

Case #1
Key Modeling Factors

Submission #	Software		Crack Definition		Stress Intensity Calculation	Material Model				Other
	Lifing Software	FE Software	Crack Front Shape	# of Points Defining Crack Front		Material Model	R shift	Negative R Behavior	Growth Increment	
1	CPAT	StressCheck	Multi-Point	30	Contour Integral Method	Tabular	linear log-log	Rlo, Kmax	2%	
2	CPAT	StressCheck	Multi-Point	20	Contour Integral Method	Tabular	linear log-log	Rlo, Kmax	0.5-2.0%	
3	AFGROW	N/A	Elliptical	2	Standard, Classic Newman/Raju	Tabular	Harter-T	Rlo, Kmax	cycle by cycle	
4a	NASGRO	N/A	Elliptical Straight Thru	2	NASGRO CC08/TC13 univariant WF	Tabular			10 cycles	Beta R
4b	NASGRO	N/A	Elliptical Straight Thru	2	NASGRO CC16/TC03 Fawaz/Anderson	Tabular			10 cycles	Beta R
4c	NASGRO	N/A	Elliptical Straight Thru	2	NASGRO CC10/TC13 bivariant WF	Tabular			10 cycles	Beta R
4d	NASGRO	N/A	Elliptical Straight Thru	2	NASGRO CC08/TC13 univariant WF	NASGRO Equation			10 cycles	Beta R
4e	NASGRO	N/A	Elliptical Straight Thru	2	NASGRO CC16/TC03 Fawaz/Anderson	NASGRO Equation			10 cycles	Beta R
4f	NASGRO	N/A	Elliptical Straight Thru	2	NASGRO CC10/TC13 bivariant WF	NASGRO Equation			10 cycles	Beta R
5	AFGROW-BAMF	StressCheck	Multi-Point	11	Contour Integral Method	Tabular	Harter-T	Rlo, Kmax	3%	
6	AFGROW	N/A	Elliptical Straight Thru	2	Standard, Classic Newman/Raju	Tabular	Harter-T	Rlo, Kmax	5%	
7	CPAT	StressCheck	Multi-Point	15	Contour Integral Method	Tabular	Harter-T	Rlo, Kmax	5%	
8	AFGROW	N/A	Elliptical Straight Thru	2	Standard, Classic Newman/Raju	Tabular	Harter-T	Rlo, Kmax	cycle by cycle	

Case #2
Key Modeling Factors

Submission #	Software		Crack Definition		RS Incorporation Approach	Stress Intensity		Material Model				Other
	Lifing Software	FE Software	Crack Front Shape	# of Points Defining Crack Front		Stress Intensity Calculation	Stress Intensity Incorporation	Material Model	R shift	Negative R Behavior	Growth Increment	
1	CPAT	StressCheck	Multi-Point	30	B-Spline Crack Face Pressure	Contour Integral Method Loaded Cracks	Superposition Kres	Tabular	linear log-log	Rlo, Kmax	2%	
2	CPAT	StressCheck	Multi-Point	20	Legendre Polynomial Crack Face Pressure	Contour Integral Method - Loaded Cracks	Superposition Kres	Tabular	linear log-log	Rlo, Kmax	0.5-2.0%	
3a	AFGROW	N/A	Elliptical	2	2-D Gaussian Integration Free Surface	Standard, Classic Newman/Raju	Superposition	Tabular	Harter-T	Rlo, Kmax	cycle by cycle	
3b	AFGROW	N/A	Elliptical	2	2-D Gaussian Integration 5 degrees	Standard, Classic Newman/Raju	Superposition	Tabular	Harter-T	Rlo, Kmax	cycle by cycle	
3c	AFGROW	N/A	Elliptical	2	2-D Gaussian Integration 10 degrees	Standard, Classic Newman/Raju	Superposition	Tabular	Harter-T	Rlo, Kmax	cycle by cycle	
4g	NASGRO	N/A	Elliptical Straight Thru	2	Bivariant WF	NASGRO CC10/TC13 bivariant WF	Superposition	NASGRO Equation			10 cycles	Beta R extrapolated RS
4h	NASGRO	N/A	Elliptical Straight Thru	2	Bivariant WF	NASGRO CC10/TC13 bivariant WF	Superposition	NASGRO Equation			10 cycles	Beta R plateauing RS
4i	NASGRO	N/A	Elliptical Straight Thru	2	Univariant WF	NASGRO CC08/TC13 univariant WF	Superposition	NASGRO Equation			10 cycles	Beta R extrapolated RS
4j	NASGRO	N/A	Elliptical Straight Thru	2	Univariant WF	NASGRO CC08/TC13 univariant WF	Superposition	NASGRO Equation			10 cycles	Beta R plateauing RS
5	AFGROW-BAMF	StressCheck	Multi-Point	11	Polynomial Fit (15th order) Crack Face Pressure	Contour Integral Method - Loaded Cracks	Superposition Kres	Tabular	Harter-T	Rlo, Kmax	3%	
6	AFGROW	N/A	Elliptical Straight Thru	2	1-D Gaussian Integration ~ 0.05" from free surface	Standard, Classic Newman/Raju	Superposition	Tabular	Harter-T	Rlo, Kmax	5%	
7	CPAT	StressCheck	Multi-Point	15	Legendre Polynomial Crack Face Pressure	Contour Integral Method - Loaded Cracks	Superposition Kres	Tabular	Harter-T	Rlo, Kmax	5%	
8	AFGROW-BAMF	StressCheck	Multi-Point	10	Polynomial Fit (15th order) Crack Face Pressure	Contour Integral Method - Loaded Cracks	Superposition Kres	Tabular	Harter-T	Rlo, Kmax	3%	

Case #3
Key Modeling Factors

Submission #	Software		Crack Definition		Stress Intensity Calculation	Material Model				Other
	Lifing Software	FE Software	Crack Front Shape	# of Points Defining Crack Front		Material Model	R shift	Negative R Behavior	Growth Increment	
1	CPAT	StressCheck	Multi-Point	30	Contour Integral Method	Tabular	linear log-log	Rlo, Kmax	2%	
2	CPAT	StressCheck	Multi-Point	20	Contour Integral Method	Tabular	linear log-log	Rlo, Kmax	0.5-2.0%	
3	AFGROW	N/A	Elliptical	2	Standard, Classic Newman/Raju	Tabular	Harter-T	Rlo, Kmax	cycle by cycle	
4a	NASGRO	N/A	Elliptical Straight Thru	2	NASGRO CC08/TC13 univariant WF	Tabular			10 cycles	Beta R
4b	NASGRO	N/A	Elliptical Straight Thru	2	NASGRO CC16/TC03 Fawaz/Anderson	Tabular			10 cycles	Beta R
4c	NASGRO	N/A	Elliptical Straight Thru	2	NASGRO CC10/TC13 bivariant WF	Tabular			10 cycles	Beta R
4d	NASGRO	N/A	Elliptical Straight Thru	2	NASGRO CC08/TC13 univariant WF	NASGRO Equation			10 cycles	Beta R
4e	NASGRO	N/A	Elliptical Straight Thru	2	NASGRO CC16/TC03 Fawaz/Anderson	NASGRO Equation			10 cycles	Beta R
4f	NASGRO	N/A	Elliptical Straight Thru	2	NASGRO CC10/TC13 bivariant WF	NASGRO Equation			10 cycles	Beta R
5	AFGROW-BAMF	StressCheck	Multi-Point	11	Contour Integral Method	Tabular	Harter-T	Rlo, Kmax	3%	
6	AFGROW	N/A	Elliptical Straight Thru	2	Standard, Classic Newman/Raju	Tabular	Harter-T	Rlo, Kmax	5%	
7	CPAT	StressCheck	Multi-Point	15	Contour Integral Method	Tabular	Harter-T	Rlo, Kmax	5%	
8	AFGROW	N/A	Elliptical Straight Thru	2	Standard, Classic Newman/Raju	Tabular	Harter-T	Rlo, Kmax	cycle by cycle	

Case #4
Key Modeling Factors

Submission #	Software		Crack Definition		RS Incorporation Approach	Stress Intensity		Material Model				Other
	Lifing Software	FE Software	Crack Front Shape	# of Points Defining Crack Front		Stress Intensity Calculation	Stress Intensity Incorporation	Material Model	R shift	Negative R Behavior	Growth Increment	
1	CPAT	StressCheck	Multi-Point	30	B-Spline Crack Face Pressure	Contour Integral Method Loaded Cracks	Superposition Kres	Tabular	linear log- log	Rlo, Kmax	2%	
2	CPAT	StressCheck	Multi-Point	20	Legendre Polynomial Crack Face Pressure	Contour Integral Method - Loaded Cracks	Superposition Kres	Tabular	linear log- log	Rlo, Kmax	0.5-2.0%	
3a	AFGROW	N/A	Elliptical	2	2-D Gaussian Integration Free Surface	Standard, Classic Newman/Raju	Superposition	Tabular	Harter-T	Rlo, Kmax	cycle by cycle	
3b	AFGROW	N/A	Elliptical	2	2-D Gaussian Integration 5 degrees	Standard, Classic Newman/Raju	Superposition	Tabular	Harter-T	Rlo, Kmax	cycle by cycle	
3c	AFGROW	N/A	Elliptical	2	2-D Gaussian Integration 10 degrees	Standard, Classic Newman/Raju	Superposition	Tabular	Harter-T	Rlo, Kmax	cycle by cycle	
4g	NASGRO	N/A	Elliptical Straight Thru	2	Bivariant WF	NASGRO CC10/TC13 bivariant WF	Superposition	NASGRO Equation			10 cycles	Beta R
4h	NASGRO	N/A	Elliptical Straight Thru	2	Bivariant WF	NASGRO CC10/TC13 bivariant WF	Superposition	NASGRO Equation			10 cycles	Beta R
4i	NASGRO	N/A	Elliptical Straight Thru	2	Univariant WF	NASGRO CC08/TC13 univariant WF	Superposition	NASGRO Equation			10 cycles	Beta R
4j	NASGRO	N/A	Elliptical Straight Thru	2	Univariant WF	NASGRO CC08/TC13 univariant WF	Superposition	NASGRO Equation			10 cycles	Beta R
5	AFGROW-BAMF	StressCheck	Multi-Point	11	Polynomial Fit (15th order) Crack Face Pressure	Contour Integral Method - Loaded Cracks	Superposition Kres	Tabular	Harter-T	Rlo, Kmax	3%	
6	AFGROW	N/A	Elliptical Straight Thru	2	1-D Gaussian Integration ~ 0.05" from free surface	Standard, Classic Newman/Raju	Superposition	Tabular	Harter-T	Rlo, Kmax	5%	
7	CPAT	StressCheck	Multi-Point	15	Legendre Polynomial Crack Face Pressure	Contour Integral Method - Loaded Cracks	Superposition Kres	Tabular	Harter-T	Rlo, Kmax	5%	
8	AFGROW-BAMF	StressCheck	Multi-Point	10	Polynomial Fit (15th order) Crack Face Pressure	Contour Integral Method - Loaded Cracks	Superposition Kres	Tabular	Harter-T	Rlo, Kmax	3%	