%	0.8	0.250	100.0%	0.8	0.250	100.0%	0.9	0.250	100.0%
1.1	0.196	78.6%	1.1	0.215	86.0%	1.1	0.228	91.0%	1.1	0.243	97.0%	1.1	0.250	100.0%	1.1	0.250	100.0%	1.1	0.250	100.0%
1.5	0.143	57.0%	1.5	0.171	68.5%	1.5	0.191	76.5%	1.5	0.213	85.2%	1.6	0.224	89.5%	1.6	0.236	94.5%	1.6	0.250	100.0%
2.0	0.124	49.5%	2.0	0.140	56.0%	2.0	0.158	63.0%	2.0	0.179	71.5%	2.0	0.198	79.3%	2.0	0.212	84.6%	2.0	0.224	89.5%
2.5	0.114	45.5%	2.5	0.126	50.5%	2.5	0.143	57.0%	2.5	0.161	64.5%	2.5	0.179	71.5%	2.5	0.195	78.0%	2.5	0.208	83.2%
3.0	0.108	43.2%	3.0	0.120	48.0%	3.0	0.133	53.0%	3.0	0.148	59.0%	3.0	0.164	65.5%	3.0	0.179	71.6%	3.0	0.197	78.9%
3.5	0.105	42.0%	3.5	0.115	46.1%	3.5	0.128	51.0%	3.5	0.140	56.1%	3.5	0.155	62.0%	3.5	0.169	67.5%	3.5	0.186	74.5%
4.0	0.103	41.0%	4.0	0.113	45.0%	4.0	0.124	49.5%	4.0	0.136	54.5%	4.0	0.150	60.0%	4.0	0.163	65.0%	4.0	0.178	71.0%
4.5	0.100	40.1%	4.5	0.110	44.0%	4.5	0.121	48.2%	4.5	0.133	53.0%	4.5	0.146	58.5%	4.5	0.158	63.2%	4.5	0.171	68.5%
5.0	0.098	39.1%	5.0	0.108	43.0%	5.0	0.118	47.1%	5.0	0.129	51.7%	5.0	0.143	57.0%	5.0	0.155	62.1%	5.0	0.168	67.0%
5.5	0.096	38.5%	5.5	0.106	42.5%	5.5	0.116	46.2%	5.5	0.127	50.6%	5.5	0.139	55.6%	5.5	0.153	61.0%	5.5	0.164	65.7%
6.0	0.094	37.7%	6.0	0.104	41.7%	6.0	0.114	45.5%	6.0	0.124	49.7%	6.0	0.136	54.5%	6.0	0.150	60.0%	6.0	0.161	64.5%
7.0	0.093	37.0%	7.0	0.103	41.0%	7.0	0.111	44.5%	7.0	0.121	48.5%	7.0	0.133	53.0%	7.0	0.145	58.1%	7.0	0.157	62.7%
8.0	0.091	36.2%	8.0	0.101	40.5%	8.0	0.110	43.8%	8.0	0.119	47.6%	8.0	0.130	52.0%	8.0	0.143	57.0%	8.0	0.154	61.6%
9.0	0.089	35.7%	9.0	0.100	40.0%	9.0	0.108	43.3%	9.0	0.118	47.0%	9.0	0.128	51.1%	9.0	0.140	56.0%	9.0	0.153	61.0%
10.0	0.089	35.5%	10.0	0.099	39.5%	10.0	0.108	43.0%	10.0	0.116	46.5%	10.0	0.126	50.5%	10.0	0.138	55.1%	10.0	0.151	60.3%
11.0	0.089	35.5%	11.0	0.098	39.2%	11.0	0.107	42.6%	11.0	0.115	46.1%	11.0	0.125	50.1%	11.0	0.136	54.5%	11.0	0.149	59.6%
12.0	0.088	35.2%	12.0	0.098	39.1%	12.0	0.106	42.5%	12.0	0.115	46.0%	12.0	0.124	49.7%	12.0	0.135	54.0%	12.0	0.148	59.0%
14.0	0.088	35.2%	14.0	0.098	39.1%	14.0	0.106	42.5%	14.0	0.115	45.8%	14.0	0.124	49.5%	14.0	0.134	53.6%	14.0	0.146	58.5%
16.0	0.088	35.1%	16.0	0.098	39.0%	16.0	0.106	42.3%	16.0	0.114	45.7%	16.0	0.124	49.5%	16.0	0.134	53.5%	16.0	0.145	58.1%
18.0	0.088	35.1%	18.0	0.098	39.0%	18.0	0.106	42.3%	18.0	0.114	45.6%	18.0	0.123	49.2%	18.0	0.134	53.5%	18.0	0.145	58.0%
20.0	0.088	35.1%	20.0	0.098	39.0%	20.0	0.106	42.2%	20.0	0.114	45.5%	20.0	0.123	49.1%	20.0	0.133	53.2%	20.0	0.145	57.8%


Crack Depth (% WT)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
Crack Length (in)
840 psi
940 psi
1040 psi
1140 psi
1240 psi
1340 psi
1440 psi
Field Sized

Critical Cracks Sizes were Determined Based on:

1 FAD Level-II per API 579
2 External semi-elliptical surface crack
3 Axially oriented single crack with no coalescence modeled
4 Stationary cracks (cracks are not growing. Only a limited amount of ductile tearing/crack extension is allowed before failure)
5 The calculated crack sizes do not represent the actual critical crack size that would fail at the prescribed pressure
6 The actual critical crack size or failure pressure is more accurately predicted by FAD Level-III Tearing Instability Approach
7 Nominal wall thickness of 0.250-inch
8 Nominal outside diameter of 12.75-inch
9 Lower bound material properties as shown below (eliminates the use of partial safety factors):

Yield Strength (SMYS)	52	ksi
Tensile Strength (minimum per API 5L)	66	ksi
Young's Modulus (E)	30,000	ksi
Fracture Toughness at the Seam Weld (K_{JMAT})	54.7	ksi$\sqrt{in}$
Fracture Toughness in Base Material (K_{JMAT})	111	ksi$\sqrt{in}$