

Goal 1: Provide for Efficient and Effective Mission Accomplishment (40%)

- Objective 1.1 – Science and Technology Results Provide Meaningful Impact on the Field (50%)
- Objective 1.2 – Provide Quality Leadership in Science and Technology (50%)

Notable Performance Items: (See JLab Insight for additional performance data on Objectives and Notable Outcomes.)

JLab is meeting performance requirements for these objectives through August 31, 2011.

- 1.1
- Theoretical and Computational Physics staff continued to generate significant results in research and development that were noted in scientific publications. Novel results were produced in lattice QCD-based calculations that are relevant for future experiments. JLab theorists, in collaboration with Hampton University, SULI and REU students, performed a comprehensive analysis of target mass corrections (TMCs) to structure functions. These results are vital for the interpretation of future inclusive electron-scattering experiments at 12 GeV. They also provided support for making the scientific case for an Electron Ion Collider (EIC) by producing a comprehensive new report summarizing the outcome of the 10-week Institute of Nuclear Theory (INT) program that was conducted in the fall of 2010. The report reviews in detail the scientific opportunities presented by an EIC, and identifies “golden experiments” with discovery potential in four major areas of investigation. EIC highlights are noted as a notable outcome under Objective 3.1.
 - A review article on electroexcitation of nucleon resonances was completed summarizing the recent progress in both theory and experiment folding in pion, eta, two-pion and kaon electroproduction data. The first measurement of the double-spin asymmetry for charged pion electroproduction on a transversely polarized ³He target was reported, indicating a positive azimuthal asymmetry for negatively-charged pions, and asymmetries for positively-charged pions consistent with zero. This provides constraints to the recently developed transverse momentum dependent parton distributions. The transparency of the nuclear medium to kaons was reported from kaon electroproduction experiments of a series of nuclei, and was found to be larger than those reported earlier for protons and pions, reflecting the smaller kaon-nucleon interaction probabilities. The medium effects on the kaon-nucleon interaction probabilities were found to be surprisingly larger than those found for pions. The experimental nuclear physics staff also largely contributed to the recent report summarizing the work of the 10-week INT program dedicated to science with an Electron-Ion Collider.
 - JLab Staff and Users were recognized for their accomplishments with the receipt of several significant awards during fourth quarter including: the inaugural Ken Wilson Lattice Award for important contributions to lattice field theory in the last three years, presented July 12 at the 29th International Symposium on Lattice Field Theory; the George T. Mulholland Award for Excellence in Cryogenic Engineering from the Cryogenic Society of America presented on June 16 for notable engineering developments that led to major contributions in the cryogenic field; the first Outstanding Nuclear Physicist Award presented in June 2011 at the annual Users Group Workshop and Meeting; and a \$3 million National Teaching Fellowship, the highest teaching honor in Canada, presented in June 2011 at the annual Society for Teaching and Learning in Higher Education conference at the University of Saskatchewan.
 - The Free Electron Laser (FEL) Division held a review of proposed VUV experiments to be performed on the FEL utilizing harmonic radiation. The external review team agreed that a solid scientific basis exists for the experiments and encouraged development of more detailed experimental requirements and further characterization of the VUV photons. This is expected to lead to performance of initial experiments in FY12.
 - The Injector Group pushed the limits of high-voltage electron guns by exploring new and improved designs. The highest beam current for a photogun – namely 20 mA average current, was achieved at JLab using a CsK2Sb photocathode grown at BNL; that could be very useful as a source for the FEL.
- 1.2
- Collaboration on accelerator development with the Indian Department of Atomic Energy will expand research in SRF accelerator technology, heavy ion physics, and particle detector development at JLab and other national laboratories. The agreement announced on July 25 will leverage U.S. and Indian scientific, technical, and engineering expertise in the pursuit of new discoveries and the development of new technologies that enhance scientific understanding, which could lead to advances in clean energy. In addition, Accelerator Division and FEL staff were instrumental in making possible and organizing the first Mexican Accelerator School in collaboration with the University of Guanajuato, to be held in October 2011.
 - JLab staff and users continued to be actively involved in scientific organizations throughout this period. Accelerator Division staff are members of numerous Review and Advisory Committees sponsored by DOE and Laboratories, and in particular took part in reviews at ANL (APS) and FRIB. The Laboratory Director is actively involved with the search committee for the Director of Laboratori Nazionale di Frascati, Italy. JLab’s Deputy Director for Science will continue to serve as the Chair-elect of the Division of Nuclear Physics of the American Physical Society through March 2012. The Deputy Project Manager for

the 12 GeV upgrade project continued to serve as a member of the Nuclear Science Advisory Committee (NSAC). JLab users also continued to actively participate with NSAC and as members of the NRC panel writing the decadal plan for Nuclear Physics.

- The Radiation Detector & Imaging group received a proposal approval towards a DOE/NP call for Applications of Nuclear Science and Technology for Silicon Photomultiplier Detector Development. In Accelerator Operations, contracts on Recirculating Linear Accelerators for MUON Acceleration, and Epicyclic Cooling were completed. New awards on advanced IR design and Epicyclic Cooling (Phase II) were also obtained. In addition, the Accelerator Division was awarded \$10M in funding over the next 5 years from BES for an R&D proposal for a compact size synchrotron light source based on an RF linac that can be operated at 4K. The reduced demands on cryogenics makes this device uniquely suited to university and small research centers.

Goal 2: Provide for Efficient and Effective Design, Fabrication, Construction and Operation of Facilities (40%)

- Objective 2.1 – Provide Effective Facility Design(s) as Required to Support Lab Programs (Activities Leading Up to CD-2) (0%)
- Objective 2.2 – Provide for Effective/Efficient Construction of Facilities (Post CD-2 to CD-4) (40%)
 - Notable Outcome: Execute Construction of the 12 GeV Upgrade for CEBAF and Refine the Transition Plan
- Objective 2.3 – Provide Effective/Efficient Operation of Facilities (45%)
- Objective 2.4 – Utilization of Facility to Grow and Support Lab Research Base/External User Community (15%)

Notable Performance Items: (See JLab Insight for additional performance data on Objectives and Notable Outcomes.)

JLab is meeting performance for these Objectives and Notable Outcome through August 31, 2011.

2.1 N/A

2.2 ■ **NOTABLE OUTCOME** Execute Construction of the 12 GeV Upgrade for CEBAF/Refine Transition Plan: The project has continued to make good overall progress at Level 1. The contingency level including management reserve is \$34.8M or 37.9% (percentage of ETC). Construction is 49.1% complete. \$153M of construction funds have been obligated including \$7.9M of out year contractual phases. In addition, \$8.9M of project scope has been obligated on WFO (Commonwealth of Virginia) funding (WBS 1.9). The project has no Level 2 reportable Construction variances.

2.3 ■ FY11 beam operations were terminated on May 13 for the scheduled six-month shutdown. The weighted average of Halls A, B and C was 84% of the target for this fiscal year. A draft beam schedule for FY12 beam operations beyond the 6MSD has been iterated with JLab management, the Hall Leaders, and the experiment spokespersons.

- The scheduled six-month shutdown (6MSD) is progressing well and continuously monitored via the 6MSD integrated schedule, daily organization meetings, and weekly progress meetings. Significant accomplishments during this period include: completion of the planned dipole magnet refurbishment, measurement and installation; installation of Arc 10 to bring beam from 11 to 12 GeV in Hall D; and successful testing of the first completed RF zone (SL24) at full power. Work is progressing in SL23 and SL25. The first 12 GeV cryomodule (C100-1), which passed acceptance tests in the test lab, has been installed in SL24 and is undergoing testing in the tunnel. Main specifications for gradient and Q_o have been met. A detailed plan for operations start-up has been developed that aims at circulating beam by mid-October and physics running by mid-November 2011.
- FEL completed the gun high-voltage processing in preparation for VUV and high power IR operations this Fall. The group tuned a new UV wiggler for installation in the vault in September. 4D Modeling was brought into operation providing encouragement for the development of a VUV/XUV oscillator system. A new low conductivity water system was brought into operation.

2.4 ■ PAC 38 was conducted August 22 – 26. There were thirteen new proposals submitted, of which four were approved and four were conditionally approved. There were also seven Letters of Intent. One previously conditional approved proposal was resubmitted and achieved full approval. The last of six science categories, on the three-dimensional structure of the hadrons was graded at PAC38, and consisted of fifteen experiments that submitted updates and had short presentations. This concludes the scientific grading and beam time allocation process for previously approved experiments.

- The technical advisory process providing technical input to the Program Advisory Committee on the submitted experiment proposals this time also included an independent technical panel, with members from all Halls. This independent technical advisory process more critically looked at a selection of technically challenging proposals.
- In conjunction with the PAC38 week, Hall C had a Summer Workshop, and started discussions on the commissioning experiments. All Halls have now started discussions with their user communities on the commissioning and early experiments, and plan to iterate over the next few quarters to complete this process.

Goal 3: Provide Effective and Efficient Science and Technology Program Management (20%)

- Objective 3.1 – Provide Effective/Efficient Stewardship of Scientific Capabilities and Program Vision (40%)
 - Notable Outcome: Work with the Community to Develop the Scientific Case for an EIC
 - Notable Outcome: Explore Technical Options for a High Luminosity MEIC
- Objective 3.2 – Provide Effective/Efficient Science and Technology Project/Program Planning and Management (35%)
- Objective 3.3 – Provide Effective/Efficient Communications and Responsiveness to Customer Needs (25%)
 - Notable Outcome: Assist/Advise WDTS in Coordinating Middle and High School Regional Science Bowls and Planning for May 2011 Science Bowl Nationals

Notable Performance Items: (See JLab Insight for additional performance data on Objectives and Notable Outcomes.)

JLab is meeting performance for these Objectives and Notable Outcomes through August 31, 2011.

- 3.1
- **NOTABLE OUTCOME** Work with the Community to Develop the Scientific Case for an Electron Ion Collider (EIC): The white paper reporting on the 10-week EIC program at the Institute of Nuclear Theory was finalized and submitted to the Archive. Several JLab staff and users co-authored sections and were involved as editors. In tandem with this white paper, work continues on the write-ups of the 2010 JLab User workshops dedicated to EIC science and detector, with some nearing completion. The detector/interaction region design of the EIC has been reiterated to ensure provision of full and hermetic detector capabilities. This will be integrated in the detector write-up. Representatives of the JLab user community are part of the Steering Committee to convert the white paper to a version of use for the general Nuclear Science committee. Several organizational meetings were held, with good information exchange between the main editors and JLab (and BNL) management. A few of the weekly EIC phone meetings at JLab have been dedicated to preparations for proposals for generic detector R&D. We anticipate at least three proposals from JLab staff and users in reply to the second call for proposals. The EIC science was presented at several international conferences, such as DIS ad PANIC, and collaboration meetings, such as JLab/Hall C and BNL/PHENIX.
 - **NOTABLE OUTCOME** Explore Technical Options for High Luminosity Medium Energy Electron Ion Collider (MEIC): During this period, the MEIC effort was strengthened by the addition of several junior scientists' positions. Design progress continued on the MEIC. Figure-eight collider ring designs further improved and work on integrating the detectors and interaction region into a common design proceeded. First results checking dynamic aperture for the electron ring have been obtained. Work on the large booster linear design has been initiated.
 - The RF expertise and services of the SRFI continue to be in high demand. The Argonne APS Upgrade SPX project (crab cavities) has been added to the list of customers. In the domain of advanced SRF R&D, the SRF thin film group recently demonstrated sample Niobium films, produced by an energetic condensation technique with purity exceeding that of bulk material typically used for cavity fabrication. Work will be proceeding to next "level-of-detail" considerations in the design, with the goal of producing a design detailed enough for full costing by the end of the calendar year.
- 3.2
- JLab management has worked with JLab staff and users to advance several new experimental equipment projects. This new equipment will significantly enhance the scientific capability of CEBAF in the 12 GeV era, and particularly expand the JLab program to perform precise tests of the standard model of particle physics. These projects include the Super Bigbite Spectrometer which is preparing for review in first quarter of FY12, and MOLLER for which a science proposal was submitted for to DOE-ONP for consideration.
 - JLab management has been fostering collaboration with institutes in China to advance the SoLID project, a new solenoidal spectrometer for high statistics studies of inclusive and semi-inclusive deep inelastic scattering. Two proposals were funded in China by the National Science Foundation of China to begin detector development studies.
- 3.3
- **NOTABLE OUTCOME** Assist Workforce Development for Teachers and Scientists (WDTS) in Coordinating Regional and National Science Bowls/Plan for May 2011 Science Bowl: Performance on this notable outcome was completed during Q3 as noted in the performance report.
 - FY11 Science Education student outreach activities include interactions with 12,320 students (35,600 hours) and 839 teachers (5,410 hours.). During the fourth quarter, the Lab hosted programs for 16 DOE-funded undergraduate students (10 weeks), eight NSF-funded undergraduate students (10 weeks), 13 middle school teachers (four weeks), and six high school students (six weeks). JLab's YouTube channel featuring more than 130 educational or informational videos, has recorded more than 1 million video views for the Frostbite Theater collection produced by Science Education and Public Affairs. Frostbite Theater provides demonstrations of simple science experiments, based on the research done at JLab, for teachers

and students The YouTube channel also host the lab's Science Series videos.

- JLab provided 85 tours of its facilities to nearly 1,000 scientists, dignitaries and members of the general public during FY11. The tours were related to proposed and ongoing research, and public outreach.
- JLab continues to communicate with DOE on emerging issues and responds to their requests in a timely manner. Examples of this include the writing and editing of a new brochure in conjunction with Brookhaven Lab entitled, Accelerating Innovation.

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Goal 4: Provide Sound and Competent Leadership and Stewardship of the Laboratory

- Objective 4.1 – Leadership and Stewardship of the Laboratory (33%)
- Objective 4.2 – Management and Operations of the Laboratory (33%)
 - Notable Outcome: Demonstrate Significant Progress in Implementing a Contractor Assurance System
 - Notable Outcome: Demonstrate Use of Full Suite of Resources to Develop Innovative, Crosscutting Strategies for Meeting EO 13514 Goals
- Objective 4.3 – Contractor Value-Added (34%)
 - Notable Outcome: Deliver on Agreements and Commitments of non-DOE Resources (i.e. JSA Initiatives Fund, Relations and Outreach Support, Applied Insight, Skillport Access)

Notable Performance Items: (See JLab Insight for additional performance data on Objectives and Notable Outcomes.)

JLab is meeting performance for these Objectives and Notable Outcomes through August 31, 2011.

- 4.1
- Jefferson Lab's vision is outlined through 2025 in the plan submitted to the Office of Science in May 2011. That vision lays out a clear scientific path beyond 12 GeV science that includes leadership in SRF technology, photon science and the development of the scientific case for an electron ion collider. New collaborative projects utilizing SRF technology are being aggressively pursued, and negotiations towards final agreements are making good progress. Organizational meetings to develop collaborations and users in photon science have been held with Virginia universities, and Jefferson Lab management continues to collaborate with BNL in organizing the EIC community. Jefferson Lab provided leadership in the development of the Hampton Roads Energy Corridor - a group of civic, governmental and scientific leaders dedicated to achieving energy independence for the Hampton Roads region. JLab submitted 10 of the 18 recommendations for improving operations within the Department of Energy. Many have been implemented. Jefferson Lab was part of the leadership team of three SC Labs and the Office of Science that developed the portfolio approach to meeting all mandated sustainability goals by 2020. JLab developed the white paper for sustainable technology beyond 2020 which was presented to SC-1 at the end of September, 2011. JLab leadership has balanced a dizzying array of competing demands and priorities in FY11 resulting in successful mission accomplishment in all critical areas.
 - JLab has a total of six Project Management Professional (PMP) certified staff. The Lab continues to address budget challenges and utilizing project management concepts assists in ensuring the scope is delivered on time and within funding constraints. The Lab embraces a tailored approach to managing tasks and staff obtaining PMP certification supports the lab leadership to align work, facilities, and equipment and technical capabilities with the lab vision and plan. There are currently 53 JPMQ (Jefferson Lab Project Management Qualification) certified staff.
- 4.2
- **NOTABLE OUTCOME** Contractor Assurance System (CAS) Implementation Progress: The Lab is working closely with the Thomas Jefferson Site Office (TJSO) to implement areas that were identified for further improvement during the CAS Peer Review conducted in April and to identify the desired end states. Tri-party meetings at the Senior Leadership level have been implemented, in which programmatic issues such as the CAS Peer Review observations have been discussed and acted upon. These meetings are scheduled for quarterly intervals and will provide an Assurance System feedback structure for future issues. Similar meetings at the functional level continue, with good feedback and results.
 - **NOTABLE OUTCOME** E.O. 13514 – Energy Sustainability Goals: JLab has taken a leadership position in developing the SC approach to sustainability. Worked continued with area Federal agencies to establish the Hampton Roads Energy Corridor which will provide long term sustainable power options to regional facilities. Laboratory staff actively participated in SC sustainability working groups for Energy and Infrastructure as well as Climate Change Adaptation. They also gave presentations at the SC Sustainability Workshop on Accelerator Driven Systems for Sustainable Energy.
- JLab's performance in reference to the Hadron Supercomputer and high performance computing clusters is noted in the *DOE Laboratories Leadership in Green IT* report. This report documents leadership and innovative practices in IT sustainability at the DOE laboratories. The Laboratory's latest supercomputer, called Hadron, makes use of GPUs (graphics processing unit) as well as CPUs. Each four-GPU server saves 7.1 kW. Jefferson Lab has 119 such nodes, which saves 845 kW compared to achieving the same computing power with conventional nodes at that time.
- 4.3
- **NOTABLE OUTCOME** JSA Initiatives Fund, Relations and Outreach Support, Applied Insight, Skillport Access: SURA and CSC/ATG, the owners of JSA, continued to provide significant value to the Lab and DOE through the JSA Initiatives Fund (IF) Program, SURA's relations and outreach support, CSC/ATG's technology tool Applied Insight and Skillport distance learning program.

During fourth quarter FY2011 through August 31, 2011, SURA and CSC/ATG, the owners of JSA, continued to be involved

with and make contributions to deal with the challenges at the Lab. JSA continued to deliver on its agreements and commitments, including the Initiatives Fund Program, relations and outreach support, Applied Insight and Skillport distance learning program. Significant IF projects engaged in during this performance period included: award of the first JSA/JLab Distinguished Theory Studentship to an Old Dominion University graduate student who will be working with the Theory Group during AY2011-2012; support of an endowment for the American Physical Society dissertation award in hadronic physics to motivate students and recognize their accomplishments in the field; support for the Lab's membership in the Hampton Roads Partnership, a public-private organization representing the cities and counties surrounding the Lab and providing a forum for looking at strategic regional approaches to address issues in the Hampton Roads area (HRP is key player in the Hampton Roads Energy Corridor looking at a regional collaboration to address E.O. 13514 and sustainability efforts); support for the International School of Physics two-week course on three-dimensional partonic structure of the nucleon; award of support for a University of South Alabama mechanical co-op student for AY2011-2012. Thirty-two proposals were received as a result of the call for proposals for support from the FY2012 IF Program. The proposals have undergone an initial round of reviews and are now being evaluated by an Evaluation Committee which includes JSA Programs Committee members and representatives from the Lab and the Users Group. FY2012 IF Program awards will be announced in late November.

During July and August, SURA continued to provide relations support in connection with the congressional deliberations on the FY2012 federal budget through its federal lobbyist and in coordination with SURA's Relations Director. Relations efforts included Hill visits to inform key staffers of the impact of insufficient funding to the Lab and a coordinated (JSA/JLab, FRIB, Brookhaven, and DNP) visit with Hill staffers in support of the President's funding profile for nuclear physics. Senator Mark Warner toured the Lab and conducted one of many town hall meetings during which the Senator addressed the current congressional state of affairs and took questions from the audience. Lab Deputy Director for S&T provided an op-ed piece to the *Richmond Times Dispatch* urging support for basic research in these hard economic times. The Virginia Secretary of Education visited the Lab and discussed funding strategies for the next biennium.

As part of its contractual commitments, CSC continued to provide a suite of technology tools and business management processes that integrate lab management data and provide ongoing insight into lab performance through a secure web-based portal and for a distance learning program for Lab-related topics. CSC provided 200 seats in its Skillport program, of which 185 were used during the past year. Nine Skillport training modules are part of the Lab's Project Management Qualification program. Thus far, 53 staff members have completed the program and 20 more are currently enrolled. CSC's Insight platform continues to be the basis for the dashboard to the Lab's data warehouse which serves as the backbone for information sharing. Relevant information is continually posted to Insight, enhancing communications internally, and with DOE, users, and external parties interested in doing business with the Lab.

Members of the JSA Board and its officers, Committee members, the owner representatives, and the Board Liaison continued to provide governance support for the Lab through regularly scheduled and ad hoc meetings, teleconferences, reports, and on-site visits. During this reporting period, the Internal Auditor continued a review of the internal controls and financial processing for state funds as requested by the Finance & Audit Committee. The Finance & Audit Committee made recommendations regarding the strategy for augmenting JSA internal audit resources. The Finance & Audit Committee reviewed and provided appropriate feedback to the Internal Auditor on the FY2012 Internal Audit Plan, 3rd quarter activities, and Internal Auditor's self assessment. The Board Liaison met with the TJSO and Lab CAS leads to discuss progress on CAS program implementation. The first of quarterly tri-party meetings including the Board Liaison, TJSO manager, deputy, and CAS lead, and the Lab COO and AD/EH&S was held to discuss progress on CAS Peer Review recommendations including desired end state for TJSO oversight, JSA governance, and Lab performance management. The Board Liaison reviewed the updates on the Corporate Dashboard and discussed performance issues with the appropriate chairs. The owner representatives and Board Liaison monitored and discussed with the Lab Director and deputy directors the status of Lab operations and safety performance. Two JSA Directors attended the Lab Director's all-hands meeting in July at which the status of the shut-down and safety concerns were discussed. The Board Liaison met with the TJSO on governance and corporate matters. Committee meetings held during this performance period include Science Council, Operations, and Safety & Risk Management Committees. The TJSO Manager met with the Operations and Safety & Risk Management Committees in an executive session. The Board Liaison participated in the DOE Office of Enforcement training.

Corporate owner CSC provided IT experts to test and evaluate new systems put in place following the cyber attack the end of June. A CSC team performed both internal and external penetration testing of both the new and prior IT systems to search for vulnerabilities. CSC will be on-site in late September to review certificate authorities and the new Windows system architecture.

Corporate owner SURA continues to provide all services and functions related to its role as the Administrative and Tax Member of JSA. SURA continues to manage and operate the Residence Facility for use by researchers and students at the

Lab.

Goal 5: Sustain Excellence and Enhance Effectiveness of Integrated Safety, Health and Environmental Protection (30%)

- Objective 5.1 – Provide Efficient/Effective Health and Safety Program (70%)
- Objective 5.2 – Provide Efficient/Effective Environmental Management System (30%)

Notable Performance Items: (See JLab Insight for additional performance data on Objectives.)

JLab is meeting performance for these Objectives through September 2011.

- 5.1
- JLab experienced a total of seven recordable injuries in FY11. Three of the injuries resulted in lost time or restricted work, which translates to a TRC rate of 0.73 and a DART rate of 0.31 as of August 31, 2011.
 - The OHSAS 18001 registration audit was conducted September 6 - 9, 2011. The auditors recommended registration, citing two minor non-conformances. There were five Opportunities for Improvement (OFIs), including one to share lessons learned of our successes along with our incidents. In addition, they identified 11 Best Practices, including Top Management commitment to safety and the dissemination of the risk assessment process throughout the lab. Every employee interviewed was able to relate how they use the work planning process to identify the hazards and risk level associated with their work.
 - The Integrated Safety Management System (ISMS) Effectiveness Review was submitted to TJSO September 9, 2011. The review concluded that JLab's ISMS, including EMS and emergency management is fully implemented and working effectively. Since the ISMS incorporate feedback and continuous improvement, opportunities for improvement are regularly evaluated and adjustments made to various elements of the ES&H program. No substantive changes to the system are required. Four OFIs have been identified and will be addressed through our issues management process.
- 5.2
- EMS program improvements continued along two major paths: (1) an independent auditor completed a gap analysis of JLab's EMS program against the requirements of the ISO 14001 standard. Three areas of improvement were identified, with all three items being administrative/record keeping. These items were entered into CATS and will be dealt with accordingly. (2) Progress on improving EMS awareness was also a focus with the completion of an EMS Training Benchmarking exercise. Training strategies at ANL, FNL and PPPL were reviewed and best practices will be incorporated into the FY12 EMS training program.
 - EMS integration with the JLab construction program continued with good results. Of note is a pollution prevention success story that resulted from routine staff interaction. It was noted during work planning activities that a detergent containing phosphates, harmful to the environment and presenting regulatory challenges, was to be used in large quantities on the TEDF project to prepare some surfaces for painting. The project team recognized the issue and worked with their vendors to identify a less harmful (non-phosphate) alternative.
 - Two compliance milestones were successfully satisfied with the delivery of the Wetlands Jurisdictional Determination Request package and the HRSD permit application.

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Goal 6: Sustain and Enhance Core Business Systems that Provide Efficient/Effective Support to Lab (25%)

- Objective 6.1 – Provide Efficient, Effective, Responsive Financial Management System (15%)
- Objective 6.2 – Provide an Efficient, Effective, Responsive Acquisition Management System (15%)
 - Notable Outcome: Demonstrate Efficient, Effective Execution of all ARRA Activities
- Objective 6.3 – Provide an Efficient, Effective, Responsive Property Management System (15%)
- Objective 6.4 – Provide Efficient, Effective, Responsive Human Resources Management System and Diversity Program (15%)
 - Notable Outcome: Analyze, Develop Path Forward, and Submit Report on JWISSE Recommendations (OBJ 6.4)
- Objective 6.5 – Provide Efficient, Effective Management Systems for Internal Audit, Quality, Info Mgt, Other Admin (25%)
- Objective 6.6 – Demonstrate Effective Transfer of Technology and Commercialization of Intellectual Assets (15%)

Notable Performance Items: (See JLab Insight for additional performance data on Objectives and Notable Outcomes.)

JLab is meeting and exceeding performance for these Objectives and Notable Outcomes through August 31, 2011.

- 6.1 ■ Financial reporting continues to be a focus area for the Lab. Accurate and timely reports continue in 533 cost reporting, institutional cost reports for DOE transparency initiatives, internal budget and direct and indirect cost tracking and reporting to maintain budget at the B&R Program Parent levels, ARRA quarterly reporting to SC and in support of Recovery.gov, and ad hoc reports and data calls as received. The Lab has streamlined reporting to eliminate certain reports as indicated earlier in the year and have worked with MIS and PM&IP to develop a Budget and Actuals MIS system to replace the Excel based files and enhance the process. A quality team is currently reviewing the budgeting process focused on opportunities for further process enhancements. We briefed the Thomas Jefferson Site Office (TJSO) after mid-year and L.D. Streit in July on the Lab’s Cost of Doing Business. Accounting and Travel are working with MIS to develop an electronic stipend process, which will be rolled out in FY12. Financial System updates to latest version were accomplished and progress was made to make financial systems more stable and secure. Financial process and entity controls were reviewed by Internal Audit and through the A-123 Financial Management Assurance (FMA) assessment with no material findings or reportable weaknesses, which supported JLab’s financial management assurance letter in support of the DOE’s assurance letter to the Secretary. We have worked with the NLDC and NLCFO groups on Lab and CFO initiatives and on improvements regarding burdensome practices and policies resulting in the implementation of improvements in several areas, such as delegations in application of Buy American Act, Class determinations in application of the Davis Bacon Act for construction projects, increases in the Major Items of Equipment (MIE) threshold from \$2M to \$10M, revisions to DOE O 551.1C of Foreign Travel approvals, to mention a few, which have been briefed to the NLDC and the Secretary of Energy.
- 6.2 ■ **NOTABLE OUTCOME** Efficient, Effective Execution of ARRA Activities: ARRA costing through this performance period is ahead of schedule and all reports have been generated and submitted. Status for the six JLab ARRA projects through August 31, 2011 is noted below. Success and issues → costed \$73.2M (84.6%) of total DOE obligations; costed/committed \$82.1M (94.9%) of total DOE obligations; total lab and first tier subcontract jobs to date 382.7 FTEs

Project	Total FY09 Obligations by DOE	FY09/11 Costed \$	FY09/11 Costed %	FY11 Commits	% Costed/Committed	Costing Projections				Total
						FY11 Balance	FY12	FY13	FY14	
Advance Funding 12 GeV CEBAF Upgrade	\$65,000	\$56,375	86.7%	\$8,380	99.6%	\$245	\$0	-	-	\$65,000
LQCD Computing	\$4,965	\$4,456	89.8%	-	89.8%	\$6	\$258	\$245	-	\$4,965
TJNAF Infrastructure Investments	\$10,000	\$9,997	100%	-	100%	\$3	-	-	-	\$10,000
Enhanced AIP Funding at NP User Facilities	\$2,760	\$453	16.4%	\$80	19.3%	\$394	\$928	\$525	\$380	\$2,760
Advanced Technology R&D Augmentation	\$1,948	\$1,141	58.6%	\$417	80.0%	\$170	\$220	-	-	\$1,948
Nuclear Science Workforce	\$1,834	\$794	43.3%	\$40	45.4%	\$180	\$662	\$159	-	\$1,834
JLab Total	\$86,507	\$73,217	84.6%	\$8,916	94.9%	\$997	\$2,068	\$929	\$380	\$86,507

- JLab is exceeding its Small Business goal with performance at 42% versus a goal of 36%, for Woman Owned business 7.2% versus a goal of 5%, and Small Disadvantaged Business with performance 8.3% versus a goal of 5%; through August 31. Accomplishments against Service-Disabled and HubZone goals are behind target despite best efforts, which was anticipated due the dollar volume of procurement required to go to large business in support of 12 GeV and TEDF projects. This project associated anomaly will continue into FY12. The breakdown for performance against all small business goals is set forth in

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the table below. Final numbers on actual performance will be updated after FY11 year end close, but are expected to remain close to these percentages. Procurement Balanced Scorecard targets are exceeding expectations in the aggregate through August at a score of 94.7%, which is in the BSC Outstanding (92-100%) range. Final results will be posted at year end and are expected to be at least what is currently recorded. In addition, our procurement manager co-led the DOE SC initiative with LBL’s Procurement Manager on Supply Chain Management Systems (SCMS) for process stream lining and cost savings, highlighting the SC Labs’ current performance and reviewing NNSA and commercial vendor E-commerce systems for benchmarks that can further enhance savings for the Labs.

	FY11 GOALS		ACHIEVED THROUGH AUGUST 31, 2011	
	M\$	%	M\$	%
Small Business	\$26.280	36.0%	\$34.606	42.1%
Women-Owned	\$3.650	5.0%	\$5.931	7.2%
Disadvantaged	\$3.650	5.0%	\$6.806	8.3%
Service-Disabled	\$2.190	3.0%	\$0.741	0.9%
HubZone	\$2.190	3.0%	\$0.901	1.1%
BASE	\$73.000		\$82.226	

- 6.3 Property Balanced Scorecard: The Property Balanced Scorecard targets are currently being met and in some instances exceeded; preliminary score is 100.8%.

TYPE OF PROPERTY	% OF INVENTORY ACCOUNTED FOR
Equipment >\$50,000	100%
Equipment \$5,000<=\$50,000	100%
Sensitive	100%
Stores Materials	100%
Precious Metals	100%

- **NOTABLE OUTCOME** Report on JWISE Recommendations: A review of all JWISE recommendations has been completed and a report has been compiled that cites those areas/activities the Lab has implemented as well as those that the Lab intends to implement in FY12.
 - Diversity and Succession Planning efforts during this period: During the past fiscal year, the Lab has increased its presence at recruiting events and in particular, attended activities that have shown to attract minorities and women (Society of Women Engineers, Women in Engineering ProActive Network, Hampton University and the Association of Historically Black College and Universities). The Lab hired three female Co-Op students for the Lab during 2011 and launched a mentoring program aimed at supporting students and supervisors. Succession Planning efforts have included the identification of the top twenty-five most critical positions for the Lab. A Skill Risk Assessment Matrix has been developed to assess the criticality and bench strength for each position. Individual development training plans have been established for all potential candidates.
- 6.5 Progress continues to be made on internal audits in accordance with the Audit Plan. Some of the actual start and completion dates of audits varied as a function of competing priorities and management operating schedules. It is anticipated that audit testwork will be complete by the end of the fiscal year; however, some of the audit reports may not be issued until after year end. The DOE Entity Assessment Tool, which documents the summary management review performed to assess the effectiveness of critical programmatic/entity internal controls for ensuring that mission objectives are met effectively, efficiently and in compliance with applicable laws and regulations, was populated with the required data and submitted in a timely manner.
 - The Quality Assurance Program was instrumental in this quarter’s successful OHSAS 18001 registration audit, with many of the programs key tenets such as Metrics, Assessments, Lessons Learned and Issues Management being reviewed. In addition, the Lab’s Quality Assurance Manager began the turnover process for the role of DOE-SC CAS Peer Review Coordinator during this reporting period.
 - JLab completed a site wide survey of staff and users on the services and support provided by the Information Technology Division. The responses to the survey were positive, indicating that most staff and uses are satisfied or very satisfied with the services and support they receive from the IT Division. The badging system completed a major upgrade, and the development of software to assist with the staffing and budgeting needs of the Lab has started a testing phase with users. An application

has been developed for rapid deployment of Lab forms, and several such forms have been deployed. Single sign-on is expected to be deployed for several web applications by the end of October. This project was initiated in part due to the site-wide survey of staff and users.

- 6.6 ▪ JLab has surpassed the FY11 goals for technology transfer (19 Invention Disclosures, 6 Patents, and 2 Licenses) with 34 Invention Disclosures, seven Patents, and two Licenses negotiated fiscal year to date. The licenses are with the University of Wisconsin for R&D and with BNNT, LLC which is a small business spin-off from the Lab. The terms of the latter were agreed to on August 2, and the National Institute of Aerospace (NIA), one of the joint owners with JLab on the BNNT technology, is drafting the license to present to the licensee later in September. During the second half of FY11, thirteen companies requested letters of support for their SBIR/STTR proposals that were due to DOE on September 19, 2011. Twenty-one letters were sent in response to that request, each addressing the individual proposals.

Goal 7: Sustain Excellence in Operating, Maintaining, Renewing Facility and Infrastructure Portfolio (25%)

- Objective 7.1 – Manage Facilities/Infrastructure in Effective Manner to Optimize Usage/Minimize Life Cycle Costs (40%)
 - Notable Outcome: Enhance Energy Management, Install System Software and Meters Identified in Phase 1 of the Project
 - Notable Outcome: Identify and Implement Milestones for a Cost Effective, Graded Approach CM Program
- Objective 7.2 – Provide Planning for and Acquire Facilities/Infra Required to Support Future Lab Program (60%)
 - Notable Outcome: Implement Corrective Actions from Causal Analysis Performed on Struck Utility Events (SC-TJSO-FMD-TJNAF-2010-001)

Notable Performance Items: (See JLab Insight for additional performance data on Objectives and Notable Outcomes.)

JLab is meeting performance for these Objectives and Notable Outcomes through August 31, 2011.

- 7.1
- **NOTABLE OUTCOME** Enhance Energy Management, Install System Software and Meters Identified in Phase I of the Project: During this period, meter system software, electric, natural gas, and water meters were installed. Additional metering is preceding based on need.
 - **NOTABLE OUTCOME** Cost Effective, Graded Approach Configuration Management (CM) Program: The remaining deliverables on track for completion by September 30th as scheduled include: (1) Gap analysis and implementation plan of the top three identified safety related systems; (2) Released Phase II of the Conduct of Engineering Manual, which includes the CM Graded Approach Procedure; and (3) CM Program Plan and Implementation.
- 7.2
- **NOTABLE OUTCOME** Implement Corrective Actions on Struck Utility Events: The Independent Assessment of the Lab’s “*Effectiveness Review of the Corrective Actions Required by Struck Utilities Reports during July 1, 2009, through June 30, 2010*” concluded on July 29, 2011. There were 0 findings, 12 Opportunities for Improvement, and 2 Noteworthy Practices identified. Facilities Management has received the draft report and is currently reviewing the Opportunities for Improvements.
 - The cost and schedule index for the major infrastructure projects TEDF and GPP are on track. The TEDF CPI is 0.96 with the SPI equal to 1.07. The TEDF DART is 0 with the Recordable Incident rate equal to 0.83 (1 incident) with over 240,000 labor hours expended. The following GPP projects scheduled for this fiscal year have been completed: Site Metering Phase 1, South LCW, and the Access Control System. Projects currently being designed for FY12 include 22 MvA and 40 MvA Electrical Tie Lines; replacing the CHL Cooling Towers, and Counting House rehabilitation. Planning continues on the extension of Building 68 and the Injector and Cryomodule Test Facility for future construction based on funding availability. Cafeteria kitchen plumbing renovations and CEBAF Center second floor computer center renovations will be constructed using operations funds due to the increase of capitalization value from \$50 to \$500K.

Goal 8: Sustain/Enhance Effectiveness of ISSM and Emergency Management Systems (20%)

- Objective 8.1 – Provide an Efficient/Effective Emergency Management System (EMS) (25%)
 - Notable Outcome: Enhance Emergency Management System Effectiveness – Benchmark against other DOE Sites, Complete Report and Disposition of Recommendations
- Objective 8.2 – Provide an Efficient/Effective System for Cyber Security (50%)
- Objective 8.3 – Provide Efficient System for Protection of SNM, Classified Matter, and Property (10%)
- Objective 8.4 – Provide Efficient/Effective System for Protection of Classified/Sensitive Information (15%)

Notable Performance Items: (See JLab Insight for Additional Performance Data on Objectives and Notable Outcomes.)

JLab is meeting performance for these Objectives and Notable Outcome through August 31, 2011.

8.1 ■ **NOTABLE OUTCOME** Enhance Emergency Management System Effectiveness: Jefferson Lab experienced a Category 1 Hurricane Storm in August. Preparations in securing the facility went smoothly. The lab lost power during the storm, but was able to restore power early the next day, minimizing the loss of Helium. An after-action critique with the Emergency Management Team, along with feedback from the Lab population, identified a few areas of improvement. These will be tracked in CATS. The OHSAS 18001 registration audit recognized JLab’s emergency response program as a best practice, referring it to as “linear and logical”.

8.2 ■ JLab continues to provide an efficient and effective system for Cyber Security as evidenced by the Laboratory’s response to the intrusion in Q3. The IP addresses used to launch the attack were entered into the Federated Model as they were discovered to provide protection for the other labs participating in the Federated Model. The CIO organized a forensics task force with experts from other labs and DOE-CIRC. Daily phone conferences were held to ensure the information discovered was shared among all those performing the forensics and that the information was shared with other labs.

The investigation into the Q3 cyber event found that Laboratory’s cyber systems were effective. The monitoring in place detected the intrusion early and the segmentation prevented attempts to access the sensitive enclaves. The monitoring systems in place proved effective in providing the information needed for DOR-CIRC to do forensics and recreate the activities of the attacker. A process was put in place to scan systems and determine which ones had been compromised. The compromised systems were then removed from the network and rebuilt before being allowed to rejoin the Windows domain.

In response to the cyber event, many enhancements were fast-tracked and implemented to better help prevent this type of intrusion in the future:

- Upgrades for the network sensors were procured to increased storage capacity. This will give the Laboratory the ability to record and store more network traffic for longer periods of time.
- The core Windows domain was redesigned and rebuilt. Segmentation of Administrative Accounts was added for each workgroup to prevent Administrative Accounts from being able to move throughout the entire domain. This provides a better least privilege model for domain Administrators and complements the network segmentation that was already in place.

The segmentation of Administrative accounts within the new Windows domain proved effective soon after being implemented when a video-streaming server was compromised and the intruder could not make use of the credentials outside of that workgroup. Additionally, the Laboratory’s participation proved in the Federated model proved effective because the same intruder was simultaneously attacking other labs. Within 13 minutes of compromising the video-streaming server the attacker was automatically blocked at the Laboratory’s firewall based on information received from other labs via the Federated Model.

Laboratory IT staff have participated in discussions with DOE regarding reorganizing how DOE handles Cyber Security and the formation of the Joint Cybersecurity Coordination Center (JC3). Andy Kowalski serves on the JC3 Integrated Project Team (IPT) as the representative for the DOE labs.

8.3 ■ JLab continues to provide an efficient system for the protection of SNM, Classified Matter, and Property. During this period, replacement of the 13-year old access control system was completed with equipment provided by DOE. A Security Risk Assessment was conducted by DOE HSS-52 Security Assistance August 8 – 11. Mike Sparks and three contractors from DOE HSS 52 Security Assistance visited JLab September 12 – 22 to develop a Security Concept of Operations and test and evaluation plan for the Lab’s electronic security systems.

- 8.4 ■ There was one cyber event in Q3. The subsequent investigation found that while there was loss of some core configuration sensitive information, there was no loss of sensitive science, technology or business information and that network segmentation had successfully prevented attempts to access those sensitive enclaves. A plan was developed to vet systems, rebuild infected systems, add cyber enhancements to address the intrusion and restore Internet access for the Laboratory. The prior core sensitive information was made obsolete by changes implemented. In response to the incident, many enhancements were fast-tracked and implemented for the sensitive enclaves. These were in addition to those listed in 8.2:
- Direct Internet access from sensitive enclaves, the Accelerator enclave and the network segments for IT Administrators has been limited to a white list proxy or via a terminal server located on another network segment.
 - The FEL enclave is being further separated from the rest of the Laboratory and a separate Windows domain for the FEL is being developed so that user accounts from the core Windows domain cannot be used to access the FEL enclave.
 - Access to the Accelerator’s EPICS data from outside the Accelerator enclave must now go through Channel Access Gateways.
 - 2-factor authentication for remote access to the Accelerator is in the process of being implemented around the Accelerator schedule.