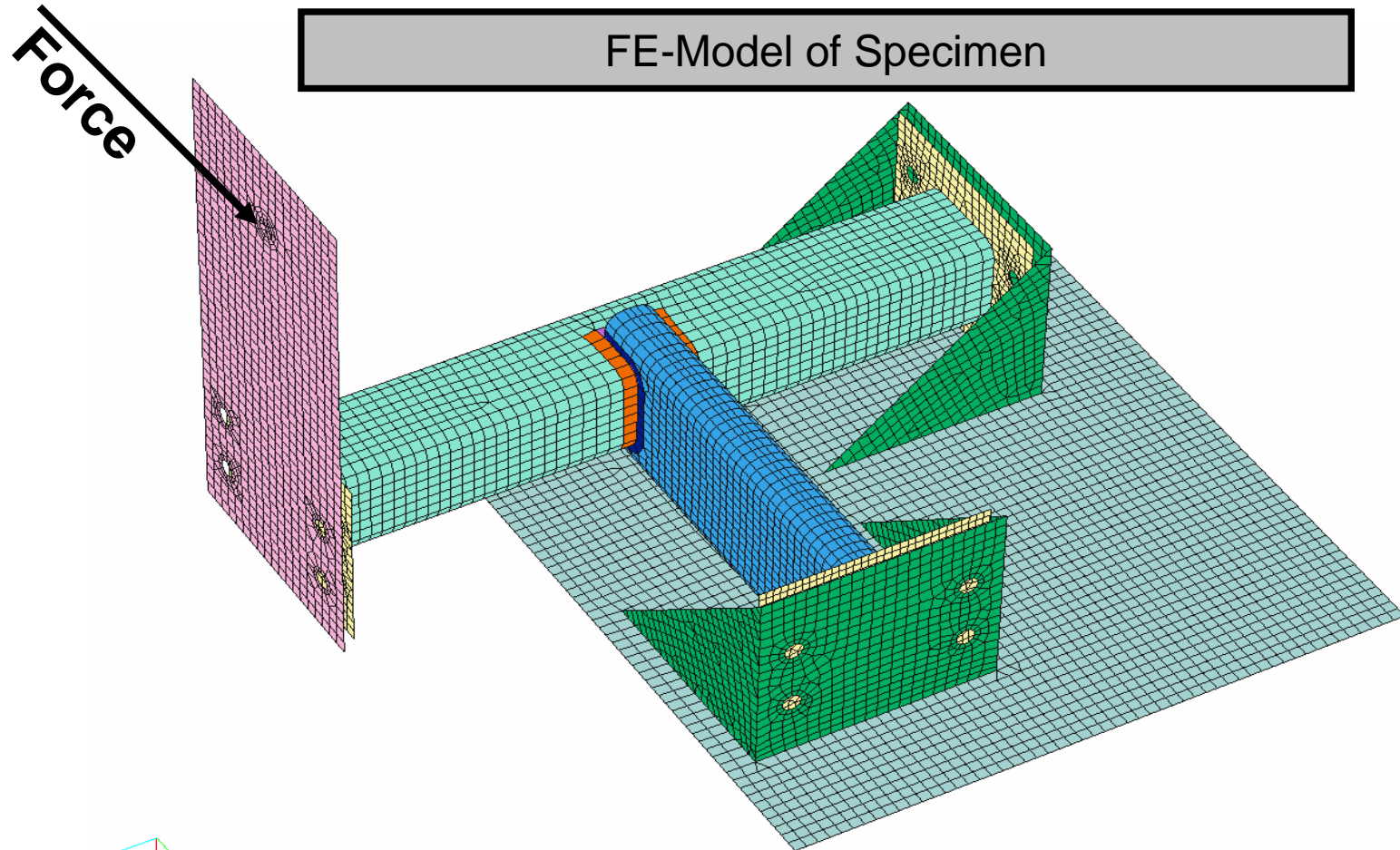


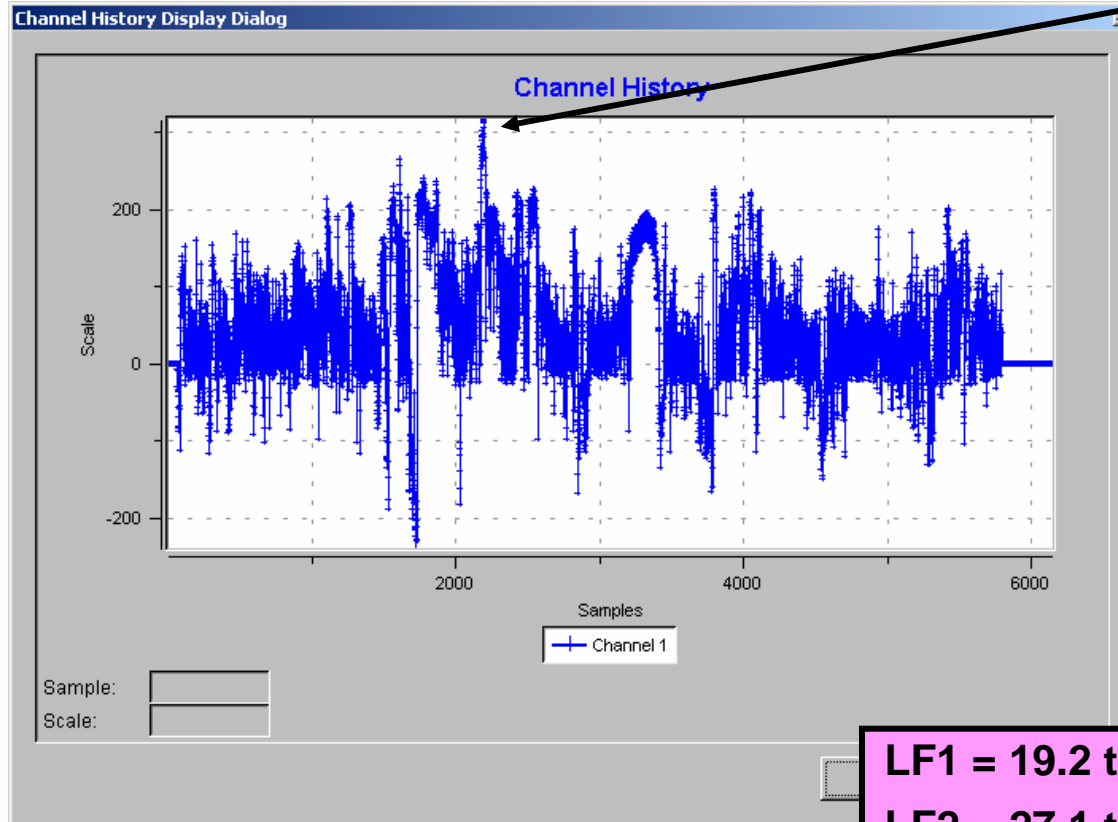
SAE FD&E Weld Challenge 2, Ajay Vittalam, 4/14/04

FE-Model of Specimen



## Real Load History

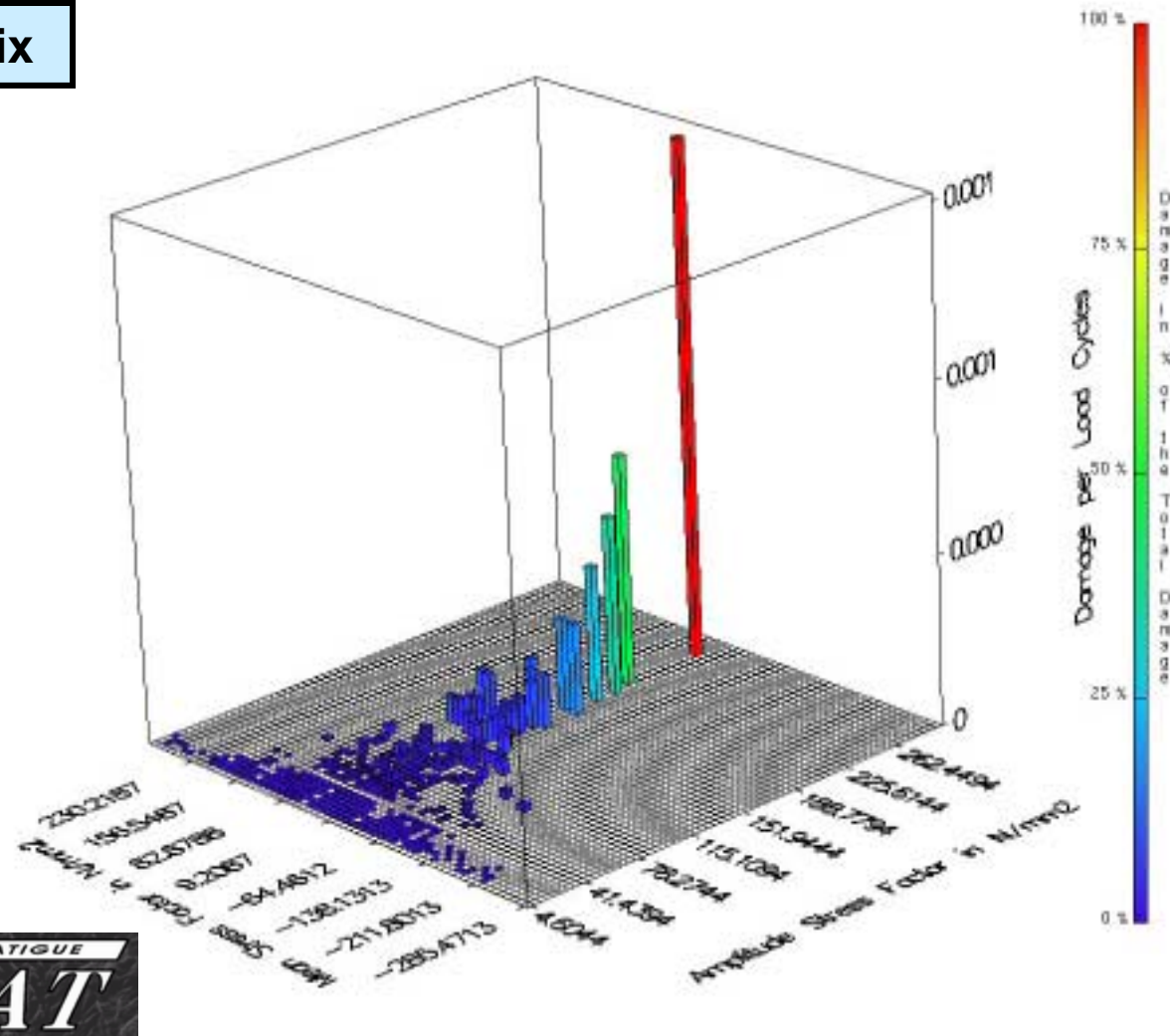
LF1 - Max 6109 lbs  
LF2 - Max 8618 lbs



LF1 = 19.2 times load history  
LF2 = 27.1 times load history



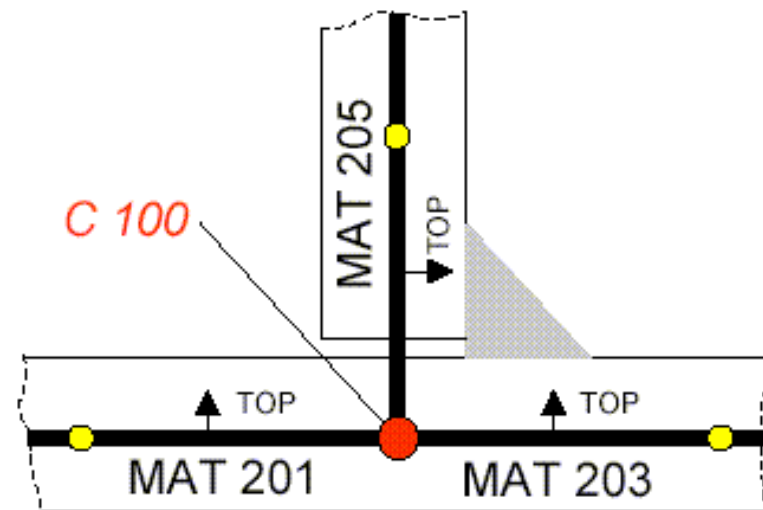
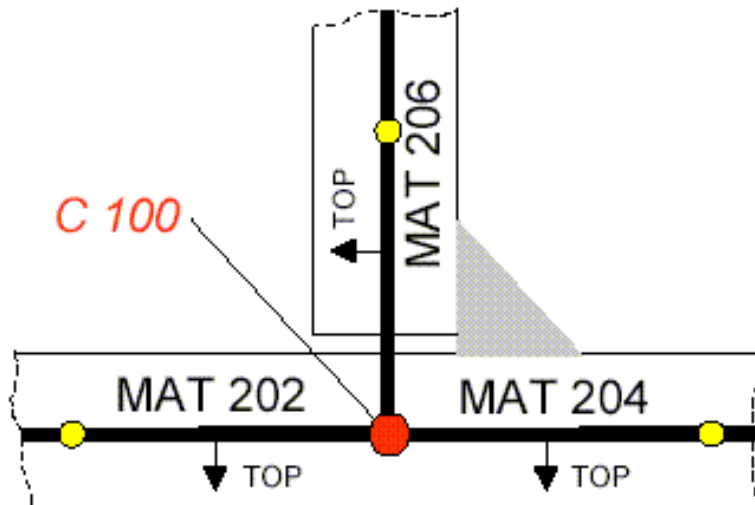
## Rainflow Matrix

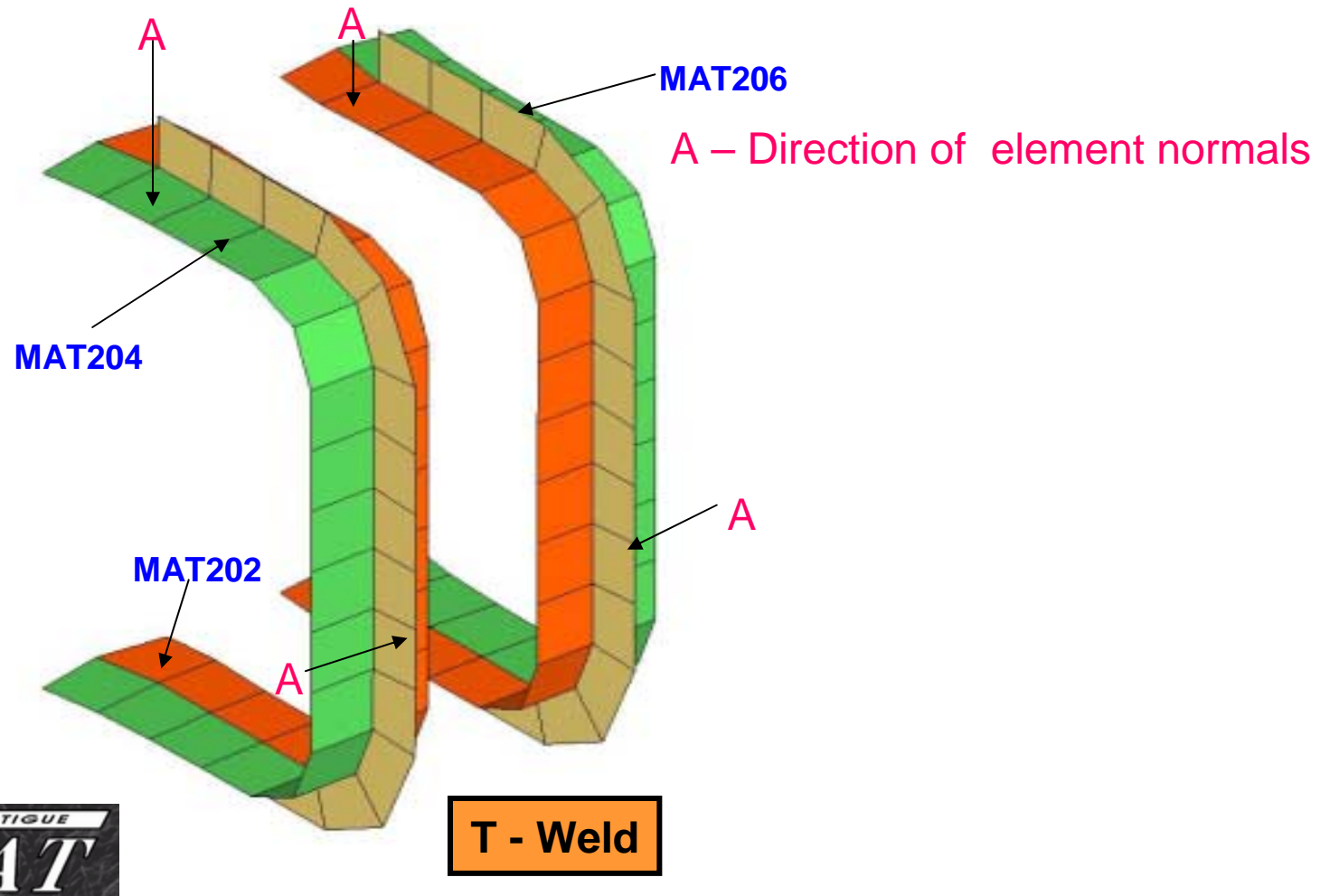


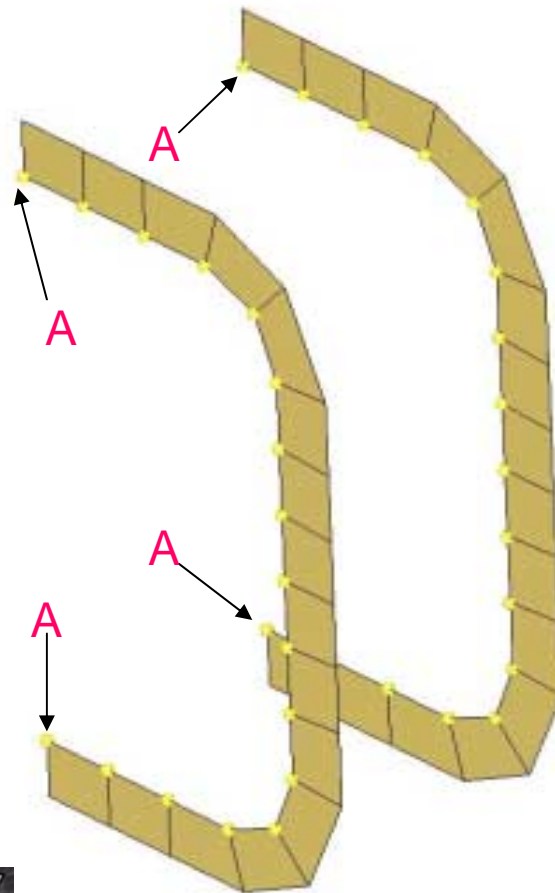
Ajay Vittalam, DaimlerChrysler, [av29@daimlerchrysler.com](mailto:av29@daimlerchrysler.com)  
 Sundar Chanduri, DaimlerChrysler, [sc126@daimlerchrysler.com](mailto:sc126@daimlerchrysler.com)  
 Gerald Schwarz, Magna Steyr, [femfat.usa@magnasteyr.com](mailto:femfat.usa@magnasteyr.com)

FEMFAT Weld Modeling Guidelines

e.g. T – Weld  
Welded on one side (outside)



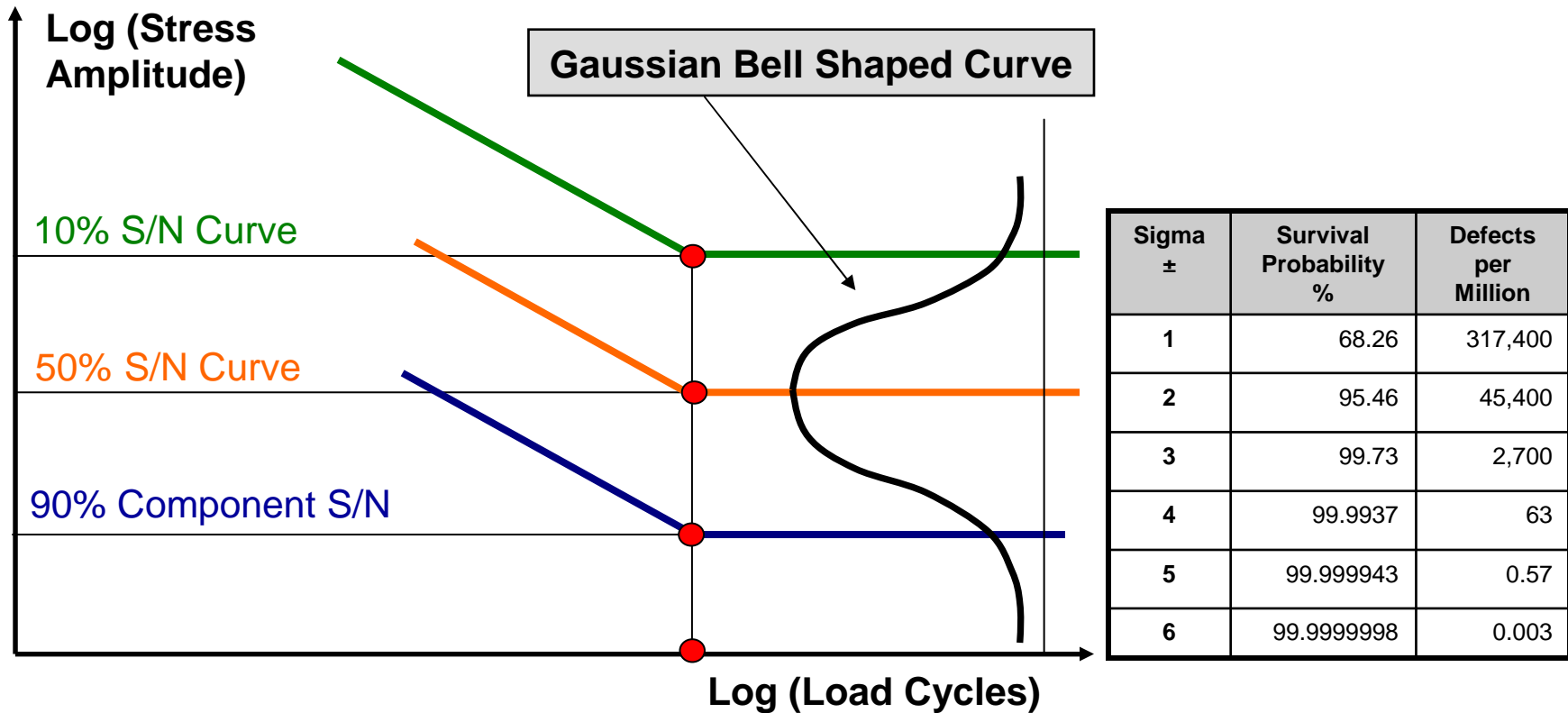




A – Set C101  
End nodes of weld

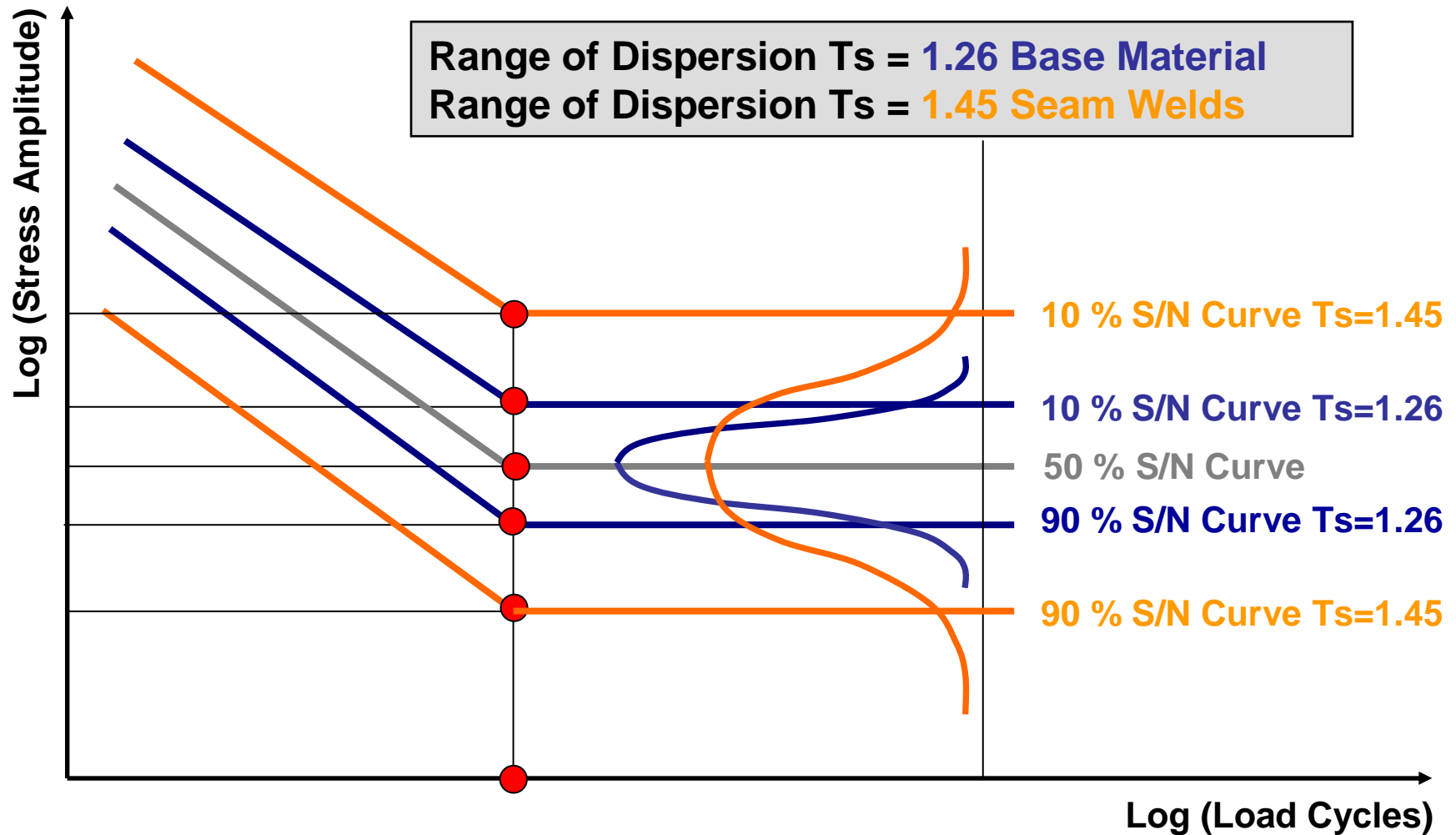
Rest of the highlighted  
Nodes in Set C100





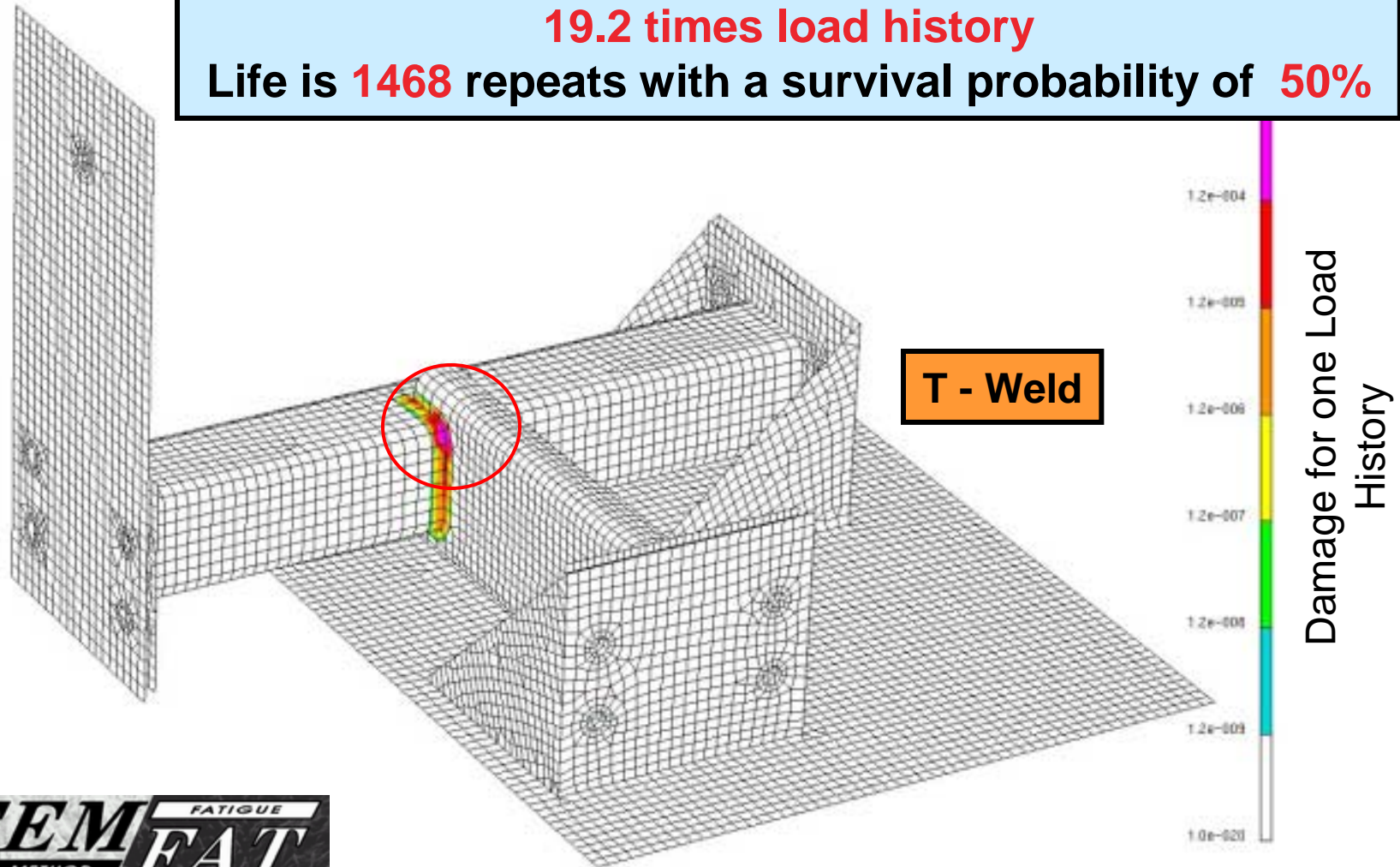
Range of Dispersion  $T_s = \frac{\text{Endurance Limit 10\%}}{\text{Endurance Limit 90\%}} = 1.45$

Recommended for seam welds by Haibach, Betriebsfestigkeit, Verfahren und Daten zur Bauteilberechnung, 2. Aufl. 2002. 500 S. SPRINGER, BERLIN / VDI



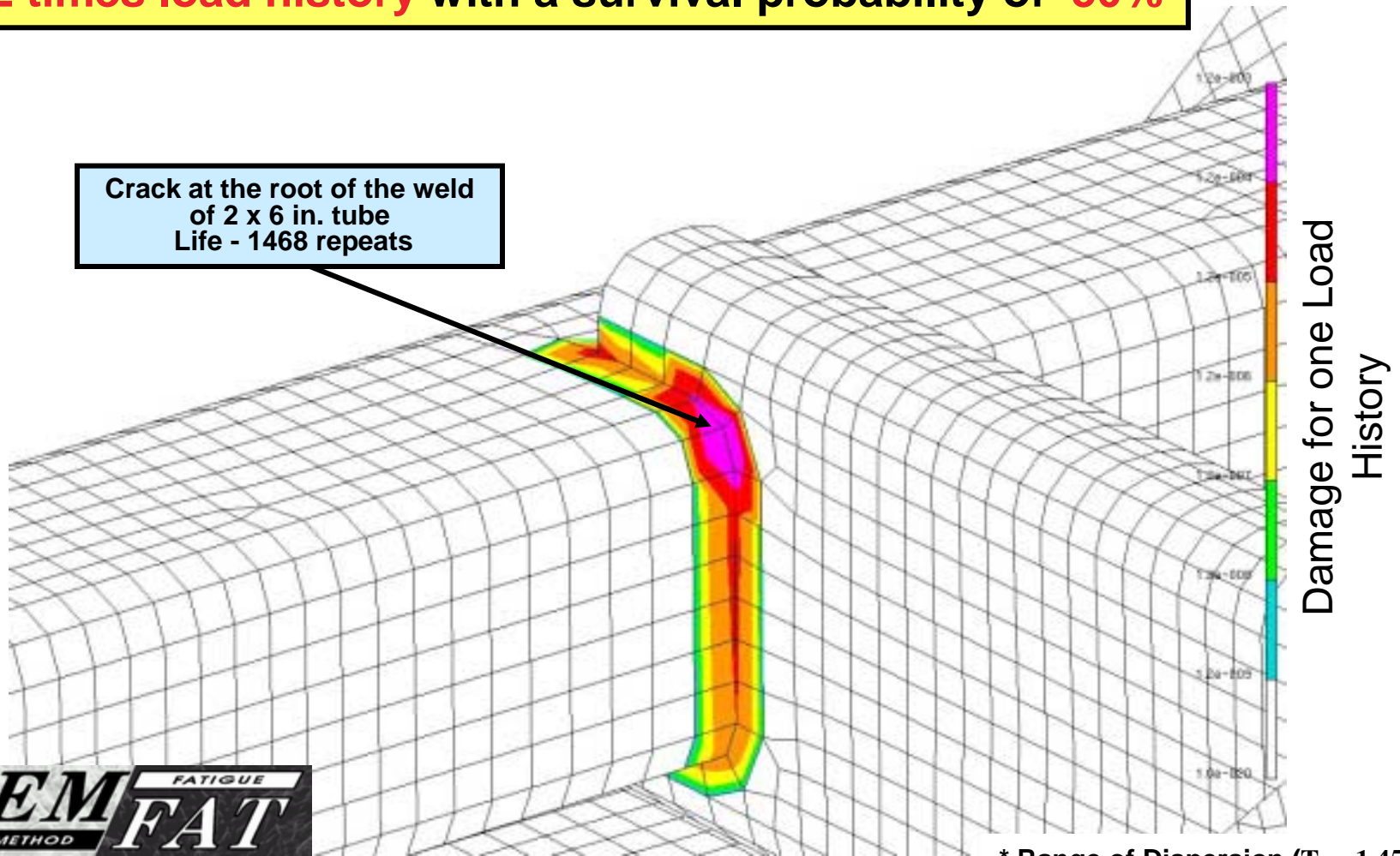


**19.2 times load history**  
**Life is 1468 repeats with a survival probability of 50%**



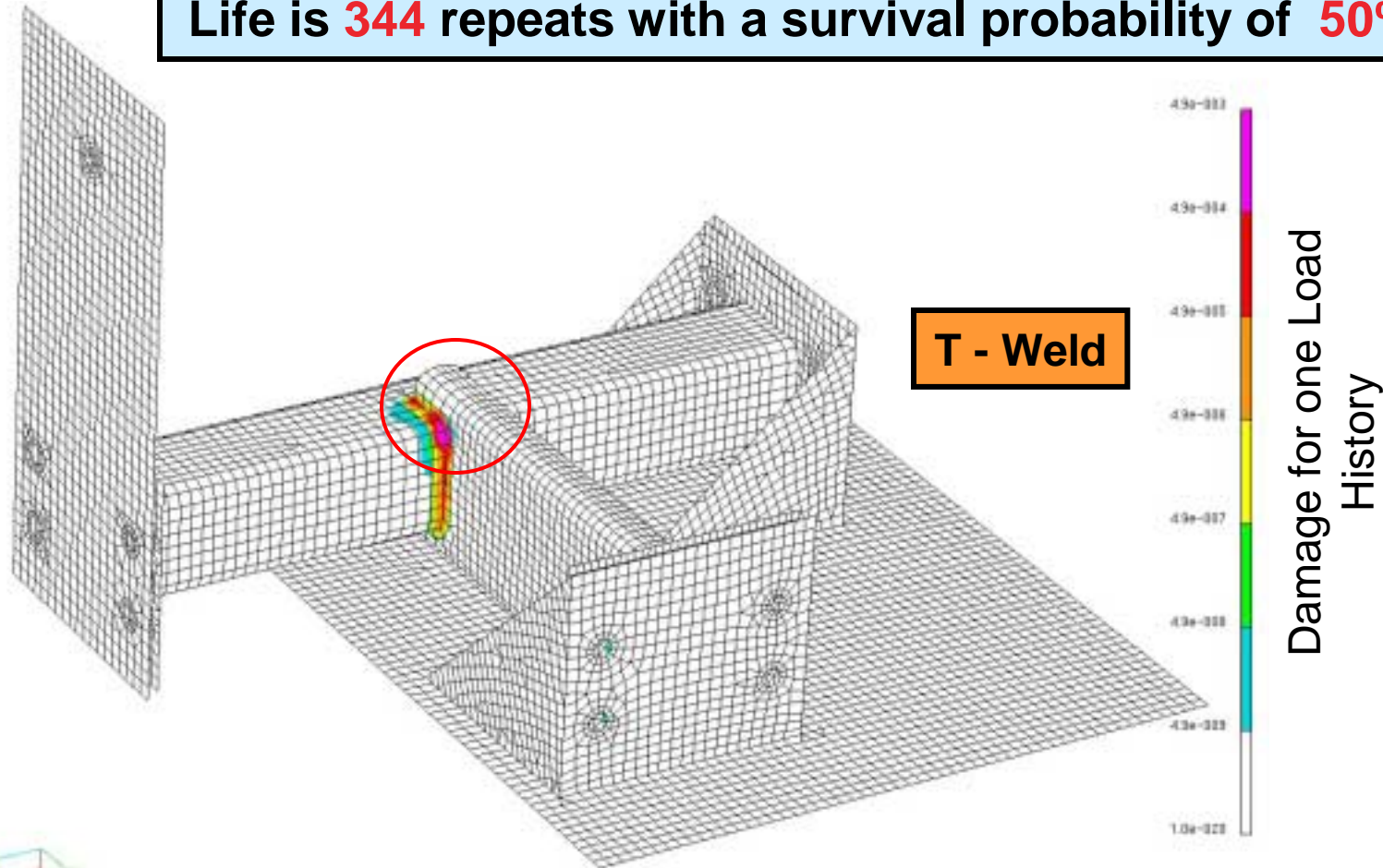
**19.2 times load history with a survival probability of 50%**

Crack at the root of the weld  
of 2 x 6 in. tube  
Life - 1468 repeats



\* Range of Dispersion ( $T_s = 1.45$ )

**27.1 times load history**  
**Life is 344 repeats with a survival probability of 50%**



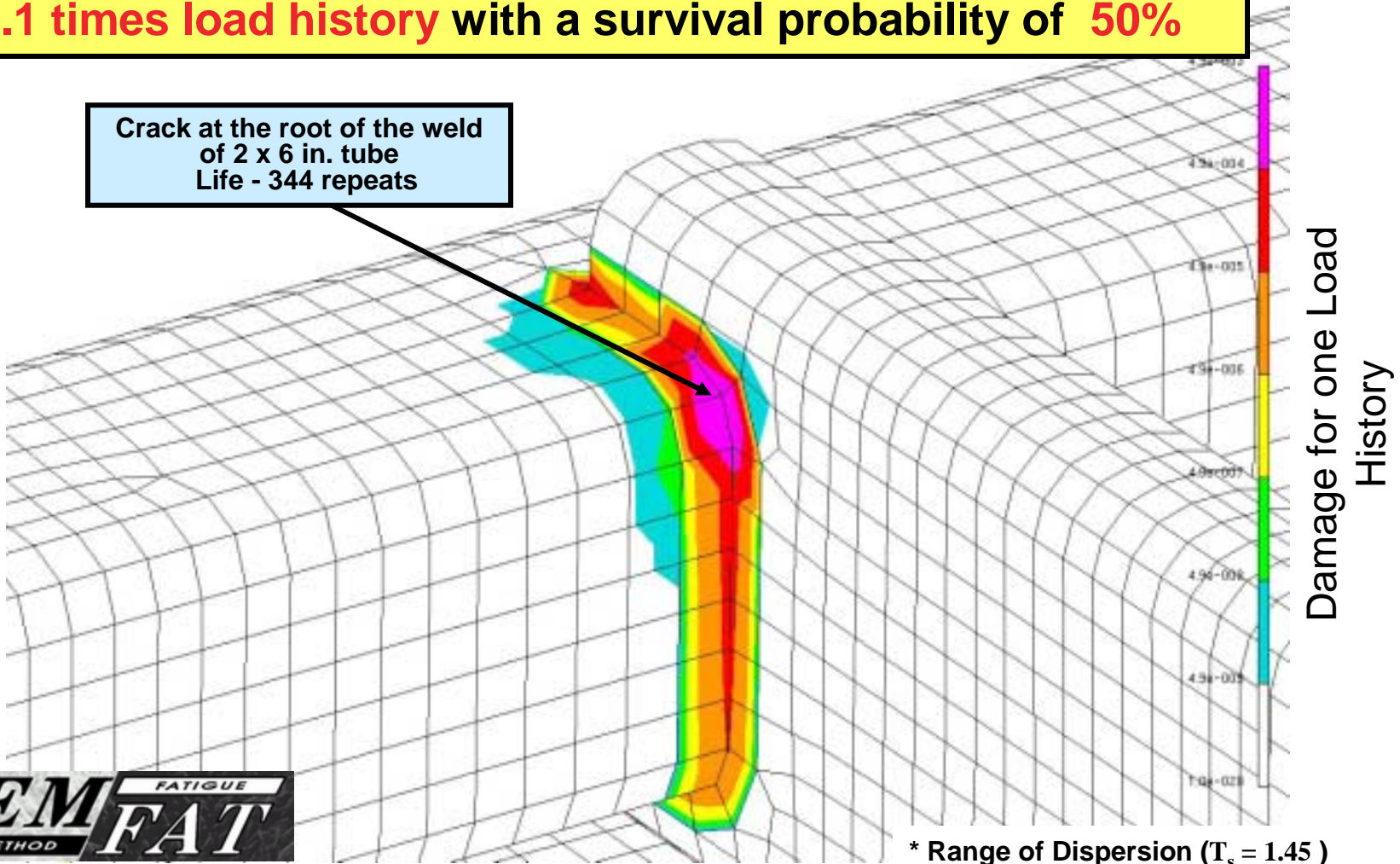
\* Range of Dispersion ( $T_s = 1.45$ )

\* Details next page

Date: 04/01/2004

**27.1 times load history with a survival probability of 50%**

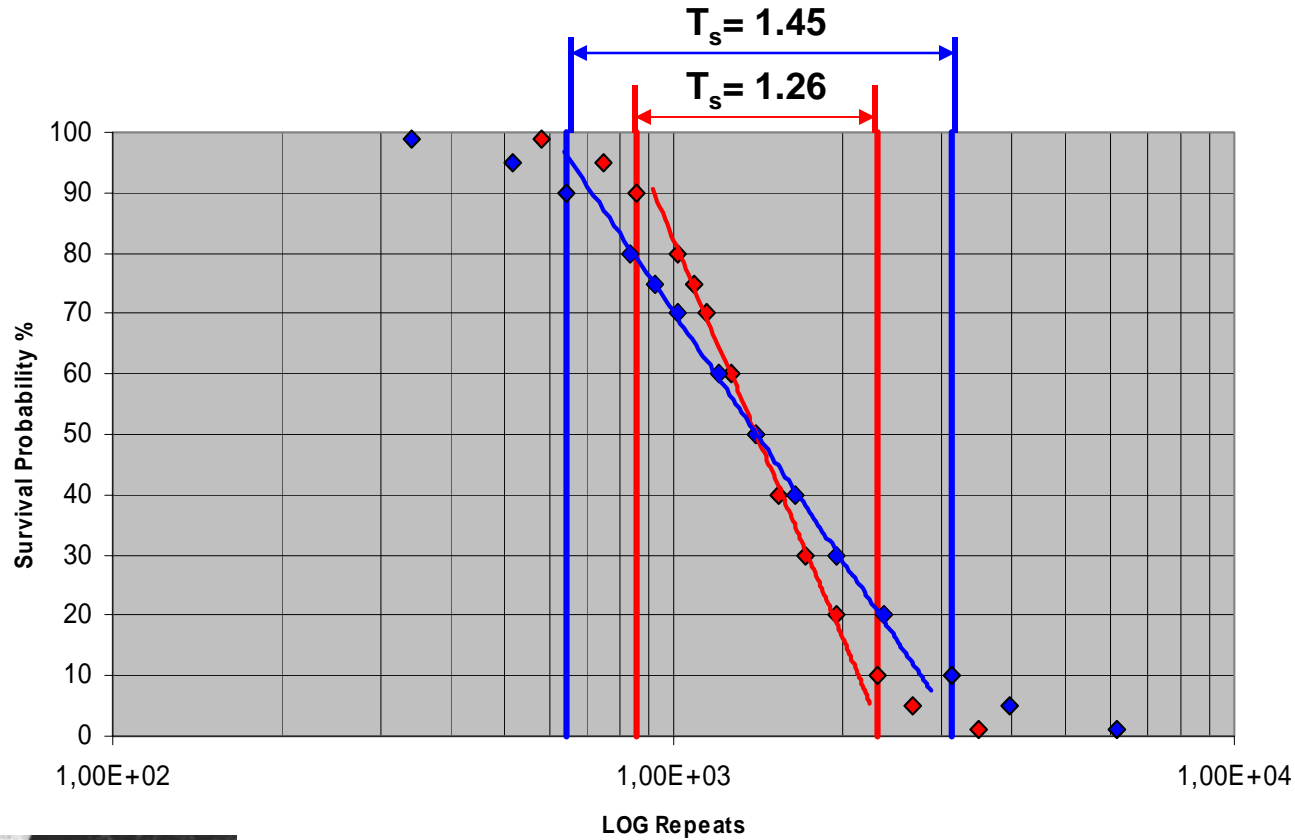
Crack at the root of the weld  
of 2 x 6 in. tube  
Life - 344 repeats



Number of repeated Load Histories Crack at Root of the Weld at 2x6 in. tube		
Survival Probability	LF1-19.2	LF2-27.1
10	3,293	743
25	2,240	515
50	1,468	344
75	969	230
90	671	161
99	357	87
99.9	231	57
99.99	173	42
99.999	133	33



**Scaling Factor 19.2 – Range of Dispersion**



**Scaling Factor 27.1 – Range of Dispersion**

