

ECP-04-008 Details

A	B	C	D	E
1	Work Breakdown Structure (WBS)	ECP 6 Baseline	Delta	ECP 8 Baseline
2		(K\$)	(K\$)	(K\$)
3				
4	WBS 11 - Plasma Facing Components			
5	111 - Limiters	\$0.1K	\$0.0K	\$0.1K
6	<i>Subtotal WBS 11</i>	<i>\$0.1K</i>	<i>\$0.0K</i>	<i>\$0.1K</i>
7				
8	WBS 12 - Vacuum Vessel			
9	121 - Vacuum Vessel Assembly	\$6,258.1K	\$390.0K	\$6,648.1K
10	122 - Vacuum Vessel Thermal Insulation	\$174.9K	\$0.0K	\$174.9K
11	123 - Vacuum Vessel Heating and Cooling Distrib	\$375.8K	\$0.0K	\$375.8K
12	124 - Vacuum Vessel Supports	\$62.6K	\$0.0K	\$62.6K
13	125 - Vacuum Vessel Local I&C	\$26.7K	\$0.0K	\$26.7K
14	<i>Subtotal WBS 12</i>	<i>\$6,898.1K</i>	<i>\$390.0K</i>	<i>\$7,288.1K</i>
15				
16	WBS 13 - Conventional Coils			
17	130 - Conventional Coils	\$462.1K	\$0.0K	\$462.1K
18	131 - TF Coils	\$1,546.3K	\$0.0K	\$1,546.3K
19	132 - PF Coils	\$1,747.4K	\$0.0K	\$1,747.4K
20	133 - External Trim Coils	\$372.0K	\$0.0K	\$372.0K
21	134 - Conventional Coil Local	\$85.5K	\$0.0K	\$85.5K
22	<i>Subtotal WBS 13</i>	<i>\$4,213.3K</i>	<i>\$0.0K</i>	<i>\$4,213.3K</i>
23				
24	WBS 14 - Modular Coils			
25	141 - Modular Coil Winding Form	\$9,212.8K	\$78.2K	\$9,291.0K
26	142 - Modular Coil Windings and Assembly	\$8,683.4K	(\$3.7K)	\$8,679.7K
27	143 - Modular Coil Local I&C	\$121.2K	\$0.0K	\$121.2K
28	144 - Modular Coil Winding Facility & Fixtures	\$2,501.7K	\$0.0K	\$2,501.7K
29	<i>Subtotal WBS 14</i>	<i>\$20,519.1K</i>	<i>\$74.5K</i>	<i>\$20,593.6K</i>
30				
31	WBS 15 - Coil Support Structure			
32	151 - Structures and Base	\$1,436.4K	\$4.7K	\$1,441.1K
33	<i>Subtotal WBS 15</i>	<i>\$1,436.4K</i>	<i>\$4.7K</i>	<i>\$1,441.1K</i>
34				
35	WBS 16 - Coil Services			
36	161 - LN2 Distribution	\$337.5K	\$0.0K	\$337.5K
37	162 - Electrical Leads	\$621.3K	\$0.0K	\$621.3K
38	163 - Coil Protection System	\$78.1K	\$0.0K	\$78.1K
39	<i>Subtotal WBS 16</i>	<i>\$1,036.9K</i>	<i>\$0.0K</i>	<i>\$1,036.9K</i>
40				
41	WBS 17 - Cryostat and Base Support Structure			
42	171 -Cryostat	\$858.5K	\$0.0K	\$858.5K
43	172 - Base Support Structure	\$438.2K	\$0.0K	\$438.2K
44	<i>Subtotal WBS 17</i>	<i>\$1,296.7K</i>	<i>\$0.0K</i>	<i>\$1,296.7K</i>
45				
46	WBS 18 - Field Period Assembly			
47	181 - Field Period Assembly Planning/Oversight	\$1,379.3K	\$0.0K	\$1,379.3K
48	182 - TFTR Test Cell Area preparations	\$92.9K	\$0.0K	\$92.9K
49	183 - Receive Inspect and Test Coils	\$77.4K	\$0.0K	\$77.4K
50	184 - Receive Inspect and Test VV	\$326.3K	\$0.0K	\$326.3K
51	185 - Assemble Field Periods	\$1,357.3K	\$76.5K	\$1,433.8K
52	186 - Tooling Design and Fabrication	\$1,342.5K	\$0.0K	\$1,342.5K
53	187 - Measurement Systems	\$591.6K	\$0.0K	\$591.6K
54	<i>Subtotal WBS 18</i>	<i>\$5,167.3K</i>	<i>\$76.5K</i>	<i>\$5,243.8K</i>
55				
56	WBS 19 - Stellarator Core Management and Integration			
57	191 - Stellarator Core Management & Oversight	\$1,083.0K	\$0.0K	\$1,083.0K
58	192 - Stellarator Core Integration & Analysis	\$1,579.0K	\$0.0K	\$1,579.0K
59	<i>Subtotal WBS 19</i>	<i>\$2,662.0K</i>	<i>\$0.0K</i>	<i>\$2,662.0K</i>

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2			(K\$)	(K\$)	(K\$)
3					
60					

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2		(K\$)	(K\$)	(K\$)
3				
61	WBS 21 - Fueling Systems			
62	210 - Fueling Systems	\$140.0K	\$0.0K	\$140.0K
63	<i>Subtotal WBS 21</i>	<i>\$140.0K</i>	<i>\$0.0K</i>	<i>\$140.0K</i>
64				
65	WBS 22 - Torus Vacuum Pumping Systems			
66	220 - Torus Vacuum Pumping Systems	\$384.2K	\$0.0K	\$384.2K
67	<i>Subtotal WBS 22</i>	<i>\$384.2K</i>	<i>\$0.0K</i>	<i>\$384.2K</i>
68				
69	WBS 25 - Neutral Beam Injection systems			
70	250 - Neutral Beam Injection System	\$1,169.1K	\$0.0K	\$1,169.1K
71	<i>Subtotal WBS 25</i>	<i>\$1,169.1K</i>	<i>\$0.0K</i>	<i>\$1,169.1K</i>
72				
73	WBS 31 - Magnetic Diagnostic Systems			
74	310 - Magnetic Diagnostics	\$454.1K	\$0.0K	\$454.1K
75	<i>Subtotal WBS 31</i>	<i>\$454.1K</i>	<i>\$0.0K</i>	<i>\$454.1K</i>
76				
77	WBS 36 - Edge and Divertor Diagnostics Systems			
78	360 - Edge and Divertor Diagnostics	\$99.3K	\$0.0K	\$99.3K
79	<i>Subtotal WBS 36</i>	<i>\$99.3K</i>	<i>\$0.0K</i>	<i>\$99.3K</i>
80				
81	WBS 38 - Electron Beam Mapping Systems			
82	380 - Electron Beam (EB) Mapping	\$292.1K	\$0.0K	\$292.1K
83	<i>Subtotal WBS 38</i>	<i>\$292.1K</i>	<i>\$0.0K</i>	<i>\$292.1K</i>
84				
85	WBS 39 - Diagnostic Integration			
86	390 - Diagnostics Integration	\$847.2K	\$0.0K	\$847.2K
87	<i>Subtotal WBS 39</i>	<i>\$847.2K</i>	<i>\$0.0K</i>	<i>\$847.2K</i>
88				
89				
90	WBS 41 - AC Power Systems			
91	411 - Auxliary AC Power Systems	\$569.3K	\$0.0K	\$569.3K
92	412 - Experimental AC Power Systems	\$42.8K	\$0.0K	\$42.8K
93	<i>Subtotal WBS 41</i>	<i>\$612.1K</i>	<i>\$0.0K</i>	<i>\$612.1K</i>
94				
95	WBS 42 - AC/DC Convertors			
96	422 - D-Site AC/DC Convertors	\$23.5K	\$0.0K	\$23.5K
97	<i>Subtotal WBS 42</i>	<i>\$23.5K</i>	<i>\$0.0K</i>	<i>\$23.5K</i>
98				
99	WBS 43 - DC Systemrs			
100	431 - C-Site DC Systems	\$326.7K	\$0.0K	\$326.7K
101	432 - D-to-C Site DC Systems	\$1,328.7K	\$0.0K	\$1,328.7K
102	433 - D-Site DC Systems	\$487.9K	\$0.0K	\$487.9K
103	<i>Subtotal WBS 43</i>	<i>\$2,143.3K</i>	<i>\$0.0K</i>	<i>\$2,143.3K</i>
104				
105	WBS 44 - Control and Protection Systems			
106	441 - Electrical Interlocks	\$578.6K	\$0.0K	\$578.6K
107	442 - Kirk Key Interlocks	\$98.0K	\$0.0K	\$98.0K
108	443 - Real Time Control Systems	\$38.4K	\$0.0K	\$38.4K
109	444 - Instrument Systems	\$433.2K	\$0.0K	\$433.2K
110	445 - Coil protection Systems	\$283.4K	\$0.0K	\$283.4K
111	446 - Ground Fault Monitoring	\$167.0K	\$0.0K	\$167.0K
112	<i>Subtotal WBS 44</i>	<i>\$1,598.6K</i>	<i>\$0.0K</i>	<i>\$1,598.6K</i>
113				

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2		(K\$)	(K\$)	(K\$)
3				
114	WBS 45 - Power Systems Design and Integration			
115	451 - System Design and Interfaces	\$591.4K	\$0.0K	\$591.4K
116	452 - Electrical Systems Support	\$91.4K	\$0.0K	\$91.4K
117	453 - System Testing (PTP's)	\$192.0K	\$0.0K	\$192.0K
118	<i>Subtotal WBS 45</i>	<i>\$874.8K</i>	<i>\$0.0K</i>	<i>\$874.8K</i>
119				
120	WBS 46 - FCPC Building Modifications			
121	460 - FCPC Building Modifications	\$78.6K	\$0.0K	\$78.6K
122	<i>Subtotal WBS 46</i>	<i>\$78.6K</i>	<i>\$0.0K</i>	<i>\$78.6K</i>
123				
124	WBS 51 - TCP/IP Infrastructure Systems			
125	510 - TCP/IP Infrastructure Systems	\$429.0K	\$0.0K	\$429.0K
126	<i>Subtotal WBS 51</i>	<i>\$429.0K</i>	<i>\$0.0K</i>	<i>\$429.0K</i>
127				
128	WBS 52 - Central Instrumentation & Control			
129	520 - Central Instrumentation & Control	\$578.0K	\$0.0K	\$578.0K
130	<i>Subtotal WBS 52</i>	<i>\$578.0K</i>	<i>\$0.0K</i>	<i>\$578.0K</i>
131				
132	WBS 53 - Data Acquisition & Facility Computing			
133	530 - Data Acquisition & Facility Computing	\$407.8K	\$0.0K	\$407.8K
134	<i>Subtotal WBS 53</i>	<i>\$407.8K</i>	<i>\$0.0K</i>	<i>\$407.8K</i>
135				
136	WBS 54 - Facility Timing & Synchronization			
137	540 - Facility Timing & Synchronization	\$352.0K	\$0.0K	\$352.0K
138	<i>Subtotal WBS 54</i>	<i>\$352.0K</i>	<i>\$0.0K</i>	<i>\$352.0K</i>
139				
140	WBS 55 - Real Time Plasma & Power Supply Control Systems			
141	550 - Real Time Plasma & Power Supply Control Systems	\$293.3K	\$0.0K	\$293.3K
142	<i>Subtotal WBS 55</i>	<i>\$293.3K</i>	<i>\$0.0K</i>	<i>\$293.3K</i>
143				
144	WBS 56 - Central Safety Interlock Systems			
145	560 - Central Safety Interlock Systems	\$399.9K	\$0.0K	\$399.9K
146	<i>Subtotal WBS 56</i>	<i>\$399.9K</i>	<i>\$0.0K</i>	<i>\$399.9K</i>
147				
148	WBS 57 - Control Room Facility			
149	570 - Control Room Facility	\$119.7K	\$0.0K	\$119.7K
150	<i>Subtotal WBS 57</i>	<i>\$119.7K</i>	<i>\$0.0K</i>	<i>\$119.7K</i>
151				
152	WBS 61 - Water Cooling Systems			
153	611 - C-Site Cooling System	\$153.3K	\$0.0K	\$153.3K
154	612 - NB Water Cooling Systems	\$239.9K	\$0.0K	\$239.9K
155	613 - Vacuum Pumping System	\$100.0K	\$0.0K	\$100.0K
156	614 - Bakeout Water System	\$38.5K	\$0.0K	\$38.5K
157	<i>Subtotal WBS 61</i>	<i>\$531.7K</i>	<i>\$0.0K</i>	<i>\$531.7K</i>
158				
159	WBS 62 - Cryogenic Systems			
160	621 - LN2-LHe Supply System	\$252.9K	\$0.0K	\$252.9K
161	622 - LN2 Coil Cooling Supply	\$274.4K	\$0.0K	\$274.4K
162	623 - GN2 Cryostat Cooling System	\$220.2K	\$0.0K	\$220.2K
163	<i>Subtotal WBS 62</i>	<i>\$747.5K</i>	<i>\$0.0K</i>	<i>\$747.5K</i>
164				
165	WBS 63 - Utility Systems			
166	630 - Utility Systems	\$120.9K	\$0.0K	\$120.9K
167	<i>Subtotal WBS 63</i>	<i>\$120.9K</i>	<i>\$0.0K</i>	<i>\$120.9K</i>
168				

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2		(K\$)	(K\$)	(K\$)
3				
169	WBS 64 - PFC/VV Heating & Cooling Systems			
170	640 - PFC/VV Heating & Cooling	\$628.9K	\$0.0K	\$628.9K
171	<i>Subtotal WBS 64</i>	\$628.9K	\$0.0K	\$628.9K
172				
173	WBS 65 - Facility Systems Integration			
174	650 - Facility Systems Integration	\$41.6K	\$0.0K	\$41.6K
175	<i>Subtotal WBS 65</i>	\$41.6K	\$0.0K	\$41.6K
176				
177	WBS 71 - Shield Wall Modifications			
178	710 - Shield Wall Seismic Modifications	\$32.2K	\$0.0K	\$32.2K
179	<i>Subtotal WBS 71</i>	\$32.2K	\$0.0K	\$32.2K
180				
181	WBS 72 - Control Room Refurbishment			
182	720 - Control Room Refurbishment	\$47.6K	\$0.0K	\$47.6K
183	<i>Subtotal WBS 72</i>	\$47.6K	\$0.0K	\$47.6K
184				
185	WBS 73 - Platform Design & Fabrication			
186	730 - Platform Design & Fabrication	\$70.0K	\$0.0K	\$70.0K
187	731 - Platform Design & Fabrication	\$89.6K	\$0.0K	\$89.6K
188	<i>Subtotal WBS 73</i>	\$159.6K	\$0.0K	\$159.6K
189				
190	WBS 74 - Machine Assembly Planning & Oversight			
191	740 - Machine Assembly Planning and Oversight	\$147.8K	\$0.0K	\$147.8K
192	741 - Planning Prior to Machine Assembly	\$281.6K	\$0.0K	\$281.6K
193	742 - Construction Management	\$1,184.8K	\$0.0K	\$1,184.8K
194	<i>Subtotal WBS 74</i>	\$1,614.2K	\$0.0K	\$1,614.2K
195				
196	WBS 75 - Test Cell & Basement Assembly Operations			
197	750 - Test Cell & Basement Assembly Operations	\$2,160.0K	\$0.0K	\$2,160.0K
198	<i>Subtotal WBS 75</i>	\$2,160.0K	\$0.0K	\$2,160.0K
199				
200	WBS 76 - Tooling Design & Fabrication			
201	76 - 76 - Tooling Design & Fabrication	\$223.7K	\$0.0K	\$223.7K
202	<i>Subtotal WBS 76</i>	\$223.7K	\$0.0K	\$223.7K
203				
204	WBS 81 - Project Management & Control			
205	810 - Project Management & Control	\$3,354.3K	\$0.0K	\$3,354.3K
206	<i>Subtotal WBS 81</i>	\$3,354.3K	\$0.0K	\$3,354.3K
207				
208	WBS 82 - Project Engineering			
209	820 - Project Engineering	\$4,723.1K	\$0.0K	\$4,723.1K
210	<i>Subtotal WBS 82</i>	\$4,723.1K	\$0.0K	\$4,723.1K
211				
212	WBS 84 - Project Physics			
213	840 - Project Physics	\$507.7K	\$0.0K	\$507.7K
214	<i>Subtotal WBS 84</i>	\$507.7K	\$0.0K	\$507.7K
215				

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3				
216	WBS 85 - Integrated Systems Testing			
217	850 - Integrated Systems Testing	\$1,225.0K	\$0.0K	\$1,225.0K
218	<i>Subtotal WBS 85</i>	<i>\$1,225.0K</i>	<i>\$0.0K</i>	<i>\$1,225.0K</i>
219				
220	AA - PPPL Allocations			
221	AA - PPPL Allocations	\$983.3K	\$0.0K	\$983.3K
222	<i>Subtotal PPPL Allocations</i>	<i>\$983.3K</i>	<i>\$0.0K</i>	<i>\$983.3K</i>
223				
224	NCSX Performance Baseline	\$71,627.8K	\$541.5K	\$72,173.5K
225				
226	CC - Contingency	\$14,721.5K	(\$541.5K)	\$14,180.0K
227				
228	NCSX TEC	\$86.3M		\$86.3M
229				
230				