APPENDIX C
NCSX Vacuum Vessel Support Fixture Local Analysis

To overcome friction of support shaft

4750	Total weight of VV assembly, lbs
0.15	Coef of Friction (assume oil llubricant)
712.5	Friction force (Ft), lbs
6	Hand wheel radius (R), in
2.75	Worm wheel shaft radius (L)
48	Nb of worm wheel teath (n)
6.8	Hand wheel fource to overcome friction load (Fe), lbs
	Fe = Ft x R / (n x L)

For added services on one side

100	Weight of services, lbs
21.3	CL distance to services, in
2130	Torque due to services
7.4	Additional hand wheel load due to services

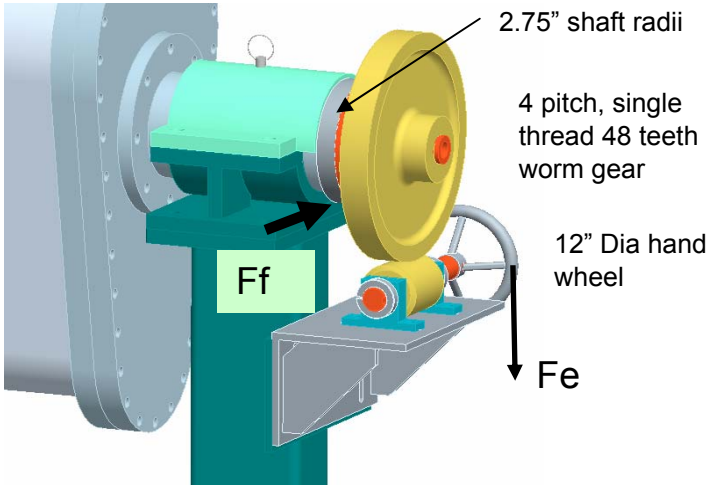
Force needed to accelerate VV

43.76	Radius of gyration about shaft axis, in
12.3	VV mass, lbf/(in/sec^2)
2	Assumed angular acceleraton, degrees/sec^2
0.03491	Angular acceleratin, radians/sec^2
822.6	Torque reqd, T=m(K^2)α, in-lbs
2.9	Hand wheel load to overcome part inertial

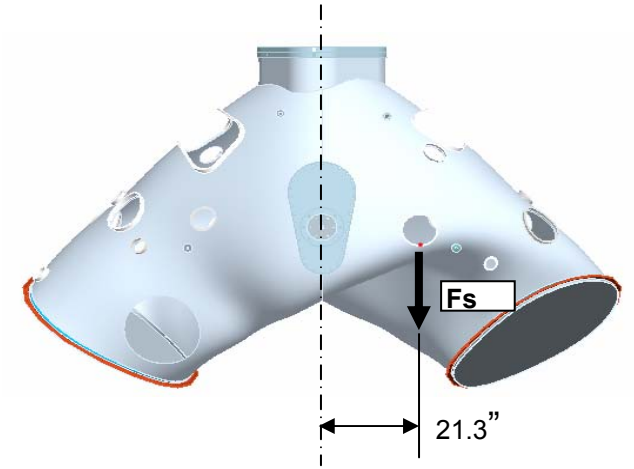
17.1 Total hand wheel load, lbs

0.49701	worm shaft polor moment of inertia, J (pi x D^4/32)
308.8	Max worm shaft shear (T r / J), psi

1 revolution of worm results in 1/48 rev of wheel
4 turns of worm relusts in 30° turn of wheel



Wheel Pitch Diam, in	12
Worm Pitch Diam	3
Worm shaft Diam	1.5



Single column stress

Center support column gerometry, 6" x 4" x .25" thk

4.59 Area of center support column, in^2

517.4 Axial stress, P/A, psi

Support leg lateral support capability

Six 1/2" dia x 2" long Hilti anchor bolt per support

6751 Hilti pullout alowable for 4000 psi concrete, lbs

182277 Moment capabiltiy of 3 pair of Hilti's with a 9" separation, in-lbs

859 Maximum permissible axial load on one support assuming that 1/3 of the Hilit's fail, lbs