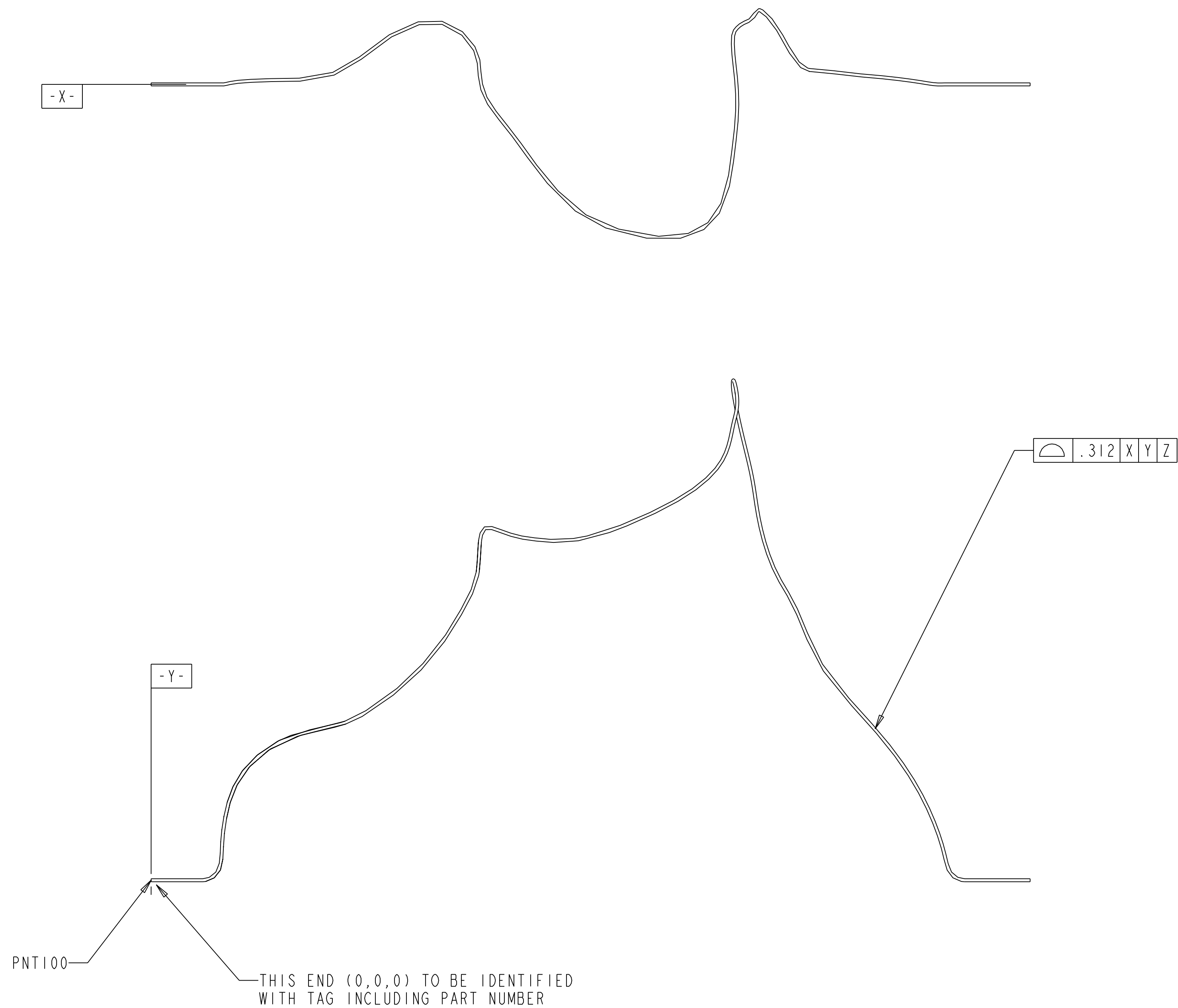


- NOTES
1. INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
  2. DIMENSIONS ARE IN INCHES.
  3. FABRICATION AND MATERIALS PER NCSX-CSPEC-123-01
  4. PROFILE TOLERANCE OF TUBE SURFACE IS BILATERAL, I.E. 0.156" ANY DIRECTION OFF REFERENCE SURFACE.
  5. ALL TUBE BEND RADII ARE 5/8" TO CENTERLINE OF 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	5.404	-0.000	0.000
PNT102	6.291	0.229	0.000
PNT103	7.043	0.985	0.000
PNT104	7.329	2.015	0.000
PNT105	7.439	5.679	0.000
PNT106	7.613	5.679	0.000
PNT107	8.112	8.116	-0.098
PNT108	8.523	9.308	-0.190
PNT109	9.040	10.386	-0.264
PNT110	9.655	11.334	-0.321
PNT111	10.247	12.053	-0.359
PNT112	10.855	12.668	-0.390
PNT113	11.562	13.274	-0.418
PNT114	12.372	13.859	-0.444
PNT115	13.054	14.275	-0.460
PNT116	13.946	14.723	-0.470
PNT117	14.812	15.068	-0.475
PNT118	15.891	15.406	-0.509
PNT119	16.856	15.650	-0.593
PNT120	17.754	15.852	-0.742
PNT121	18.512	16.018	-0.931
PNT122	19.312	16.206	-1.203
PNT123	20.077	16.420	-1.546
PNT124	20.686	16.635	-1.891
PNT125	21.360	16.933	-2.345
PNT126	21.898	17.219	-2.752
PNT127	22.505	17.593	-3.243
PNT128	23.149	18.024	-3.762
PNT129	23.757	18.437	-4.219
PNT130	24.423	18.898	-4.680
PNT131	24.997	19.315	-5.048
PNT132	25.715	19.870	-5.466
PNT133	26.474	20.509	-5.853
PNT134	27.178	21.154	-6.147
PNT135	27.779	21.745	-6.341
PNT136	28.414	22.412	-6.486
PNT137	28.944	23.006	-6.554
PNT138	29.542	23.721	-6.567
PNT139	30.116	24.453	-6.512
PNT140	30.624	25.145	-6.402
PNT141	31.108	25.845	-6.241
PNT142	31.599	26.603	-6.012
PNT143	32.184	27.580	-5.637
PNT144	32.688	28.498	-5.209
PNT145	33.200	29.511	-4.651
PNT146	33.660	30.504	-4.014
PNT147	34.067	31.647	-3.241
PNT148	34.372	33.040	-2.294
PNT149	34.433	34.367	-1.461
PNT150	34.421	35.488	-0.703
PNT151	34.512	36.376	0.147
PNT152	34.935	36.848	1.256
PNT153	35.639	36.834	2.406
PNT154	36.395	36.625	3.437
PNT155	37.217	36.339	4.473
PNT156	38.229	36.010	5.767
PNT157	38.766	35.904	6.523
PNT158	39.381	35.801	7.386
PNT159	39.968	35.714	8.190
PNT160	40.610	35.631	9.036
PNT161	41.357	35.559	9.971
PNT162	42.003	35.525	10.732
PNT163	42.615	35.517	11.470
PNT164	43.381	35.545	12.177
PNT165	44.074	35.609	12.797
PNT166	44.749	35.705	13.331
PNT167	45.428	35.836	13.795
PNT168	45.995	35.971	14.128
PNT169	46.505	36.109	14.393
PNT170	47.070	36.275	14.654
PNT171	47.724	36.488	14.919
PNT172	48.466	36.752	15.177
PNT173	49.130	37.005	15.373
PNT174	49.795	37.270	15.543
PNT175	50.544	37.583	15.713
PNT176	51.126	37.836	15.827
PNT177	51.791	38.136	15.934
PNT178	52.454	38.446	16.014
PNT179	53.280	38.850	16.072
PNT180	54.016	39.230	16.078
PNT181	55.060	39.810	15.999
PNT182	55.992	40.377	15.823
PNT183	57.088	41.126	15.445
PNT184	57.999	41.862	14.910
PNT185	58.865	42.721	14.087
PNT186	59.538	43.547	13.072
PNT187	60.116	44.644	11.591
PNT188	60.407	45.823	10.087
PNT189	60.622	46.902	8.611
PNT190	60.931	47.736	7.001
PNT191	61.190	48.568	5.189
PNT192	61.315	49.494	3.274
PNT193	61.316	50.477	1.299
PNT194	61.196	51.518	-0.837
PNT195	61.038	52.127	-2.373
PNT196	60.913	52.316	-3.562
PNT197	60.910	51.441	-5.048
PNT198	61.185	49.723	-5.749
PNT199	61.628	47.610	-6.197
PNT200	62.019	45.934	-6.425
PNT201	62.484	43.970	-6.665
PNT202	62.960	41.813	-6.972
PNT203	63.239	40.011	-7.475
PNT204	63.451	38.670	-7.719
PNT205	63.876	36.599	-7.684
PNT206	64.349	34.858	-7.327
PNT207	64.898	33.313	-6.721
PNT208	65.489	31.994	-5.912
PNT209	66.009	31.020	-5.083
PNT210	66.668	29.897	-3.914
PNT211	67.279	28.816	-2.817
PNT212	67.816	27.702	-2.022
PNT213	68.502	25.954	-1.617
PNT214	69.092	24.505	-1.574
PNT215	69.800	23.114	-1.458
PNT216	70.638	21.799	-1.319
PNT217	71.572	20.547	-1.214
PNT218	72.575	19.349	-1.116
PNT219	73.739	18.047	-1.006
PNT220	74.912	16.753	-0.898
PNT221	75.947	15.582	-0.800
PNT222	77.007	14.312	-0.693
PNT223	77.963	13.077	-0.586
PNT224	78.919	11.727	-0.469
PNT225	79.760	10.412	-0.355
PNT226	80.709	8.733	-0.208
PNT227	81.478	7.167	-0.070
PNT228	82.158	5.496	0.000
PNT229	82.638	4.062	0.000
PNT230	83.027	2.718	0.000
PNT231	83.338	1.468	0.000
PNT232	84.289	0.203	0.000
PNT233	85.136	-0.000	0.000
PNT234	85.136	-0.000	0.000
PNT235	92.000	0.000	0.000



**RELEASED FOR  
FABRICATION / INSTALLATION**  
PPPL Drafting:

APPROX TUBE LENGTH = 178.6 IN

REV	AR	CAGE CODE	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL	SPECIFICATION	FIND NO
1			-1	COOLANT TUBE 11-2	316L SS 5/16" - .032 WALL	SEE NOTE 4	1

**-1 COOLANT TUBE 11-2**  
SCALE .125

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**P** THIS DRAWING PRODUCED ON PRO-ENGINEER

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

SCALE	NOTED	DES	DATE	DRW	DATE	CHK	DATE	SEC	DATE	FRAC	DEC	ANG	BREAK	FINISH
		P GORANSON	4-22-05	G MCGINNIS	4-22-05	G.H. JONES	05-04-05							

PPPL DRFT	VERSION NO.	PLANT	BLDG	FL	SHT	OF	TYPE	CLASS
	0	ORNL	5700	3	1	1	S	U

RELEASE LEVEL	Fabrication
	SE123-117

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 11-2  
DETAIL