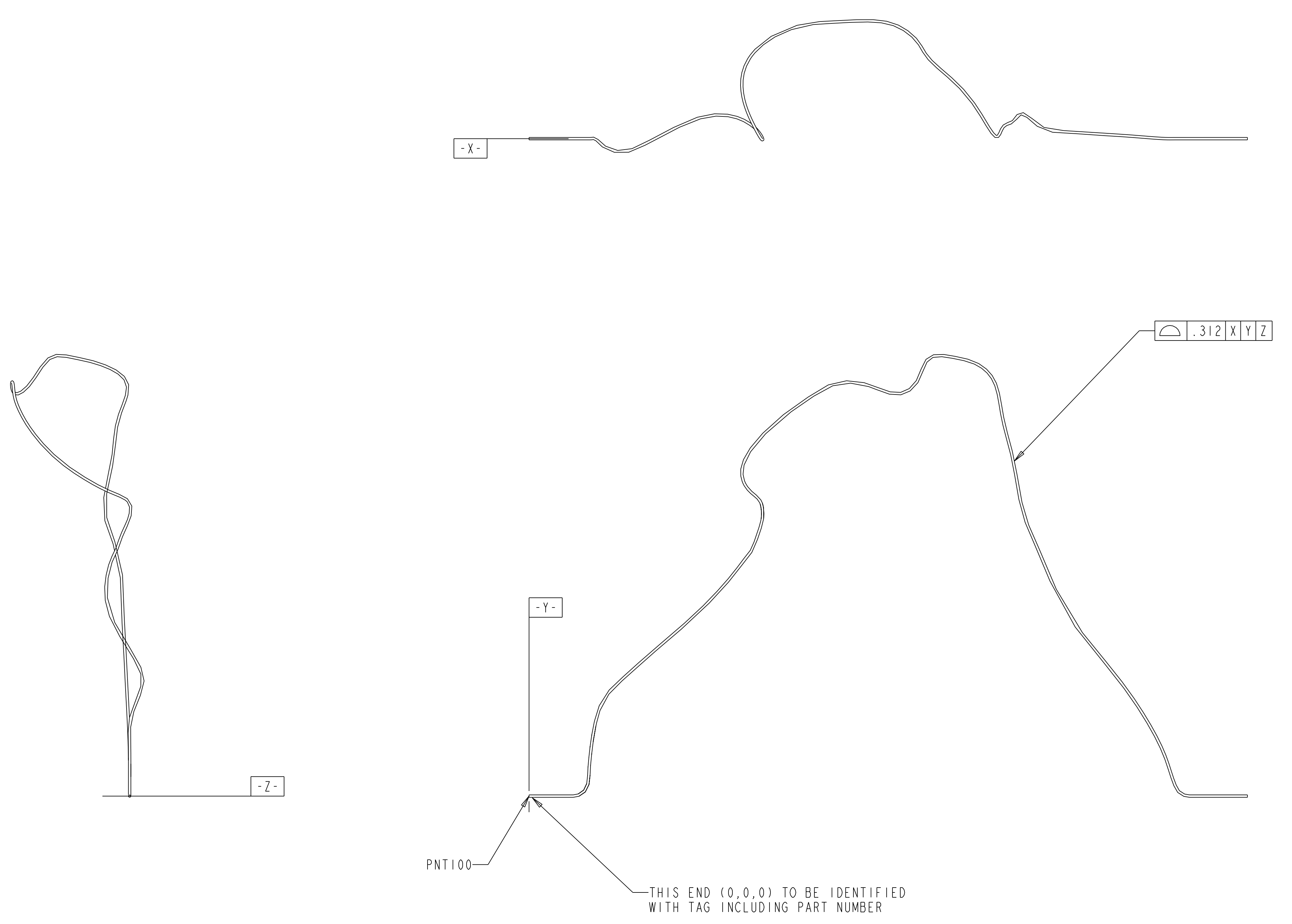


- NOTES
1. INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
 2. DIMENSIONS ARE IN INCHES.
 3. FABRICATION AND MATERIALS PER NCSX-CSPEC-123-01
 4. PROFILE TOLERANCE OF TUBE SURFACE IS BILATERAL, I.E. 0.156" ANY DIRECTION OFF REFERENCE SURFACE.
 5. ALL TUBE BEND RADII ARE 5/8" TO CENTERLINE OF TUBE.
 6. DATUM POINTS ON CHART ARE THEORETICAL INTERCEPTS OF THE TUBE CENTERLINE. BEND RADII ARE OMITTED. PROFILE TOLERANCE INCLUDES ALLOWANCES FOR THE RADII ERRORS.

Point	X	Y	Z
PNT100	0.000	0.000	0.000
PNT101	5.653	0.000	0.000
PNT102	6.651	0.278	0.000
PNT103	7.359	1.035	0.000
PNT104	7.591	1.896	0.000
PNT105	7.694	3.533	0.000
PNT106	7.795	4.731	0.000
PNT107	7.906	5.819	0.000
PNT108	8.098	7.274	-0.022
PNT109	8.307	8.460	-0.080
PNT110	8.568	9.722	0.068
PNT111	8.849	10.760	0.356
PNT112	9.155	11.581	0.660
PNT113	9.550	12.357	0.979
PNT114	9.836	12.943	1.219
PNT115	10.505	13.632	1.469
PNT116	11.015	14.152	1.610
PNT117	11.487	14.592	1.680
PNT118	12.043	15.084	1.690
PNT119	12.529	15.510	1.629
PNT120	13.073	15.994	1.486
PNT121	13.534	16.415	1.309
PNT122	13.923	16.772	1.131
PNT123	14.567	17.359	0.811
PNT124	15.282	17.989	0.447
PNT125	15.937	18.552	0.108
PNT126	16.789	19.276	-0.345
PNT127	17.706	20.054	-0.837
PNT128	18.559	20.781	-1.283
PNT129	19.348	21.461	-1.676
PNT130	20.072	22.099	-2.011
PNT131	20.796	22.752	-2.311
PNT132	21.453	23.363	-2.548
PNT133	22.044	23.926	-2.726
PNT134	22.696	24.567	-2.880
PNT135	23.342	25.225	-2.987
PNT136	24.041	25.966	-3.047
PNT137	25.033	27.069	-3.026
PNT138	25.579	27.698	-2.956
PNT139	26.166	28.406	-2.833
PNT140	26.724	29.128	-2.667
PNT141	27.263	29.853	-2.455
PNT142	27.749	30.486	-2.209
PNT143	28.234	31.097	-1.912
PNT144	28.534	31.973	-1.505
PNT145	28.784	31.516	-1.1702
PNT146	29.067	32.825	-1.234
PNT147	29.318	33.571	-0.949
PNT148	29.538	34.209	-0.664
PNT149	29.776	35.017	-0.292
PNT150	29.909	35.788	0.000
PNT151	29.913	36.617	0.155
PNT152	29.751	37.450	0.034
PNT153	29.285	38.169	-0.718
PNT154	28.844	38.577	-1.547
PNT155	28.359	39.004	-2.550
PNT156	28.073	39.290	-3.206
PNT157	27.830	39.595	-3.837
PNT158	27.605	39.982	-4.542
PNT159	27.464	40.298	-5.092
PNT160	27.355	40.624	-5.643
PNT161	27.272	41.010	-6.271
PNT162	27.238	41.412	-6.894
PNT163	27.266	41.883	-7.583
PNT164	27.349	42.318	-8.178
PNT165	27.533	42.882	-8.891
PNT166	27.741	43.345	-9.433
PNT167	28.034	43.873	-10.009
PNT168	28.300	44.288	-10.432
PNT169	28.686	44.823	-10.944
PNT170	29.064	45.299	-11.370
PNT171	29.473	45.773	-11.770
PNT172	29.908	46.243	-12.144
PNT173	30.787	47.112	-12.784
PNT174	31.606	47.852	-13.271
PNT175	32.607	48.688	-13.754
PNT176	33.663	49.503	-14.153
PNT177	34.764	50.292	-14.471
PNT178	35.984	51.099	-14.722
PNT179	37.248	51.860	-14.880
PNT180	38.710	52.666	-14.921
PNT182	43.100	52.752	-15.107
PNT183	45.435	51.656	-15.023
PNT184	47.177	51.520	-14.436
PNT185	48.279	51.800	-13.819
PNT186	49.515	52.818	-12.737
PNT187	50.254	54.456	-11.598
PNT188	51.177	56.083	-10.279
PNT189	52.686	56.354	-8.961
PNT190	54.309	56.228	-7.443
PNT191	55.967	55.906	-5.614
PNT192	57.670	55.188	-3.374
PNT193	58.944	54.186	-1.340
PNT194	59.713	52.825	-0.311
PNT195	60.109	51.085	-0.628
PNT196	60.619	48.575	-1.379
PNT198	61.100	46.430	-1.905
PNT199	62.366	41.012	-2.657
PNT200	63.139	36.831	-3.175
PNT201	63.702	35.049	-2.962
PNT203	64.346	33.372	-2.510
PNT204	65.082	31.838	-1.781
PNT205	65.999	29.837	-0.944
PNT206	66.776	27.793	-1.022
PNT207	67.887	25.317	-0.976
PNT208	69.211	23.018	-0.848
PNT209	70.748	20.853	-0.731
PNT210	72.290	18.924	-0.633
PNT211	74.371	16.397	-0.508
PNT212	76.082	14.208	-0.396
PNT213	77.624	12.047	-0.286
PNT214	79.330	9.327	-0.143
PNT215	80.634	6.906	0.000
PNT216	81.648	4.553	0.000
PNT217	82.349	2.612	0.000
PNT218	82.735	1.358	0.000
PNT219	83.152	0.672	0.000
PNT220	83.859	0.132	0.000
PNT221	84.582	0.000	0.000
PNT222	82.000	0.000	0.000



RELEASED FOR FABRICATION / INSTALLATION
PPPL Drafting:

APPROX TUBE LENGTH = 176.7 IN

REV	DESCRIPTION	BY	DATE	CHK	DEPT	DATE	PE	REQ	DATE	ORNL	DOE	DATE
1	PER ECN NO. 5003	MJC	6/24/05	PLG								

SE	AR	CAGE CODE	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL	SPECIFICATION	FIND NO
SE123-110	AR		-1	COOLANT TUBE 10-2	316L SS	SEE NOTE 4	1
					5/16" ± .032 WALL		

-1 COOLANT TUBE 10-2
SCALE .125

NO REPRESENTATION OR WARRANTY, EXPRESSED OR IMPLIED, IS MADE AS TO THE ACCURACY, COMPLETENESS OR USEFULNESS OF THE INFORMATION OR STATEMENTS CONTAINED IN THESE DRAWINGS, OR THAT THE USE OR DISCLOSURE OF ANY INFORMATION, APPARATUS, METHOD OR PROCESS DISCLOSED IN THESE DRAWINGS MAY NOT INFRINGE PRIVATE RIGHTS OF OTHERS. NO LIABILITY IS ASSUMED WITH RESPECT TO THE USE OF, OR FOR DAMAGES RESULTING FROM THE USE OF, ANY INFORMATION, APPARATUS, METHOD OR PROCESS DISCLOSED IN THESE DRAWINGS. DRAWINGS MADE AVAILABLE FOR PURPOSES, AND ARE TO BE RETURNED UPON REQUEST OF THE FORWARDING CONTRACTOR.

P THIS DRAWING PRODUCED ON PRO-ENGINEER

SCALE NOTED	DES P GORANSON	4-22-05	Oak Ridge National Laboratory managed for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC05-00OR22725 UT-BATTELLE, LLC, Oak Ridge, Tennessee PROJECT NAME NATIONAL COMPACT STELLARATOR EXPERIMENT VACUUM VESSEL HEATING/COOLING COOLANT TUBE 10-2 DETAIL
TOLERANCES UNLESS OTHERWISE SPECIFIED	DRW G MCGINNIS	4-22-05	
FRACTIONS	CHK G. H. JONES	05-04-05	
XX DECIMALS ± .01	SECT :		VERSION NO.
XXX DECIMALS ± .005	DEPT :		0
ANGLES ± 0°15'	PE :		PLANT
BREAK SHARP EDGES OR MAX FINISH .125 UNLESS OTHERWISE SPECIFIED	CR :		ORNL
	PJ :		BLDG
	RD :		5700
	PPPL DRFT :		FL
	RELE :		3
	DATE :		SHT
			1
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			SE123-112
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			1