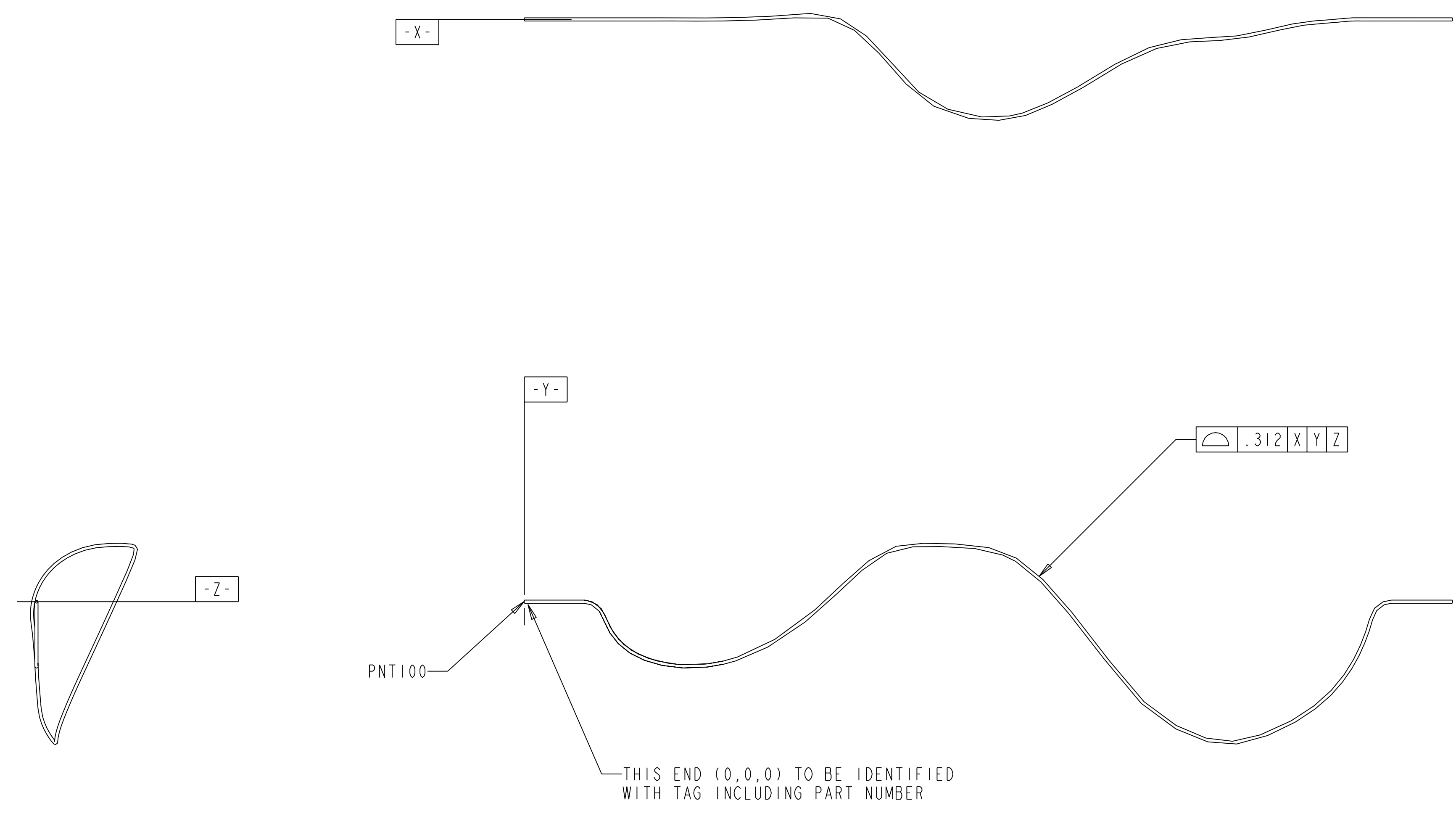


- NOTES
- INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
 - DIMENSIONS ARE IN INCHES.
 - FABRICATION AND MATERIALS PER NCSX-CSPEC-123-01
 - PROFILE TOLERANCE OF TUBE SURFACE IS BILATERAL, I.E. 0.156" ANY DIRECTION OFF REFERENCE SURFACE.
 - ALL TUBE BEND RADII ARE 5/8" TO CENTERLINE OF TUBE.
 -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

Point Name	X	Y	Z
PNT100	0.000	0.000	0.000
PNT101	5.907	-0.000	0.000
PNT102	6.660	-0.149	0.000
PNT103	7.399	-0.654	0.000
PNT104	7.865	-1.418	0.000
PNT105	8.330	-2.506	-0.000
PNT106	8.786	-3.268	-0.000
PNT107	9.274	-3.888	-0.000
PNT108	9.914	-4.503	-0.000
PNT109	10.723	-5.068	0.000
PNT110	11.603	-5.515	0.000
PNT111	12.339	-5.798	0.000
PNT112	13.096	-6.024	0.000
PNT113	13.849	-6.195	-0.012
PNT114	14.527	-6.305	-0.004
PNT115	15.113	-6.371	0.002
PNT116	15.700	-6.411	0.007
PNT117	16.388	-6.428	0.010
PNT118	17.173	-6.406	0.012
PNT119	18.151	-6.321	0.010
PNT120	19.025	-6.188	0.005
PNT121	19.985	-5.981	-0.006
PNT122	20.929	-5.712	-0.023
PNT123	21.855	-5.387	-0.048
PNT124	22.761	-5.009	-0.079
PNT125	23.731	-4.536	-0.121
PNT126	24.674	-4.011	-0.168
PNT127	25.507	-3.492	-0.214
PNT128	26.399	-2.886	-0.276
PNT129	27.270	-2.252	-0.358
PNT130	28.043	-1.650	-0.426
PNT131	28.796	-1.020	-0.440
PNT132	29.529	-0.369	-0.383
PNT133	30.241	0.294	-0.252
PNT134	30.867	0.889	-0.068
PNT135	31.547	1.541	0.209
PNT136	32.146	2.111	0.523
PNT137	32.795	2.715	0.944
PNT138	33.368	3.224	1.384
PNT139	33.994	3.742	1.835
PNT140	34.550	4.159	2.481
PNT141	35.102	4.526	3.065
PNT142	35.778	4.903	3.819
PNT143	36.588	5.243	4.745
PNT144	37.415	5.467	5.691
PNT145	38.204	5.575	6.559
PNT146	39.132	5.622	7.434
PNT147	40.087	5.636	8.123
PNT148	41.204	5.622	8.738
PNT149	42.390	5.587	9.209
PNT150	43.425	5.529	9.513
PNT151	44.768	5.407	9.774
PNT152	45.929	5.226	9.860
PNT153	47.236	4.921	9.835
PNT154	48.236	4.431	9.705
PNT155	49.313	3.791	9.468
PNT156	50.363	2.973	9.124
PNT157	51.251	2.134	8.754
PNT158	52.082	1.251	8.356
PNT159	52.942	0.274	7.913
PNT160	53.665	-0.573	7.527
PNT161	54.613	-1.713	7.007
PNT162	55.480	-2.796	6.510
PNT163	56.215	-3.744	6.073
PNT164	57.102	-4.921	5.526
PNT165	57.926	-6.027	5.010
PNT166	58.934	-7.344	4.399
PNT167	59.813	-8.419	3.908
PNT168	60.752	-9.456	3.445
PNT169	61.839	-10.488	2.997
PNT170	62.950	-11.395	2.637
PNT171	64.071	-12.141	2.360
PNT172	65.179	-12.742	2.161
PNT173	66.340	-13.256	2.030
PNT174	67.449	-13.647	1.972
PNT175	68.692	-13.932	1.942
PNT176	69.768	-14.007	1.890
PNT177	71.121	-13.860	1.716
PNT178	72.062	-13.643	1.539
PNT179	73.432	-13.195	1.234
PNT180	75.016	-12.507	0.857
PNT181	76.125	-11.925	0.614
PNT182	77.205	-11.271	0.425
PNT183	78.247	-10.544	0.298
PNT184	79.454	-9.542	0.221
PNT185	80.412	-8.559	0.151
PNT186	81.033	-7.802	0.083
PNT187	81.603	-7.005	0.012
PNT188	82.010	-6.367	-0.000
PNT189	82.492	-5.505	0.000
PNT190	82.839	-4.796	0.000
PNT191	83.153	-4.071	0.000
PNT192	83.437	-3.334	0.000
PNT193	83.661	-2.681	-0.000
PNT194	83.836	-2.115	0.000
PNT195	83.995	-1.544	0.000
PNT196	84.342	-0.826	0.000
PNT197	85.047	-0.223	0.000
PNT198	85.947	-0.000	-0.000
PNT199	92.000	0.000	0.000



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

APPROX TUBE LENGTH = 117.5 IN

-1 COOLANT TUBE 15-1
SCALE .125

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	P	GORANSON	4-22-05
TOLERANCES UNLESS OTHERWISE SPECIFIED		DRW	G	MCGINNIS	4-22-05
FRACTIONS		CHK	G	H. JONES	05-04-05
XX DECIMALS ±.01		SECT			
XXX DECIMALS ±.005		DEPT			
ANGLES ±0°15'		FE			
BREAK SHARP EDGES OR MAX FINISH .125 UNLESS OTHERWISE SPECIFIED		CR			
		PJ			
		RD			
		PPPL DRFT			

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	P	GORANSON	4-22-05
TOLERANCES UNLESS OTHERWISE SPECIFIED		DRW	G	MCGINNIS	4-22-05
FRACTIONS		CHK	G	H. JONES	05-04-05
XX DECIMALS ±.01		SECT			
XXX DECIMALS ±.005		DEPT			
ANGLES ±0°15'		FE			
BREAK SHARP EDGES OR MAX FINISH .125 UNLESS OTHERWISE SPECIFIED		CR			
		PJ			
		RD			
		PPPL DRFT			

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

RELEASE LEVEL	Fabrication
SEI23-136	

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 INFORMATION TO BIDDER ARE NOT TO BE USED FOR OTHER PURPOSES, AND ARE TO BE RETURNED UPON REQUEST OF THE FORWARDING CONTRACTOR.

P THIS DRAWING PRODUCED ON PRO-ENGINEER

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 15-1
DETAIL