

E.O. Lawrence Berkeley National Laboratory
GRETINA MONTHLY PROGRESS REPORT
February, 2005

I. DEPUTY CONTRACT PROJ. MGR. ASSESSMENT

1. TECHNICAL AND PROGRAMMATIC PROGRESS AND ACCOMPLISHMENTS

Following the Jan. 25 and 26 DOE review, we generated a path forward for a follow up review at DOE. We have developed a schedule to meet this goal and we are presently executing it.

Because of the increase in the Dollar/Euro exchange ratio, DOE has directed us to perform a cost “scrubbing” to identify possible sources of savings to move to detector procurement. We are presently reviewing all risk and contingency. We are also working to identify any cost savings we have incurred to January 2005 to also transfer to detector procurement.

Another important development during this month is that we have placed the order for detector module design.

2. ACTIONS

N/A

3. COST AND SCHEDULE STATUS

3.1 VARIANCE ANALYSIS AND PROJECT COST PERFORMANCE REPORTS

	<u>Sched</u>	<u>Act</u>	<u>Variance</u>
MIE	941.1	656.0	285.1
OPC	979.0	849.3	129.7

Variance Statement:

Primary component of the MIE variance is related to the Eurisys design contract (the \$159k lien does not show up yet in the LBNL Cost Browser), and Mechanical Design efforts being slowed awaiting data from the detector design, lower than planned travel costs for FY04 and FY05 and savings on Environmental reviews through Feb. 05.

Project Impact:

These variances do not impact the MIE completion.

Corrective Action:

Mechanical Design effort has been increased. The Eurisys contract has been placed. Travel and Environment costs are being reviewed.

3.2 MILESTONE STATUS

N/A

3.3 PROJECT CRITICAL PATH ANALYSIS

The critical path continues to be the production and delivery of the Detector Modules. The placement of the detector design order is very important to keep the critical path under control.

II. DETAIL SUBSYSTEM STATUS

A. WBS 1.1. Mechanical

WBS 1.1.2 Mechanical Design

Technical Progress/Accomplishments

We have identified that the dimensions of the conceptual design of the detector support structure will not fit the MSU site. We have reviewed the design and the resized of the hexapod slightly to provide a more generous fit in the space available at MSU. Don Lawton sent a 3D model of MSU's site to work from when reducing the hexapod.

We are developing finite element analysis (FEA) models of the quarter spheres.

We sent layout drawings of the GRETINA mechanical interface to the other sites. We had a meeting with Thomas Glasmacher of MSU to review this interface and he agrees with our suggestion. The interface is now being specified at the struts, either above them or below them. We will arrange a meeting with representatives from ORNL and ANL to review this interface design with them.

Also, we have devoted effort on the Risk Analysis needed for CD-2/3a.

Significant Issues/Actions

The mechanical team has generated a set of “envelop” dimensions for the detector module and we have sent this information to Eurisys for their review. We hope we will receive a feedback soon to progress on the mechanical structure design.

WBS 1.1 Variance Analysis (Cumulative To-date) (\$k)

<u>Sched</u>	<u>Act</u>	<u>Variance</u>
314.6	178.6	136.0

Variance Discussion

Variance is primarily related to design effort awaiting the design data from Eurisys, and lower costs for the LN system. The conceptual design continues to evolve.

B. WBS 1.2 Detector Module

WBS 1.2.1 Procurement

Technical Progress/Accomplishments

Analysis of the impact of the latest Eurisys proposal on both cost and schedule continues. We have received a new quotation with the price of seven detector modules. Eurisys has quoted a \$1.35 Dollar to Euro exchange ratio. In order to absorb this impact on exchange rate, DOE has directed us to perform a review of the cost and contingency of all GRETINA WBS elements. We are executing this task.

The procurement for the detector design was placed and Eurisys informed us that they already started work in this direction.

Significant Issues/Actions

N/A

WBS 1.2.2 Test/Characterize Module 1

Technical Progress/Accomplishments

Effort on the characterization of the triple detector cluster continued. The detector and readout electronics were moved back to the lab area (from the beam test area) and the pre-amplifier readout cables were rearranged.

Significant Issues/Actions

N/A

WBS 1.2 Variance Analysis (Cumulative To-date) (\$k)

<u>Sched</u>	<u>Act</u>	<u>Variance</u>
142.9	63.4	79.5

Variance Discussion

Detector Engineering and Test efforts have run lower cost than planned to-date. Also, we have saved money through utilization of freeware in development of the database software.

C. WBS 1.3 Electronics

WBS 1.3.1 Requirement Document

Technical Progress/Accomplishments

We have continued the revision of the Electronics Requirement document with members of ORNL, ANL and LBNL.

Significant Issues/Actions

N/A

WBS 1.3 Variance Analysis (Cumulative To-date) (\$k)

<u>Sched</u>	<u>Act</u>	<u>Variance</u>
9.2	6.9	2.3

Variance Discussion

We are now planning to have this document finalized in April.

D. WBS 1.4 Computing Systems

WBS 1.4.1 Requirement document

Technical Progress/Accomplishments

The first draft of the requirement document is done. Carl Lionberger and Mario Cromaz are requesting inputs from the GRETINA collaboration. We are now planning to finish this document in April.

Significant Issues/Actions

N/A

WBS 1.4 Variance Analysis (Cumulative To-date) (\$k)

<u>Sched</u>	<u>Act</u>	<u>Variance</u>
9.1	5.5	3.6

Variance Discussion

We are now planning to finish this document in April.

E. WBS 1.6 Project Management

WBS 1.6.1 Management

Technical Progress/Accomplishments

A day before the DOE review we received a detector module quotation from Eurisys with a substantial increase in the Dollar/Euro exchange ratio. Eurisys is using a \$1.35 Dollar to Euro exchange ratio. Based on this information, DOE has directed us to perform a cost “scrubbing” to identify possible sources of money savings to move to detector procurement and also, that we will have a follow up review in Washington.

We are working on these tasks. We have envisioned a schedule to generate the necessary documents and actions for the DOE follow up review. We have started the review of GRETINA’s risk and contingency estimates in an effort to free budget for the detector procurement. Also, we are working to identify any cost savings we have incurred to January 2005.

Significant Issues/Actions

N/A

WBS 1.6.2 General Project Expenses

Technical Progress/Accomplishments

N/A

Significant Issues/Actions

N/A

WBS 1.6 Variance Analysis (Cumulative To-date) (\$k)

<u>Sched</u>	<u>Act</u>	<u>Variance</u>
430.4	391.2	39.2

Variance Discussion

Travel costs are running under plan.

E. WBS 1.7 Environment, Safety and Health

WBS 1.7.1

Technical Progress/Accomplishments

Several members of the GRETINA team at LBNL participated in safety training on how to handle the high current capacity VME crates. This is a safety hazard, since the crate's low voltage power supply has more than 500W power capacity.

Significant Issues/Actions

N/A

WBS 1.7 Variance Analysis (Cumulative To-date) (\$k)

<u>Sched</u>	<u>Act</u>	<u>Variance</u>
34.8	10.3	24.5

Variance Discussion

Approximately half of this schedule money was assigned for reviews. We have held these reviews, but at a reduced cost due to the handling of planned oversight in the course of related divisional support.

III. Research and Development Status

Technical Progress/Accomplishments

Tests of the Prototype II refurbished detector continued. We have installed a new FET in a segment and we observed a ~5% improvement in the energy resolution.

Computing Systems has several activities progressing in parallel:

- a) Crystal/Crate readout computer implementation: The Crystal Event Builder was tested in the Linux environment using data from the in-beam test.
- b) Mario Cromaz worked with Jackie Scoggins (Unix support) to get firewire-connected to external disks. Mario began successfully backing up the data from the in-beam run to these disks late in the month.
- c) Mario continued work on signal decomposition algorithm.
- d) The LBNL's Unix support installed second shelf of our Network Appliance RAID system.

Significant Issues/Actions

N/A

R&D Variance Analysis (Cumulative To-date) (\$k)

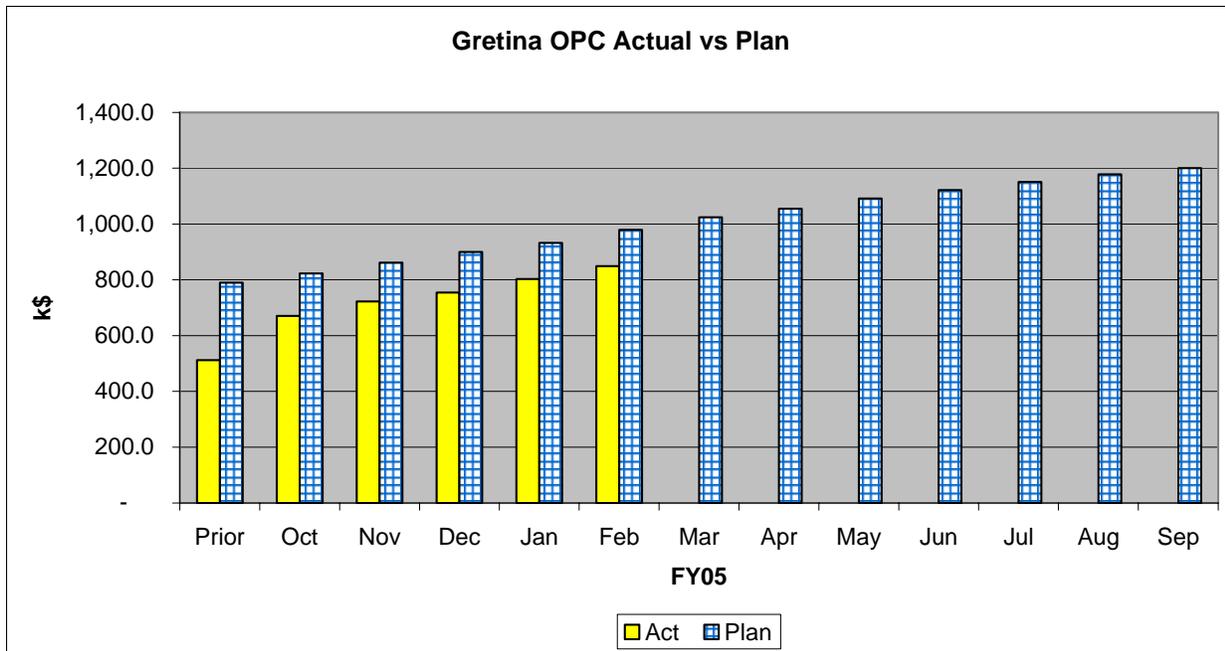
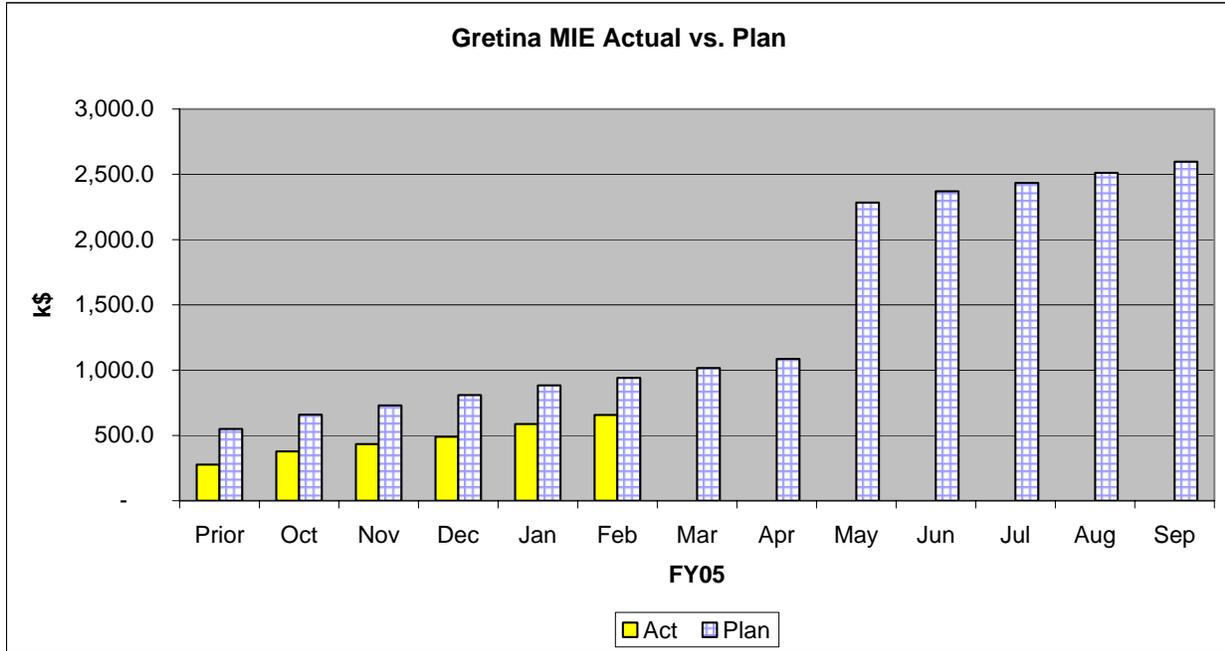
<u>Sched</u>	<u>Act</u>	<u>Variance</u>
979.0	849.3	129.7

Variance Discussion

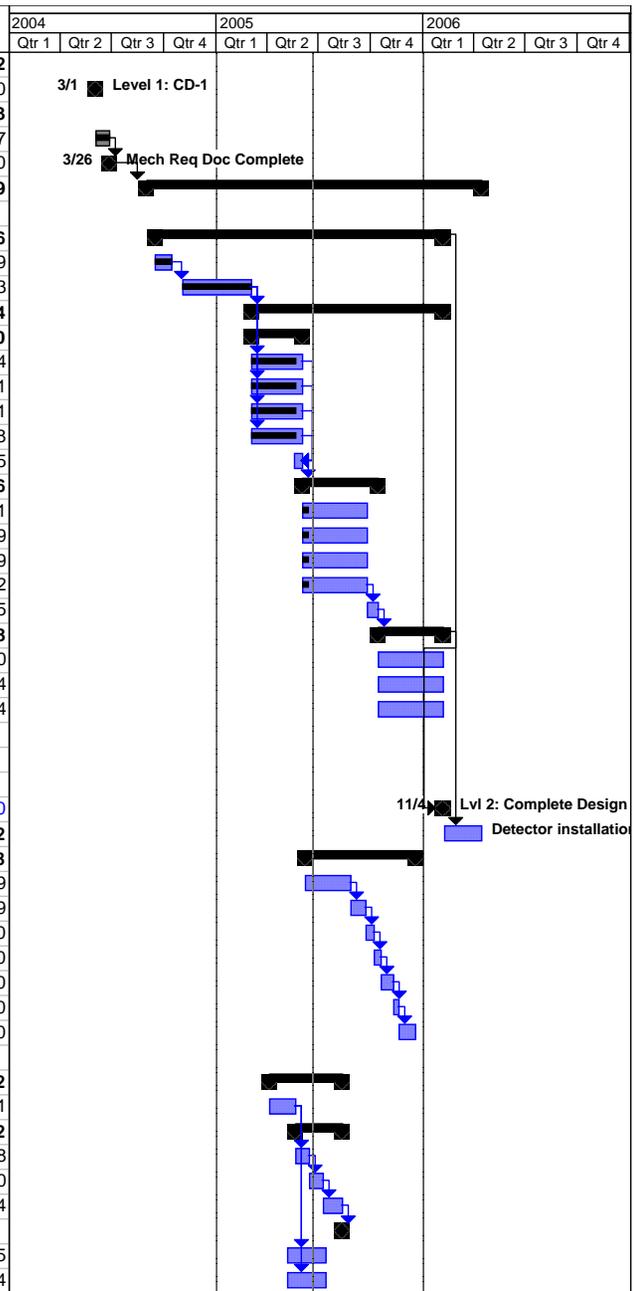
N/A

IV. Cost Chart

The above charts compare project-to-date budgeted cost with actual for the FY05 time period.



ID	Work breakdown	Task Name	% Comp	Start	Finish	Cost	2004				2005				2006				
							Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	
1	1	GRETINA	4.29	Wed 10/1/03	Mon 5/17/10	\$13,564,660.82													
2		Level 1: CD-1	0	Mon 3/1/04	Mon 3/1/04	\$0.00													
3	1.1	Mechanical	12	Mon 3/1/04	Fri 5/30/08	\$995,514.13													
4	1.1.1	Requirement document	100	Mon 3/1/04	Fri 3/26/04	\$9,065.97													
5		Mech Req Doc Complete	0	Fri 3/26/04	Fri 3/26/04	\$0.00													
6	1.1.2	Design	24.08	Tue 6/1/04	Wed 1/11/06	\$458,437.49													
7																			
8	1.1.2.1	Support structure	31.37	Tue 6/15/04	Fri 11/4/05	\$351,873.76													
9		Define requirements/spec	100	Tue 6/15/04	Tue 7/13/04	\$9,690.19													
10		Conceptual design to Nov	100	Mon 8/2/04	Tue 11/30/04	\$50,390.13													
11		New Design Schedule	17.24	Wed 12/1/04	Fri 11/4/05	\$291,793.44													
12		Conceptual Design	67.65	Wed 12/1/04	Mon 2/28/05	\$74,350.40													
13		Split Hemisphere	85	Wed 12/1/04	Mon 2/28/05	\$23,670.74													
14		Rotation System	85	Wed 12/1/04	Mon 2/28/05	\$14,794.21													
15		Translating Structure	85	Wed 12/1/04	Mon 2/28/05	\$14,794.21													
16		Site Interface	85	Wed 12/1/04	Mon 2/28/05	\$5,917.68													
17		Conceptual design review	0	Tue 2/15/05	Mon 2/28/05	\$15,173.55													
18		Final design	0	Tue 3/1/05	Tue 7/12/05	\$114,180.96													
19		Split Hemisphere	0	Tue 3/1/05	Thu 6/23/05	\$33,381.81													
20		Rotation System	0	Tue 3/1/05	Thu 6/23/05	\$27,312.39													
21		Translating Structure	0	Tue 3/1/05	Thu 6/23/05	\$27,312.39													
22		Site Interface	0	Tue 3/1/05	Thu 6/23/05	\$11,000.82													
23		Final design review	0	Fri 6/24/05	Tue 7/12/05	\$15,173.55													
24		Detail Dwgs	0	Wed 7/13/05	Fri 11/4/05	\$103,262.08													
25		Split Hemisphere	0	Wed 7/13/05	Fri 11/4/05	\$41,605.60													
26		Rotation System	0	Wed 7/13/05	Fri 11/4/05	\$30,828.24													
27		Translating Structure	0	Wed 7/13/05	Fri 11/4/05	\$30,828.24													
28																			
29																			
30																			
31		Level 2: Complete Design and Drawings of Me	0	Fri 11/4/05	Fri 11/4/05	\$0.00													
32	1.1.2.2	Detector installation tool	0	Mon 11/7/05	Wed 1/11/06	\$45,293.32													
33	1.1.2.3	Target chamber Washington Univ.	0	Mon 3/7/05	Fri 9/16/05	\$9,857.18													
34		Define requirements	0	Mon 3/7/05	Wed 5/25/05	\$4,928.59													
35		Design Specifications	0	Thu 5/26/05	Tue 6/21/05	\$4,928.59													
36		Conceptual design	0	Wed 6/22/05	Wed 7/6/05	\$0.00													
37		Conceptual design review	0	Thu 7/7/05	Mon 7/18/05	\$0.00													
38		Final design	0	Tue 7/19/05	Mon 8/8/05	\$0.00													
39		Final design review	0	Tue 8/9/05	Thu 8/18/05	\$0.00													
40		Detail Dwgs	0	Fri 8/19/05	Fri 9/16/05	\$0.00													
41																			
42	1.1.2.4	LN system	0	Mon 1/3/05	Wed 5/11/05	\$51,413.22													
43		Define requirements/specifications	0	Mon 1/3/05	Thu 2/17/05	\$10,289.41													
44		Mechanical	0	Fri 2/18/05	Wed 5/11/05	\$34,061.52													
45		Conceptual design	0	Fri 2/18/05	Mon 3/14/05	\$16,780.18													
46		Final design	0	Tue 3/15/05	Wed 4/6/05	\$12,266.00													
47		Detail Dwgs	0	Thu 4/7/05	Wed 5/11/05	\$5,015.34													
48																			
49		Electrical	0	Thu 2/3/05	Mon 4/11/05	\$3,260.25													
50		Computer control	0	Thu 2/3/05	Mon 4/11/05	\$3,802.04													



ID	Work breakdown	Task Name	% Comp	Start	Finish	Cost	2005				2006				2007		
							Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
51	1.1.3	Production	0	Thu 9/6/07	Fri 5/30/08	\$528,010.67											
85		Level 2: Mechanical Production Complete	0	Fri 5/30/08	Fri 5/30/08	\$0.00											
86	1.2	Detector Module	1.2	Mon 3/1/04	Thu 7/23/09	\$6,963,220.19											
87	1.2.1	Purchasing	0.02	Mon 10/11/04	Mon 2/2/09	\$6,537,301.43											
88	1.2.1.1	Write detector requirements and specs and procurement specs	30	Mon 10/11/04	Tue 4/26/05	\$5,059.43											
89		Write Detector requirements	0	Mon 10/11/04	Wed 1/5/05	\$0.00											
90		Detector Req Doc Complete	0	Wed 1/5/05	Wed 1/5/05	\$0.00											
91		Define interfaces	30	Thu 1/6/05	Fri 3/4/05	\$5,059.43											
92		Write procurement specification	0	Mon 3/7/05	Fri 4/8/05	\$0.00											
93																	
94		Receive bids	0	Mon 4/11/05	Fri 4/22/05	\$0.00											
95		LVL 1: CD 2/3A	0	Tue 4/26/05	Tue 4/26/05	\$0.00											
96	1.2.1.2	Detector Procurement	0	Mon 1/3/05	Mon 2/2/09	\$6,532,242.00											
97		Detector Design Contract	0	Mon 1/3/05	Tue 3/29/05	\$164,272.00											
98		FY05: Detector Module 1	0	Wed 5/11/05	Wed 6/28/06	\$1,170,970.00											
99		Procure detector module 1	0	Wed 5/11/05	Wed 5/11/05	\$1,143,000.00											
100		LVL 2: Award Detector Module Contract	0	Wed 5/11/05	Wed 5/11/05	\$0.00											
101		Delivery of module 1	0	Thu 5/12/05	Tue 6/27/06	\$0.00											
102		Flat Procurement Burden	0	Wed 6/28/06	Wed 6/28/06	\$27,970.00											
103		FY06: Detector Module 2 thru 3	0	Tue 9/12/06	Wed 8/29/07	\$1,765,000.00											
108		FY07: Detector Module 4 thru 6	0	Thu 8/30/07	Tue 8/19/08	\$2,574,000.00											
114		FY08: Detector Module 7	0	Wed 2/13/08	Mon 2/2/09	\$858,000.00											
118	1.2.2	Test/Characterize Module 1	24.57	Mon 3/1/04	Mon 9/11/06	\$333,505.92											
119	1.2.2.1	Detector Engineering and Test	12.56	Fri 10/1/04	Thu 12/22/05	\$250,130.11											
120		Detector Engineer (FY05)	26	Fri 10/1/04	Fri 9/30/05	\$67,704.77											
121		Detector Engineer (FY06)	0	Mon 10/3/05	Thu 12/22/05	\$43,156.55											
122		Detector Testing	9.93	Fri 10/1/04	Thu 12/22/05	\$139,268.78											
123	1.2.2.2	Develop test procedures and apparatus	100	Mon 3/1/04	Fri 12/10/04	\$35,448.17											
124		Develop test procedures	100	Mon 3/1/04	Fri 4/23/04	\$11,779.45											
125		Detector Test Procedures Complete	0	Fri 4/23/04	Fri 4/23/04	\$0.00											
126		Develop test software	100	Mon 4/26/04	Wed 9/29/04	\$15,994.16											
127		Determine energy and time resolution	0	Mon 4/26/04	Fri 5/21/04	\$0.00											
128		Noise analysis	0	Mon 5/24/04	Mon 6/21/04	\$0.00											
129		Pulse shape analysis	0	Tue 6/22/04	Tue 7/20/04	\$0.00											
130		Compare with simulation	0	Wed 7/21/04	Tue 8/17/04	\$0.00											
131		Interfaces	100	Wed 8/18/04	Wed 9/29/04	\$15,994.16											
132		Detector Test Software Complete	0	Wed 9/29/04	Wed 9/29/04	\$0.00											
133		Assemble test apparatus	100	Thu 9/30/04	Wed 10/13/04	\$7,674.56											
134		Tests and performance characterization	0	Thu 10/14/04	Fri 12/10/04	\$0.00											
135		Level 2: Detector Test Procedures and Apparatus Complete	0	Fri 12/10/04	Fri 12/10/04	\$0.00											
136	1.2.2.3	Develop database	31.46	Thu 7/1/04	Wed 9/28/05	\$47,927.64											
137		Define database requirements	100	Thu 7/1/04	Thu 7/15/04	\$1,370.93											
138		Define backup and recovery	100	Fri 7/16/04	Thu 8/12/04	\$13,709.28											
139		Select and procure package	0	Fri 8/13/04	Fri 9/10/04	\$12,795.33											
140		Customize System	0	Mon 9/13/04	Fri 10/8/04	\$13,873.79											
141		Confine support	0	Mon 10/11/04	Wed 9/28/05	\$6,178.32											

ID	Work reackdow	Task Name	% Comp	Start	Finish	Cost	2004				2005				2006					
							Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4		
142	1.2.2.4	Test/characterize Module 1	0	Wed 6/28/06	Mon 9/11/06	\$0.00														
147		Lvl 2: Test/Char. of Mod 1 Complete	0	Mon 9/11/06	Mon 9/11/06	\$0.00														
148	1.2.3	Test/Char Mod 2 thru 7	0	Tue 9/12/06	Thu 7/23/09	\$92,412.84														
190	1.3	Electronics	0.54	Wed 7/28/04	Tue 4/28/09	\$1,707,738.56														
191	1.3.1	Requirement document	100	Wed 7/28/04	Fri 7/15/05	\$9,177.21														
192																				
193	1.3.2	Electronics Prototype	0	Mon 10/3/05	Thu 6/21/07	\$677,918.76														
278	1.3.3	Electronics Production	0	Thu 9/6/07	Tue 4/28/09	\$1,020,642.59														
348	1.4	Computing Systems	0.65	Wed 10/1/03	Thu 3/26/09	\$1,340,291.26														
349	1.4.1	Requirement document	95	Mon 3/1/04	Fri 3/26/04	\$9,139.52														
350		Computing Req Doc Complete	0	Fri 3/26/04	Fri 3/26/04	\$0.00														
351	1.4.2	Prototype	0	Mon 10/3/05	Thu 6/28/07	\$327,707.72														
425	1.4.3	CS Production	0	Wed 10/1/03	Thu 3/26/09	\$1,003,444.02														
525	1.5	System Assembly	0	Thu 6/28/07	Thu 4/15/10	\$221,515.04														
578	1.6	Project Management	15.8	Mon 3/1/04	Mon 5/17/10	\$2,197,754.98														
579	1.6.1	Management	16.55	Mon 3/1/04	Mon 5/17/10	\$1,977,915.17														
580	1.6.1.1	Initial phase (FY04-FY05)	65.62	Mon 3/1/04	Fri 9/30/05	\$475,345.35														
581		Contractor Project Manager - FY04	100	Mon 3/1/04	Thu 9/30/04	\$40,653.79														
582		CPM - FY05	39.11	Fri 10/1/04	Fri 9/30/05	\$68,438.67														
583		Project Engineer - FY04	100	Mon 3/1/04	Thu 9/30/04	\$129,423.80														
584		Proj Engineer - FY05	41.89	Fri 10/1/04	Fri 9/30/05	\$157,532.46														
585		Project Control Analyst - FY04	100	Mon 3/1/04	Thu 9/30/04	\$29,713.10														
586		Project Controls Analyst - FY05	39.11	Fri 10/1/04	Fri 9/30/05	\$49,583.54														
587	1.6.1.2	Long term	0	Mon 10/3/05	Wed 9/30/09	\$1,020,651.03														
591	1.6.1.3	Final phase (~0.5 of FY10)	0	Thu 10/1/09	Mon 5/17/10	\$132,533.36														
596	1.6.1.4	Quality Assurance Manager	0	Tue 6/1/04	Tue 12/22/09	\$35,417.84														
597	1.6.1.5	Subsystem Managers	4.91	Mon 3/1/04	Fri 9/18/09	\$313,967.58														
598		Mechanical (Design)	39.81	Tue 6/1/04	Mon 3/27/06	\$38,685.78														
599		Mechanical (Production)	0	Tue 8/14/07	Thu 9/4/08	\$25,235.38														
600		Detector	0	Mon 3/1/04	Thu 9/3/09	\$0.00														
601		Electronics	0	Mon 8/1/05	Thu 8/13/09	\$114,777.50														
602		Computing Systems	0	Mon 8/1/05	Thu 8/13/09	\$125,241.52														
603		Systems assembly	0	Wed 4/29/09	Fri 9/18/09	\$10,027.40														
604	1.6.2	General Project Expenses	9.05	Mon 3/1/04	Wed 1/20/10	\$219,839.81														
619	1.7	Environment and Safety	10.47	Mon 3/1/04	Wed 9/16/09	\$138,626.67														
620	1.7.1	Perform safety analysis of all subsystems	11.37	Mon 3/1/04	Fri 2/27/09	\$127,590.55														
637	1.7.2	Conduct global safety review	0	Thu 9/10/09	Wed 9/16/09	\$11,036.11														