PROCESS ENGINEERING

TRUNNION PIPING STRESS

INPUT DATA PGM RUN ***V1.0***

* Description	PIPE		* Item No.	E-1234	
* Pipe outside Dia.	600	mm	* Pipe nom. thickness	12.7	mm
* Trunnion outside Dia.	300	mm	* Pad nom. thickness	10	mm
* Moment arm (L)	600	mm	* Corrosion allowance,CA	3	mm
* Pipe tolerance, %	12.5	%	* Design press.P	15	bar,g
* Pipe allowable stress,Sa	1201	kg/cm^2	* Direct axial load (Fa),	38000	N
* Force producing circumferential moment (Fc)	7000	N	* Force producing longitudinal moment (Fl)	17000	N

RESULT OF CALCULATION

* Pipe min. thickness		8.11	mm
* Effective wall thickness, (tmin) = T + tp		18.11	mm
* Longitudinal linear load,(fl)=Fl*L/π*r^2		144.30	N/mm
* Circumferential linear load (fc),=Fc*L/π*r^2		59.41	N/mm
* Direct axial lineal load (fa),=Fa/2*π*r		40.31	N/mm
* Combined circ. load without-plane factor (f1)=1.5(fa+fc)		149.59	N/mm
* Combined long. load without-plane factor (f2)=(1.5*fa)+fl		204.77	N/mm
* Circumferential bending stress (Sbc)=1.17*f1*R^0.5/tmin^1.5		39.33	N/mm^2
* Longitudinal bending stress (Sbl)=1.17*f2*R^0.5/tmin^1.5		53.83	N/mm^2
* Hoop primary stress (Sph)=P*R/(10*tmin)		24.84	N/mm^2
* Long. primary stress (Spl)=P*R/(20*tmin)		12.42	N/mm^2
* Combined circ. stress (Sc) =Sbc + Sph	36.3%	64.17	N/mm^2
* Combined long. stress (Sl) =Sbl + Spl	37.5%	66.26	N/mm^2

* Allow. stress (Sm)=Sa*1.5	176.67	N/mm^2
* Judgement	O.K	

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Please contact E-mail ***pes21@pes21.com***