

**06-SC-01, 12 GeV CEBAF Upgrade, Thomas Jefferson National Accelerator Facility
Newport News, Virginia
Project Data Sheet is for PED/Construction**

1. Significant Changes

This Project Data Sheet (PDS) is an update of the FY 2009 PDS.

The most recent DOE O 413.3A approved Critical Decision (CD) is CD-3, Approve Start of Construction, which was signed on September 15, 2008, with a Total Project Cost (TPC) of \$310,000,000. Construction was authorized to begin under the FY 2009 Continuing Resolution at FY 2008 funding levels. In March 2009, the project received funding from the American Recovery and Reinvestment Act of 2009 (ARRA) that advances a portion of future FY 2010 and FY 2011 appropriations. The funding is anticipated to reduce project risks. There have been no changes in project scope, cost, or schedule since the project was baselined. There is one high risk and three moderate risks associated with this project, each with a mitigation plan to achieve successful completion. A Federal Project Director (FPD) with certification Level III was assigned to this project as required.

2. Design, Construction, and D&D Schedule^a

(fiscal quarter or date)

	CD-0	CD-1	PED Complete	CD-2	CD-3	CD-4	D&D Start	D&D Complete
FY 2007	03/31/2004	1Q 2007	4Q 2009	4Q 2007	4Q 2008	1Q 2014	N/A	N/A
FY 2008	03/31/2004	2/14/2006 ^a	4Q 2009	4Q 2007	4Q 2008	1Q 2015	N/A	N/A
FY 2009	03/31/2004	2/14/2006	4Q 2009	11/09/2007	4Q 2008	3Q 2015	N/A	N/A
FY 2010	03/31/2004	2/14/2006	4Q 2009	11/09/2007	09/15/2008	3Q 2015	N/A	N/A

CD-0 – Approve Mission Need

CD-1 – Approve Alternative Selection and Cost Range

CD-2 – Approve Performance Baseline

CD-3 – Approve Start of Construction

CD-4 – Approve Start of Operations or Project Closeout D&D Start – Start of Demolition & Decontamination (D&D) work

D&D Complete –Completion of D&D work

^a CD-1 was approved on 2/14/2006. Engineering and design activities started in 4Q FY 2006 after Congress approved the Department of Energy’s request to reprogram \$500,000 within the FY 2006 funding for Nuclear Physics, per direction contained in H.Rpt 109–275.

3. Baseline and Validation Status

(dollars in thousands)

	TEC, PED	TEC, Construction	TEC, Total	OPC Except D&D	OPC, D&D	OPC, Total	TPC
FY 2007	21,000	TBD	TBD	11,000	TBD	TBD	TBD
FY 2008	21,000	TBD	TBD	10,500	TBD	TBD	TBD
FY 2009	21,000	266,500	287,500	22,500	N/A	22,500	310,000
FY 2010	21,000	266,500	287,500	22,500	N/A	22,500	310,000 ^a

4. Project Description, Justification, and Scope

The Continuous Electron Beam Accelerator Facility (CEBAF) at the Thomas Jefferson National Accelerator Facility, or Jefferson Laboratory, is today the world-leading facility in the experimental study of hadronic matter. An energy upgrade of CEBAF has been identified by the nuclear science community as a compelling scientific opportunity that should be pursued. In particular, the Nuclear Science Advisory Committee (NSAC) stated in the 1996 Long Range Plan that "...the community looks forward to future increases in CEBAF's energy, and to the scientific opportunities that would bring." In the 2007 Long Range Plan, NSAC concluded that completion of the 12 GeV CEBAF Upgrade project was the highest priority for the Nation's nuclear science program.

- The 12 GeV CEBAF Upgrade directly supports the Nuclear Physics mission and addresses the objective to measure properties of the proton, neutron, and simple nuclei for comparison with theoretical calculations to provide an improved quantitative understanding of their quark substructure. The upgrade is identified as a near-term priority in the Office of Science Twenty-Year Outlook.

The scope of the project includes upgrading the electron energy capability of the main accelerator from 6 GeV to 12 GeV, building a new experimental hall (Hall D) and associated beam-line, and enhancing the capabilities of the existing experimental halls to support the most compelling nuclear physics research.

Key Performance Parameters to achieve CD-4, *Approve Start of Operations or Project Closeout*, are phased around the accelerator and conventional facilities (CD-4A) and the experimental equipment in Halls B, C, and D (CD-4B). The deliverables defining completion are identified in the Project Execution Plan and have not changed since CD-2. Mitigation plans exist to help ensure that the one high risk associated with the breadth of the vendor pool for the cryogenics work required and three moderate risks associated with the unforeseen technical problems with the superconducting magnets in two experimental Halls and the fabrication of the Silicon Vertex Tracker will not impact the planned completion dates.

^a The Governor of Virginia signed House Bill 1600, the appropriation bill amending the 2008-2010 biennial budget for the Commonwealth of Virginia on March 30, 2009, which provided "\$6,000,000 for Jefferson Science Associates, LLC to leverage a federal investment of \$310 million for an upgrade of the Jefferson Lab's research facilities, which will maintain its leadership in the study of nuclear physics and secure the benefits of such a facility for the Commonwealth." This funding will be paid in \$500,000 monthly increments beginning in July 2009. It is anticipated that this funding will reduce project cost risks and schedule risks and help ensure timely completion of the project. The SC Office of Project Assessment's annual review planned for September 21, 2009, will evaluate any adjustments to the federal government's share of the TPC as a result of the funding from the Commonwealth of Virginia.

The project is being conducted in accordance with the project management requirements in DOE O 413.3A, *Program and Project Management for the Acquisition of Capital Assets*, and all appropriate project management requirements have been met.

5. Financial Schedule

(dollars in thousands)

	Appropriations	Obligations	Recovery Act Costs	Costs
Total Estimated Cost (TEC)				
PED				
FY 2006	500	500	—	88
FY 2007	7,000	7,000	—	6,162
FY 2008	13,377 ^a	13,377	—	9,108
FY 2009	123 ^a	123	—	5,642
Total, PED	21,000	21,000	—	21,000
Construction				
FY 2009	28,500	28,500	—	2,878
FY 2009 Recovery Act	65,000	65,000	12,520	—
FY 2010	22,000	22,000	32,200	29,000
FY 2011	34,000	34,000	14,485	29,000
FY 2012	66,000	66,000	4,400	58,622
FY 2013	40,500	40,500	1,395	53,000
FY 2014	10,500	10,500	—	26,500
FY 2015	—	—	—	2,500
Total, Construction	266,500	266,500	65,000	201,500
TEC				
FY 2006	500	500	—	88
FY 2007	7,000	7,000	—	6,162
FY 2008	13,377	13,377	—	9,108
FY 2009	28,623	28,623	—	8,520
FY 2009 Recovery Act	65,000	65,000	12,520	—
FY 2010	22,000	22,000	32,200	29,000
FY 2011	34,000	34,000	14,485	29,000
FY 2012	66,000	66,000	4,400	58,622
FY 2013	40,500	40,500	1,395	53,000
FY 2014	10,500	10,500	—	26,500
FY 2015	—	—	—	2,500
Total, TEC	287,500	287,500	65,000	222,500

^a The baseline FY 2008 PED funding was reduced by \$123,000 as a result of the FY 2008 rescission. This reduction is restored in FY 2009 to maintain the TEC and project scope.

(dollars in thousands)

Appropriations	Obligations	Recovery Act Costs	Costs
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Other Project Cost (OPC)

OPC except D&D

FY 2004	700	700	—	77
FY 2005	2,300	2,300	—	2,142
FY 2006	4,000	4,000	—	3,508
FY 2007	2,500	2,500	—	2,751
FY 2008	1,000	1,000	—	1,802
FY 2009	—	—	—	220
FY 2013	2,500	2,500	—	2,400
FY 2014	7,500	7,500	—	7,000
FY 2015	2,000	2,000	—	2,600
Total, OPC	22,500	22,500	—	22,500

Total Project Cost

FY 2004	700	700	—	77
FY 2005	2,300	2,300	—	2,142
FY 2006	4,500	4,500	—	3,596
FY 2007	9,500	9,500	—	8,913
FY 2008	14,377	14,377	—	10,910
FY 2009	28,623	28,623	—	8,740
FY 2009 Recovery Act	65,000	65,000	12,520	—
FY 2010	22,000	22,000	32,200	29,000
FY 2011	34,000	34,000	14,485	29,000
FY 2012	66,000	66,000	4,400	58,622
FY 2013	43,000	43,000	1,395	55,400
FY 2014	18,000	18,000	—	33,500
FY 2015	2,000	2,000	—	5,100
Total, TPC	310,000	310,000	65,000	245,000

6. Details of Project Cost Estimate

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Estimate
Total Estimated Cost (TEC)			
Design (PED)			
Design	20,150	19,200	19,200
Contingency	850	1,800	1,800
Total, PED (PED no. 06-SC-01)	21,000	21,000	21,000
Construction Phase			
Civil Construction	29,290	27,450	27,450
Accelerator/ Experimental Equipment	171,810	174,150	174,150
Contingency	65,400	64,900	64,900
Total, Construction	266,500	266,500	266,500
Total, TEC	287,500	287,500	287,500
Contingency, TEC	66,250	66,700	66,700
Other Project Cost (OPC)			
OPC except D&D			
Conceptual Design	3,445	3,500	3,500
R&D	7,020	6,400	6,400
Start-up	7,385	7,450	7,450
Contingency	4,650	5,150	5,150
Total, OPC	22,500	22,500	22,500
Contingency, OPC	4,650	5,150	5,150
Total, TPC	310,000	310,000	310,000
Total, Contingency	70,900	71,850	71,850

7. Schedule of Project Costs

For schedule of project costs, see Section 5, "Financial Schedule."

8. Related Operation and Maintenance Funding requirements

Start of Operation or Beneficial Occupancy (fiscal quarter or date)	3Q FY 2015
Expected Useful Life (number of years)	15
Expected Future start of D&D for new construction (fiscal quarter)	N/A

(Related Funding requirements)

(dollars in thousands)

	Annual Costs		Life cycle costs	
	Current Total Estimate	Previous Total Estimate	Current Total Estimate	Previous Total Estimate
Total Project Costs	N/A	N/A	310,000	310,000
Operations	150,000	150,000	2,250,000 ^a	2,250,000 ^a
Maintenance	Included above	Included above	Included above	Included above
Total, Operations & Maintenance	150,000	150,000	2,560,000	2,560,000

9. Required D&D Information

	Square Feet
Area of new construction	31,500
Area of existing facility(ies) being replaced	N/A
Area of any additional D&D space to meet the “one-for-one” requirement	31,500

The “one-for-one” requirement is met by offsetting 31,500 square feet of the 80,000 square feet of banked space that was granted to TJNAF in a Secretarial waiver.

10. Acquisition Approach

The Acquisition Strategy was approved in 2Q FY 2006 with CD-1 approval. All acquisitions will be managed by Jefferson Science Associates with appropriate Department of Energy oversight. Cost, schedule and technical performance will be monitored using an earned-value process that is described in the Jefferson Lab Project Control System Manual. The procurement practice is to use firm fixed-price purchase orders and subcontracts for supplies, equipment and services, and to make awards through competitive solicitations. Project and design management, inspection, coordination, tie-ins, testing and checkout witnessing, and acceptance will be performed by TJNAF and A-E subcontractors as appropriate.

^a The total operations and maintenance (O&M) is estimated at an average annual cost of ~\$150,000,000 (including escalation) over 15 years. Almost 90% of the O&M cost would still have been required had the existing accelerator not been upgraded and instead continued operations at 6 GeV.