FY05 JEFFERSON LAB SELF-ASSESSMENT OF CONTRACT PERFORMANCE

U. S. Department of Energy's

Jefferson Lab

THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY

U. S. Department of Energy's

Jefferson Lab

THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY

FY05 JEFFERSON LAB

SELF-ASSESSMENT
OF
CONTRACT PERFORMANCE

Section	Description	Key Indicator	Point Value	Points Awarded	Percent of Assigned Pts	Adjectival Rating
1	Outstanding Science and Technology	1. Peer Review	720	678.8	94.3%	Outstanding
2	Corporate Citizenship	1. Public Participation 2. Non-DOE Investment in Jefferson Lab	75	74.8	99.7%	Outstanding
3	Quality Performance in Environment, Health, and Safety	1. Total Recordable Case Rate (TRC) 2. Days Away, Restricted or Transferred 3. Environmental Exceedances	150	149.5	99.7%	Outstanding
4	Business & Administrative Practices	1. Peer Review	105	98.0	93.3%	Outstanding
5	Responsible Institutional Management	1. Peer Review	100	91.0	91.0%	Outstanding
6	Project Management	1. Schedule Performance - SNS 2. Schedule Performance - CEBAF Center	70	70.0	100%	Outstanding
		TOTAL POINT VALUE	**1220**	**1162.1**	**95.3%**	

Director's Overview

It is an important requirement of our performance-based contract that we take stock of our performance in the past year and identify areas of improvement for the year ahead. Our assessment is based on both quantitative metrics and qualitative measures such as our peer reviews. This self-assessment is the basis for a "report card" that comes to us each year from the DOE. I am pleased that this year, based on the review report we should expect a rating of "Outstanding", but even more than that, I am very proud of the progress the Lab has made in the focus areas identified by last year's assessments and reviews, particularly in the areas of advancing the 12 GeV Upgrade and in improving safety performance at the Lab.

As of the end of FY05, we have completed data-taking for roughly 75% of the program approved to date (though analysis of the data is not as far along). Full data is at hand for 121 of the 165 approved experiments, and significant portions of the needed data have been obtained for eight more. We were gratified to see that the Science and Technology Peer Review Panel agrees with our assessment of the significance of this program, noting that JLab's "planned experimental program is well-aligned with the goals of the NP program. TJNAF is responsible for eight of the ten Office of Science (SC) milestones in hadronic physics." These milestones were identified as important measures of progress toward addressing key issues in the field by a subcommittee of the Nuclear Science Advisory Committee (NSAC). The Panel's summary judgment was that it considered "the quality and productivity of the overall program to be outstanding." The Panel also recognized the effective and realistic planning of the experimental program based on the interaction between Accelerator division (particularly CASA) and the experimental program, and the benefits that the Nuclear Physics program gains from the FEL program.

In addition to the results of the S&T Review, the Lab made great strides in moving the 12 GeV Upgrade forward. A very successful external review of the 12 GeV science convened by DOE-NP "strongly endorsed the proposed program for the 12 GeV upgrade, which would poise TJNAF to continue its role as the world center for hadron physics research using electrons." In addition, the Independent Project (Lehman) Review of the 12 GeV Upgrade project found the project ready for the next step to Critical Decision (CD) 1, the next milestone toward the realization of the Upgrade.

Our major focus in the past year in conjunction with delivering excellence in science and technology has been on improving safety performance, a recommendation of just about every external review last year. We have taken aggressive measures that are yielding excellent results. An Associate Director for EH&S has been hired, a Director's Safety Council has been formed and a Worker's Safety Committee was chartered to assure that safety issues are addressed both at the management level and from the workers' perspective. This focus on safety has resulted in the awarding of three National Safety Council awards to Jefferson Lab based on excellent safety performance in FY05.

Jefferson Lab is dedicated to meeting user needs and believes that it has succeeded in so doing. While the 2005 S&T review noted that the users are generally satisfied, the laboratory strives to improve the situation. Space for users in the expanded CEBAF Center, becoming available in FY 2006, is a major step in enhancing the quality of life for users and thus their productivity. This Self Assessment also notes, as an area of emphasis in FY 2006, that the laboratory will "continue close interaction and involvement…..with the user community." This will be particularly true in the future transition from 6 to 12 GeV operations.

I want to note the importance that Jefferson Lab attaches to the contributions that the more than 1000 active users of CEBAF continue to make to the laboratory and to science. Without their active participation and involvement in the work of the laboratory, there would be a dearth of significant research output from the laboratory. Moreover, as stated in the 2005 DOE S&T Review Report, "the TJNAF user group and the contractor, Southeastern Universities Research Association (SURA), together are active in outreach activities."

We have performed successfully in areas of business and administrative practices as well, with our biennial Emergency Management Review judging our programs as "Outstanding" and several audits of administrative functions completed with no findings. We have addressed or begun addressing items raised by both our S&T and Institutional Management Reviews. We have completed and delivered the components we have been producing for the SNS on time and on budget. These are all indicators that the Lab is well-managed. The coming year will be challenging due to expected budget constraints, and therefore we must be diligent in assuring that our policies and processes enhance progress toward our priorities. Our focus for the coming year will continue to be delivering the excellent science that is in the queue, progressing toward construction of the 12 GeV Upgrade project, and continuing to enhance the safety culture and ensure excellent safety performance. Peer reviews, self assessments, and performance metrics are important "mile markers" that provide feedback to help ensure that we continue to meet our goals.

1.0 Outstanding Science and Technology						
PM	**Description**	**Point Value**	**Points Awarded**	**Goal**	**Raw Score**	**Adjectival Rating**
1.1	**Key Indicator - Peer Review**	450	412	100	91.6%	Outstanding
	Subtotal Peer Review	**450**	**412**	**% of Points Assigned = 91.6%**		**Outstanding**
1.2 Reliable Experimental and Accelerator Operations						
1.2.1	Delivered Physics Research Operations *Dependent on details of beam schedule	100	100	5948.2 Hours	8796.3 Hours	Outstanding
1.2.2	Accelerator Downtime	40	40	<=15%	14.5%	Outstanding
1.2.3	Experimental Equipment Availability *Dependent on details of beam schedule	20	20	85.1%	89.8%	Outstanding
1.2.4	Effectiveness of the Scheduling Process	20	18.9	100%	94.4%	Outstanding
1.2.5	Overall Operations Effectiveness	20	20	27 Weeks	37.1 Weeks	Outstanding
	Subtotal Reliable Experimental and Accelerator Operations	**200**	**198.9**	**% of Points Assigned = 99.5%**		**Outstanding**
1.3 Production of Scientific and Technical Manpower						
1.3.1	Number Of Student Years Per Year On Jefferson Lab Related Research Or Technical Activities	20	18.6	1075	1,021	Outstanding
1.3.2	Number Of Advanced Degrees Per Year Based On Jefferson Lab Research	35	35	53	53	Outstanding
1.3.3	Number Of Advanced Degrees Per Year Granted By Minority Universities And Based On Jefferson Lab Research	5	4.3	6	5.3	Excellent
1.3.4	Participation Of Students From Groups Traditionally Underrepresented In Physical Science And Engineering Fields	10	10	>35%	35.2%	Outstanding
	Subtotal Production of Scientific and Technical Manpower	**70**	**67.9**	**% of Points Assigned = 97.0%**		**Outstanding**
	TOTAL OUTSTANDING SCIENCE AND TECHNOLOGY	**720**	**678.8**	**% OF POINTS ASSIGNED = 94.3%**		**Outstanding**

2.0 Corporate Citizenship						
PM	**Description**	**Point Value**	**Points Awarded**	**Goal**	**Raw Score**	**Adjectival Rating**
2.1 Public Outreach and Improved Scientific Literacy						
2.1.1	**Key Indicator - Public Participation**	20	20	90,000 Person-hours	152,488 Person-hours	Outstanding
2.1.2	Public Visibility (a) Number of Articles (b) Citations Mentioning DOE	 7 3	 7 3	 900 100%	 906 100%	 Outstanding Outstanding
2.1.3	Customer Satisfaction	5	4.8	5	4.8	Outstanding
	Subtotal Public Outreach and Improved Scientific Literacy	**35**	**34.8**	**% of Points Assigned = 99.4%**		**Outstanding**

2.2 Technology Transfer						
2.2.1	**Key Indicator - Non-DOE investment in Jefferson Lab initiatives (including direct dollars, manpower costs, and contributions in-kind)**	20	20	2.5% of JLab ops budget	14.2%	Outstanding
2.2.2	Intellectual property generation as indicated by the annual number of	10	10			Outstanding
	(a) Patent applications			5 or	11	
	(b) Patents awarded			1 or	4	
	(c) License agreements			2	7	
2.2.3	Benefit to partners based on customer surveys	10	10	5	5	Outstanding
	Subtotal Technology Transfer	**40**	**40**	**% of Points Assigned = 100%**		Outstanding
	TOTAL CORPORATE CITIZENSHIP	**75**	**74.8**	**% OF POINTS ASSIGNED = 99.7%**		**Outstanding**

3.0 Quality Performance in Environment, Health, and Safety

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
3.1	**Key Indicator - Total Recordable Case Rate (TRC)**	50	50	<=0.9 per 100 person years	0.5	Outstanding
3.2	**Key Indicator – Days Away, Restricted or Transferred (DART) Case Rate**	50	50	0.4 per 100 person years	0.1	Outstanding
3.3	**Key Indicator - Environmental Exceedances**	20	20	To have no environ-mentally significant violations of permitted limits	0	Outstanding
3.4	Reportable Radiation Exposures	6	6	Satisfactory ALARA program; no exposures >80% of ORPS SC3 threshold	No exposures and Satisfactory ALARA program	Outstanding
3.5	Hazardous Substance Exposures	6	6	No exposures above OSHA action level	No exposures	Outstanding
3.6	Affirmative Procurement	8	8	85% for FY score	85% (estimated, actual result to be provided by Procurement)	Outstanding

3.7	Peer Review of the Radiological Control Program – Even Years; or, Peer Review of Emergency Management Program – Odd Years	10	9.5	Appropriate program = 100	95	Outstanding
TOTAL QUALITY PERFORMANCE IN ENVIRONMENT, HEALTH, AND SAFETY		**150**	**149.5**	**% OF POINTS ASSIGNED = 99.7%**		**Outstanding**

4.0 Quality of Business and Administrative Practices						
PM	**Description**	**Point Value**	**Points Awarded**	**Goal**	**Raw Score**	**Adjectival Rating**
4.1	**Key Indicator - Peer Review**	45	41.8	65	62	Outstanding
	Chief Financial Office Timesheet Floor Check	5	4.5			Outstanding
	Chief Financial Office Funds Control Review	5	4.5			Outstanding
	UFV&A Review	10	9			Outstanding
Subtotal Peer Review		**65**	**59.8**	**% of Points Assigned = 92.0%**		Outstanding
4.2 Facilities Management						
4.2.1	Asset Condition Index (ACI) defined as one (1) minus the ratio of Deferred Maintenance to Replacement Plant Value	2	1.6	>=98%	95.6%	Excellent
4.2.2	% of Planned Facility Condition Assessments Completed	2	2	>=94%	100%	Outstanding
4.2.3	% of Indirect Projects Completed from the Planned Project List	2	2	>=94%	100%	Outstanding
Subtotal Facilities Management		**6**	**5.6**	**% of Points Assigned = 93.3%**		**Outstanding**
4.3 Property Management & Protection						
4.3.1	% of value of property located during the inventory cycle: Capital Property (Odd Years)	2	2	>=99%	99.7%	Outstanding
4.3.2	% of value of property located during the inventory cycle: Sensitive Property	2	1.3	>=99%	97.4%	Marginal
Subtotal Property Management & Protection		**4**	**3.3**	**% of Points Assigned = 82.5%**		**Excellent**
4.4 Financial Management						
4.4.1	Number of CAS violations	1	1	0	0	Outstanding
4.4.2	Dollar % of invoices deemed unallowable	1	1	<=1%	0	Outstanding
4.4.3	% of vendor invoices paid with discounts lost	1	1	<=1%	0.1%	Outstanding
4.4.4	% of annual actual cost variance from budget for each overhead pool	1	1	<=3%	0.4%	Outstanding
4.4.5	Number of occurrences that resulted in the monthly Cost Management Report being resubmitted to Contracting Officer – DOE Site Office	1	1	0	0	Outstanding
4.4.6	Number of audit errors in travel expense reports	1	1	<=2%	1%	Outstanding
Subtotal Financial Management		**6**	**6**	**% of Points Assigned = 100%**		**Outstanding**

4.5 Procurement						
4.5.1	Average procurement cycle time	3	3	<10 days	5.72	Outstanding
4.5.2	% of total available purchasing dollars awarded to:					
	Small Business concerns	1	1	50.0%	63.9%	Outstanding
	Small Women-Owned business concerns, and	0.5	0.5	9.9%	12.4%	Outstanding
	Small Disadvantage business concerns	0.5	0.4	15.0%	13.2%	Marginal
	Service-Disabled Veteran business concerns	0.5	0	3.0%	0.4%	Unsatisfactory
	HubZone business concerns	0.5	0.5	3.0%	4.5%	Outstanding
	Subtotal Procurement	**6**	**5.4**	**% of Points Assigned = 90.0%**		**Outstanding**
4.6 Human Resources and Services						
PM	**Description**	**Point Value**	**Points Awarded**	**Goal**	**Raw Score**	**Adjectival Rating**
4.6.1	% of action oriented diversity commitments as established in the Affirmative Action Plan	1	1	>= 90%	1	Outstanding
4.6.2	Representation of protected classes within each EEO-1 category	1	0.9	100% Maintained	95%	Excellent
4.6.3	Sustainable EEOC charges	1	1	0 charges	0	Outstanding
4.6.4	Compensation positions aligned with market practices	1	1	+/-3% of market average	Within 1.1%	Outstanding
4.6.5	% of 3-year rolling average of annual increases in premium cost relative to market	1	1	>=5% below market data	-11.8%	Outstanding
	Subtotal Human Resources and Services	**5**	**4.9**	**% of Points Assigned = 98.0%**		**Outstanding**
4.7 Information Systems						
4.7.1	Cyber Security Review (5pts, held every 3 years, next one in '05)	5	5	>90%	100%	Outstanding
4.7.2	Performance on addressing identified cyber security vulnerabilities	5	5	100%	102%	Outstanding
4.7.3	Number of times JLab computer systems were compromised or used to attack other systems	2	2	<=1	0	Outstanding
4.7.4	% of current year's papers written by JLab staff or Users placed online	1	1	>=97%	100%	Outstanding
	Subtotal Information Systems	**13**	**13**	**% of Points Assigned = 100%**		**Outstanding**
TOTAL BUSINESS & ADMINISTRATIVE PRACTICES		**105**	**98.0**	**% OF POINTS ASSIGNED = 93.3%**		**Outstanding**

5.0 Responsible Institutional Management						
PM	**Description**	**Point Value**	**Points Awarded**	**Goal**	**Raw Score**	**Adjectival Rating**
5.1	**Key Indicator - Responsible Institutional Management Peer Review**					
	Strategic Planning	40	37	40	37	Outstanding
	Managerial Effectiveness	40	36	40	36	Outstanding
	Organizational Culture	20	18	20	18	Outstanding
	TOTAL RESPONSIBLE INSTITUTIONAL MANAGEMENT	**100**	**91**	**% OF POINTS ASSIGNED = 91.0%**		**Outstanding**

6.0 Project Management						
PM	**Description**	**Point Value**	**Points Awarded**	**Goal**	**Raw Score**	**Adjectival Rating**
6.1	**Key Indicator - Schedule Performance SNS**	35	35	<=one month behind schedule	100%	Outstanding
6.2	**Key Indicator - Schedule Performance on the CEBAF Center Addition**	10	10	<=one month behind schedule	Ahead of Schedule	Outstanding
6.3	Cost Performance on the CEBAF Center Addition Project	10	10	>=10%	14.3%	Outstanding
6.4	% of Overrun on all Projects >$100K	3	3	<=8%	2.5%	Outstanding
6.5	Variance of Scheduled Completion Time for Projects >$100K	2	2	<=1.1	1.1	Outstanding
6.6	Schedule Performance on the 12 GeV Upgrade Project	10	10	<=one month behind schedule	<one month behind schedule	Outstanding
	TOTAL PROJECT MANAGEMENT	**70**	**70**	**% OF POINTS ASSIGNED = 100%**		Outstanding

TOTAL APPENDIX B SCORE ON PERFORMANCE MEASURES	
	Total
TOTAL APPENDIX B SCORE	**1162.1**

1.0 Outstanding Science and Technology

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
TOTAL OUTSTANDING SCIENCE AND TECHNOLOGY		**720**	**678.8**	**% OF POINTS ASSIGNED = 94.3%**		**Outstanding**

1.1 Key Indicator - Peer Review

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
1.1	**Key Indicator - Peer Review**	450	412	100	91.6%	Outstanding
	Subtotal Peer Review	**450**	**412**	**% of Points Assigned = 91.6%**		**Outstanding**

Discussion

The experimental program at Jefferson Lab continues in steady state operation, with all three halls in production running at design specification. Following PAC28, the complete approved experimental program broken down by subject and hall is:

Topic	Number of Experiments	Hall A	Hall B	Hall C
Nucleon and Meson Form Factors and Sum Rules	31	12	6	13
Few Body Nuclear Properties	29	18	6	5
Properties of Nuclei	30	8	11	11
*N** and Meson Properties	54	10	33	11
Strange Quarks	21	4	15	2
Total	**165**	**52**	**71**	**42**

The Lab believes that this approved program represents some of the best nuclear physics that will be done anywhere in the next decade. The program to date is having a major impact on our understanding of the basic quark structure of matter, and the portion of the program that has been approved but not yet run is of uniformly high quality as a consequence of both the outstanding capabilities of the accelerator and experimental equipment and the intense competition for beam time.

As of the end of FY05, we have completed data-taking for roughly 75% of the program approved to date (though analysis of the data is not as far along). Full data is at hand for 121 of the 165 approved experiments, and significant portions of the needed data have been obtained for 8 more. We were gratified to see that the Science and Technology Peer Review Panel agrees with our assessment of the significance of this program, noting that JLab's "planned experimental program is well-aligned with the goals of the NP program. TJNAF is responsible for eight of the ten Office of Science (SC) milestones in hadronic physics." These milestones were identified as important measures of progress toward addressing key issues in the field by a subcommittee of the Nuclear Science Advisory Committee (NSAC). The Panel's summary judgment was that it considered "the quality and productivity of the overall program to be outstanding."

Some of the particularly noteworthy results identified by the Panel included: the speed with which the new pentaquark searches were performed with a factor of ten improvement in statistics, setting stringent new limits for its existence; the parity-violating electron scattering results that provide tighter constraints for the extraction of the electromagnetic form factors GsE and GsM, providing information regarding the spatial distribution of s quarks in the hadrons; and the newly-demonstrated capability for obtaining high resolution (<0.5 MeV) hypernuclear spectra, allowing a precision study of the Lambda-nucleon interaction important, for example, for understanding the role of strange quarks in neutron stars.

Other achievements of significance in the nuclear physics program included: a year of three-hall operation with high accelerator and hall availability, and a multiplicity of 2.34, the delivery of 5.78 GeV beam for physics; and the continued improvements in polarized beam delivery, with the implementation of superlattice cathodes allowing delivery of electrons with up to 85% polarization with record average currents. At the time of the review the accelerator and experimental halls were "meeting overall performance goals at the 98% level" and the average ratio of good beam delivered to the hours scheduled for all three halls was over 100%, but Hall C was averaging only 87% due to problems implementing the new HKS detector with its demanding beam requirements. We are pleased to note that the final performance of Hall C (summed over the entire fiscal year) rose to 95.9%, and the three hall weighted average ended up at 108.2%.

All in all a very good year of delivered physics operations. Work to reduce the impact of RF trips on beam delivery and plans in place to further address the problem for high energy running by the refurbishment of cryomodules were also noted positively. The reviewers continue to be "impressed with the Accelerator Division's efforts to minimize downtime using a systematic database to track failures of the facility."

The committee noted two real strengths of the program that we quote here to emphasize our agreement with their judgment:

> "There appears to be good interaction between the Accelerator Division, its Operations Department, and CASA in particular and the NP Experimental Program which allows effective and realistic planning regarding beam capabilities for experiments" and
>
> "The NP program benefits from the FEL as it provides a useful testbed for components which are also needed for CEBAF. The linac control room has been recently modernized utilizing technology developments from the FEL."

The large backlog of experiments, which exceeds four years in Halls A and C, continues to be a concern to both the Panel and the laboratory. Recent PACs have found new proposals sufficiently compelling that they have recommended awarding beamtime above the nominal allocation, hampering efforts to cut back on the backlog. From our perspective, the ideal backlog has also become a more complex issue, as the increasingly demanding beam requirements and constraints of newer proposals are making it more and more difficult to find experiments that can be scheduled simultaneously (i.e. using beams delivered with the same linac and polarized source settings). This has lead us to adjust the target for the backlog somewhat higher, as this then provides a broader range of experiments to search through to find experiments that run in parallel and therefore enhance the overall efficiency of machine operations.

Real progress on the backlog could be made with greater speed if we could increase the weeks of accelerator operations and availability, both of which are difficult in times of tight resources. The additional operating funds required to have a significant (~15% increase) impact on overall scientific throughput are relatively modest.

One of the major accomplishments of the year was the further validation for our vision for the facility's future provided by a very successful external review of the 12 GeV science convened by DOE-NP, which "strongly endorsed the proposed program for the 12 GeV upgrade, which would poise TJNAF to continue its role as the world center for hadron physics research using electrons." In addition, we successfully completed a "Lehman" or Independent Project Review of the 12 GeV project and are prepared to proceed to the next stage of the project. We await CD-1 approval and the start of PED funding.

In commenting on the Theory Program at the laboratory, the Panel noted how well the group's efforts are aligned with the experimental program at the laboratory and its growing effectiveness and fruitfulness. Two contributions were singled out as particularly effective: the further elucidation of the contributions of two-photon interactions to elastic electron-proton scattering; and a careful theoretical analysis of the contribution of the strange quarks to the magnetic moment of the nucleon. The group's research program is well balanced, aligned with national priorities and generally well tuned to the laboratory's experimental program.

A continuing concern noted by the Panel was the rate of progress on the analysis of the extensive data from CLAS and other JLab experiments on baryon structure. Our plans for implementing the Excited Baryon Analysis Center (a key part of our plan to address issues associated with moving this analysis forward more rapidly) were "considered appropriate" by the Panel, and we are moving forward as rapidly as possible to implement them.

Two other theory initiatives in progress are an effort to develop world-class capability in lattice QCD and a plan to expand a visitor program that will bring more theorists to the laboratory. The Panel noted that a white paper was prepared that articulates the physics which TJNAF wants to address through LQCD and identifies the hardware resources necessary to realize the goals. They went on to comment that it was "unclear how the proposed TJNAF LQCD efforts would be coordinated with the national LQCD program." We are working with both the larger LQCD community and DOE/NP to resolve these questions as quickly and effectively as possible.

The SRF Institute's work in developing cryomodules for the Upgrade was also praised, with the completion of the upgrade cryomodule design review in April 2005 and plans in place for completing and testing a prototype module. They further noted the plan submitted to DOE for SRF Accelerator Science and Technology Center, that could make important contributions to advancing the technology:

> "Today, TJNAF is the only location in the United States (U.S.) that has the necessary vertically integrated facilities and capability for advanced SRF R&D and for mass producing high performance SRF cavities. This has resulted in significant involvement in developing cavities for the International Linear Collider (ILC) and engagement with industry. TJNAF is encouraged to continue involving industry in developing production capabilities."

The Panel also recognized progress in the FEL program, noting that:

> "There are plans to increase the FEL's performance in the coming year. The FEL is preparing to operate as a user facility and plans to provide high quality, tunable terahertz (THz) infrared (IR) and Ultra Violet (UV) light in subpicosecond pulses and with record levels of power unmatched worldwide."

We were particularly pleased by the findings of the committee about the quality and productivity of the Jefferson Lab staff. The Panel noted that "the productivity shown by the many publications etc. is indicative of the high creativity and productivity of both the scientific and technical staff." They also highlighted the work of the theory group's active role in developing the staff through workshops, seminars and a strong visitor program, and the Accelerator Division's "world leadership in SRF technology, ERs and high power FELs, providing technological advances that are relevant to the NP mission and other areas."

The Panel noted the effectiveness of the User Group and the degree to which it is appreciated by the larger laboratory community. Working closely with them in developing plans for the transition from 6 to 12 GeV operation was cited as an important priority for the coming year (we agree completely).

In commenting on laboratory management, the Panel noted that "effective planning both in accelerator operation and execution of an experimental program has resulted in impressive productivity over the past year." They further noted that "the experimental program appears to be optimized and prioritized to take advantage of accelerator capability and at the same time to do the best and most timely physics." We are quite pleased with this characterization, as identifying and executing the best possible physics program is our highest priority.

Looking ahead, we have found setting overall priorities for FY06 within our continuing financial constraints exceedingly difficult. The final budget for FY06 has still not been established, with the ultimate impact of pressures ranging from the President's budget request (very low for nuclear physics) for FY06 to the funding for relief efforts from the impact of Hurricane Katrina still not known. We continue to experience increasing pressures on our budget to support essential R&D and preparations for the 12 GeV Upgrade.

Despite this situation, we began FY06 with a plan to maintain full operations of the accelerator, but with some changes in overall operational philosophy. First, we are restricting operations for the summer period (when the demand charge for electrical power is set) to very low energies (one pass, one linac only operation). On the one hand this will save considerably on the power bill, and on the other will permit execution of a major portion of the high priority G0 backward angle running. We are also "stretching out" experimental physics operations, running the accelerator longer but with lower hall multiplicity. This year's operation will be an experimental test of the estimates that this mode of operation will ultimately result in more physics being delivered for the same total operating budget.

In previous reviews of the laboratory EH&S has been a major area of concern. Both we and the Panel were pleased to note that "the laboratory's safety record currently places TJNAF at the lowest level of reportable incidents among all DOE laboratories." We are working hard to keep our performance at this level for the long term and have reorganized the EH&S activities at the laboratory in an effort to do this.

In FY06, we will continue to maximize productivity through careful internal prioritization and resource allocation. While we remain unable to invest adequately in advanced accelerator research and development at our present funding level, we recognize that it will be essential to remedy this problem soon in preparation for the 12 GeV Upgrade. It is also clearly of interest to the larger physics community to see the Lab's Accelerator Physics and SRF expertise strengthened with stabilized funding.

We were also pleased to note that the Panel indicated that we are making appropriate progress on all of the action items from last year's S&T Review.

In summary, the Lab found the concrete observations of the Science and Technology Peer Review Panel to be consistent with our own assessment of the Lab's performance. We believe this Review was constructive, useful, and accurate in its observations.

Principal Areas of Emphasis for FY06

• Deliver beams as required for the planned experimental program, and continue to manage the approved experiment backlog toward a goal of ~3 years/hall.

• Complete development work toward the prototyping of the final "high performance" cryomodule appropriate for the 12 GeV upgrade.

• Carry out critical R&D and advanced conceptual design work essential for the moving the project forward as quickly as possible following CD-1 approval.

• Further strengthen the science case for BES funding of research using the upgraded FEL.

• Continue to pursue with DOE a plan for an SRF Center of Excellence that fits into a comprehensive national accelerator R&D plan, capitalizes on the existing capabilities to attract world class experts, and encourages the transfer of SRF fabrication technology to industry.

• Advance LQCD at JLab through coordinated effort with DOE and the national LQCD collaboration.

• Continue close interactions and involvement with the nuclear physics user community.

• Take the first concrete steps toward the establishment of the Excited Baryon Analysis Center to optimize the physics output from the CLAS detector.

• Participate as requested in RIA R&D.

1.2 Reliable Experimental and Accelerator Operations

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
1.2.1	Delivered Physics Research Operations *Dependent on details of beam schedule	100	100	5948.2 Hours	8796.3 Hours	Outstanding

Discussion

Performance Goal: Sphysics research-goal = (Sbeam-1.2.5) (Aaccel-goal) (Ahalls-goal) (Mgoal)
Sbeam-1.2.5 = 27 weeks x 168 hours = 4536 hours
Aaccel-goal-routine = (S1-hall Aaccel-1-hall + S2-hall Aaccel-2-hall + S3-hall Aaccel-3-hall)

	Accelerator Availability			**A**accel-#-hall	**S**#-hall
	FY02	FY03	FY04	3yr Avg	FY05 Hrs
1-Hall Ops	68.06%	76.54%	72.97%	72.52%	1046.86
2-Hall Ops	70.63%	65.44%	73.83%	69.97%	4407.14
3-Hall Ops	73.35%	62.03%	69.40%	68.26%	9021.86
				Sbeam	14475.86
				FY05 Goal for **A**accel-goal-routine	69.09%

Nacc-cap-upgrade = 1 for near max. energy operations
Aaccel-goal = Aaccel-goal-routine - (Nacc-cap-upgrade x 2.5%) = 69.09 - 2.5 = 66.59%
Ahalls-goal = Ehalls-goal = 85.13% (from PM 1.2.3)
Mgoal = Sbeam / (S1-hall + S2-hall/2 + S3-hall/3) = 2.31
Sphysics-research-goal = Sbeam-1.2.5 Aaccel-goal Ahalls-goal Mgoal
Sphysics-research-goal = 4536 x 66.59% x 85.13% x 2.31 = 5948.19 hours

Actual performance during FY05 was as follows:
Sphysics research = hallA(ABU+PCC) + hallB(ABU+PCC) + hallC(ABU+PCC)

FY2005	ABU	PCC	TOTAL
Hall A total	2845.59	163.87	3009.46
Hall B total	3207.6	121.03	3328.63
Hall C total	2305.48	152.74	2458.22
			8796.31

Sphysics research = 8796.31
Sphysics-research / Sphysics-research-goal = $\frac{8796.31}{5948.19}$ = 1.4788 = 100 points.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
1.2.2	Accelerator Downtime	40	40	<=15%	14.5%	Outstanding

Discussion

	Scheduled Hours		Down Hard Hours		UP Hours		Dt (cumulative)
FY 2005	Physics	Accel Dev	Physics	Accel Dev	Physics	Accel Dev	% DnHard
October	624	47	99.81	7.89	524.19	39.11	16.05%
November	553	23	73.60	9.79	479.37	13.21	15.32%
December	470	65	46.02	12.71	424.00	52.29	14.02%
January	530	46	87.57	5.08	442.43	40.92	14.52%
February	32	23	7.69	3.00	24.31	20.00	14.64%
March	489	86	77.62	5.96	411.38	80.04	14.62%
April	555	28	128.29	0.86	426.71	27.14	15.85%
May	597	27	99.48	3.95	497.52	23.05	15.96%
June	597	51	104.14	3.81	492.86	47.19	16.05%
July	545	25	74.85	2.43	470.15	22.57	15.79%
August	714	28	76.09	2.06	637.91	25.94	15.15%
September	530	30	35.50	3.58	494.51	26.42	14.47%
Sums	6235.99	479.00	910.66	61.12	5325.34	417.88	14.47%
	Sbeam	Sad			Sbeam-actual	Sad-actual	

Dt = 100% X [(Sbeam – Sbeam-actual) + (Sad – Sad-actual)] / (Sbeam + Sad)
Dt = 100% x ((6235.99 – 5325.34) + (479.00 – 417.88)) / (6235.99 + 479.00)
Dt = 14.47%
Dt is <15%; therefore 40 points are earned.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
1.2.3	Experimental Equipment Availability *Dependent on details of beam schedule	20	20	85.1%	89.8%	Outstanding

Discussion

The goal for the availability of the experimental equipment in routine operations, Ehalls-goal-routine, is given by the average of the individual hall availability goals for routine operations (given by the average over the three previous fiscal years) weighted by the hours of each hall's operation scheduled for the year:

	Hall Availability			Ei-goal	Si
	FY02	FY03	FY04	3yr Avg	FY05 Hrs
Hall A	77.52%	90.71%	70.64%	79.62%	4727.43
Hall B	93.10%	87.95%	94.23%	91.76%	5428.00
Hall C	90.99%	90.55%	92.09%	91.21%	4320.43
			FY05 Goal for	Ehalls-goal-routine	87.63%

FY05 Adjustments: Hall A 2.5% BigBite Installation
Hall B 2.5% DVCS Installation
Hall C 2.5% HKS Installation

Note: following formula suggests Nhall-cap-upgrade = 3 x 2.5%; it probably intends to be applied to each hall individually then combined; i.e. using the same format equation as used for Ehalls-goal-routine.

Experimental equipment availability for all halls for FY05:

				Si-actual	**Ei**-actual	
FY2005	ER	PCC	UED	Hours	Exper %	**EiSi**
Hall A total	4153.32	163.87	506.82	4824.01	89.49	4317.19
Hall B total	4896.19	121.03	353.78	5371.00	93.41	5017.22
Hall C total	3594.13	152.74	620.08	4366.95	85.801	3746.87
Physics Total	12643.64	437.64	1480.68	14561.96	89.83	13081.28
				∑Si-actual	**Et**	**∑EiSi**

Et = 89.83%
89.83% / 85.13% > 1, therefore 20 points are awarded.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
1.2.4	Effectiveness of the Scheduling Process	20	18.9	100%	94.4%	Outstanding

Discussion

Experiment Number	t_{bs} Date of Schedule	t_{ss} Scheduled Start Date	t_{sa} Actual Start Date	S_j Scheduled* FY05 Hours	$(t_{ss}-t_{bs})$ Delta - Days Scheduled	$(t_{sa}-t_{bs})$ Delta - Days Actual	R_j Delta Days S / Delta Days A	S_j*R_j Scheduled* times ratio
E00-110	6/11/2004	9/24/2004	9/28/2004	579.43	105	109	0.963	558.17
E03-106	6/11/2004	10/31/2004	11/7/2004	691.86	142	149	0.953	659.35
E01-015	11/18/2004	1/14/2005	1/13/2005	1258.43	57	56	1.000	1258.43
E94-107	11/18/2004	6/4/2005	6/13/2005	477.71	198	207	0.957	456.94
E99-115	11/18/2004	7/9/2005	7/28/2005	1258.43	233	252	0.925	1163.55
E02-103	7/14/2004	9/27/2004	10/10/2004	1137.57	75	88	0.852	969.52
eg3	11/18/2004	12/8/2004	12/10/2004	944.57	20	22	0.909	858.70
E01-113	11/18/2004	3/17/2005	3/21/2005	1605.86	119	123	0.967	1553.63
g8	11/18/2004	6/24/2005	6/27/2005	1433.14	218	221	0.986	1413.69
E02-019	6/11/2004	9/20/2004	9/21/2004	914.71	101	102	0.990	905.75
E03-103	6/11/2004	11/15/2004	9/21/2004	222.86	157	102	1.000	222.86
E03-008	11/18/2004	11/30/2004	11/23/2004	245.14	12	5	1.000	245.14
E01-107	11/18/2004	12/13/2004	12/10/2004	245.14	25	22	1.000	245.14
E02-109	11/18/2004	1/8/2005	1/8/2005	347.43	51	51	1.000	347.43
E04-001	11/18/2004	1/8/2005	1/8/2005	347.43	51	51	1.000	347.43
E01-011	11/18/2004	6/18/2005	7/9/2005	1954.29	212	233	0.910	1778.15
E02-017	8/25/2005	9/15/2005	9/25/2005	347.43	21	31	0.677	235.35
			Totals	14011.43	1797	1824	NA	13219.23
							Percentage	94.35%

* Scheduled hours based on the Long-range schedule for FY05.

Actual Performance: $\varepsilon sched = \sum Sj\text{-}schedRj / \sum Sj$
Actual Start Time Factor = 13219.23 = 0.9435
Scheduled Start Time Factor 14011.43
(0.9435)(20 points) = 18.869 points earned.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
1.2.5	Overall Operations Effectiveness	20	20	27 Weeks	37.1 Weeks	Outstanding

Discussion

Contractual requirement = 27 weeks of accelerator operations for physics for FY05.
Eops-goal = 27 weeks
Accelerator operations for physics for FY05:
Hours for Physics = 6236.0 hours / 168 = 37.119weeks

$$\frac{37.119 \text{ weeks}}{27 \text{ weeks}} = 1.3748 > 1$$

, therefore 20 points are awarded.

Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
Subtotal Reliable Experimental and Accelerator Operations	**200**	**198.9**	**% of Points Assigned = 99.5%**		**Outstanding**

1.3 Production of Scientific and Technical Manpower

Introduction

Jefferson Lab remains committed to increasing production of scientific and technical manpower by continuing to engage students in a broad range of research projects. Our continued success is indicated, as in previous years, by data gathered primarily with a Jefferson Lab Users Group Survey. In this year's survey, we again provided respondents with an easy means of submitting a "no students" reply by promptly returning the electronic mail survey with that two-word phrase in the subject heading. As in the past, many Users replied to our initial request within hours of our sending it out. In addition to our e-mail survey, we ran a crosscheck of respondents against a list of known Users and known Jefferson Lab graduate students and consulted Laboratory staff who oversee the work of students in order to enhance the statistical reliability.

In FY06, we will continue to improve our database of Users and students. We will continue to contact Users throughout the year and encourage them to track and report these data. As in the past, we must work to ensure that Users do not overlook the production of advanced degrees that were granted earlier in the same fiscal year. In FY06 we intend to keep our databases and User reports at a level that allows us to minimize follow-up contacts.

Jefferson Lab continues to be strongly involved with the development of research programs and the corresponding production of advanced degrees at Historically Black Colleges and Universities (HBCUs) and at Minority Educational Institutions (MEIs). Advanced degrees have been awarded based upon Lab research at one or more of the six HBCUs and MEIs with which we have memoranda of understanding (MOU) agreements. During the past fiscal year, Jefferson Lab maintained MOUs with the following HBCUs and MEIs:

- Florida International University
- Hampton University
- Norfolk State University
- North Carolina A&T
- North Carolina Central University
- New Mexico State University

Table 1.3-1 shows the number of advanced degrees granted by these institutions since FY97. Although the absolute numbers in any three-year period are small, they represent a significant fraction of U.S. minority degrees awarded in physics and reflect a promising trend in the participation of minority students in physics research at Jefferson Lab. Annual variations in minority advanced degrees can be attributed both to the time delay in completion of an advanced degree and to statistical fluctuations in small numbers such as these. A dozen such students are in progress toward the PhD degree at present and thus a rise in minority degree production may occur in the coming fiscal year. We note that an unusual rise in these numbers was evident for FY02. Such fluctuations lend support to the decision to report a three-year average for this metric.

Table 1.3-1 Advanced Degrees Awarded by Minority Institutions

	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05
MS	3	3	3	0	1	6	1	1	2
PhD	1	1	1	2	3	6	0	1	3
Total	4	4	4	2	4	12	1	2	5

Principal Areas of Emphasis for FY06

• We will continue our practice of interviewing each arriving graduate student and conducting follow-up interviews with a majority of those already on site. In addition, we will take advantage of a variety of activities organized under the Jefferson Lab Student Affairs Office to facilitate and enhance the student experience at Jefferson Lab and encourage the research effort at the Lab to become more efficient at production of trained manpower in physics and related technical fields.

• We continue to expand involvement and opportunities—intellectual, social, and recreational—for students during their tenure at Jefferson Lab. Laboratory management has supported use of the Residence Facility Great Room for graduate student meetings, and a dedicated space is now set aside for a graduate student meeting room. Comfortable furniture and facilities for table-soccer and table tennis and a computer terminal are installed in that room. We arrange a regular schedule of seminars presented by the students in addition to other activities that serve to welcome and integrate new students into the student community.

• Jefferson Lab has been actively producing data from the three experimental halls for several years, allowing timely progress in PhD studies. In addition, many theory graduate students are closely associated with the Laboratory. In FY06 we will continue to publicize these unique opportunities both in the United States and throughout the world.

• The head of the Jefferson Lab Student Affairs Office has participated in a Nuclear Sciences Advisory Committee educational subcommittee which published its final report in the past fiscal year. One goal of that study was the enhancement of minority participation in nuclear science. Although such a goal is expected to be a long term one, we will continue to make Jefferson lab a welcome experience for all students and especially for those previously underrepresented in this field.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
1.3.1	Number Of Student Years Per Year On Jefferson Lab Related Research Or Technical Activities	20	18.6	1075	1021	Outstanding

Discussion

This performance measure is based on a Weighted Student Involvement Index (WSII) defined by:

WSII (Weighted Student Involvement Index) = 1(HSS) + 2(UGS) + 4(GS)
where HSS = High School Students, UGS = Undergraduate Students,
and GS = Graduate Students

The FY05 score is WSII = 1.8 + 2(47) + 4(231.4) = 1021.4

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
1.3.2	Number Of Advanced Degrees Per Year Based On Jefferson Lab Research	35	35	53	53	Outstanding

Discussion

In FY05, there were 23 advanced degrees (8 Masters and 15 PhDs) awarded based on Jefferson Lab research. This performance measure results from a Composite Degree (CD) Index defined by:

CD (Composite Degrees) = 1(MD) + 3(PHD)
where MD = Number of awarded Masters degrees and PHD = Number of awarded PhDs

The FY 05 CD score is: CD = 8 + 3x15 = 53

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
1.3.3	Number Of Advanced Degrees Per Year Granted By Minority Universities And Based On Jefferson Lab Research	5	4.3	6	5.3	Excellent

Discussion

In FY05, we report 2 MS and 3 PhD degrees awarded by a minority institution. We note that in FY02 six PhD and six MS degrees were awarded by minority institutions based on Jefferson Lab research. We believe that the expected fluctuations in these small variables give ample justification to the decision made two years ago to evaluate this datum based on a three-year average. It is also worth noting that 12 African American students are listed on the Jefferson Lab roster of graduate students for FY05.

The score of this performance measure for FY05 is based on the following equation:

CDM (Composite Degrees Minority) = (MDy+MDy-1+MDy-2 + 3(PHDy+PHDy-1+PHDy-2))/3
where MD = Number of awarded Master's degrees and PHD = Number of awarded PhD's
and y is the current year.

In FY05 3 PhD and 2 MS degrees were granted by minority institutions.

FY05 CDM = (1 x (1 + 1 + 2) + 3 x (0 + 1 + 3))/3 = 5.3

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
1.3.4	Participation Of Students From Groups Traditionally Underrepresented In Physical Science And Engineering Fields	10	10	>35%	35.2%	Outstanding

Discussion

The Minority Weighted Student Involvement Index for women and underrepresented minorities is:
Scoring: Determine the percent of students at all levels participating in Jefferson Lab based research and technical activities who are women or underrepresented minorities.

$$\text{Participation} = P = \frac{\text{Number of research students who are female, African American, Hispanic, or Native American}}{\text{Total number of research students}}$$

Students who qualify for more than one category can be counted more than once. In order to correct for this bias, each match will be treated as a distinct individual, thereby ensuring that whatever number is added to the numerator also will be added to the denominator.

For FY05 our survey of active graduate students engaged in Jefferson Lab research efforts yielded 120 graduate students reported. That represents approximately half of our cadre of students. Of the 120 reported, 43 students were female or were minority. Two students were both female and minority. This group represents an excellent sampling of active graduate students and thus can be expected to yield a fairly reliable percentage of participation by underrepresented persons. Of that group:

25 were female,
6 were Hispanic, and
12 were African American.

Two were both female and minority and thus to be included in the denominator as described above.

$$\text{Thus, Participation } P = \frac{25 + 6 + 12}{120 + 2} = 35.2\%$$

We note that the percentage of Jefferson Lab related female PhD candidates (20%) compares favorably with the results of a recent survey (by an NSAC subcommittee) indicating that 12.5% of nuclear physics PhDs went to women in the period 1991-2002. Similarly, in 2001 there were 18 PhDs and 34 masters degrees awarded in the United States to African Americans in all fields of physics. In FY2005, 12 African American students were seeking advanced degrees based on Jefferson Lab research.

Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
Subtotal Production of Scientific and Technical Manpower	**70**	**67.9**	**% of Points Assigned = 97.0%**		**Outstanding**

2.0 Corporate Citizenship

Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
TOTAL CORPORATE CITIZENSHIP	**75**	**74.8**	**% OF POINTS ASSIGNED = 99.7%**		**Outstanding**

2.1 Public Outreach and Improved Scientific Literacy

Jefferson Lab's approach to strong community relations and public outreach efforts starts with top management and is based on involvement by the Lab leadership and staff in the community. The Director and the Chief Technology Officer serve on state-wide boards namely the Virginia Research and Technology Advisory Council and the Virginia Nanotechnology Committee. The Director also is an executive member of the Hampton Roads Partnership, a committee whose mission is to capitalize on regional economic development opportunities. Other Lab staff are actively involved with and serve as members of committees and boards including: the Jefferson Center for Research and Technology Committee, the United Way of Virginia, Corporate Volunteer Council, the Cooperating Hampton Roads Organization for Minorities in Engineering, the Newport News Environmental Commission, the Newport News Chamber of Commerce Business and Education Council, the Virginia Emergency Management Committee, the Tidewater Minority Purchasing Council and the Hampton Roads Research Partnership.

Through these interactions, city officials, state delegates, local business leaders, and the citizens of the community remain informed of Lab activities and have the opportunity to communicate frequently with Lab management. Lab leadership and staff are afforded the opportunity to demonstrate their commitment to the local community and are better able to be proactive when dealing with issues that could impact the public. The Lab has a strong sense of community and takes its role as a responsible community member most seriously.

2.1.1 Key Indicator - Public Participation

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
2.1.1	**Key Indicator - Public Participation**	20	20	90,000 Person-hours	152,488 Person-hours	Outstanding

Discussion

Jefferson Lab's Corporate Citizenship activities illustrate the priority given by the Lab to engage the public in the national science agenda and to inform local citizens about the DOE research being conducted at Jefferson Lab. Activities and events managed by the Public Affairs Office throughout the year include: conducting tours; giving public lectures to civic groups; and inviting the public to the Lab for guest speaker presentations. These efforts involve the community at Jefferson Lab and result in continued goodwill.

Major public events hosted by the Lab in FY 2005 were the Jefferson Lab Open House and the World Year of Physics events. Over 9,000 local citizens came to JLab's Open House to learn about the science programs and tour the accelerator facility and the experimental end stations. Local universities and science museums joined the Lab in this event to help inform the public about the local scientific enterprise. This biennial opportunity presents the Lab's science to a segment of the population that would otherwise have no opportunity to visit the Lab. Attendance at the event exceeded the past record of attendance by 4,000 people.

Jefferson Lab hosted two special events in celebration of the 2005 World Year of Physics. Lawrence Krauss, former winner of the AIP science writing award, presented a well attended lecture entitled, "Einstein's Biggest Blunder". The second special event included a lecture on Einstein's love of music, presented by Dr. Brian Foster from Oxford University, followed by a performance of Einstein's favorite music by internationally known violinist Jack Liebeck and pianist Inon Barnatan.

Another program that is integral to the Lab's commitment to Corporate Citizenship is the Science Education program. This program contributes to the Commonwealth and the nation's science education and literacy as evidenced in Public Participation metrics. The educational centerpiece is the Lab's K-12 science education program, Becoming Enthusiastic About Math and Science, most often referred to as BEAMS. The BEAMS program serves all sixth, seventh, and eighth grade students and teachers from two local schools with the most "at-risk" students. Students and teachers visit Jefferson Lab for two to five days of hands-on math and science activities conducted by Jefferson Lab scientists, engineers, and technicians. This continued interaction has yielded measurable results, increasing test scores of these students in Virginia Standards of Learning tests in Math and Science.

During the summer of 2005, 17 middle school science teachers participated in the Lab's Teacher Academy in the Physical Science program, a four-week basic refresher course in physical science, taught by physics professionals including staff scientists. Additional activities in science education include classroom visits to assist teachers and students in math and science educational activities; Physics Fest days (field trips to the Lab); providing internship programs for high school and college students interested in science and technology careers; participating as local and regional science fair judges; providing science lectures to the public; and hosting the Department of Energy's High School and Middle School Science Bowls. The Virginia high school team went on to win the national Science Bowl championship for the fourth year in a row. During FY05, Jefferson Lab's Science Education program served more than 13,000 students. In addition, the Lab provided in-service activities, which include access to the Lab's expertise and equipment, to more than 2,600 teachers.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
2.1.2	Public Visibility (a) Number of Articles (b) Citations Mentioning DOE	 7 3	 7 3	 900 100%	 906 100%	 Outstanding Outstanding

Discussion

Public awareness of the Department of Energy and Jefferson Lab continues to be reinforced through the use of the media and interactions with the public. Local and regional news articles cover Jefferson Lab's science programs and research results, science-related public lectures, and technology development. On the national and international front, articles on Lab scientific research were included in the New York Times, USA Today, Science, Science News, The Economist, Physics Today, Nature and on websites spanning the globe. JLab features a new science article on its homepage each month to encourage the general public to revisit the site. The continued subscription by the Department of Energy to a science journalist website called EUREKALERT! continues to give Jefferson Lab news good exposure nationally and internationally and reflects well in the scores.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
2.1.3	Customer Satisfaction	5	4.8	5	4.8	Outstanding

Discussion

The Lab also conducted over 30 tours—attended by over 1,000 people —for industry and government officials and members of professional organizations, and provided speakers for civic groups as requested. Customer satisfaction ratings of public tours and student interactions is outstanding.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
Subtotal Public Outreach and Improved Scientific Literacy		**35**	**34.8**	**% of Points Assigned = 99.4%**		**Outstanding**

2.2 Technology Transfer

Technology Transfer is an integral part of the mission of Jefferson Lab. The basic idea is to get discoveries made at the Lab into the applied and commercial fields as quickly as possible, so that the public – who foots the bill for the Lab – will not have to wait to benefit from their investment in basic research. In addition, Tech Transfer activities are mandated by Federal Law in the Bayle-Dole Act of 1980.

Technology Transfer activities at Jefferson Lab are managed by a multi-disciplinary, cross-division team of subject matter experts (SMEs). Chartered by the Jefferson Lab Directors Council as the Technology Review Committee (TRC), the TRC is composed of representatives from the major divisions of the Lab, a representative from Jefferson Lab's M&O Contractor (SURA), and is chaired by the Chief Technology Officer.

The majority of Technology Transfer activities can be categorized in four areas: applications of the Free Electron Laser (FEL) facility and the laboratory's core expertise in x-ray and gamma imaging, managing intellectual property, working with the private sector companies doing unique work that cannot be done anywhere else, and actively participating in local, regional, state, and national organizations that promote technology.

The FEL is a direct application of superconducting radiofrequency (SRF) accelerator technology, a core expertise of Jefferson Lab. The FEL is the world's most powerful tunable Infrared (IR) light source producing up to 10 kW of IR light. The facility was built by the Commonwealth of Virginia, the equipment was funded by the U.S. Navy, and it is located on the accelerator site. The Laser Processing Consortium (LPC) was formed to organize the myriad of application topics and experiments, and is composed of private companies, federal and state organizations, and universities. Annually, the LPC conducts a comprehensive workshop/conference to report, review, and propose FEL activities.

The laboratory's expertise in gamma and x-ray imaging (which is a core expertise tied to the laboratory's primary scientific mission in nuclear physics), has been transferred to a local start-up company that is successfully manufacturing scintimammography equipment. Licenses of related IP are under negotiation for other biomedical applications.

Intellectual property (IP) generated by Lab staff goes through our IP procedures that move the IP through various steps: Disclosure, Evaluation, Patentability, Filing, Awarding, Maintenance, and Licensing. When a patent is awarded, inventors receive $500 per patent and share with SURA, on a 50-50 basis, resulting net royalties. Periodically, the TRC hosts an award ceremony to honor recent patent recipients. As of the end of FY05, JLab has 55 patents and 5 licenses in its portfolio.

On occasion, organizations outside the Lab have need for services that cannot be found anywhere else in the world. If Jefferson Lab can accommodate the work, and if the Dept. of Energy approves, then the appropriate contractual agreement is executed with the outside organization. Most of these agreements take the form of, but are not limited to, Memoranda of Understanding (MOUs), Work for Others (WFOs) – i.e., pay-for-services, Cooperative Research and Development Agreements (CRADAs) and Inter-Agency Agreements. The TRC works with the organization to match their needs with the appropriate agreement and then gets the required approvals prior to executing the agreement. These agreements bring in over $20M annually.

The Chief Technology Officer and his associate actively participate in outside technology organizations, serving on the Board of Directors of several. The Hampton Roads Research Partnership (HRRP)+A331 composed of 7 local universities, JLab, and NASA Langley Research Center, facilitates interdisciplinary, multi-organizational collaboration in applied and basic research. The Hampton Roads Technology Council (HRTC), composed of regional technology companies and companies that support technology, is dedicated to increasing technology-based economic development for the region. At the state level, Jefferson Lab management serves on several technology commissions.

Although the above descriptions imply neat categorizing of the JLab Tech Transfer activities, that is not the case. We are now working on a Laser BioScience Center proposal for a 60,000 sq. ft. interdisciplinary facility to be constructed and operated adjacent to the present FEL. This activity is a direct result of the collaborations facilitated by the HRRP, the LPC, SURA and three partner medical schools.

In summary, Technology Transfer activities at Jefferson Lab meet the requirements of the Bayle-Dole Act, fulfill the scientific mission of the Laboratory, and support a broad range of inter- and multi-disciplinary research applications for the region, state, and nation.

2.2.1 Key Indicator - Non-DOE investment in Jefferson Lab initiatives (including direct dollars, manpower costs, and contributions in-kind)

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
2.2.1	**Key Indicator - Non-DOE investment in Jefferson Lab initiatives (including direct dollars, manpower costs, and contributions in-kind)**	20	20	2.5% of JLab ops budget	14.2%	Outstanding

Discussion

The FEL continues to be the largest source of Non-DOE investment in Jefferson Lab initiatives. However, both the number and amount due to "other than FEL" sources increased in FY05, and supply funding for over 10 FTEs.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
2.2.2	Intellectual property generation as indicated by the annual number of	10	10			Outstanding
	(a) Patent applications			5 or	11	
	(b) Patents awarded			1 or	4	
	(c) License agreements			2	7	

Discussion

Once again we had an innovative year by JLab staff. The invention disclosures continue their pace of at least 2 per quarter and continue to range over all "business lines" of Jefferson Lab. In addition, we have implemented a comprehensive database system (Inteum C/S) in order to track the growing portfolio of Intellectual Property.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
2.2.3	Benefit to partners based on customer surveys	10	10	5	5	Outstanding

Discussion

The results of customer surveys is not available as of end of FY05. We expect the results by early CY06. Positive feedback from these surveys is anticipated, consequently, the goal of 5 is assumed to be met. The actual results will be submitted when available.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
	Subtotal Technology Transfer	**40**	**40**	**% of Points Assigned = 100%**		**Outstanding**

3.0 Quality Performance in Environment, Health and Safety

Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
TOTAL QUALITY PERFORMANCE IN ENVIRONMENTAL, HEALTH & SAFETY	**150**	**149.5**	**% OF POINTS ASSIGNED = 99.7%**		**Outstanding**

JLab developed and implemented a lab wide comprehensive safety strategy that bolstered positive EH&S results in FY05. Key safety parameters indicate that the strategy has been successful in improving integrated safety management (ISM) at Jefferson Lab.

Several key organizational and cultural items were put in place in FY05 to ensure the principles of ISM are implemented across the site.

- Establish a Director's Safety Council (complete)
- Identify an interim Safety Director to lead the Safety Enhancement Plan (complete)
- Hire a full time AD, Safety reporting to the Lab Director with membership on the Director's Council (complete)
- Conduct culture survey to identify areas of needed improvement (complete)
- Establish a Worker's Safety Committee with direct feedback to the Director (complete)
- Establish an external Senior Safety Advisory Committee reporting to the Director

In conjunction with the February accelerator shutdown and installation of the HKS spectrometer in Hall C, extensive use was made of lessons learned from recent injuries and the SLAC arc flash burn accident to reinforce ISM principles. Formal presentations of lessons learned from the SLAC accident, review of the task hazard analysis requirements and process, and the application of the process in HKS experiment work planning were reviewed in detail at the shutdown planning meeting.

JLab has effectively used the Safety Incident Notification process to ensure incidents are quickly reviewed, facts gathered, notifications made and corrective actions identified. This process has been effective in raising the awareness of events around the laboratory, and has resulted in more thorough analysis of the event and resulting actions to prevent recurrence.

JLab personnel participate in feedback and improvement efforts with the other SC laboratories and DOE entities in sharing lessons learned and seeking best practices to address common issues. For example, JLab participated in EFCOG/DOE sponsored workshops on subcontractor health and safety and electrical safety. JLab's Safety Division Associate Director participates in frequent conference calls among SC laboratory safety directors to share recent experiences and lessons learned. These calls provide early identification of potential problem areas that enable the lab to examine an area before an event occurs.

JLab has taken an approach of looking at lab-wide safety performance improvement including hazard identification and analysis at the lab-wide level and task/activity level.

The February 2005 accelerator shutdown safety meeting presentations reinforced the lab's task hazard analysis process and showed how this common process was applied in Accelerator, Physics, and Administration Divisions work planned.

To provide for a common EH&S approach across the laboratory a central EH&S organization has been established, led by Craig Ferguson (AD, Safety) reporting to the Laboratory Director. The EH&S organization combines the functions of environmental safety, occupation medicine, industrial safety/hygiene, radiological control, performance assurance and emergency response.

In addition, with establishing the Director's Safety Council we have an effective mechanism to identify and address cross-cutting issues at the most senior level of the laboratory. The Director's Safety Council, made up of the Laboratory Director, Physics AD, Accelerator AD, Safety AD, Admin AD, and Chief Scientist, reviews lab wide recommendations and issues to influence safety improvement. An example of applying common operational safety practices is our implementation of safe electrical work practices and NFPA 70E. Our review of the SLAC arc flash event and our own electrical safety improvement team recommendations resulted in several lab-wide hazard control improvements and mitigations.

An assessment program outline was developed to improve the assessment process. The elements of the upgraded assessment program include:

- o Independent assessments
- o Management self assessments
- o Issues management

A laboratory wide survey of employee, user, and subcontractor perception of JLab safety culture was conducted in February 2005 by a nationally recognized expert firm. The survey results ranked JLab overall safety culture at the "world class" level (top 5% of companies surveyed in the past 15 years) and identified several focus areas for continuing improvement. A Worker Safety Committee was established in June 2005 which provides direct feedback to Laboratory senior managers. This committee, among other things, makes recommendations addressing the focus areas from the safety culture survey and to makes recommendations to the Director's Safety Council.

The Lab-wide Corrective Action Tracking System (CATS) was put in place June 30, 2005.
• Internal assessment recommendations are routinely entered into the CATS and tracked to closure
• An issues management process outline has been developed with the following elements:

- o Screening issues
- o Assigning issues and actions
- o Use of the CATS application
- o Expectations of closure of CATS items
- o Director's Safety Council periodic review of outstanding/overdue actions

• Director's Safety Council periodic review of outstanding/overdue actions

Significant effort has been applied to implementation of the Environmental Management System (EMS) at JLab with a schedule to complete before the end of the calendar year. An internal audit of the EMS to ISO 14001 standards was conducted in preparation for self-declaration. A significant EMS milestone was the development of EMS awareness training. This training was provided electronically to Lab staff in August.

JLab has put tremendous energy toward improving the safety performance of the laboratory with demonstrable results:

- • JLab has improved from having one of the poorest TRC/DART rates in SC to leading the SC laboratories in DART and second in TRC performance.
- • We have passed one million work hours and one year without a DART injury/illness.
- • We closed out all OSHA issues ahead of schedule.
- • We have received two regional awards for our environmental stewardship performance.
- • The Director's Safety Council and Worker Safety Committee are addressing on the floor safety issues important to lab staff.
- • Completed major accelerator shutdown with heavy industrial work and a major installation in Hall C with no safety related events or injury.
- • JLab received three National Safety Council awards for excellent safety performance in FY05.

3.1 Key Indicator - Total Recordable Case Rate (TRC)

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
3.1	**Key Indicator - Total Recordable Case Rate (TRC)**	50	50	<=0.9 per 100 person years	0.5	Outstanding

Discussion

The Jefferson Lab TRC rate of 0.5 compared very favorably with the SC goal of 1.1 for FY05. Important progress was made in improving worker and supervisory safety awareness through several SURA management initiatives. This emphasis improved the Lab safety culture by a broad range of activities. These FY05 initiatives included improving staff awareness of timely injury reporting, monthly Integrated Safety Management (ISM) posters distributed lab wide, weekly EH&S tips in the electronic Lab newsletter, and the formation of a Worker Safety Committee.

3.2 Key Indicator – Days Away, Restricted or Transferred (DART) Case Rate

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
3.2	**Key Indicator – Days Away, Restricted or Transferred (DART) Case Rate**	50	50	0.4 per 100 person years	0.1	Outstanding

Discussion

The Jefferson Lab DART rate noted a very strong improvement from the FY04 rate of 0.7 to 0.1 in FY05. It is important to note that the single FY05 DART injury case was the result of an injury that had one (1) restricted workday. The EH&S improvement initiatives noted under 3.1 above were also applicable to the strong improvement in this injury avoidance metric. This FY05 DART result continued the FY04 improvement when the rate improved to 0.7 from 1.0 in FY03.

3.3 Key Indicator - Environmental Exceedances

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
3.3	**Key Indicator - Environmental Exceedances**	20	20	To have no environ-mentally significant violations of permitted limits	0	Outstanding

Discussion

As measured by the number of environmental exceedances that violated regulatory limits, the Lab's environmental program is extremely effective. In FY05 no environmental permit Notices of Violation were issued to Jefferson Lab. The Lab again received the highest award of the Hampton Roads Sanitation District (HRSD) in FY05, the HRSD Gold Award for Pretreatment Excellence.

JLab did stay within permitted or other regulatory environmental limits. Lab staff involved with chemical use or other processes with exceedance potential are trained and appropriately manage their systems. JLab had both announced and unannounced inspections in FY05 from environmental regulatory agencies, no exceedances or violations were noted.

Jefferson Lab was also recognized by the HRSD for a pollution prevention initiative. A plaque for "significant pollution prevention efforts" was received for the Test Lab Acid Neutralization System.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
3.4	Reportable Radiation Exposures	6	6	Satisfactory ALARA program; no exposures >80% of ORPS SC3 threshold	No exposures and Satisfactory ALARA program	Outstanding

Discussion

JLab's ALARA-based program radiation protection program continued to be effective in FY05. JLab activities with the potential for worker exposure of regulatory significance (>100 millirem, or involving radioactive contamination) were controlled by a work permit process. There were no measurable exposures for the large majority of monitored staff and users.* Consequently, the radiological control program is rated "Outstanding."

* The radiological control program maintained its accreditation with the DOE Laboratory Accreditation Program.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
3.5	Hazardous Substance Exposures	6	6	No exposures above OSHA action level	No exposures	Outstanding

Discussion

JLab industrial hygienists continued the Lab's comprehensive workplace surveillance program activities during FY05. The industrial hygiene (IH) surveillance program consisted of recognizing, evaluating, and controlling both new and ongoing JLab activities by our industrial hygiene staff.

Some examples of new workplace activities with potential occupational health impacts that were evaluated, to verify that action levels or other regulatory limits were not approached, include:

- Noise survey for the NAVSEA 0.9 Mach wind tunnel experiment in the FEL Lab 2.

- Coolant mist sampling for Particulates Not Otherwise Regulated (PNOR) during mill machine operations using coolant misters in the EEL Machine Shop.

- Air monitoring for indium and molybdenum during indium soldering operations for the Accelerator Division Source Group.

- Air monitoring for Particulates Not Otherwise Regulated (PNOR) during installation of Kaowool insulation into a new Load Lock Gun Table.

Examples of Lab ongoing workplace activities that were re-evaluated in FY05 to verify that previous sampling verifications were still valid include:

- Air monitoring for welding metal fumes during welding/grinding operations on stainless steel and copper.

- Air monitoring of the Production Chemistry Group for inorganic acid mist during Closed Chemistry Processing.

- Yearly noise monitoring of high noise workers and survey of posted high noise areas.

This comprehensive IH evaluation program also reviewed field observations from safety and health inspections. These inspections were performed by Lab safety staff including several Certified Safety Professionals. Examples of these reviews included:

- Air monitoring for indium and molybdenum during indium soldering operations in the Accelerator Source Group. Activity was identified during a safety inspection for IH sampling and follow-up.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
3.6	Affirmative Procurement	8	8	85% for FY score	85% (estimated, actual result to be provided by Procurement	Outstanding

Discussion

This FY05 Affirmative Procurement metric replaced several previous measures for recycling program performance in addition to hazardous and radioactive waste generation. Lab procurement is currently collecting the FY05 information to calculate this measure. The FY05 result should be available in late November 2005. For purposes of this draft report, the 85% score (or 100% of available points) was used.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
3.7	Peer Review of the Radiological Control Program – Even Years; or, Peer Review of Emergency Management Program – Odd Years	10	9.5	Appropriate program = 100	95	Outstanding

Discussion

The biennial Emergency Management Peer Review was held September 15 – 16, 2005. The Laboratory's emergency management program was rated as "outstanding" or a numerical rating of 95%. The 2003 Peer Review score was 99% and the 2005 Peer Review score represented a re-baselining. It is important to be aware that the 2005 Peer Review Panel's report specifically stated "It should be noted that this Peer Review Panel did not feel that Program has deteriorated from the 2003 Peer Review rating of 99% but that the 95% rating is more in line with a Program that is "Outstanding" but has opportunities for continuous improvement."

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
TOTAL QUALITY PERFORMANCE IN ENVIRONMENT, HEALTH, AND SAFETY		**150**	**149.5**	**% OF POINTS ASSIGNED = 99.7%**		**Outstanding**

4.0 Quality of Business and Administrative Practices

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
TOTAL BUSINESS & ADMINISTRATIVE PRACTICES		**105**	**98**	**% OF POINTS ASSIGNED = 93.3%**		**Outstanding**

4.1 Key Indicator - Peer Review

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.1	**Key Indicator - Peer Review**	45	41.8	65	62	Outstanding
	Chief Financial Office Timesheet Floor Check	5	4.5			Outstanding
	Chief Financial Office Funds Control Review	5	4.5			Outstanding
	UFV&A Review	10	9			Outstanding
	Subtotal Peer Review	65	59.8	**% of Points Assigned =** 92.0%		Outstanding

Discussion

TJSO and SURA/JLab agreed that there would be no Administration Peer Review in FY05. Because there had been very few changes since FY04 and no significant issues were raised in the FY04 Review, it was decided to reassign the 65 points of the FY05 Peer Review (because a Cyber Security Peer Review occurred in FY05 the Admin Peer Review was to be worth 65 points, rather than 70 as in most years) as follows:

- 10 points for reviews in the Office of the Chief Financial Officer (CFO)
- 10 points the Unclassified Foreign Visits and Assignments (UFV&A) review
- 45 points from the FY04 Administration Peer Review

There were two CFO reviews:

- Funds control review
- Timesheet floor check

Funds control review. DOE summarized the funds control review by stating "... our analysis indicates the SURA funds control system has ensured adequated funds are available prior to commitment. This was accompliished largely by the manual monitoring and intervention effort of budget personnel." As to suggested improvements DOE wrote: "However, we have noted certain elements of the contractor's funds control system that should be corrected [moved from a manual system to a more automated system] in order to provide adequate funds management."

Timesheet floor check. Although DOE conducted the timesheet floor check, no report has been received.

Based on the feedback received from the review teams JLab assigns a score of 9 (out of 10).

The UFV&A review team commented as follows:

> TJNAF has an effective process for foreign national visits and assignments consistent with U.S. and DOE national security and program-specific policies, requirements, and objectives.
>
> The responsible Laboratory staff have a clear understanding of the DOE approval process and requirement to authorize Lab access for non-U.S. citizens who are citizens of, or were born in, a country identified by the U.S. State Department as State Sponsors of Terrorism.
>
> The mission of the Office of Science Laboratories is to advance the state of humankind' knowledge of the physical world. The expertise of the worldwide scientific community is required to accomplish this mission within the bounds of safety, security and national policy. It is a credit to TJNAF's implementation of the DOE Order 142.3, Unclassified Foreign Visits and Assignments, that in our limited interviews of scientists and users of the facility that they were virtually unaware of the process, beyond the filling out of standard forms. The head of the user's organization told us the UFV&A process is not a matter that has been brought to the attention of this organization.
>
> The commitment and support of senior Laboratory management to the UFV&A program was evident to the Panel. This was reflected in the time the Laboratory Director spent with the Panel. In addition, the staff interviews were conducted showed evidence of this support from the top.

Based on these comments the Lab assigns a score of 9 (out of 10) to UFV&A review.

The FY04 Administration Peer Review score was 65 out of 70. Scaling this to 45 points gives a score of 41.8 (65/70 times 45).

Therefore the overall score for metric 4.1 is 59.8 out of 65 or 92% for an adjectival rating of "Outstanding."

Other reviews in the Administration area confirm this "outstanding" rating:

Business Services

• The Business Services Department Balanced Scorecard assessed performance in the areas of: Customer Satisfaction; effectiveness of Internal Processes; employee evaluation of Learning and Growth opportunities; and optimum cost efficiency techniques in Financial evaluation. At this time, it is estimated that Business Services will receive an Outstanding Rating.

Human Resources

• U. S. Department of Labor Office of Federal Contract Compliance Programs (OFCCP) performed a compliance evaluation of the equal employment opportunity policies and practices at JLab. Audit closed with no findings.

• The SURA Internal Auditor reviewed the Lab's Conflict of Interest Policy and Management Development Program. Both audits closed with no findings.

CFO

• The SURA supported annual external audit of the Lab's financial systems for FY04 closed in FY05 with no findings. The FY05 audit is currently in progress.

• The SURA Internal Auditor's annual transaction testing for FY05 resulted in no findings.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
	Subtotal Peer Review	**65**	**59.8**	**% of Points Assigned = 92.0%**		**Outstanding**

4.2 Facilities Management

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.2.1	Asset Condition Index (ACI) defined as one (1) minus the ratio of Deferred Maintenance to Replacement Plant Value	2	1.6	>=98%	95.6%	Excellent

Discussion

This is the second year Asset Condition Index (ACI) (1-DM/RPV) has been a formal metric. The metric includes DOE owned facilities and does not consider the VARC and Forestry buildings or personal property trailers. The overall ACI is brought down by the failed condition of our real property trailers. About 45% of the real property trailers are slated for removal at the completion of CEBAF Center Addition Phase 1.

FIMS Category	Deferred Maintenance (DM)	Replacement Plant Value (RPV)	FCI	ACI
Buildings	$3,103,479	$96,082,056	3.2	96.8
Real Property Trailers	$4,980,830	$5,022,548	99.2	0.8
OSF	$1,715,011	$119,907,919	1.4	98.6
Total	**$9,799,320**	**$221,012,523**	**4.4**	**95.6**

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.2.2	% of Planned Facility Condition Assessments Completed	2	2	>=94%	100%	Outstanding

Discussion

Condition assessments were planned and completed for 45 facilities totaling 269,403 SF during the fiscal year. A combination of subcontractor and in-house forces were used to conduct the survey due to reduced budget.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.2.3	% of Indirect Projects Completed from the Planned Project List	2	2	>=94%	100%	Outstanding

Discussion

A total of 13 indirect projects were identified following the establishment of FY05 funding in April 2005. Of these, five projects were completed, one was canceled, two contracts were awarded for work this fall, one was deferred due to operational schedule, and four were deferred due to higher priority work. Eight additional projects were completed in support of operations or safety. Budget uncertainties continue to have an adverse impact on project completion.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
	Subtotal Facilities Management	**6**	**5.6**	**% of Points Assigned = 93.3%**		**Outstanding**

4.3 Property Management & Protection

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.3.1	% of value of property located during the inventory cycle: Capital Property (Odd Years)	2	2	>=99%	99.7%	Outstanding

Discussion

The inventory is based on a 10% random sample. The FY 2005 sample was 269 items with an original acquisition cost of $5,515,562.39. We located 266 items with a value of $5,497,426.52.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.3.2	% of value of property located during the inventory cycle: Sensitive Property	2	1.3	>=99%	97.4%	Marginal

Discussion

The inventory is based on a 10% random sample of Sensitive Property. The FY2005 sample was 960 items with an acquisition value of $738,513.36. During the inventory 938 items were located with a value of $719,161.67. We failed to locate 22 items with a value of $19,353.69. Of the items not located, 11 are ADPE items over 5 years old with an original acquisition value of $13,609.98. Old ADPE has little functional value and essentially no commercial value and thus custodians tend to be less attentive to these items.

While the inventory result for sensitive property does indicate a problem we need to address, we do not believe it indicates a serious deficiency in the JLab property program. All other inventory results for FY05 (e.g. "equipment", "stores" and "precious metals") are outstanding, indicating the overall property program is sound.

The only sensitive information at JLab is personnel and business data in the Administration Division. Because none of the computers or hard drives was from the Administration Division, there is little concern about the data on the ADPE not located. While some of the equipment was installed in the Computer Center, it is highly unlikely that anything except data related to open science research was on the disks.

As noted above, because old ADPE has little value, custodians tend to be inattentive to these items. In years past the property staff would conduct site wide “round-ups” of excess electronic and data processing equipment in order to encourage custodians to dispose of obsolete equipment. Not having these annual “round-ups” may be contributing to the number of obsolete data processing items showing up on our inventory sample and being difficult to locate. The last property “round-up” was conducted in May 2000.

JLab plans to take the following corrective actions to improve the sensitive property inventory:

- Educate property custodians that unneeded, unserviceable or obsolete property is a liability. Since this property is carried in the database at the original acquisition cost, misplacing it adversely affects inventory results far in excess of its real functional or commercial value. We will increase our efforts to encourage custodians to release excess ADPE for disposal so it can be removed from the sensitive property database.

- Reinstated the annual personal property round-up to help custodians and encourage timely disposal of excess property. The first phase of the FY 06 round-up begins on 5 December 2005.

• Require each custodian annually to review (on line) and verify his or her sensitive property holdings. This will ensure all custodians are cognizant of the sensitive property assigned to them.

• Identify those custodians who are responsible for more property than they can effectively track and manage. We will work with these custodians to reassign an appropriate portion of their property to subordinates or colleagues.

• Submit a proposal to DOE to raise the dollar threshold for sensitive property from $150 to $300 and to allow automatic reclassification of computer and other data processing equipment older than 5 years from sensitive to administrative property (e.g. not subject to inventory). Acceptance of this proposal would avoid continuing to spend excessive time looking for low value property. Both of these changes are consistent with DOE approved procedures at other Office of Science laboratories.

Note: We continue to look for all missing property. Since the Self-Assessment was submitted we have located two additional items from the inventory sample. If found during the review period these would have raised our score to 97.8% with an Adjectival Rating of Excellent.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
	Subtotal Property Management & Protection	**4**	**3.3**	**% of Points Assigned = 82.5%**		**Excellent**

4.4 Financial Management

The Chief Financial Office (CFO) continued its outstanding performance in FY05. All metrics measured at the outstanding level while the CFO brought up a new time and reporting system impacting all Lab employees and managed 10% attrition in an effort to reduce Lab overhead costs.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.4.1	Number of CAS violations	1	1	0	0	Outstanding

Discussion

There were no violations of Cost Accounting Standards during this period.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.4.2	Dollar % of invoices deemed unallowable	1	1	<=1%	0	Outstanding

Discussion

The Internal Audit report for FY04 conducted in FY05 concluded with no findings of unallowable cost.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.4.3	% of vendor invoices paid with discounts lost	1	1	<=1%	0.1%	Outstanding

Discussion

Discounts were lost on only one of the total 1700 eligible invoices.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.4.4	% of annual actual cost variance from budget for each overhead pool	1	1	<=3%	0.4%	Outstanding

Discussion

The variance from budget on the G&A overhead pool was .43%.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.4.5	Number of occurrences that resulted in the monthly Cost Management Report being resubmitted to Contracting Officer – DOE Site Office	1	1	0	0	Outstanding

Discussion

There were no Cost Management Reports re-submitted during FY05.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.4.6	Number of audit errors in travel expense reports	1	1	<=2%	1%	Outstanding

Discussion

There was one expense report out of 103 audited that contained an error exceeding $100.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
	Subtotal Financial Management	**6**	**6**	**% of Points Assigned = 100.0%**		**Outstanding**

4.5 Procurement

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.5.1	Average procurement cycle time	3	3	<10 days	5.72	Outstanding

Discussion

The results of this measure are obtained using data associated with procurement actions placed by Procurement personnel. Decentralized purchases are not included. Procurement Cycle time is an effective mechanism to measure the efficiency of the Procurement Department.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.5.2	% of total available purchasing dollars awarded to:					
	Small Business concerns	1	1	50.0%	63.9%	Outstanding
	Small Women-Owned business concerns, and	0.5	0.5	9.9%	12.4%	Outstanding
	Small Disadvantage business concerns	0.5	0.4	15.0%	13.2%	Marginal
	Service-Disabled Veteran business concerns	0.5	0	3.0%	0.4%	Unsatisfactor
	HubZone business concerns	0.5	0.5	3.0%	4.5%	Outstanding

Discussion

The results of this measure are determined by the percentage of expended dollars which are awarded to the various vendor classifications. In past years, certain expenditures (i.e. specific University Agreements) were exempt from inclusion in the expended dollars calculation. In May of 2005, DOE directed that all expenditures be included when determining the expended dollars. This effectively increased our base, making it much more difficult to attain our goals which were forecast based on the exemption of certain expenditures. Further, this year marked the addition of a new category (Service-Disabled Veteran Business concerns). This goal was not met because of the lack of business concerns using this designation, and even fewer who understand the requirements for the Service-Disabled Veteran designation. We are continuing to develop sources to meet our FY2006 requirements; however, we expect this will continue to be a challenge because of the lack of known Service-Disabled Veteran small business sources.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
	Subtotal Procurement	**6**	**5.4**	**% of Points Assigned = 90.0%**		**Outstanding**

4.6 Human Resources and Services

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.6.1	% of action oriented diversity commitments as established in the Affirmative Action Plan	1	1	>= 90%	100%	Outstanding

Discussion

All diversity commitments were completed.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.6.2	Representation of protected classes within each EEO-1 category	1	0.9	100% Maintained	95%	Excellent

Discussion

Maintain representation or meet availability in 95% (19 or 20) categories.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.6.3	Sustainable EEOC charges	1	1	0 charges	0	Outstanding

Discussion

There were no sustainable EEOC charges.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.6.4	Compensation positions aligned with market practices	1	1	+/-3% of market average	Within 1.1%	Outstanding

Discussion

Compensation Factor = 98.9

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.6.5	% of 3-year rolling average of annual increases in premium cost relative to market	1	1	>=5% below market data	-11.8%	Outstanding

Discussion

Three year rolling average = -11.8

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
	Subtotal Human Resources and Services	**5**	**4.9**	**% of Points Assigned = 98.0%**		**Outstanding**

4.7 Information Systems

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.7.1	Cyber Security Review (5pts, held every 3 years, next one in '05)	5	5	>90%	100%	Outstanding

Discussion

The Cyber Security Peer review was held in May 2005. The Lab was seen as having an outstanding cyber security program including aggressively meeting the Plans Of Action and Milestones (POA&Ms) from the May 2004 DOE Office of Independent Oversight and Performance Assurance. The Review did not find any new POA&Ms.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.7.2	Performance on addressing identified cyber security vulnerabilities	5	5	100%	102%	Outstanding

Discussion

This is a project management performance metric that measures the progress on accomplishing the cyber security POA&Ms coming from various reviews and assessments. Because of finishing several of the actions early, the raw score is 102% of the available points giving a final score of 5 points.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.7.3	Number of times JLab computer systems were compromised or used to attack other systems	2	2	<=1	0	Outstanding

Discussion

There were no root compromises during FY05 and no instances of Jefferson Lab computer systems used to attack other systems.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
4.7.4	% of current year's papers written by JLab staff or Users placed online	1	1	>=97%	100%	Outstanding

Discussion

The Lab's online publication system efficiently logs all JLab publications.

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
	Subtotal Information Systems	**13**	**13**	**% of Points Assigned = 100%**		**Outstanding**

5.0 Responsible Institutional Management

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
	TOTAL RESPONSIBLE INSTITUTIONAL MANAGEMENT	**100**	**91**	**% OF POINTS ASSIGNED = 91.0%**		**Outstanding**

A biennial assessment of the Institutional Management (IM) of Jefferson Lab is done via a peer review, which looks at how Jefferson Lab is managed and how Lab leadership plans and prepares for the future of the Lab. The IM review was held in 2004 and was chaired by Charles Shank, Director-at-Large at Lawrence Berkeley National Laboratory. Other members of the review panel included Jerry Bellows, Associate Director for Laboratory Operations at the National Renewable Energy Laboratory; Michael Derbidge, Chief Operating Officer at Argonne National Laboratory; Don Geesaman, Director of Physics Division at Argonne National Laboratory; Walter Henning, Scientific Director at GSI Darmstadt; and Bernard Maguire, Chief Executive Officer of VPA Corporation. This review encompassed three focus areas – Strategic Planning, Managerial Effectiveness, and Organizational Culture. The review included presentations from Lab management, external representatives of the Science and Technology and Administrative Peer Reviews, and a representative from the JLab User Group. IM Panel members also met with JLab staff to assess the state of organizational culture.

The 2004 IM Review found the Lab to be "a vibrant institution which continues to be well managed and to have a clear vision of its future." The IM review assigned the Lab a rating of "Outstanding," stating that "The Laboratory is clearly making its mark in quark physics and is viewed worldwide as a unique institution…the Lab is delivering on its commitments…(and) Lab culture is viewed as robust." The reviewers were impressed with progress the Lab has made in developing a strategic plan that builds on unique expertise and past success and is closely aligned with the goals of the Office of Science within the Department of Energy. The Panel reiterated that the 12 GeV Upgrade is a high priority for the Lab and encouraged the Lab to take the steps necessary to realize the Upgrade. The Panel noted JLab's leadership role in SRF technology and the success that JLab has demonstrated in this core competency with its work for the Spallation Neutron Source.

The Panel noted the Lab's excellent use of the time and resources during the post-(Hurricane) Isabel shutdown to perform "opportunistic" maintenance to many systems that had not been accessible since operations began. Reviewers also noted the Navy's long term commitment to the FEL as a positive step.

Principal Areas of Emphasis for FY 2005

The reviewers recommended that Lab management focus their efforts on several issues which have been or begun to be addressed by management. Progress has been made in a number of these focus areas.

• *Focus and enhance efforts in EH&S performance; enhancing communication, raising visibility at the Director level and hire a professional who would direct EH&S activities and report to the Director as a strategy to improve safety culture and performance.*

JLab management has established an Associate Director (AD) for EH&S who is a member of Director's Council. The Lab's EH&S professionals and resources have been consolidated under this AD. Roles and responsibilities for this new division have been established and communicated to Lab staff. A Director's Safety Council has been formed to focus the attention of Lab leadership on EH&S and a Worker Safety Committee has been formed to help elevate employee safety concerns and take quick action to resolve them. These actions along with several other activities to raise the profile and awareness of safety at JLab have resulted in excellent TRC and DART statistics over the past year, a significant improvement over the year before.

• *Ensure that the 12 GeV project team has the resources and authority needed to accomplish their goals, especially in light of the heightened DOE expectations in the area of project management.*

The 12 GeV Project team is very well integrated into the Lab and has effectively met DOE milestones and produced required documentation that has moved the 12 GeV Upgrade Project forward. A very comprehensive Independent Project (Lehman) Review was successfully completed in July 2005 and concluded that the 12 GeV Project is ready for approval of the next milestone, CD-1.

• *Maintain record of outstanding performance in assessments and audits*

Besides the contractually mandated peer reviews, Jefferson Lab has had a number of audits and assessments. In all cases, the Lab has received Outstanding ratings.

• *Move toward activity based budgeting and accounting in the Nuclear Physics Program*

During the year, efforts have been made to develop a Work Breakdown Structure that defines activities with more granularity than our current project structure. These efforts will continue into the next fiscal year.

• *Enhance effective communication with the DOE Site Office*

The Lab Director and members of Director's Council meet regularly with the Site Office Manager to discuss topics and issues of importance.

5.1 Key Indicator - Responsible Institutional Management Peer Review

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
	Key Indicator - Responsible Institutional Management Peer Review					
5.1	Strategic Planning	40	37	40	37	Outstanding
	Managerial Effectiveness	40	36	40	36	Outstanding
	Organizational Culture	20	18	20	18	Outstanding

Discussion

The IM Peer Review continues to be a valid indicator of performance and provides valuable perspective and input to Lab management. The review also helps to identify focus areas for Lab leadership attention in the spirit of continuous improvement. We recommend that this metric be retained in FY06.

6.0 Project Management

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
	TOTAL PROJECT MANAGEMENT	**70**	**70**	**% OF POINTS ASSIGNED = 100%**		**Outstanding**

6.1 Key Indicator - Schedule Performance SNS

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
6.1	**Key Indicator - Schedule Performance SNS**	35	35	<=one month behind schedule	100%	Outstanding

6.1 Key Indicator – Schedule Performance on the SNS Project - The SNS Project was completed one week ahead of schedule.

6.2 Key Indicator - Schedule Performance on the CEBAF Center Addition

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
6.2	**Key Indicator - Schedule Performance on the CEBAF Center Addition**	10	10	<=one month behind schedule	Ahead of Schedule	Outstanding

Discussion

The CEBAF Center Addition project is proceeding on schedule. Building construction is currently a month and a half behind schedule on the construction schedule however follow-on activities (installation of furniture, telecom/data cabling, and trailer removal) are ahead of schedule. Current building construction will not impact the overall project completion date.

Selected Milestone	Scheduled Date	Actual Date	Variance
Building Beneficial Occupancy	1 Dec 05	On track	None
Systems Furniture Installation	Start 2 Dec 05, finish 9 Jan 06	Scheduled to start 7 Nov 05, complete early Dec	Ahead
Install Telecommunications Cable	Start 2 Dec 05, finish 9 Jan 06	Started Jul, 64% complete	Ahead
Trailer Removal	Start 31 Jan 06, finish 13 Mar 06	First trailer removed Jul 05, 2 more scheduled for Oct 05	Ahead

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
6.3	Cost Performance on the CEBAF Center Addition Project	10	10	>=10%	14.3%	Outstanding

Discussion

At the time of award, the DOE Site Office agreed that maintaining 10% contingency was higher than necessary to manage risk associated with the project and agreed to a lower contingency at award. Construction changes have been kept to a minimum on the project with a total change order rate of only 2.54%. At the end of the fiscal year the project funding status showed the following:

Total Project Amount	$10,500,000
Remaining Construction Contingency	$290,000
Cost Incurred	$8,188,000
Estimate to Complete	$2,022,000
Performance Level	[(290,000/2,022,000)*100] = 14.3%

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
6.4	% of Overrun on all Projects >$100K	3	3	<=8%	2.5%	Outstanding

Discussion

Below are listed the projects with a contract value greater than $100K completed during FY05. The value of contract changes for these projects totaled 2.5%.

Project	Contract Award	Total Change Orders	Adjusted Change Orders*
CTF Cooling Tower	$222,313	$0	$0
Tunnel Receptacles	$99,735	$2,983	$2,983
2 MW Substation	$107,525	$23,010	$23,010
BMP #1 Construction	$452,236	$9,200	$9,200
Accelerator Generator	$391,981	$0	$0
3rd Chiller Replacement	$199,539	$6,331	$4,942
Hall A Laser Building	$147,890	$7,092	$7,092
Fabric Storage Building	$116,490	$400	$400
FEL Trailers	$138,573	$0	$0
TOTAL	**$1,876,282**	**$49,016**	**$47,627**

* Does not include post-design programmatic changes, value-added new technology, and value engineering proposals.

Total Initial Contract Amount $1,876,282
Applicable Final Contract Cost $1,923,909
Performance Level [(1,923,909/1,876,282)-1]*100 = 2.5%

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
6.5	Variance of Scheduled Completion Time for Projects >$100K	2	2	<=1.1	1.1	Outstanding

Discussion

Below are listed the projects with a contract value greater than $100K completed during FY05. The construction contract durations for these projects averaged 6% longer than planned.

Project	Original Contract Duration (Days)	Actual Duration (Days)	Adjusted Actual Duration* (Days)
CTF Cooling Tower	112	125	125
Tunnel Receptacles	169	214	169
2 MW Substation	131	108	108
BMP #1 Construction	210	210	210
Accelerator Generator	202	174	174
3rd Chiller Replacement	180	285	245
Hall A Laser Building	112	152	152
Fabric Storage Building	70	88	80
FEL Trailers	64	64	64
TOTAL	**1,250**	**1,420**	**1,327**

* Time attributed with acts of God (weather), labor disputes, documented material unavailability, and user desired post-award change orders is not included.

Performance Level 1,327/1250 = 1.06

PM	Description	Point Value	Points Awarded	Goal	Raw Score	Adjectival Rating
6.6	Schedule Performance on the 12 GeV Upgrade Project	10	10	<=one month behind schedule	<one month behind schedule	Outstanding

Discussion

The greatest emphasis regarding schedule performance for the 12 GeV Upgrade Project in FY05 was placed on preparation for the CD-1 Independent Project Review (IPR). All documentation required for the IPR was completed on schedule including the Conceptual Design Report, the Acquisition Strategy, the Preliminary Project Execution Plan, the Preliminary Hazards Assessment, and the Risk Management Plan. Jefferson Lab also developed a Technical Design Report which was reviewed by the committee. The IPR was held July 12-14, 2005. The review committee concluded that essentially all requirements for CD-1 approval had been met, and no action items were identified.

In addition, DOE-NP convened an external Panel to review the Science of the 12 GeV Upgrade. Jefferson Lab together with its User community wrote in preparation for this review a Scientific Conceptual Design Report including technical details for the experimental equipment. The review committee concluded that "The 12 GeV Upgrade will make TJNAF the world center for research in this area for at least a decade following start of operations of the upgrade project." An active and successful R&D program was carried out in FY05 with all R&D reports completed within one month of the scheduled dates.

Scheduled performance on the 12 GeV Upgrade Project is less than one month behind schedule.