

LQCD-Ext II Cost Forecast - \$14 Million
(as of 09/10/2016)

Effort & Budget Summary

LEVEL OF EFFORT (FTE-vrs)

	<u>FY15</u>	<u>FY16</u>	<u>FY17</u>	<u>FY18</u>	<u>FY19</u>	<u>Total</u>
Site Management	0.50	0.50	0.70	0.60	0.60	
Steady-state Operations Support	6.14	5.38	4.44	3.83	3.24	
Deployment Planning	0.00	0.30	0.30	0.30	0.30	
Deployment Support	0.00	0.50	0.50	0.50	0.50	
Project Management	0.35	0.35	0.35	0.35	0.35	
Total	6.99	7.03	6.29	5.58	4.99	30.88

1,954,035 1,895,627 1,842,889 1,725,804 1,625,778

BUDGET (\$K)

	(closed) <u>FY15</u>	(allocated) <u>FY16</u>	<u>FY17</u>	<u>FY18</u>	<u>FY19</u>	<u>Total</u>
<i>Steady-state Operations</i>						
Personnel	1,543,737	1,451,490	1,546,717	1,450,697	1,346,617	7,339,258
Travel	11,000	11,000	11,000	11,000	11,000	55,000
M&S (hardware, repairs, etc.)	281,000	297,786	146,000	120,000	120,000	964,786
Sub-total (SS Ops)	1,835,737	1,760,276	1,703,717	1,581,697	1,477,617	8,359,044
<i>New Hardware Deployment</i>						
Personnel	-	198,800	204,444	277,829	215,398	896,471
Travel	-	-	-	-	-	-
Equipment (compute)	495,000	992,175	779,171	825,323	986,897	4,078,565
Equipment (storage)	60,000	50,359	86,575	71,767	85,817	354,518
Sub-total (New Deployment)	-	1,241,334	1,070,189	1,174,919	1,288,112	5,329,554
<i>Project Management</i>						
Personnel	110,298	127,351	131,172	135,107	139,160	643,089
Travel	6,000	6,000	6,000	7,000	7,000	32,000
M&S	2,000	2,000	2,000	2,000	2,000	10,000
Sub-total (Project Mgmt)	118,298	135,351	139,172	144,107	148,160	685,089
<i>Total Project Cost</i>						
Personnel	1,654,035	1,777,641	1,882,333	1,863,633	1,701,176	8,878,818
Travel	17,000	17,000	17,000	18,000	18,000	87,000
M&S	283,000	299,786	148,000	122,000	122,000	974,786
Equipment (compute)	495,000	992,175	779,171	825,323	986,897	4,078,565
Equipment (storage)	60,000	50,359	86,575	71,767	85,817	354,518
Management Reserve	45,964	83,039	86,920	99,276	86,113	401,312
Total	2,555,000	3,220,000	2,999,999	2,999,999	3,000,003	14,774,999
CD-2/3 Budget Guidance Profile	2,000,000	3,000,000	3,000,000	3,000,000	3,000,000	14,000,000
Additional funding for larger budget	555,000	220,000	-	-	-	775,000
Total CD-2/3 Planning Budget Profile	2,555,000	3,220,000	3,000,000	3,000,000	3,000,000	14,775,000
<i>Difference between budget and guidance</i>	(0)	(0)	(1)	(1)	3	(1)
<i>Compute hardware portion of difference</i>	(0)	(0)	(1)	(1)	2	

Notes:

- 1) Management reserve set at 20% of unspent deployment personnel budget and 3% of unspent steady-state ops personnel budget.
- 2) CD-1 planning guidance profile has been provided for a \$14M budget.
- 3) CD-2/3 budget profile has been set for a \$14M budget.
- 4) FY15 Cost Accounting: Carry-over from past project assigned to FY15 and remainder to FY16

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Level of Effort Summary, by Site

LEVEL OF EFFORT (FTE-yrs)

	<u>FY15</u>	<u>FY16</u>	<u>FY17</u>	<u>FY18</u>	<u>FY19</u>	<u>Total</u>
Brookhaven						
Site Management	0.10	0.10	0.30	0.20	0.20	
Steady-state Operations Support (BG/Q)	0.40	0.40	0.40	-	-	
Steady-state Operations Support (Cluster)	-	-	0.99	1.10	1.10	
Deployment Planning	-	-	0.30	-	-	
Deployment Support	-	-	0.50	-	-	
Project Management	-	-	-	-	-	
Sub-total (BNL)	0.50	0.50	2.49	1.30	1.30	6.08
Fermilab						
Site Management	0.20	0.20	0.20	0.20	0.20	
Steady-state Operations Support	2.70	2.58	2.11	2.04	1.84	
Deployment Planning	-	-	-	0.30	-	
Deployment Support	-	-	-	0.50	-	
Project Management	0.35	0.35	0.35	0.35	0.35	
Sub-total (FNAL)	3.25	3.13	2.66	3.39	2.39	14.83
	2.90	2.78	2.31	3.04	2.04	
Thomas Jefferson National Accelerator Facility						
Site Management	0.20	0.20	0.20	0.20	0.20	
Steady-state Operations Support	3.04	2.40	1.93	1.79	1.39	
Deployment Planning	-	0.30	-	-	0.30	
Deployment Support	-	0.50	-	-	0.50	
Project Management	-	-	-	-	-	
Sub-total (JLab)	3.24	3.40	2.13	1.99	2.39	13.15
Total						
Site Management	0.50	0.50	0.70	0.60	0.60	
Steady-state Operations Support	6.14	5.38	4.44	3.83	3.24	
Deployment Planning	-	0.30	0.30	0.30	0.30	
Deployment Support	-	0.50	0.50	0.50	0.50	
Project Management	0.35	0.35	0.35	0.35	0.35	
Total	6.99	7.03	6.29	5.58	4.99	30.88
	6.64	6.68	5.94	5.23	4.64	

Total agrees with TPC Summary? Yes Yes Yes Yes Yes

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Brookhaven National Laboratory

LEVEL OF EFFORT (FTEs)	BG/Q+Cluster					Total
	FY15	FY16	FY17	FY18	FY19	
Site Management	0.10	0.10	0.30	0.20	0.20	0.90
Steady-state Operations Support (BG/Q)	0.40	0.40	0.40	-	-	1.20
Steady-state Operations Support (Cluster)	-	-	0.99	1.10	1.10	3.18
Deployment Planning	-	-	0.30	-	-	0.30
Deployment Support	-	-	0.50	-	-	0.50
Project Management	-	-	-	-	-	-
Total	0.50	0.50	2.49	1.30	1.30	6.08

BUDGET	<i>This FY15 column has not been updated with actuals</i>					Total
	(closed) FY15	(allocated) FY16	FY17	FY18	FY19	
Steady-state Operations						
Personnel	76,482	78,776	397,967	312,684	322,065	1,187,974
Site Management	17,510	18,035	89,131	61,203	63,039	248,919
Operations Support	58,972	60,741	308,836	251,481	259,026	939,055
Travel	3,000	3,000	3,000	3,000	3,000	15,000
M&S	201,000	201,000	66,000	40,000	40,000	548,000
(Hardware, repairs, spares, tapes, etc.)	20,000	20,000	35,000	40,000	40,000	
IBM BG/Q Maintenance; FY17 BG/Q Parts	181,000	181,000	31,000	-	-	393,000
Total (Steady-state Ops)	280,482	282,776	466,967	355,684	365,065	1,750,974
New Hardware Deployment						
Personnel	-	-	204,444	-	-	204,444
Deployment Planning	-	-	93,075	-	-	93,075
Deployment Support	-	-	111,369	-	-	111,369
Travel	-	-	-	-	-	-
Equipment (compute)	-	-	779,171	-	-	779,171
Equipment (storage)	-	-	51,945	-	-	51,945
Total (New Deployment)	-	-	1,035,560	-	-	1,035,560
Project Management						
Personnel	-	-	-	-	-	-
Travel	-	-	-	-	-	-
M&S	-	-	-	-	-	-
Total (Project Mgmt)	-	-	-	-	-	-
Total Site Allocation						
Personnel	76,482	78,776	602,411	312,684	322,065	1,392,418
Travel	3,000	3,000	3,000	3,000	3,000	15,000
M&S	201,000	201,000	66,000	40,000	40,000	548,000
Equipment	-	-	831,115	-	-	831,115
Total	280,482	282,776	1,502,526	355,684	365,065	2,786,534

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Fermilab

LEVEL OF EFFORT (FTEs)

	FY15	FY16	FY17	FY18	FY19	Total
Site Management	0.20	0.20	0.20	0.20	0.20	
Steady-state Operations Support	2.70	2.58	2.11	2.04	1.84	
Deployment Planning	-	-	-	0.30	-	
Deployment Support	-	-	-	0.50	-	
Project Management	0.35	0.35	0.35	0.35	0.35	
Total	3.25	3.13	2.66	3.39	2.39	14.83

BUDGET

This FY15 column has not been updated with actuals

	(closed) FY15	(allocated) FY16	FY17	FY18	FY19	Total
Steady-state Operations						
Personnel	744,828	853,525	718,050	718,984	676,876	3,712,263
Site Management	59,896	76,486	78,781	81,144	83,579	379,886
Operations Support	684,932	777,039	639,269	637,840	593,298	3,332,377
Travel	5,000	5,000	5,000	5,000	5,000	25,000
M&S (hardware, repairs, tape, etc.)	40,000	56,786	40,000	40,000	40,000	216,786
Total (Steady-state Ops)	789,828	915,311	763,050	763,984	721,876	3,954,049
New Hardware Deployment						
Personnel	-	-	-	277,829	-	277,829
Deployment Planning	-	-	-	121,716	-	121,716
Deployment Support	-	-	-	156,112	-	156,112
Travel	-	-	-	-	-	-
M&S (compute hardware)	-	-	-	825,323	-	825,323
M&S (storage hardware)	-	-	17,315	53,825	21,454	92,595
Total (New Deployment)	-	-	17,315	1,156,977	21,454	1,195,746
Project Management						
Personnel	110,298	127,351	131,172	135,107	139,160	643,089
Travel	6,000	6,000	6,000	7,000	7,000	32,000
M&S	2,000	2,000	2,000	2,000	2,000	10,000
Total (Project Mgmt)	118,298	135,351	139,172	144,107	148,160	685,089
Total Site Allocation						
Personnel	855,126	980,876	849,222	1,131,920	816,037	4,633,181
Travel	11,000	11,000	11,000	12,000	12,000	57,000
M&S (SS Ops)	42,000	58,786	42,000	42,000	42,000	226,786
M&S (DME)	-	-	17,315	879,148	21,454	917,917
Total	908,126	1,050,662	919,537	2,065,068	891,491	5,834,884

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Thomas Jefferson National Accelerator Facility

LEVEL OF EFFORT (FTE-yrs)

	FY15	FY16	FY17	FY18	FY19	Total
Site Management	0.20	0.20	0.20	0.20	0.20	
Steady-state Operations Support	3.04	2.40	1.93	1.79	1.39	
Deployment Planning	-	0.30	-	-	0.30	
Deployment Support	-	0.50	-	-	0.50	
Project Management	-	-	-	-	-	
Total	3.24	3.40	2.13	1.99	2.39	13.15

BUDGET

This FY15 column has not been updated with actuals

	FY15 (closed)	FY16 (allocated)	FY17	FY18	FY19	Total
Steady-state Operations						
Personnel	702,994	519,189	430,700	419,029	347,676	2,419,589
Site Management	71,070	58,400	60,152	61,957	63,815	315,394
Operations Support	631,924	460,789	370,548	357,072	283,861	2,104,195
Travel	3,000	3,000	3,000	3,000	3,000	15,000
M&S (hardware, repairs, tape, etc.)	40,000	40,000	40,000	40,000	40,000	200,000
Total (Steady-state Ops)	745,994	562,189	473,700	462,029	390,676	2,634,589
New Hardware Deployment						
Personnel	-	198,800	-	-	215,398	414,198
Deployment Planning	-	103,800	-	-	113,425	217,225
Deployment Support	-	95,000	-	-	101,973	196,973
Travel	-	-	-	-	-	-
M&S (compute hardware)	-	992,175	-	-	986,897	1,979,072
M&S (storage hardware)	-	50,359	17,315	17,942	64,363	149,979
Total (New Deployment)	-	1,241,334	17,315	17,942	1,266,658	2,543,248
Project Management						
Personnel	-	-	-	-	-	-
Travel	-	-	-	-	-	-
M&S	-	-	-	-	-	-
Total (Project Mgmt)	-	-	-	-	-	-
Total Site Allocation						
Personnel	702,994	717,989	430,700	419,029	563,074	2,833,787
Travel	3,000	3,000	3,000	3,000	3,000	15,000
M&S (SS Ops)	40,000	40,000	40,000	40,000	40,000	200,000
M&S (DME)	-	1,042,534	17,315	17,942	1,051,260	2,129,050
Total	745,994	1,803,523	491,015	479,971	1,657,334	5,177,837

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Management Reserve

Baseline management reserve is set at a % of the steady-state operations personnel budget plus a % of the new hardware deployment personnel budget.	
% of steady-state ops budget	3%
% of new hardware deployment budget	20%

<u>Reference Values (from TPC Summary)</u>	<u>FY15</u>	<u>FY16</u>	<u>FY17</u>	<u>FY18</u>	<u>FY19</u>	<u>Total</u>
Steady-state Operations Personnel Budget	1,543,737	1,451,490	1,546,717	1,450,697	1,346,617	7,339,258
New Hardware Deployment Personnel Budget	-	198,800	204,444	277,829	215,398	896,471
<u>Management Reserve Budget</u>	<u>FY15</u>	<u>FY16</u>	<u>FY17</u>	<u>FY18</u>	<u>FY19</u>	<u>Total</u>
Baseline Budget	46,312	83,305	87,290	99,087	83,478	399,472
Adjustments						
-- Adjustment in management reserve to balance the budget to the guidance	(17,597)					(17,597)
-- 07/01/14 adjustment to offset reduction in JLab salary support correlating with node count adjustment	17,249	(244)	(254)	(194)		16,557
-- 07/01/14 adjustment to offset salary adjustments due to change in hardware split from 60:40 to 50:50.	-	(22)	(116)	383	2,635	2,880
TOTAL	<u>45,964</u>	<u>83,039</u>	<u>86,920</u>	<u>99,276</u>	<u>86,113</u>	<u>401,312</u>

