

ID	WBS	Task Name	Generic R&D Fy05	Manpower	Material (loc. overhead +tax)	Additional Overhead	DOE Contingency	TPC DOE (with contingency)	RIKEN	RIKEN Contingency	RIKEN Total
1	1	VTX project	315338	1,678,103	1233383	129,083	1,221,115	4,261,684	2,702,500	380,175	3082675
2		DOE FY04 Generic R&D Funds	0	0	0	0	0	0	0	0	0
3		RIKEN Construction Funds	0	0	0	0	0	0	0	0	0
4		DOE FY05 Generic R&D Funds	0	0	0	0	0	0	0	0	0
5		HYTEC R&D funding	0	0	0	0	0	0	0	0	0
6		DOE Construction Funds	0	0	0	0	0	0	0	0	0
7		MILESTONE - Completion of SILICON BARREL	0	0	0	0	0	0	0	0	0
8	1.1	SILICON BARREL	145338	442,603	626807	62,213	398,259	1,529,882	2,572,500	353,750	2926250
9	1.1.1	STRIP	145338	442,603	626807	62,213	398,259	1,529,882	1,035,000	112,500	1147500
10	1.1.1.1	Strip FEE	145338	353,853	485485	62,213	284,854	1,186,405	160,000	0	160000
11		MILESTONE - Strip ROC Card Ready for Fab.	0	0	0	0	0	0	0	0	0
12		MILESTONE - Strip ROC Card Fabricated	0	0	0	0	0	0	0	0	0
13	1.1.1.1.1	ROC R&D	145338	0	0	0	0	0	0	0	0
14	1.1.1.1.1.1	ROC Design 0th Round	0	0	0	0	0	0	0	0	0
15	1.1.1.1.1.2	ROC Prototype 0th Round	0	0	0	0	0	0	0	0	0
16	1.1.1.1.1.3	ROC Design 1st Round	0	0	0	0	0	0	0	0	0
17	1.1.1.1.1.4	ROC Prototype 1st Round	0	0	0	0	0	0	0	0	0
18	1.1.1.1.1.9	ROC Design 2nd Round	145338	0	0	0	0	0	0	0	0
19	1.1.1.1.2	ROC Design	0	34,605	0	3,114	13,202	50,921	0	0	0
20	1.1.1.1.2.1	ROC Design Pre-production	0	34,605	0	3,114	13,202	50,921	0	0	0
21	1.1.1.1.3	ROC Prototype	0	74,507	307890	34,416	129,212	546,025	0	0	0
22	1.1.1.1.3.1	ROC Prototype 2nd Round	0	45,260	119311	14,811	55,609	234,991	0	0	0
23	1.1.1.1.3.2	ROC Prototype Pre-production	0	29,247	188579	19,604	73,603	311,034	0	0	0
24	1.1.1.1.4	ROC Fabrication	0	43,871	83984	3,948	43,303	175,106	160,000	0	160000
25	1.1.1.1.4.1	ROC Fabrication - Boards	0	0	30550	0	11,915	42,465	0	0	0
26	1.1.1.1.4.5	ROC Fabrication - SVX4s	0	0	0	0	0	0	160,000	0	160000
27	1.1.1.1.4.6	ROC Fabrication - Other Parts	0	0	15246	0	4,726	19,972	0	0	0
28	1.1.1.1.4.7	ROC Fabrication - Assembly	0	0	38188	0	11,838	50,026	0	0	0
29	1.1.1.1.4.8	ROC Fabrication - Test	0	43,871	0	3,948	14,824	62,643	0	0	0
30		MILESTONE - Strip FEM Ready for Fab.	0	0	0	0	0	0	0	0	0
31	1.1.1.1.5	FEM Design	0	80,037	0	7,203	27,045	114,285	0	0	0
32	1.1.1.1.5.1	FEM Design - 1st Round	0	49,749	0	4,477	16,810	71,036	0	0	0
33	1.1.1.1.5.5	FEM Design - Pre-production	0	30,288	0	2,726	10,234	43,249	0	0	0
34	1.1.1.1.6	FEM Prototype	0	76,963	18534	8,595	32,268	136,360	0	0	0
35	1.1.1.1.6.1	FEM Prototype - 1st Round	0	48,212	9267	5,173	19,422	82,074	0	0	0
36	1.1.1.1.6.5	FEM Prototype - Pre-production	0	28,751	9267	3,422	12,846	54,286	0	0	0
37		MILESTONE - Strip FEM Fabricated	0	0	0	0	0	0	0	0	0
38	1.1.1.1.7	FEM Fabrication	0	43,871	64097	3,948	33,841	145,757	0	0	0
39	1.1.1.1.7.1	FEM Fabrication - Boards	0	0	7755	0	1,551	9,306	0	0	0
40	1.1.1.1.7.2	FEM Fabrication - Parts	0	0	49879	0	15,463	65,342	0	0	0
41	1.1.1.1.7.3	FEM Fabrication - Assembly	0	0	6463	0	2,004	8,467	0	0	0
42	1.1.1.1.7.4	FEM Fabrication - Test	0	43,871	0	3,948	14,824	62,643	0	0	0
43	1.1.1.1.8	ROC/FEE Testbench development	0	0	10980	988	5,984	17,952	0	0	0
44		MILESTONE - Strip Sensor Fabricated	0	0	0	0	0	0	0	0	0
45	1.1.1.2	Strip Sensor	0	0	26436	0	13,218	39,654	875,000	112,500	987500
46	1.1.1.2.1	PROTOTYPE of Strip Sensor	0	0	0	0	0	0	300,000	25,000	325000
47	1.1.1.2.1.1	1st round - beam test	0	0	0	0	0	0	0	0	0
48	1.1.1.2.1.1.1	signal/noise, position resolution	0	0	0	0	0	0	0	0	0
49	1.1.1.2.1.2	2nd round	0	0	0	0	0	0	90,000	0	90000
50	1.1.1.2.1.2.1	delivery of sensors	0	0	0	0	0	0	50,000	0	50000
51	1.1.1.2.1.2.2	tests	0	0	0	0	0	0	40,000	0	40000
52	1.1.1.2.1.3	final pre-production strip sensor	0	0	0	0	0	0	0	0	0
53	1.1.1.2.1.3.1	SINTEF pre-production sensor	0	0	0	0	0	0	0	0	0

ID	WBS	Task Name	Generic R&D Fy05	Manpower	Material (loc. overhead +tax)	Additional Overhead	DOE Contingency	TPC DOE (with contingency)	RIKEN	RIKEN Contingency	RIKEN Total
54	1.1.1.2.1.3.2	Hamamatsu pre-production sensor	0	0	0	0	0	0	0	0	0
55	1.1.1.2.1.3.3	tests at vendor	0	0	0	0	0	0	0	0	0
56	1.1.1.2.1.4	Q/A of prototype sensor	0	0	0	0	0	0	40,000	8,000	48000
57	1.1.1.2.1.4.1	sensor Q/A at BNL	0	0	0	0	0	0	25,000	5,000	30000
58	1.1.1.2.1.4.2	sensor Q/A at UNM	0	0	0	0	0	0	15,000	3,000	18000
59		SINTEF budget	0	0	0	0	0	0	70,000	7,000	77000
60		Hamamatsu budget	0	0	0	0	0	0	100,000	10,000	110000
61	1.1.1.2.2	FABRICATION of Strip Sensor	0	0	0	0	0	0	300,000	75,000	375000
62	1.1.1.2.2.1	order	0	0	0	0	0	0	0	0	0
63	1.1.1.2.2.2	delivery	0	0	0	0	0	0	300,000	75,000	375000
64	1.1.1.2.3	Q/A of final sensor	0	0	26436	0	13,218	39,654	25,000	12,500	37500
65	1.1.1.2.3.1	Q/A of sensor at BNL	0	0	8812	0	4,406	13,218	25,000	12,500	37500
66	1.1.1.2.3.2	Q/A/ of sensor at UNM	0	0	8812	0	4,406	13,218	0	0	0
67	1.1.1.2.3.3	Q/A at USB	0	0	8812	0	4,406	13,218	0	0	0
68	1.1.1.2.4	Wire bonder	0	0	0	0	0	0	250,000	0	250000
69		MILESTONE - ROC/Sensors Technology choice	0	0	0	0	0	0	0	0	0
70		MILESTONE - Strip system tests finished	0	0	0	0	0	0	0	0	0
71	1.1.1.3	Strip System test	0	43,750	10311	0	25,400	79,461	0	0	0
72	1.1.1.3.1	Strip System Test R&D	0	0	0	0	0	0	0	0	0
73	1.1.1.3.1.1	0th round	0	0	0	0	0	0	0	0	0
74	1.1.1.3.1.1.1	used viking	0	0	0	0	0	0	0	0	0
75	1.1.1.3.1.2	1st round system test	0	0	0	0	0	0	0	0	0
76	1.1.1.3.1.2.1	use 0th round roc, 2nd round sensor	0	0	0	0	0	0	0	0	0
77	1.1.1.3.1.3	2nd round system test	0	0	0	0	0	0	0	0	0
78	1.1.1.3.1.3.1	use 1st round ROC	0	0	0	0	0	0	0	0	0
79	1.1.1.3.2	Electronics ROC & Sensor	0	0	3525	0	1,763	5,288	0	0	0
80	1.1.1.3.2.1	final pre-production system test	0	0	3525	0	1,763	5,288	0	0	0
81	1.1.1.3.2.1.1	use 2nd round ROC	0	0	3525	0	1,763	5,288	0	0	0
82	1.1.1.3.3	Ladder (roc, sensor, bus, pilot, ladder)	0	43,750	6786	0	23,637	74,173	0	0	0
83	1.1.1.3.3.1	design of assembly jigs	0	22,500	0	0	11,250	33,750	0	0	0
84	1.1.1.3.3.2	1st round test ladder	0	0	1762	0	881	2,643	0	0	0
85	1.1.1.3.3.3	test of the 1st round test ladder	0	0	1762	0	0	1,762	0	0	0
86	1.1.1.3.3.4	2nd round design of assembly jigs	0	11,250	0	0	5,625	16,875	0	0	0
87	1.1.1.3.3.5	pre-production test ladder	0	10,000	1762	0	5,881	17,643	0	0	0
88	1.1.1.3.3.6	test of pre-production test ladder	0	0	1500	0	0	1,500	0	0	0
89		MILESTONE - strip ladders assembled	0	0	0	0	0	0	0	0	0
90	1.1.1.4	Assembly and Testing of Strip ladders	0	45,000	38775	0	41,888	125,663	0	0	0
91	1.1.1.4.1	ROC & sensor+pilot+ladder	0	45,000	38775	0	41,888	125,663	0	0	0
92	1.1.1.4.1.1	Glue ROC on sensor	0	0	17625	0	8,813	26,438	0	0	0
93	1.1.1.4.1.2	wire bond ROC+Sensor	0	45,000	0	0	22,500	67,500	0	0	0
94	1.1.1.4.1.3	test assembled ROC+sensor	0	0	0	0	0	0	0	0	0
95	1.1.1.4.1.4	Mount (ROC+sensor) on the ladder substrate	0	0	0	0	0	0	0	0	0
96	1.1.1.4.1.5	test assembled ladders	0	0	21150	0	10,575	31,725	0	0	0
97	1.1.1.5	Services, LV, racks etc	0	0	65800	0	32,900	98,700	0	0	0
98	1.1.2	PIXEL	0	0	0	0	0	0	1,537,500	241,250	1778750
99		RIKEN/CERN MOU	0	0	0	0	0	0	200,000	0	200000
100		RIKEN/CERN contract(2)	0	0	0	0	0	0	400,000	0	400000
101	1.1.2.1	Pixel Sensors	0	0	0	0	0	0	0	0	0
102	1.1.2.1.1	Design Pixel Sensor	0	0	0	0	0	0	0	0	0
103	1.1.2.1.1.1	Design of sensors	0	0	0	0	0	0	0	0	0
104	1.1.2.1.2	Pixel Sensor Fab/QA	0	0	0	0	0	0	0	0	0
105	1.1.2.1.2.1	Sensor ladder fab.(54 ladders)	0	0	0	0	0	0	0	0	0
106	1.1.2.1.2.2	QA Round 1	0	0	0	0	0	0	0	0	0

ID	WBS	Task Name	Generic R&D Fy05	Manpower	Material (loc. overhead +tax)	Additional Overhead	DOE Contingency	TPC DOE (with contingency)	RIKEN	RIKEN Contingency	RIKEN Total
107	1.1.2.1.2.3	Sensor ladder fab.(108 ladders)	0	0	0	0	0	0	0	0	0
108	1.1.2.1.2.4	QA Round 2	0	0	0	0	0	0	0	0	0
109	1.1.2.2	Pixel ROC	0	0	0	0	0	0	160,000	5,000	165000
110	1.1.2.2.1	Pixel R/O ALICE1 Readout Delivery	0	0	0	0	0	0	0	0	0
111	1.1.2.2.1.1	Delivery of ALICE1 Read-out (16 wafers)	0	0	0	0	0	0	0	0	0
112	1.1.2.2.1.2	2nd Delivery of ALICE1 Read-out (8 wafers)	0	0	0	0	0	0	0	0	0
113	1.1.2.2.2	Pixel R/O QA	0	0	0	0	0	0	160,000	5,000	165000
114	1.1.2.2.2.1	chip Probe station setup	0	0	0	0	0	0	140,000	0	140000
115	1.1.2.2.2.2	Pixel R/O Q/A for 15 wafer	0	0	0	0	0	0	0	0	0
116	1.1.2.2.2.3	pixel R/O Q/A for 5 wafers	0	0	0	0	0	0	0	0	0
117	1.1.2.2.2.4	move the probe station to RIKEN	0	0	0	0	0	0	10,000	2,500	12500
118	1.1.2.2.2.5	probe station setup at RIKEN	0	0	0	0	0	0	10,000	2,500	12500
119	1.1.2.2.2.6	Pixel R/O chip QA for 4 wafers	0	0	0	0	0	0	0	0	0
120		MILESTONE - Pixels bump-bonded	0	0	0	0	0	0	0	0	0
121	1.1.2.3	Pixel Sensor assembly	0	0	0	0	0	0	0	0	0
122	1.1.2.3.1	Hybrid bump-bonding	0	0	0	0	0	0	0	0	0
123	1.1.2.3.1.1	bump-bonding of first 50 sensor assemblies	0	0	0	0	0	0	0	0	0
124	1.1.2.3.1.2	bump bonding of 100 more sensor assemblies	0	0	0	0	0	0	0	0	0
125	1.1.2.4	Pixel Bus	0	0	0	0	0	0	190,000	70,000	260000
126	1.1.2.4.1	PROTOTYPE of Pixel Bus	0	0	0	0	0	0	130,000	40,000	170000
127	1.1.2.4.1.1	ALICE bus copy	0	0	0	0	0	0	50,000	0	50000
128	1.1.2.4.1.2	Test of prototype ALICE bus	0	0	0	0	0	0	0	0	0
129	1.1.2.4.1.3	Design of PHENIX bus	0	0	0	0	0	0	30,000	15,000	45000
130	1.1.2.4.1.4	PHENIX bus test production	0	0	0	0	0	0	50,000	25,000	75000
131	1.1.2.4.1.5	PHENIX test bus final test	0	0	0	0	0	0	0	0	0
132	1.1.2.4.2	FABRICATION of Pixel Bus	0	0	0	0	0	0	60,000	30,000	90000
133	1.1.2.4.2.1	fabrication	0	0	0	0	0	0	50,000	25,000	75000
134	1.1.2.4.2.2	testing	0	0	0	0	0	0	10,000	5,000	15000
135	1.1.2.5	Pixel Pilot Module	0	0	0	0	0	0	115,000	35,000	150000
136	1.1.2.5.1	Pixel Digital Pilot ASIC	0	0	0	0	0	0	25,000	7,500	32500
137	1.1.2.5.1.1	PILOT ASIC design 1st round	0	0	0	0	0	0	0	0	0
138	1.1.2.5.1.2	PILOT ASIC 1st round fab	0	0	0	0	0	0	10,000	0	10000
139	1.1.2.5.1.3	PILOT ASIC final design	0	0	0	0	0	0	0	0	0
140	1.1.2.5.1.4	PILOT ASIC final production	0	0	0	0	0	0	15,000	7,500	22500
141	1.1.2.5.2	test of PILOT ASIC	0	0	0	0	0	0	30,000	2,500	32500
142	1.1.2.5.2.1	GOL test	0	0	0	0	0	0	10,000	0	10000
143	1.1.2.5.2.2	test board design	0	0	0	0	0	0	0	0	0
144	1.1.2.5.2.3	test of 1st round PILOT ASIC	0	0	0	0	0	0	10,000	0	10000
145	1.1.2.5.2.4	test of final PILOT ASIC	0	0	0	0	0	0	10,000	2,500	12500
146	1.1.2.5.3	PILOT module	0	0	0	0	0	0	60,000	25,000	85000
147	1.1.2.5.3.1	1st round pilot module design	0	0	0	0	0	0	0	0	0
148	1.1.2.5.3.2	1st round pilot module board fab	0	0	0	0	0	0	10,000	2,500	12500
149	1.1.2.5.3.3	1st round pilot module board test	0	0	0	0	0	0	10,000	2,500	12500
150	1.1.2.5.3.4	final pilot module design	0	0	0	0	0	0	0	0	0
151	1.1.2.5.3.5	final pilot module board fab	0	0	0	0	0	0	20,000	10,000	30000
152	1.1.2.5.3.6	Test of final pilot module	0	0	0	0	0	0	20,000	10,000	30000
153	1.1.2.6	Pixel FEM	0	0	0	0	0	0	292,500	72,500	365000
154	1.1.2.6.1	E&D of Pixel FEM	0	0	0	0	0	0	82,500	16,250	98750
155	1.1.2.6.1.1	1st round	0	0	0	0	0	0	50,000	0	50000
156	1.1.2.6.1.1.1	firmware	0	0	0	0	0	0	30,000	0	30000
157	1.1.2.6.1.1.2	circuit diagram	0	0	0	0	0	0	20,000	0	20000
158	1.1.2.6.1.2	final round	0	0	0	0	0	0	32,500	16,250	48750
159	1.1.2.6.1.2.1	firmware	0	0	0	0	0	0	22,500	11,250	33750

ID	WBS	Task Name	Generic R&D Fy05	Manpower	Material (loc. overhead +tax)	Additional Overhead	DOE Contingency	TPC DOE (with contingency)	RIKEN	RIKEN Contingency	RIKEN Total
160	1.1.2.6.1.2.2	circuit diagram	0	0	0	0	0	0	10,000	5,000	15000
161	1.1.2.6.2	PROTOTYPE of Pixel FEM	0	0	0	0	0	0	30,000	11,250	41250
162	1.1.2.6.2.1	1st round	0	0	0	0	0	0	15,000	3,750	18750
163	1.1.2.6.2.1.1	assembly	0	0	0	0	0	0	15,000	3,750	18750
164	1.1.2.6.2.1.2	testing	0	0	0	0	0	0	0	0	0
165	1.1.2.6.2.2	final round	0	0	0	0	0	0	15,000	7,500	22500
166	1.1.2.6.2.2.1	assembly	0	0	0	0	0	0	15,000	7,500	22500
167	1.1.2.6.2.2.2	testing	0	0	0	0	0	0	0	0	0
168	1.1.2.6.3	FABRICATION of Pixel FEM	0	0	0	0	0	0	180,000	45,000	225000
169	1.1.2.6.3.1	order	0	0	0	0	0	0	0	0	0
170	1.1.2.6.3.2	delivery	0	0	0	0	0	0	180,000	45,000	225000
171	1.1.2.6.3.3	test	0	0	0	0	0	0	0	0	0
172		MILESTONE - Pixel ladders ready for production	0	0	0	0	0	0	0	0	0
173	1.1.2.7	Prototype Pixel ladder (sensor+ROC+bus+pilot MCI	0	0	0	0	0	0	55,000	13,750	68750
174	1.1.2.7.1	Assembly Fixture	0	0	0	0	0	0	35,000	8,750	43750
175	1.1.2.7.1.1	Assembly fixture design	0	0	0	0	0	0	20,000	5,000	25000
176	1.1.2.7.1.2	Assembly fixture fab	0	0	0	0	0	0	15,000	3,750	18750
177	1.1.2.7.2	Prototype ladder	0	0	0	0	0	0	20,000	5,000	25000
178	1.1.2.7.2.1	assemble prototype ladder	0	0	0	0	0	0	10,000	2,500	12500
179	1.1.2.7.2.2	prototype ladder testing	0	0	0	0	0	0	10,000	2,500	12500
180		MILESTONE - Pixel Ladders assembled	0	0	0	0	0	0	0	0	0
181	1.1.2.8	final ladder production	0	0	0	0	0	0	95,000	30,000	125000
182	1.1.2.8.1	production	0	0	0	0	0	0	75,000	20,000	95000
183	1.1.2.8.1.1	1st PHENIX half ladder	0	0	0	0	0	0	5,000	2,500	7500
184	1.1.2.8.1.2	10 half ladder	0	0	0	0	0	0	10,000	2,500	12500
185	1.1.2.8.1.3	10 half ladder (total 20; 1st layer done)	0	0	0	0	0	0	10,000	2,500	12500
186	1.1.2.8.1.4	20 half ladder (total 40)	0	0	0	0	0	0	20,000	5,000	25000
187	1.1.2.8.1.5	20 half ladder (total 60; 2nd layer done)	0	0	0	0	0	0	20,000	5,000	25000
188	1.1.2.8.1.6	10 spare half ladders	0	0	0	0	0	0	10,000	2,500	12500
189	1.1.2.8.2	test production ladders	0	0	0	0	0	0	20,000	10,000	30000
190	1.1.2.9	Pixel Services, LV, racks etc	0	0	0	0	0	0	30,000	15,000	45000
191	1.2	DAQ	0	30,000	55000	7,650	23,163	115,813	68,500	17,125	85625
192	1.2.1	Strip DCM	0	30,000	55000	7,650	23,163	115,813	0	0	0
193	1.2.2	Pixel DCM	0	0	0	0	0	0	68,500	17,125	85625
194	1.3	ELECTRONICS SYSTEM INTEGRATION	0	375,000	0	0	187,500	562,500	0	0	0
195	1.3.1	oversight tasks	0	325,000	0	0	162,500	487,500	0	0	0
196	1.3.2	Environmental Safety & Compliance	0	50,000	0	0	25,000	75,000	0	0	0
197	1.4	AUXILLARY SYSTEMS & INTEGRATION	170000	790,500	551576	55,620	590,393	1,988,089	61,500	9,300	70800
198		MILESTONE - Completion of Specifications	0	0	0	0	0	0	0	0	0
199	1.4.1	Specifications	0	0	0	0	0	0	61,500	9,300	70800
200	1.4.1.1	E&D of Specifications	0	0	0	0	0	0	61,500	9,300	70800
201	1.4.1.1.1	1st Round	0	0	0	0	0	0	45,000	6,000	51000
202	1.4.1.1.1.1	specify heat load	0	0	0	0	0	0	15,000	3,000	18000
203	1.4.1.1.1.2	specify mechanical tolerances/distortions	0	0	0	0	0	0	15,000	3,000	18000
204	1.4.1.1.1.3	plan service routing	0	0	0	0	0	0	15,000	0	15000
205	1.4.1.1.2	2nd Round	0	0	0	0	0	0	16,500	3,300	19800
206	1.4.1.1.2.1	ladder	0	0	0	0	0	0	5,500	1,100	6600
207	1.4.1.1.2.2	support	0	0	0	0	0	0	5,500	1,100	6600
208	1.4.1.1.2.3	integration	0	0	0	0	0	0	5,500	1,100	6600
209		MILESTONE - Completion of Mechanical Structure	0	0	0	0	0	0	0	0	0
210	1.4.2	Mechanical Structure	170000	230,500	372500	54,270	220,180	877,450	0	0	0
211	1.4.2.1	Mechanical Structure R&D	110000	0	0	0	0	0	0	0	0
212	1.4.2.1.1	Engineering Design + Simulations	110000	0	0	0	0	0	0	0	0

ID	WBS	Task Name	Generic R&D Fy05	Manpower	Material (loc. overhead +tax)	Additional Overhead	DOE Contingency	TPC DOE (with contingency)	RIKEN	RIKEN Contingency	RIKEN Total
213	1.4.2.1.1.1	Ladder staves R&D	50000	0	0	0	0	0	0	0	0
214	1.4.2.1.1.2	Ladder Coolant tubes R&D	10000	0	0	0	0	0	0	0	0
215	1.4.2.1.1.3	Barrel Support R&D	0	0	0	0	0	0	0	0	0
216	1.4.2.1.1.4	Outer Stability R&D	50000	0	0	0	0	0	0	0	0
217	1.4.2.2	Cooling System	0	75,000	25000	9,000	44,963	153,963	0	0	0
218	1.4.2.2.1	Design	0	65,000	0	5,850	35,425	106,275	0	0	0
219	1.4.2.2.2	Procure	0	10,000	25000	3,150	9,538	47,688	0	0	0
220	1.4.2.2.2.1	Liaison	0	10,000	0	900	2,725	13,625	0	0	0
221	1.4.2.2.2.2	Material	0	0	25000	2,250	6,813	34,063	0	0	0
222	1.4.2.3	Outer Stability Structure	35000	40,000	120000	14,400	53,138	227,538	0	0	0
223	1.4.2.3.2	1st Round	35000	0	0	0	0	0	0	0	0
224	1.4.2.3.2.1	design+prototype	35000	0	0	0	0	0	0	0	0
225	1.4.2.3.3	2nd Round	0	30,000	5000	3,150	19,075	57,225	0	0	0
226	1.4.2.3.3.1	design+prototype	0	30,000	5000	3,150	19,075	57,225	0	0	0
227	1.4.2.3.4	procure	0	10,000	115000	11,250	34,063	170,313	0	0	0
228	1.4.2.3.4.1	Liaison	0	10,000	0	900	2,725	13,625	0	0	0
229	1.4.2.3.4.2	Tooling	0	0	45000	4,050	12,263	61,313	0	0	0
230	1.4.2.3.4.3	fabrication	0	0	50000	4,500	13,625	68,125	0	0	0
231	1.4.2.3.4.4	material	0	0	20000	1,800	5,450	27,250	0	0	0
232		MILESTONE - Completion of Mechanical Ladders	0	0	0	0	0	0	0	0	0
233	1.4.2.4	barrel ladder staves	25000	50,000	129000	16,110	62,403	257,513	0	0	0
234	1.4.2.4.1	1st Round ladder staves prototypes	25000	0	0	0	0	0	0	0	0
235	1.4.2.4.1.1	design+prototype of strip ladder	12500	0	0	0	0	0	0	0	0
236	1.4.2.4.1.2	design+prototype of pixel ladder	12500	0	0	0	0	0	0	0	0
237	1.4.2.4.2	2nd Round	0	40,000	10000	4,500	27,250	81,750	0	0	0
238	1.4.2.4.2.1	design+prototype strip ladder	0	20,000	5000	2,250	13,625	40,875	0	0	0
239	1.4.2.4.2.2	design+prototype pixel ladder	0	20,000	5000	2,250	13,625	40,875	0	0	0
240	1.4.2.4.3	procure strip ladders	0	5,000	69000	6,660	20,165	100,825	0	0	0
241	1.4.2.4.3.1	Liaison	0	5,000	0	450	1,363	6,813	0	0	0
242	1.4.2.4.3.2	Tooling	0	0	10000	900	2,725	13,625	0	0	0
243	1.4.2.4.3.3	fabrication	0	0	44000	3,960	11,990	59,950	0	0	0
244	1.4.2.4.3.4	material	0	0	15000	1,350	4,088	20,438	0	0	0
245	1.4.2.4.4	procure pixel ladders	0	5,000	50000	4,950	14,988	74,938	0	0	0
246	1.4.2.4.4.1	Liaison	0	5,000	0	450	1,363	6,813	0	0	0
247	1.4.2.4.4.2	Tooling	0	0	10000	900	2,725	13,625	0	0	0
248	1.4.2.4.4.3	fabrication	0	0	30000	2,700	8,175	40,875	0	0	0
249	1.4.2.4.4.4	material	0	0	10000	900	2,725	13,625	0	0	0
250	1.4.2.5	Barrel	0	47,500	62500	9,900	42,238	162,138	0	0	0
251	1.4.2.5.2	2nd Round	0	37,500	7500	4,050	24,525	73,575	0	0	0
252	1.4.2.5.2.1	design+prototype	0	37,500	7500	4,050	24,525	73,575	0	0	0
253	1.4.2.5.3	procure (barrel)	0	10,000	55000	5,850	17,713	88,563	0	0	0
254	1.4.2.5.3.1	Liaison	0	10,000	0	900	2,725	13,625	0	0	0
255	1.4.2.5.3.2	Tooling	0	0	20000	1,800	5,450	27,250	0	0	0
256	1.4.2.5.3.3	fabrication	0	0	25000	2,250	6,813	34,063	0	0	0
257	1.4.2.5.3.4	material	0	0	10000	900	2,725	13,625	0	0	0
258	1.4.2.6	ladder coolant tubes	0	18,000	36000	4,860	17,440	76,300	0	0	0
259	1.4.2.6.2	1st Round	0	8,000	2000	900	2,725	13,625	0	0	0
260	1.4.2.6.2.1	design+prototype	0	8,000	2000	900	2,725	13,625	0	0	0
261	1.4.2.6.3	2nd Round	0	8,000	2000	900	5,450	16,350	0	0	0
262	1.4.2.6.3.1	design+prototype	0	8,000	2000	900	5,450	16,350	0	0	0
263	1.4.2.6.4	procure	0	2,000	32000	3,060	9,265	46,325	0	0	0
264	1.4.2.6.4.1	Liaison	0	2,000	0	180	545	2,725	0	0	0
265	1.4.2.6.4.2	Tooling	0	0	5000	450	1,363	6,813	0	0	0

ID	WBS	Task Name	Generic R&D Fy05	Manpower	Material (loc. overhead +tax)	Additional Overhead	DOE Contingency	TPC DOE (with contingency)	RIKEN	RIKEN Contingency	RIKEN Total
266	1.4.2.6.4.3	fabrication	0	0	20000	1,800	5,450	27,250	0	0	0
267	1.4.2.6.4.4	material	0	0	7000	630	1,908	9,538	0	0	0
268		MILESTONE Decision to Procure mechanical ladders	0	0	0	0	0	0	0	0	0
269		MILESTONE Decision to Procure mechanical	0	0	0	0	0	0	0	0	0
270	1.4.2.7	Mechanical Task Out to Bid	0	0	0	0	0	0	0	0	0
271	1.4.2.7.1	ladders	0	0	0	0	0	0	0	0	0
272	1.4.2.7.2	support structures	0	0	0	0	0	0	0	0	0
273		MILESTONE - vtx ready for installation	0	0	0	0	0	0	0	0	0
274	1.4.3	Assembly of ladders onto barrel	0	45,000	43076	1,350	44,713	134,139	0	0	0
275	1.4.3.1	assembly jig for ladders onto barrel	0	15,000	17625	1,350	16,988	50,963	0	0	0
276	1.4.3.1.1	design jig	0	15,000	0	1,350	8,175	24,525	0	0	0
277	1.4.3.1.2	fabricate jig	0	0	17625	0	8,813	26,438	0	0	0
278	1.4.3.2	mount pixel ladders on barrel	0	7,500	9788	0	8,644	25,932	0	0	0
279	1.4.3.2.1	align + fix ladders	0	7,500	5288	0	6,394	19,182	0	0	0
280	1.4.3.2.2	test	0	0	4500	0	2,250	6,750	0	0	0
281	1.4.3.3	mount strip Ladders on barrel	0	7,500	9788	0	8,644	25,932	0	0	0
282	1.4.3.3.1	align + fix ladders	0	7,500	5288	0	6,394	19,182	0	0	0
283	1.4.3.3.2	test	0	0	4500	0	2,250	6,750	0	0	0
284	1.4.3.4	add outer stability structure barrel	0	15,000	5875	0	10,438	31,313	0	0	0
285	1.4.4	Infrastructure	0	110,000	118375	0	114,188	342,563	0	0	0
286	1.4.4.1	Installation+support	0	10,000	89000	0	49,500	148,500	0	0	0
287	1.4.4.1.1	Beam-pipe	0	10,000	6750	0	8,375	25,125	0	0	0
288	1.4.4.1.1.1	Procure Beam-pipe	0	0	0	0	0	0	0	0	0
289	1.4.4.1.1.2	Beam-pipe support	0	10,000	6750	0	8,375	25,125	0	0	0
290	1.4.4.1.4	Detector Support	0	0	82250	0	41,125	123,375	0	0	0
291	1.4.4.1.4.1	Detector Support in CM	0	0	58750	0	29,375	88,125	0	0	0
292	1.4.4.1.4.2	Installation Fixtures	0	0	23500	0	11,750	35,250	0	0	0
293	1.4.4.2	Services	0	100,000	29375	0	64,688	194,063	0	0	0
294	1.4.4.2.1	Rack Platforms	0	60,000	11750	0	35,875	107,625	0	0	0
295	1.4.4.2.2	Power+water services for IR, outside of IR	0	15,000	5875	0	10,438	31,313	0	0	0
296	1.4.4.2.3	preparation of IR region	0	25,000	11750	0	18,375	55,125	0	0	0
297	1.4.5	Installation	0	55,000	17625	0	36,313	108,938	0	0	0
298		IR Open Summer 07	0	0	0	0	0	0	0	0	0
299		IR close winter 07	0	0	0	0	0	0	0	0	0
300	1.4.5.1	Install vtx in inner region	0	10,000	0	0	5,000	15,000	0	0	0
301	1.4.5.1.1	Tech	0	5,000	0	0	2,500	7,500	0	0	0
302	1.4.5.1.2	survey	0	5,000	0	0	2,500	7,500	0	0	0
303	1.4.5.6	preops	0	45,000	17625	0	31,313	93,938	0	0	0
304	1.4.6	Mechanical system Integration	0	350,000	0	0	175,000	525,000	0	0	0
305	1.4.6.1	Mechanical System Engineer	0	300,000	0	0	150,000	450,000	0	0	0
306	1.4.6.1.1	oversight tasks	0	150,000	0	0	75,000	225,000	0	0	0
307	1.4.6.1.2	Design support from nosecone	0	70,000	0	0	35,000	105,000	0	0	0
308	1.4.6.1.3	Design installation fixtures	0	40,000	0	0	20,000	60,000	0	0	0
309	1.4.6.1.4	Environmental Safety & Compliance	0	20,000	0	0	10,000	30,000	0	0	0
310	1.4.6.1.5	supervise installation	0	20,000	0	0	10,000	30,000	0	0	0
311	1.4.6.2	Detailing/drawings	0	50,000	0	0	25,000	75,000	0	0	0
312	1.5	MANAGEMENT	0	40,000	0	3,600	21,800	65,400	0	0	0