On Oct 30, 2007, at 5:01 PM, Phil Heitzenroeder wrote:

Irv, Kevin, and myself worked through the shim stresses and allowables- see summary below:

	Av. Sect. stress ksi	Peak sect. stress ksi
AA	25.76	42.112
AB	33.6	47.04
BC	22.4	40.096
Allow.	39	58.30608

The average section stress has an allowable of 2/3 yield -ie 39 ksi; the peak stress has an allowable of 1.5 of 2/3 yield, or yield, which is 58 ksi at 77k. , so we're fine with 316L.

We talked to Larry about this, and he's going to seek sources with a min. room temperature yield of 40 ksi...based on the certifications that Irv has, it should be possible to get as high as 49 ksi yield, which would give us a better margin if we can get it.

Phil

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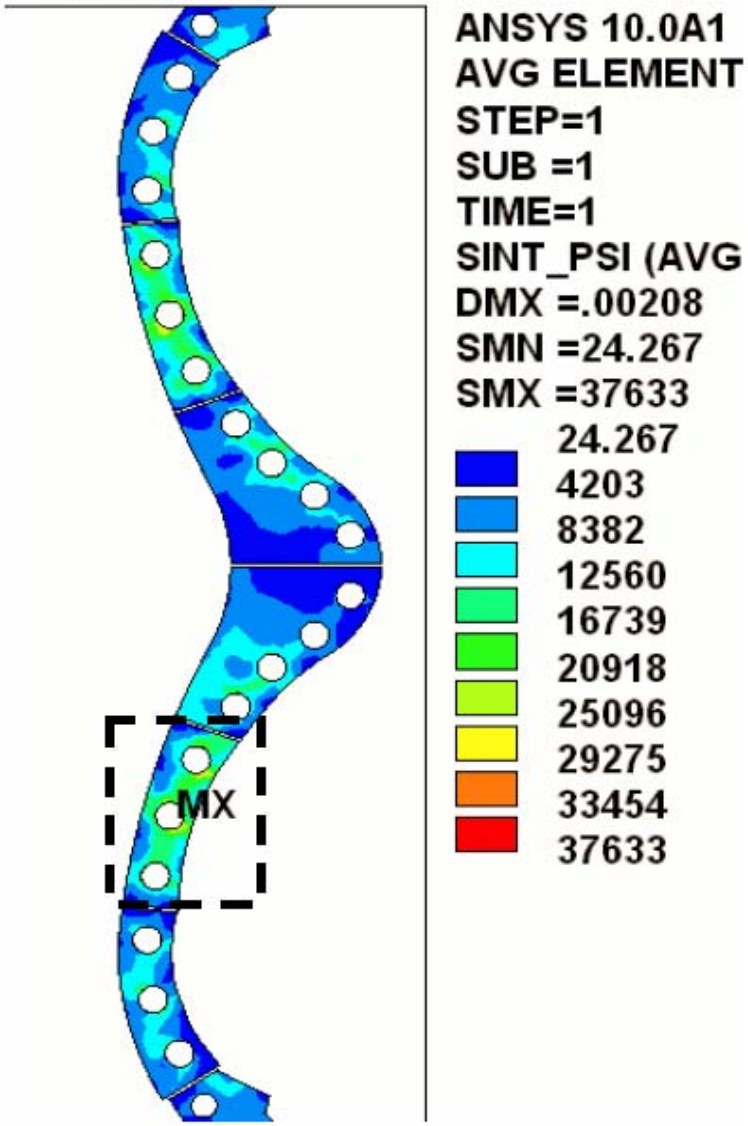
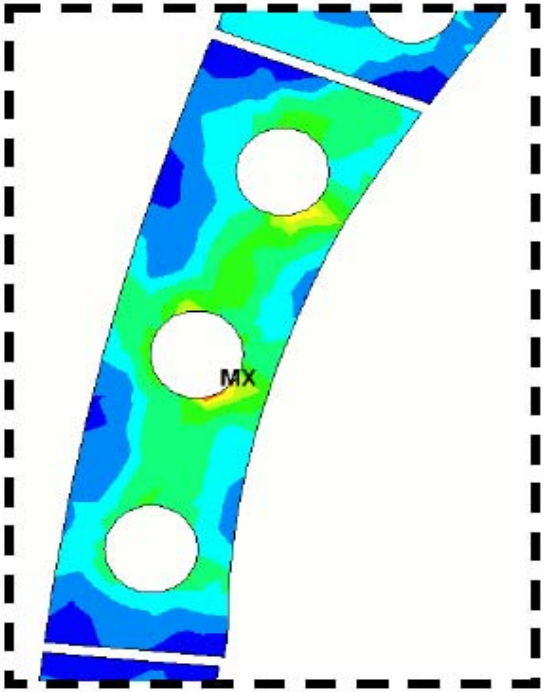
A-A

Shim Stresses (psi)

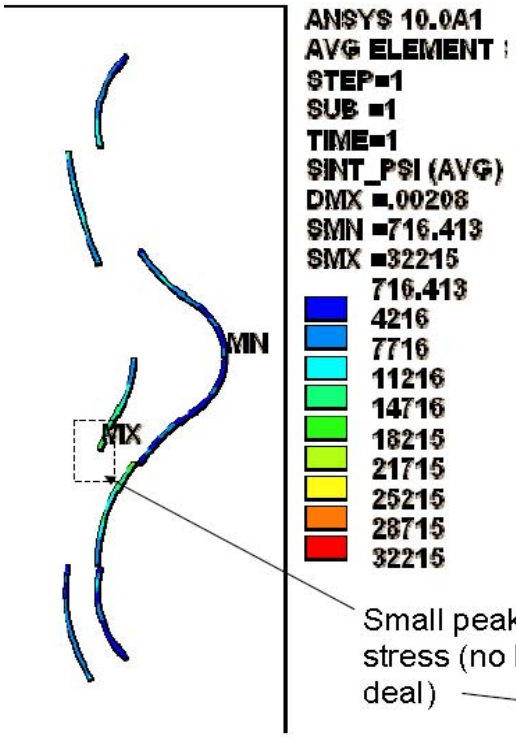




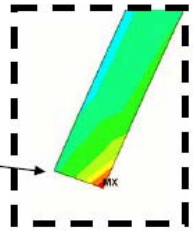
Small localized stress which can go to 1.5*Sm where Sm is 68 ksi for 316LN.

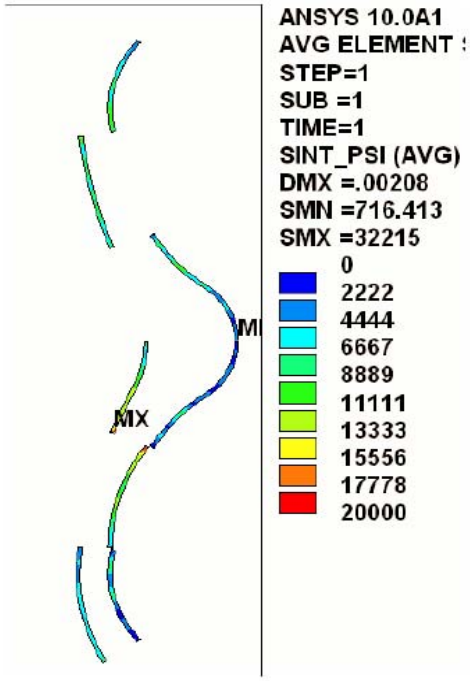
A-A

Weld Stresses (psi)



Small peaky stress (no big deal)

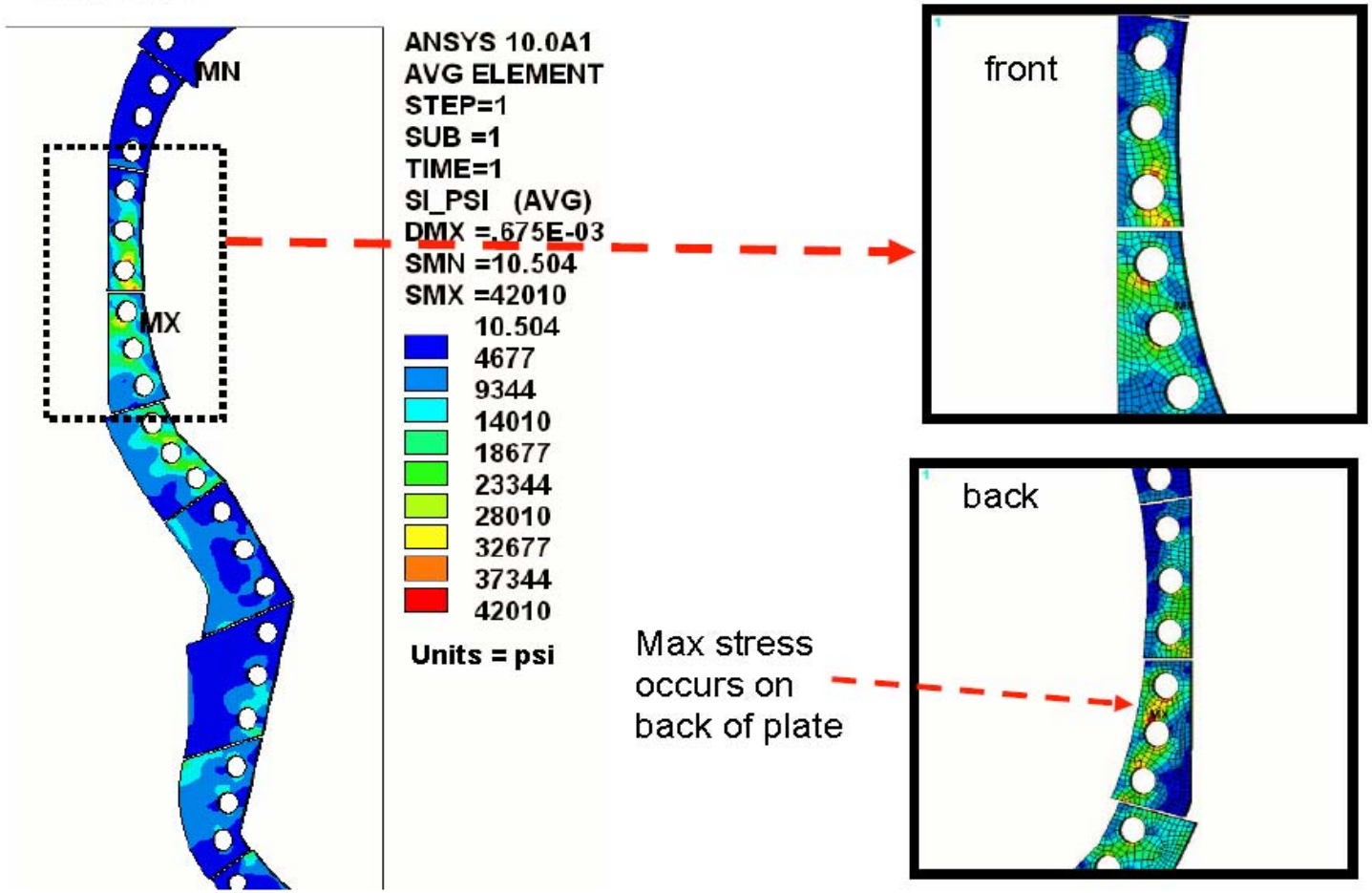




Stress Rescaled to max of 20 ksi. (very small end effects exceed this value.)

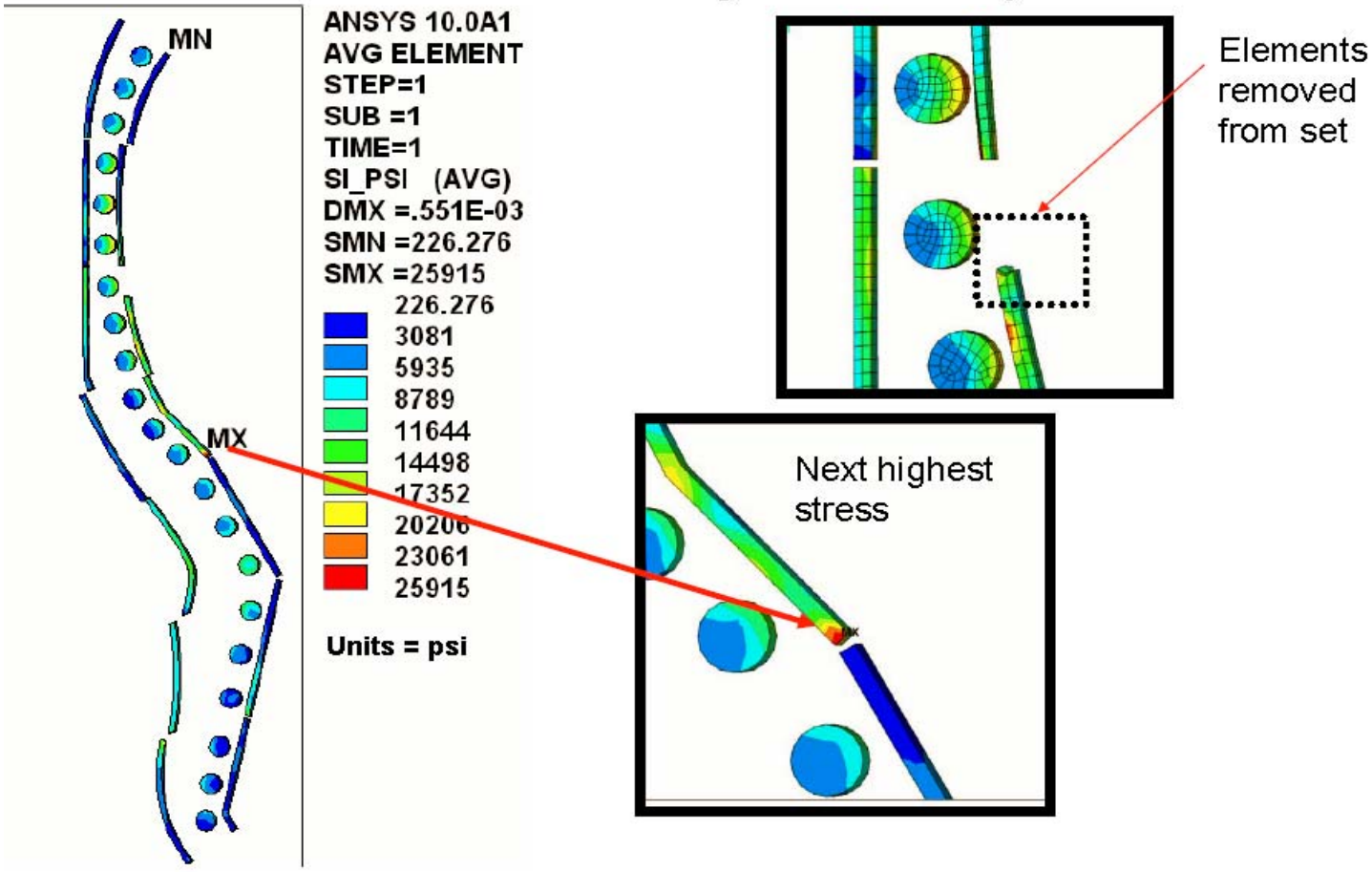
A-B

Stress in Shims

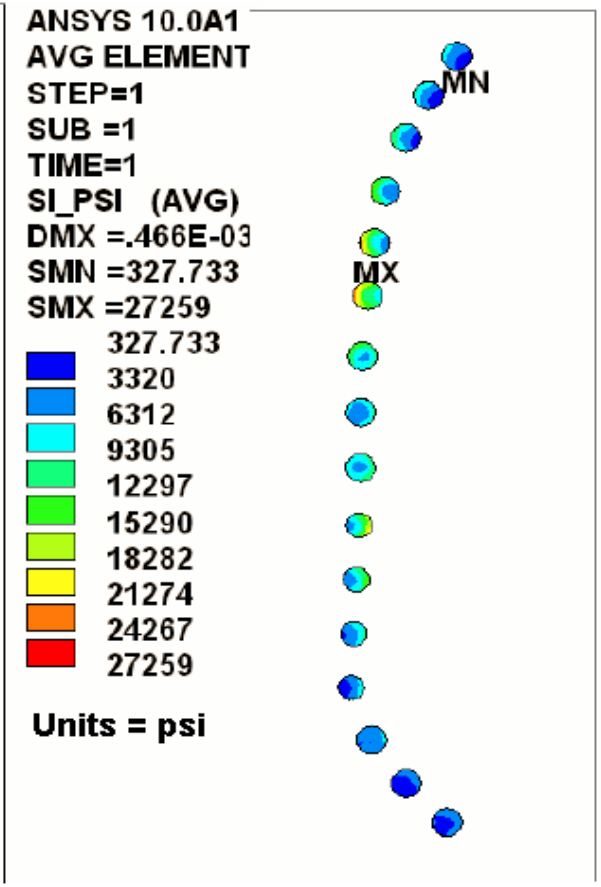


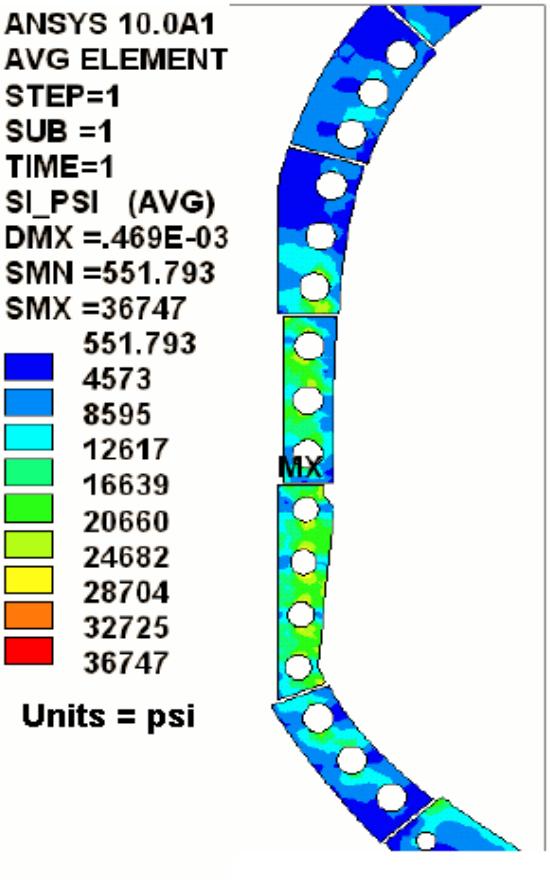
A-B

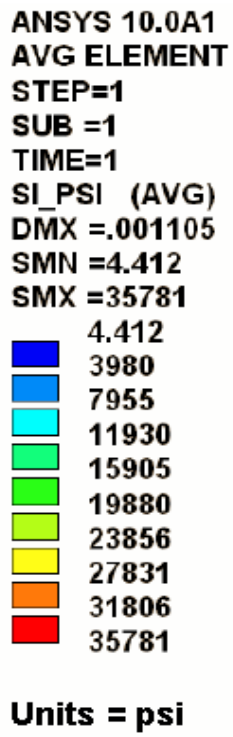
Weld and Puck Stress- (After removal of stress discontinuity elements)



BC Stress Intensities







Welds

Pucks

Shims

Stress Limits at 77K				**Sm**			
Limits 316 L				**2/3yield**	**1/3Ult**		**Av. Sect. stress ksi**	**Peak sect. stress ksi**
sy	402	Mpa	58.30608 ksi	39	56	**AA**	23	37.6
sult	1156	Mpa	167.66624 ksi	ksi	ksi	**AB**	30	42
						BC	20	35.8
Limits 316 LN						**Allow.**	39	58.30608
sy	902	Mpa	130.82608 ksi	87	68		2/3 yield	yield
sult	1415	Mpa	205.2316 ksi	ksi	ksi			
							316 L at RT yield	
Stellaloy (measuresd mins)								
sy	641		92.97064	62	53	45 yield	1.526316	68.68421
sult	1103		159.97912	ksi	ksi			
						adjusted for plate thickness		
							Av. Sect. stress ksi	**Peak sect. stress ksi**
A286								
sy	803	Mpa	116.46712 ksi	78	68			
sult	1416	Mpa	205.37664 ksi	ksi	ksi	**AA**	25.76	42.112
						AB	33.6	47.04
Inconel 718 for ref only						**BC**	22.4	40.096
sy	1066	Mpa	154.61264 ksi	103	76	**Allow.**	39	58.30608
sult	1569	Mpa	227.56776 ksi	ksi	ksi			