

*Department of Energy
Review Committee Report*

for the

Technical, Cost, Schedule, and
Management Review

of the

**TECHNOLOGY and
ENGINEERING
DEVELOPMENT FACILITY
(TEDF)**

September 2009

EXECUTIVE SUMMARY

A Department of Energy (DOE) Office of Science (SC) review of the Technology and Engineering Development Facility (TEDF) project was conducted at Thomas Jefferson National Accelerator Facility (TJNAF) during September 29-30, 2009, at the request of Mr. Marcus E. Jones, Associate Director of Science for the Office of Safety, Security and Infrastructure. The purpose of the review was to evaluate project readiness to establish a performance baseline and begin the final design.

Overall, the project has made significant progress since the September 2008 DOE/SC review of CD-1, Approve Alternative Analysis and Cost Range. Preliminary design meets the key performance parameters. The construction cost estimate is well supported, and cost contingency is sufficient at this stage. However, additional schedule contingency should be considered, as project completion is dependent on the 12 GeV and Relocation projects. Additionally, the Construction Management/General Contractor (CM/GC) contract is needed to validate the project schedule. As a consequence, the Committee recommended approval of Critical Decision (CD) 2, Performance Baseline, after the CM/GC contract is awarded and review recommendations are addressed.

Technically, the design has reached the 35 percent level. Buildings are designed to achieve Leadership in Energy and Environmental Design (LEED) Gold certification. Early construction is planned to deliver limited operations before the project is completed.

The cost for the overall effort remains unchanged at \$73.2 million, which includes \$12.2 million of contingency (approximately 20.6 percent of the Estimate-to-Complete). The cost estimate is well substantiated by Independent Cost Estimate and Architect/Engineering cost estimates, which differ by only three percent.

In general, the project is properly managed for successful execution. There is strong support and leadership from the Laboratory Director and the Project Management Team. The Integrated Project Team is effectively managing issues. The CD-4 was accelerated by three quarters to first quarter 2014, due to an improved funding profile.

Environmental, Safety, Health and Quality (ESH&Q) programs are appropriate for this stage of the project and support CD-2. National Environmental Policy Act and project documentation are complete.

Below summarizes major recommendations:

- Consider adding additional schedule contingency due to interface risks from the 12 GeV project and Superconducting Radio Frequency manufacturing operations before CD-2.
- Add indirect resources to the project schedule prior CD-2.
- Approve CD-2, after the CM/GC contract is awarded and review recommendations are addressed.

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1. INTRODUCTION

The Technology and Engineering Development Facility (TEDF) is a Department of Energy (DOE) line item project that will provide modern, 21st-century technical workspace, high-bay space, office space, and associated space for support functions. The scope of the project includes design, site work (including fence and gate relocation), construction of new facilities, renovation of the Test Laboratory (TL) building, commissioning, building demolition, and removal of trailers at Thomas Jefferson National Accelerator Facility (TJNAF). The project received Critical Decision (CD) 0, Approve Mission Need, in September 2007, and CD-1, Approve Alternative Selection and Cost Range, in September 2008.

In a September 2, 2009, memorandum, Mr. Marcus Jones, Associate Director, Office of Safety, Security and Infrastructure, requested that an Independent Project Review (IPR) be conducted to support the CD-2 decision. The focus of this review was to verify the readiness of the project to establish a performance baseline and to proceed to final design.

The TEDF will construct between 90,000-120,000 gross square feet (gsf) of new industrial assembly, laboratory, and office space that will include laboratories, high-bay space, technical workspace, office space, clean-rooms, and associated support and circulation space. These new facilities will eliminate existing overcrowding, and improve workflow and productivity by co-locating the engineering and technical functions currently spread across TJNAF. This project will also renovate about 90,000 gsf of space in the TL Building, which consists of clean rooms, chemistry facilities, high-bay space, office space, and laboratories. This project will provide efficient workflow, a safe and sustainable work environment, and functional efficiencies, and will remove between 9,000-22,000 gsf of inadequate and obsolete workspace, including the removal of dilapidated trailers.

The space increase from the project will be offset by the space eliminated, and banked space acquired via an approved Secretarial Waiver granted in 2006. The banked space will be sufficient to offset the space increase regardless of the amount of space eliminated.

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2. TECHNICAL

2.1 Findings

Required documentation for CD-2 is complete and ready for approval.

The project preliminary design is well developed and is approximately 35 percent complete. Building siting has been modified since the CD-1 decision. New construction has been connected through a courtyard to Building 58. This modification is an overall improvement for operations and sustainability requirements.

The Acquisition Strategy has been modified since CD-1, changing to a Construction Management/General Contractor (CM/GC) delivery method. This improvement reduces risk and improves delivery.

Performance requirements have been appropriately defined. Preliminary design for new construction is consistent with current industry standards and code requirements. Preliminary design has been developed in conformance with the key performance parameters as defined for this project. Renovation plans include defined scope segregated into work zones for planning and execution purposes.

The Leadership in Energy and Environmental Design (LEED) Gold requirement has been implemented individually for the new construction and for the renovation/addition. The geothermal well field concept has been integrated into the design for new construction.

The project scope contingency reduction of ten percent has been developed through a series of deductive alternates. Additive scope alternates are being developed. Scope for the early construction package has been identified for a CD-3a decision.

The TEDF project integrates with other Laboratory entities for direct staffing through a series of annual work plans. The Project Director holds a monthly meeting with Environment, Safety and Health (ES&H) and project staff for coordination and integration purposes. This is considered a best practice.

2.2 Comments

The value of the CD-3a scope is within the funding profile and provides an opportunity to deliver scope earlier in the project.

The CM/GC award has not been completed. This award is critical for completion of the 60 percent design and constructability review.

Development of additive options would be beneficial in management of project scope contingency.

Project coordination with 12 GeV is key to successful project delivery.

2.3 Recommendation

1. Award of the CM/GC contract should be completed prior to CD-2 approval.

3. COST ESTIMATE

3.1 Findings

The TEDF project has a Total Project Cost (TPC) of \$73.2 million. This consists of \$3.7 million of Project Engineering and Design (PED) funds; \$56.7 million of construction funds; contingency of \$12.2 million (approximately 20.6 percent of the Estimate-to-Complete (ETC)); and one million of Other Project Costs. Scope contingency of ten percent is identified. Add-alternates are being developed to spend unused contingency.

Construction costs are escalated at four percent per year to the midpoint of construction based on a market trend analysis performed at CD-1. Overhead costs are applied in the Cost Book.

The construction cost estimate was developed by the architecture and engineering (A/E) firm, Ewing Cole, based on the 35 percent design and adjusted for results from the Independent Cost Estimate (ICE), Value Engineering, and design review. The ICE (performed by Alpha Corporation) and the A/E estimates were within three percent of each other.

The project Risk Registry was prepared by the Integrated Project Team (IPT). High and medium risks are assessed monthly. Cost contingency was calculated using expert judgment and the Monte Carlo analysis. The analysis calculated a cost confidence level of greater than 90 percent.

TJNAF's Earned Value Management System (EVMS) is certified and the project has started to collect earned value data. As of July 2009, approximately \$3 million (four percent) of the TPC has been obligated, and the project has spent \$1.1 million (1.5 percent) of TPC. Through the end of July, the project was slightly ahead of schedule. Approximately 1.8 percent of scope is complete, versus a plan of 1.3 percent. The actual cost is less than budgeted cost, therefore the project has a positive cost variance (Cost Performance Index) of 1.41.

3.2 Comments

The cost estimate is considered credible and realistic to support establishment of the baseline. The cost contingency is considered adequate.

Project Management (PM) and Engineering, Design, Inspection and Acceptance (EDIA) costs comprise 19 percent of total improvement costs. The TEDF project has the lowest PM and EDIA overhead among ongoing infrastructure projects and is approximately 27 percent lower than the Office of Science (SC) average.

The project relies more on indirect labor than direct labor. Current and projected project staffing is indirect: two to four full-time equivalents (FTE); and direct: one to three FTEs. Direct charged labor represents only two percent of the TPC. The Project Manager accounts for most of the direct labor. Organizations coordinate, forecast, and budget for indirect labor support in annual work plans. Indirect staff resources, without costs, should be added to the project schedule in order to better plan resource needs.

3.3 Recommendation

2. Consider adding indirect staff resources, without costs, to the project schedule before CD-2 in order to better plan resource needs.

4. SCHEDULE and FUNDING

4.1 Findings

The critical path consists of design, CM/GC procurement, new construction, and TL renovation. Performance baseline approval (CD-2) is scheduled for first quarter 2010. Approval of Early Procurement (CD-3a) and Start of General Construction (CD-3b) are scheduled for second quarter 2010 and fourth quarter 2010, respectively. Approval of project completion is scheduled for first quarter 2014. One year of schedule contingency is included.

The project schedule was developed using Primavera 6.0 with an 80 percent confidence level. Activities for relocation and a delay for receipt of funding due to continuing resolutions are included in the schedule.

The schedule was confirmed against the CM/GC proposals by the Project Manager and IPT. The schedule is also supported by several of the CM/GC proposals.

The project funding schedule is shown in Table 4-1:

Table 4-1. TEDF Funding Profile (\$K)

	2008	2009	2010	2011	2012	Total
PED		3,700				3,700
Construction			27,700	20,800	20,000	68,500
TEC		3,700	27,700	20,800	20,000	72,200
OPC	300	700				1,000
TPC	300	4,400	27,700	20,800	20,000	73,200

4.2 Comments

Since CD-1, project completion has been accelerated three quarters by a positive change in the funding profile.

External interfaces pose significant risks to the TEDF project. Delays in the 12 GeV project and relocation of Superconducting Radio Frequency (SRF) manufacturing operations

could impact TEDF progress. A draft Move Plan, outlining the relocation will be developed prior to CD-3b.

Excess facility demolition activities are not explicitly identified in the project schedule. A schedule logic error results in obligations being higher than funding during the first quarter in FY 2011.

4.3 Recommendations

3. Consider adding additional schedule contingency for interface risks from the 12 GeV project and SRF manufacturing operations before CD-2.
4. Consider identifying demolition of excess facilities in the project schedule before CD-2.

5. ENVIRONMENT, SAFETY and HEALTH

5.1 Findings

The National Environmental Policy Act (NEPA) compliance determination of the TEDF is that it is covered under existing NEPA analyses and documentation, which indicated that potential impacts from the proposed action should not be considered significant. The NEPA determination was approved by the Thomas Jefferson Site Office (TJSO) Manager on May 29, 2009. The NEPA documentation is in order.

The Hazard Analysis Report (HAR) was signed and approved by the TJSO Federal Project Director (FPD) on September 18, 2009. The HAR is comprehensive and identifies a wide variety of hazards for the TEDF project once it is completed. The hazards for the completed facility include radiation, chemicals, oxygen deficiency, lasers, and magnetic fields. The construction activities include significant safety hazards such as materials handling and trenching, radiation, chemicals and electrical hazards. The mitigation controls focus on engineering controls and the use of the TJNAF ES&H Manual. The report states each subcontractor will be responsible for implementing a construction safety and health plan, and formalized documentation to identify and mitigate hazards for subcontractor construction activities and TJNAF organizations will be submitted to the TEDF Project Manager for review and concurrence prior to CD-3.

The August 2008 DOE/SC review committee report for the TEDF indicated that the laboratory was in the process of hiring a construction safety manager and will also transition the current construction safety manager from the 12 GeV CEBAF Upgrade project to the TEDF project. The August report recommended that the Project Execution Plan (PEP) should further refine/define the level of effort for laboratory staff that will be supporting ES&H, construction safety and environmental protection.

The presentation and subsequent interviews with the TJNAF Environment, Safety, Health and Quality (ESH&Q) Director and her staff identified four ES&H professionals who provide 0.75 FTEs per year of ES&H oversight and design review services to the TEDF project. In addition, the project office hired two full-time FTEs for the TEDF, 12 GeV, and American Recovery and Reinvestment Act (ARRA) construction projects, and their function is to address safety support work such as training and permitting. The manpower efforts of the TJNAF are good and include the breadth and depth of expertise necessary to address to hazard complexities of the project.

The PEP was signed and submitted by the TJNAF and TJSO Project Manager, Directors and the Deputy Site Office Manager on September 21-22, 2009, and it awaits DOE concurrences and approval. The PEP identifies that the ESH&Q has matrixed approximately 0.75 FTEs per year to the TEDF project for design review, oversight, approval of subcontractor safety plans, and safety advice to project management. The PEP identifies the FPD as the primary point of contact for the TJSO ES&H oversight activities that ensure TJNAF ESH&Q oversight is effective and conducted in accordance with the TJNAF and TJSO Project Specific Oversight Plan established prior to the start of construction.

The DOE TJSO Preliminary Project Specific Oversight Plan (PPSOP) was approved September 2, 2009, by the TJSO Manager. The purpose of the PPSOP is to establish a DOE oversight plan for the protection of the public, workers, and the environment during construction of TEDF, and it describes the planned Federal construction oversight on all aspects of the project primarily during project new construction, renovation activities, and commissioning. It establishes clear roles and responsibilities for oversight for Federal management and staff, and clearly describes how Federal construction oversight is accomplished. Interviews with TJSO staff and management confirmed that TJSO reviews and ensures that TJNAF design review activities are effective. The PPSOP is considered a best practice.

5.2 Comments

The August 2008 DOE/SC review committee report recommended that TJNAF define the level of effort that will support ES&H, construction safety, and environmental protection. This recommendation has been addressed. The PEP identified approximately 0.75 FTEs per year of support from the ESH&Q organization for design review, oversight, approval of subcontractor safety plans, and safety advice to project management. The September 29, 2009, ESH&Q Director's presentation identified the four ES&H Subject Matter Experts (SMEs) who will support the TEDF project, and subsequent interviews and presentation identified that the project office has hired two safety FTEs, in addition to ESH&Q manpower, to address training and permitting needs for the TEDF and other construction projects.

The TJSO PPSOP describes the Federal oversight plan and is an important innovation for project oversight. There have been some significant safety events at projects at other sites that required increased Federal intervention to curb accidents and improve hazard controls. The PPSOP process identifies the Federal roles and responsibilities and will engage the site office earlier in the construction process more quickly and effectively. Since the TJSO plays an important oversight role to ensure the contractor engages ES&H SMEs in the design review

phase of the project, TJSO may want to consider clarifying and defining their oversight role for design review.

The NEPA, HAR and PEP documents are adequate for the ES&H aspects of the TEDF project and meet the needs and requirements for CD-2.

5.3 Recommendation

5. From an ES&H perspective, the TEDF project can be approved for CD-2.

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6. MANAGEMENT

6.1 Findings

TJNAF has dedicated a project management team for the TEDF project consisting of a project director, full-time project manager, procurement, project controls, and ES&H staff. A full-time CM and safety professional will be hired prior to the start of construction. Project staffing is one to two FTEs direct charged to the project and two to four FTEs charged to indirect overhead accounts. The project team is committed to the success of the project through its life cycle.

Line management responsibility for the project is from the project team through the Chief Operating Officer to the Laboratory Director. Status and performance updates are given to Senior Laboratory Management on a monthly basis. The project has the full support and attention of Senior Laboratory Management.

Project risks have been analyzed, and a Risk Registry has been developed that is being updated on a monthly basis. Cost contingency is currently 20 percent of the ETC and schedule contingency is 12 months. These levels are developed by expert judgment and supported by the Monte Carlo analysis.

Project A/E and ICE reviews have been completed and reconciled. Project estimates are within the construction budget.

The current design will achieve a LEED Gold rating. The project, once complete, will retire \$6 million of deferred maintenance (compared to a base of \$11 million). TEDF design has matured considerably since the CD-1 review. TJNAF developed a master plan of the Laboratory and TEDF fits well within that vision. SC Laboratory master planning has been noted as a Best Practice.

At the time of the review, the CM/GC procurement was in the final stages with a recommendation submitted to the Oak Ridge service center for review and transmittal to SC for approval.

EVMS has been established for the project.

Required DOE Order 413.3A documents have been updated and/or approved. CD-2 prerequisites have been met. The Committee reviewed the External Independent Review Lines of Inquiry checklist. All elements have been satisfactorily responded to.

6.2 Comments

Currently the Commissioning Agent (CA) is contracted through the A/E team. The project should consider contracting the CA through the Laboratory during Construction Administration to remove any potential conflict of interest.

The obligation and funding profile presented at the review did not match the project schedule. The funding profile should be updated and maintained to accurately account for the continuing resolution (CR) and carry-over costs.

The Risk Registry did not clearly show hidden conditions or the potential of Low Level Waste in the TL facility. The Committee recommended adding these risks.

The Project Data Sheet for FY 2011 did not accurately reflect the current acquisition plan (CM/GC). The project should consider updating the Project Data Sheet.

While the project is adequately staff, there was some concern about other larger projects at TJNAF drawing critical resources away from TEDF. The Chief Operating Officer assured the Committee that adequate resources would be available and staffing would be monitored accordingly. The project should continue to maintain the project team staffing plan (direct and indirect) to assure resource availability.

It would have been optimum to have the CM/GC on board prior to CD-2 to perform a constructability review and cost estimate of the project prior to setting the performance baseline. Currently, the project team has completed a thorough design review of the project and has completed and reconciled two cost estimates (A/E and ICE). The performance baseline is sound. The Program office may want to consider moving the CD-2 approval until after the CM/GC has verified the CD-2 cost estimate (schedule impact may be two to three months).

6.3 Recommendations

6. Develop more than three Level 3 milestones in PEP prior to CD-2 Approval.
7. Develop a detailed move plan prior to CD-3b.
8. Recommend CD-2 approval once CM/GC contract is awarded.

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APPENDIX A

CHARGE

MEMORANDUM



Department of Energy

Washington, DC 20585

SEP 02 2009

MEMORANDUM FOR DANIEL LEHMAN

**DIRECTOR
OFFICE OF PROJECT ASSESSMENT**

FROM:

MARCUS E JONES *Marcus Jones*
ASSOCIATE DIRECTOR
OFFICE OF SAFETY, SECURITY AND INFRASTRUCTURE
OFFICE OF SCIENCE

SUBJECT:

Independent Project Review of the Technology and Engineering
Development Facility (TEDF) Project at Thomas Jefferson
National Accelerator Facility (TJNAF)

I request that your office organize and conduct an Independent Project Review of the TEDF project at TJNAF on September 29 - 30, 2009. The purpose of this review will be to verify the readiness of the project to establish a performance baseline and to proceed to final design.

The TEDF project received Critical Decision (CD)-0 approval in September 18, 2007, and CD-1 approval on September 23, 2008. The project team is currently working to complete preliminary design and will be seeking approval of CD-2, Approve Performance Baseline.

In carrying out its charge, the review committee is requested to consider the following questions:

1. Have performance requirements been appropriately and sufficiently defined? Is the preliminary design sound and likely to meet the requirements?
2. Are the cost and schedule estimates credible and realistic to support establishment of the baseline? Do they include adequate contingency?
3. Is the project being managed (i.e., properly organized and adequately staffed) as needed to complete Final Design and support the project through construction to successful completion?
4. Are Environmental, Safety & Health aspects being properly addressed given the project's current stage of development? Are Integrated Safety Management Principles being followed?



5. Is the project documentation (e.g., Project Execution Plan, Hazard Analysis Report) complete and ready for CD-2 approval?

Gordon Fox is the program manager for this project and will serve as the contact person for this review and can be reached at 301-903-1457. I would appreciate receiving your committee's report by October 15, 2009.

cc:

R. Korynta, TJSO
J. Turi, TJSO
R. Sprouse, TJNAF
K. Chao, SC-28
R. Won, SC-28
G. Malosh, SC-3
S. Short, SC-31
G. Fox, SC-31

APPENDIX B

REVIEW

PARTICIPANTS

**Department of Energy Review of the
Technology and Engineering Development Facility (TEDF) CD-2 Review
September 29-30, 2009**

REVIEW COMMITTEE PARTICIPANTS

Department of Energy

Kin Chao, DOE/SC, Chairperson

Review Committee

Technical

Karen Hellman, ANL

Gary Bloom, ORNL

Cost and Schedule

Gail Penny, DOE/BHSO

Ray Won, DOE/SC

ES&H

Jay Larson, DOE/SC

Management

Jerry Ohearn, LBNL

Anne Frankowski, ANL

Observers

Marcus Jones, DOE/SC

Stephanie Short, DOE/SC

Gordon Fox, DOE/SC

Chris McLaughlin, DOE/SC

Rick Korynta, DOE/TJSO

APPENDIX C

REVIEW AGENDA

**Department of Energy Review of the
Technology and Engineering Development Facility (TEDF) Review
September 29-30, 2009**

AGENDA

Tuesday, September 29, 2009—VARC (Building 28), Conference Room 53

- 8:00 a.m. DOE Executive Session (Committee Only)..... K. Chao
 Charge to the Committee G. Fox
 Federal Project Director Perspective R. Korynta
- 8:30 a.m. TJNAF Welcome H. Montgomery/M. Dallas
- 8:40 a.m. Project Welcome..... Rusty Sprouse
- 9:10 a.m. Project Overview K. Royston
- Project Scope and Execution Approach
 - Performance Baseline—Cost and Schedule
 - Status and Highlights
- 10:10 a.m. Break
- 10:20 a.m. Design Overview E. Cole (A/E)
- Programming
 - Design Approach
- 11:10 a.m. Project Site Tour
- 12:00 p.m. Lunch
- 1:00 p.m. Science Interface/Transition A. Hutton
- 1:20 p.m. TEDF Integration with 12 GeV C. Rode
- 1:30 p.m. Integrated Safety Management M. Logue
- 2:00 p.m. Construction Safety Approach..... R. Sprouse
- 2:30 p.m. Break
- 3:00 p.m. Subcommittee Breakout Sessions

1	ES&H and Construction Safety	VARC 51	Logue/Owen
2	Cost, EVMS, Schedule, Risk	VARC 55	Miner/Wells/Alpha
3	Management	VARC 22i	Sprouse
4	Technical	VARC 53	Royston/Jones/Powers/Kausch

- 5:30 p.m. DOE Executive Session Kin Chao
- 6:00 p.m. Adjourn

Wednesday, September 30, 2009

- 7:30 a.m. Lab Site Tour
- 9:00 a.m. Continued Subcommittee Breakout Sessions
- 11:00 a.m. Closeout Dry Run (Committee Only)..... K. Chao
- 12:00 p.m. Lunch
- 1:30 p.m. Closeout Presentation..... All
- 2:30 p.m. Adjourn

APPENDIX D

COST TABLE

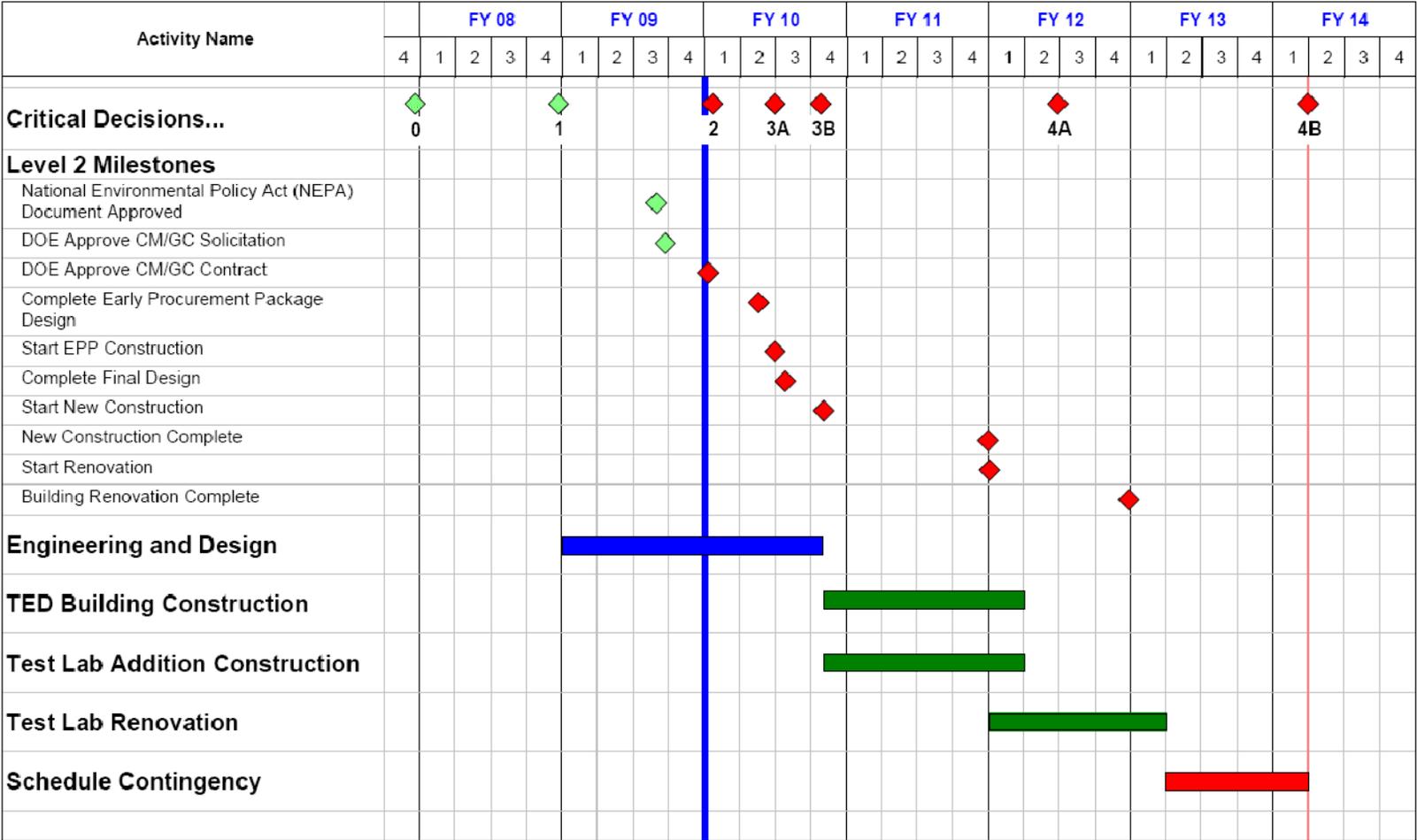
TEDF—Baseline Cost Estimate (\$K)

WBS #	WBS Title	Project Estimate						Committee Estimate						Comment
		Original Estimate (\$K)	To Date - thru Aug. 2009	To Go Cost (\$K)	Contingency (\$K)	% Contingency on ETC	Total Cost (\$K)	Original Estimate (\$K)	To Date - thru Oct. 2008	To Go Cost (\$K)	Contingency (\$K)	% Contingency on ETC	Total Cost (\$K)	
1.2	Design Phase													
1.2.01	Design Services	\$2,791	\$1,030	\$1,761	\$180	10.2%	\$2,971							
1.2.02	Pre-Construction Services	\$422		\$422	\$165	39.1%	\$587							
1.2.03	Pre-Constructio Project Management	\$137	\$53	\$84	\$5	6.0%	\$142							
1.2	Design Phase Subtotal	\$3,350	\$1,083	\$2,267	\$350	15.4%	\$3,700							
1.3	Construction Phase													
1.3.1	Conventional Facilities Construction	\$47,723		\$47,723	\$10,009	21.0%	\$57,732							
1.3.2	Furnished Furniture/Equipment	\$1,966		\$1,966	\$492	25.0%	\$2,458							
1.3.3.1	Construction Management	\$5,716		\$5,716	\$1,143	20.0%	\$6,859							
1.3.3.2	Commissioning	\$240		\$240	\$36	15.0%	\$276							
1.3.3.3	A-E Support	\$302		\$302	\$76	25.2%	\$378							
1.3.4	Project Management	\$726		\$726	\$73	10.1%	\$799							
1.3	Construction Phase Subtotal	\$56,673	\$0	\$56,673	\$11,829	20.9%	\$68,502							
	Additional Contingency Reserve				(\$1)		(\$1)							
	Project Total Estimated Cost (TEC)	\$60,023	\$1,083	\$58,940	\$12,178	20.7%	\$72,201							
	Other Project Costs (OPC)	\$ 1,000	\$ 800	\$ 200	0%	0.0%	\$1,000							
	Total Project Costs (TPC)	\$ 61,023	\$ 1,883	\$ 59,140	\$12,178	20.6%	\$73,201							

APPENDIX E

SCHEDULE CHART

TEDF—Schedule



APPENDIX F

FUNDING CHART

TEDF—Funding Profile

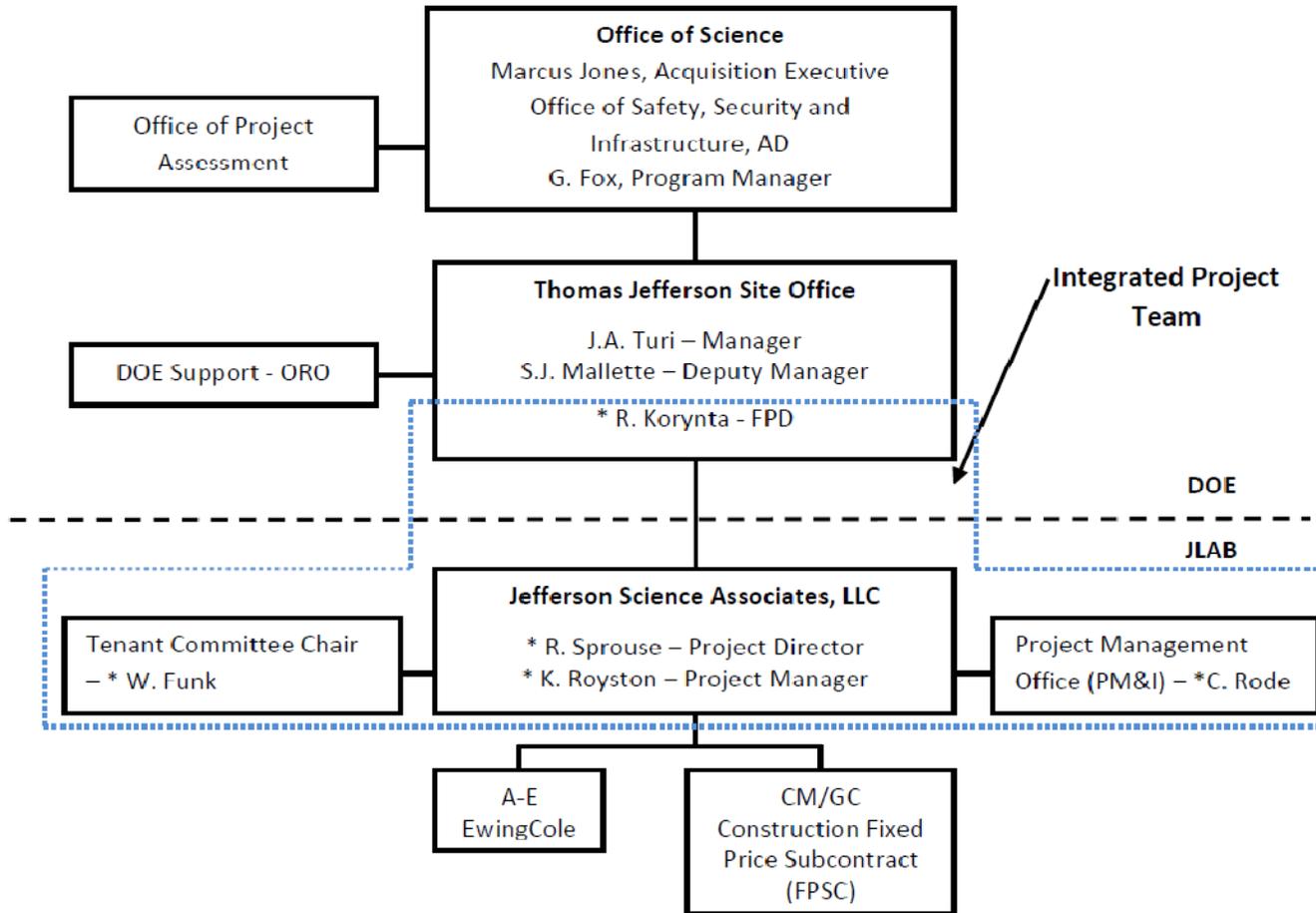
	2008	2009	2010	2011	2012	Total
PED		3,700				3,700
Construction			27,700	20,800	20,000	68,500
TEC		3,700	27,700	20,800	20,000	72,200
OPC	300	700				1,000
TPC	300	4,400	27,700	20,800	20,000	73,200

APPENDIX G

MANAGEMENT

TABLE

TEDF—Project Organization



APPENDIX H

EIR LINES OF INQUIRY

EIR Element	SC Review Team Assessment	Comment
1. Basis of Scope	Satisfactory	<p>Project Response: The lines of inquiry in this element are addressed in the MNS, WBS dictionary, PEP, Risk Management Plan, and design documents. Design review comments have been addressed and incorporated in the design and cost estimate.</p> <p>Committee Response: Completed development of additive options would be beneficial for managing project scope contingency.</p>
2. Basis of Cost	Satisfactory	<p>Project Response: AE cost estimate and reconciliation with the Independent Cost Estimate provide verification that the cost estimate is reasonable. The Monte Carlo risk analysis confirms that the cost contingency is more than adequate to cover identified risks. The cost value of schedule contingency is included in the cost contingency allocation. The project funding profile supports the baseline cost profile.</p> <p>Committee Response: The cost estimate is sufficient at the 35% design stage, as the Independent Cost Estimate and Architect/Engineer estimate only differ by 3%.</p>
3. Basis of Schedule	Satisfactory with Comment	<p>Project Response: The schedule is supported by the CM/GC proposal and schedule contingency has been determined both quantitatively through Monte Carlo analysis and objective review by the IPT. Additional schedule contingency has been added to the project completion date based on empirical analysis in coordination with Test Lab Building users who will be impacted by the renovation activities. A key criteria included in the assessment of schedule contingency is priority fabrication of the 12 GeV Upgrade project cryomodules. This work must be appropriately supported to maintain the 12 GeV Upgrade project schedule. Coordination with the 12 GeV Upgrade project and ongoing SRF operations in the Test Lab will be maintained throughout the project through close collaboration on between the projects and the SRF program.</p> <p>Committee Response: Consider explicit identification of excess facility demolition activities in the project schedule before CD-2.</p>
4. Funding Profile and Budget	Satisfactory with Comment	<p>Project Response: The funding profile supports the cost profile as indicated by the Cost Loaded schedule which is shown by WBS element, and provides sufficient advanced funding to accommodate normal budget turbulence.</p> <p>Committee Response: In order to ensure personnel availability, consider adding indirectly funded staff resource requirements to the project schedule.</p>

<p>5. Critical Path</p>	<p>Satisfactory with Comment</p>	<p>Project Response: The critical path has been developed using critical path methodology applied to project work activities representative of this project. All elements of work are integrated into the schedule and 12 months of schedule contingency has been allocated based on the risk analysis and project management consideration of the schedule interface between the TEDF and 12 GeV Upgrade projects.</p> <p>Committee Response: More than three level-3 milestones are recommended to monitor project progress.</p>
<p>6. Risk and Contingency Management</p>	<p>Satisfactory with Comment</p>	<p>Project Response: Risk management planning is performed by the IPT, incorporating both DOE and contractor input. The Risk Management Plan and registry has been updated. Risk management activities (e.g. routine IPT evaluation of risk and Risk Registry updates) are ongoing. The project risk assessment and registry, including a Monte Carlo analysis are fully developed to support CD-2. Contingency has been allocated to risks based on application of the risk assessment.</p> <p>Committee Response: Additional schedule contingency should be considered, as project completion is dependent on the 12 GeV and relocation projects.</p>
<p>7. Hazards Analysis/Safety</p>	<p>Satisfactory</p>	<p>Project Response: The Preliminary Hazards Analysis developed at CD-1 has been significantly enhanced in preparation for CD-2 based on the evolution of the project design and improved knowledge of the project specific hazards. Integrated Safety Management (ISM) has been practiced in project planning in accordance with the approved TJNAF ISM System. A Fire Hazards Analysis and life safety review have been performed.</p> <p>Committee Response: The Hazards Analysis Report (HAR) was signed and approved by the TJSO Federal Project Director on September 18, 2009. The HAR is comprehensive and identifies a wide variety of hazards for the TEDF project once it is completed. The hazards for the completed facility include radiation, chemicals, oxygen deficiency, lasers and magnetic fields. The construction activities include significant safety hazards such as materials handling and trenching, radiation, chemicals and electrical hazards. The mitigation controls focus on engineering controls and the use of the TJNAF EH&S Manual. The report states each subcontractor will be responsible for implementing a construction safety and health plan, and formalized documentation to identify and mitigate hazards for subcontractor construction activities and Jefferson Lab organizations will be submitted to the TEDF Project Manager for review and concurrence prior to CD-3.</p>
<p>8. Basis of Design</p>	<p>Satisfactory</p>	<p>Project Response: The basis of design has been well developed and review with input from the building occupants (Tenant Committee) and Lab Management Council.</p> <p>Committee Response: The preliminary design is well developed at a mature 35% level.</p>

<p>9. Preliminary Design Review and Comment Disposition</p>	<p>Satisfactory with Comment</p>	<p>Project Response: The design has been well reviewed with an independent design review having been performed and sustainability, value engineering, fire hazards, and life safety reviews also performed. Review comments have been incorporated in the design as appropriate.</p> <p>Committee Response: Award of the CM/GC contract should be completed by CD-2 approval.</p>
<p>10. Start-Up Planning and Operations Readiness</p>	<p>Satisfactory</p>	<p>Project Response: Start-up planning has been appropriately developed for this stage of the project. A third party commissioning agent will be engaged to review design documents to ascertain performance and operational test requirements for all major building systems. A commissioning plan to test and evaluate system performance both individually and collectively as compared to approved design criteria will be prepared and completed prior to the start of building construction. Functional performance tests will be established and all designated systems will be tested against the performance criteria. Results will be recorded, and corrective actions initiated if required. Appropriate cost and schedule contingency have been allocated to address potential startup issues.</p> <p>Committee Response:</p>
<p>11. Project Controls/Earned Value Management System</p>	<p>Satisfactory</p>	<p>Project Response: TJNAF has a certified EVMS system. The system is maintained in compliance with EIA-748 by the TJNAF Office of Project Management and Integration. Earned valued management has been implemented for the project and reporting will be started after CD-2.</p> <p>Committee Response:</p>
<p>12. Quality Control/Assurance</p>	<p>Satisfactory</p>	<p>Project Response: This project is following the JLab established quality assurance program. The project falls under Standard industry Quality Level 3. A tailored QA plan has been developed for the project. The industry standard practices for industrial construction projects are being applied. Specific quality control requirements involving program requirements, personnel training and qualifications, documentation and record keeping, work process, design, procurement, inspection and testing, and independent assessment are being addressed in the procurement documents. Division 1 General Requirements of the construction documents will identify the general requirements of the subcontractor's quality control program and the technical specifications (Divisions 2 – 44) will identify the specific technical requirements.</p> <p>Committee Response:</p>

<p>13. Value Management/Engineering</p>	<p>Satisfactory</p>	<p>Project Response: Consideration of sustainable design and energy savings are being incorporated during the design of the project. A value engineering study has been completed during preparation of the preliminary design to evaluate the effectiveness of possible alternative design approaches, sustainability, and energy conservation features. The study evaluated impacts to the project initial and life cycle cost as well as schedule of any suggested changes to the design. The project will apply value engineering principles throughout the life of the project. Value management will be employed through the life of the project for the purpose of achieving the overall best value for the government.</p> <p>Committee Response:</p>
<p>14. Project Execution</p>	<p>Satisfactory</p>	<p>Project Response: The Project Execution Plan (PEP) has been developed with broad support from Laboratory, Site Office, and Modernization program. The PEP is the overarching project management document and provides the first level definition for all project management documentation. Key intra-site coordination issues have been identified and incorporated into the project planning and risk analysis as appropriate.</p> <p>Committee Response:</p>
<p>15. Acquisition Strategy/Plan</p>	<p>Satisfactory with Comment</p>	<p>Project Response: An addendum to the Acquisition Strategy has been completed to update the document for consistency with other documentation and plans for CD-2. The project is being executed in accordance with the updated strategy. The changes to the Acquisition Strategy are the result of changes in the funding profile for the project which made the use of a CM/GC subcontract the preferred approach for project execution. An Acquisition Plan has been developed specifically for the CM/GC procurement action.</p> <p>Committee Response: The Committee is concerned about the delay of the CM/GC contract.</p>
<p>16. Integrated Project Team</p>	<p>Satisfactory</p>	<p>Project Response: The Federal Project Director is certified at Level II and supported by DOE Site Office personnel as well as the JLab members of the IPT. Safety experts supporting the IPT from both the Site Office and JLab staff are seasoned professionals with a broad range of experience on construction projects. The recent HSS review of JLab commended the Facilities Management Division on their safety practices and exemplary performance record. The IPT Charter was approved by the AE as part of the PPEP at CD-1.</p> <p>Committee Response: The Integrated Project Team (IPT) is effectively managing issues.</p>
<p>17. Sustainable Design</p>	<p>Satisfactory</p>	<p>Project Response: Sustainable design features have been incorporated in the preliminary design. A sustainability study was performed to evaluate the effectiveness of possible alternative design approaches, sustainability, and energy conservation features. The study evaluated the impacts to the project initial and life cycle cost as well as schedule of any suggested changes to the design. The project is registered for LEED Gold certification.</p> <p>Committee Response:</p>

18. Safeguards and Security	Satisfactory	<p>Project Response: The TJSO reviewed the Security Risk Assessment performed by Gregg Services, Inc., for the TEDF dated May 29, 2009. The Security Risk Assessment report meets the intent of DOE M 470.4-1 Section E paragraph 7 for Vulnerability Assessment Reports and serves as the Security Vulnerability Assessment Report for the TEDF. The assessment, which followed the format of the Interagency Security Committee Security Design Criteria, provided recommendations that are being considered to enhance protection of personnel and property during execution of the TEDF project and are being considered during design to enhance facility security systems.</p> <p>Committee Response:</p>
19. New Technology and Technology Readiness	Satisfactory	<p>Project Response: Not applicable, the CD-2A/3A scope involves simple civil construction using established and available methods.</p> <p>Committee Response:</p>
20. Contract Management	Satisfactory	<p>Project Response: The JLab M&O Contractor, Jefferson Science Associates, LLC (JSA), under the direction, guidance, and oversight of DOE/TJSO, is managing a Fixed-Price A-E design subcontract, and will manage and administer a Fixed-Price Construction Management/General Contractor (CM/GC) subcontract that will consist of two phases, JSA will also manage any other service-type subcontracts required by JLab in the execution of this project. Project performance metrics for the M&O contractor are included in the annual performance evaluation and measurement plan. The A-E fixed price subcontract includes a design-to-cost clause. The subcontract is inclusive of all materials, equipment, labor, etc. necessary to perform the work, which includes delivery of technical specifications, drawings and bills of materials. The A-E firm selected has experience in the design-to-cost approach for laboratories and fully familiar with and utilizes the Green Building Rating System – LEED, in their designs. The A-E will prepare all drawings, calculations, and specifications for the construction activity. The A-E will coordinate with the CM/GC during the final design phase and provide support during the construction phase. The subcontract with the CM/GC will be for two phases of fixed-price work. Phase 1 will be for the CM/GC to provide support services to the A-E, including input regarding material selection, equipment, construction feasibility, and factors relating to construction, and cost estimates including cost estimates of alternative designs or materials. The CM/GC will also provide cost validation and schedule validation services and provide recommendations of actions designed to minimize adverse effects of labor or material shortages, time requirements for procurements and installation and construction completion to JLab. Phase 2 will be to execute the construction project, including the management, ES&H oversight, and the administration of construction subcontracts. Phase 2 will be inclusive of all material, labor, equipment, etc. necessary to perform the work in accordance with the contractual requirements in order to meet the defined scope and schedule. All work performed by the CM/GC will be monitored by JLab personnel, with support from the A-E. The TJSO will provide oversight to ensure safety and quality performance.</p> <p>Committee Response: Consider contracting the Commissioning Agent directly through the laboratory.</p>
21. Documentation and Incorporation of Lessons Learned	Satisfactory with Comment	<p>Project Response: The on-going efforts to integrate lesson learned into the project will be continued at all stages of the Project. The Project will use the lesson learned from past projects at JLab in recent years such as CEBAF Center Addition and 12 GeV Upgrade projects. Throughout the project, instances of right and wrong approaches will be documented as lessons learned and will be distributed through the JLab and DOE Lessons-Learned System. At the conclusion of the project, the project manager and FPD will analyze these lessons learned and review them with the IPT. The results of this review will also be distributed through the JLab and DOE Lessons-Learned System.</p> <p>Committee Response: Consider developing a detailed Move Plan prior to CD-3B to improve readiness.</p>