Agency Strategic Plan

Jefferson Science Associates, LLC (936) 3/17/2014 11:46 am

Biennium: 2010-12

Mission and Vision

Mission Statement

As a national and international nuclear physics research facility, Jefferson Lab provides unique research capabilities at the forefront of nuclear and light source physics for university users, provides research opportunities for Virginia faculty and students, and explores and develops core technologies for the economic benefit of the Commonwealth.

Vision Statement

Jefferson Science Associates/Jefferson Lab (JLab) will continue to lead the world in exploring the complex dynamics by which quarks, interacting via gluons, form the stable and solid massive matter of everyday experience. To this end, JLab will continue to conduct experiments using a unique facility that is continually being upgraded to serve more than 2,000 users, provide theoretical analysis to guide and evaluate experiments, and develop state-of-the-art computer simulations to compute experimentally verifiable predictions.

Jefferson Lab will lead the world in the technology of superconducting radio frequency (SRF) and energy recovering linacs. These technologies will be put to use with JLab participation for the research aims of nuclear physics and basic energy sciences.

The Free Electron Laser (FEL) – providing THz to DUV light - will support a thriving photon basic science program (examining dynamics in complex physical, chemical, and biological systems) and support the development of applications ranging from nanostructures to thin films of unprecedented properties.

A prerequisite to achievement of all of these goals, and success for Jefferson Lab, is exceptional institutional management.

Executive Progress Report

Service Performance and Productivity

- *Summary of current service performance*

  Jefferson Science Associates (JSA)/Jefferson Lab measures its progress and performance via a performance-based management and operating contract with the United States Department of Energy (U.S. DOE). For activities funded by the Commonwealth of Virginia it also reports progress towards metrics to the Virginia Performs database. These activities are:

  1) Support for new research directions and technology development, including emerging technologies with economic development potential. Support for these research activities provide an opportunity for Virginia research universities to participate in research at an international level, and may lead to important developments in science, defense, security, health and manufacturing with economic impact.

  2) The Governor's Distinguished Continuous Electron Beam Accelerator Facility (CEBAF) Professorships, Scientists and Fellows provide support for salaries that allow JSA and Jefferson Lab to attract and retain top scientific and technological talent to the Commonwealth.

  3) Leveraging support for the $310M federal investment in the 12 GeV Upgrade of Jefferson Lab.

  4) Participation in Emergency Preparedness activities consistent with statewide efforts.

- *Summary of current productivity*

  Jefferson Science Associates (JSA)/Jefferson Lab has shown excellent scientific and technological productivity in its basic research and technology transfer missions.

  We have ~1,300 active users from the international scientific community, including 120 on approved experiments led by scientists at Virginia research universities.

  More than one third of all nuclear science Ph.D.s awarded in the United States are based on Jefferson Lab science. Three hundred twelve Ph.D.s (~100 in Virginia institutions) have been awarded to date, with 224 more in progress (~70 from Virginia).

  Jefferson Lab research is cited more than 25,000 times in scientific literature, including several of the top-cited papers in the field. The Jefferson Lab FEL was awarded a 2005 R&D 100 Award as one of the 100 top technology advances in

the U.S.

Work at Jefferson Lab has resulted in 83 patents and one spin-off company, Dilon Technologies, now producing breast imagers for use in centers around the world, and featured on the ABC Evening News on October 23, 2006.

More than 70 faculty positions in nuclear science and JLab-related technologies have been created at Virginia's research universities.

Initiatives, Rankings and Customer Trends

- *Summary of Major Initiatives and Related Progress*

  The bulk of JSA/Jefferson Lab's basic research mission in nuclear physics is funded through the US DOE Office of Science. However, funds from the Commonwealth support three major activities:

  Support for the Governor's Distinguished CEBAF Professorships (GDCP), Scientists and Fellows,

  Support for exploration and development of areas of research such as the Free Electron Laser, medical imaging and other emerging research areas,

  Leveraging the $310M federal investment in the 12 GeV Upgrade of the Jefferson Lab accelerator.

  Progress has been demonstrated in all of these areas due to the use of Commonwealth funds to leverage federal assets and resources.

  Funding for GDCPs has enabled the lab to provide salary support to attract and retain top notch international scientists. During this cycle it has allowed the lab to attract a leading international researcher to Virginia to serve as the Lab's third Lab Director and will be essential in attracting a new Deputy for Science, Hall D leader and Associate Project Manager for Physics to advance the forefront science program and work with the international community to attract in-kind and other resources and investments.

  Funding support for research at the JLab Free Electron Laser has been critical in sustaining the world-class expertise the JLab FEL has amassed in Free Electron Technology and the team that moved breast imaging technology to the marketplace was recognized with an Excellence in Technology Transfer Award by the Federal Lab Consortium.

  Leveraging of the $310M federal funding for the 12 GeV Upgrade project has resulted in the beginning of civil construction for the project including several major contracts let to Virginia firms.

- *Summary of Virginia's Ranking*

  Jefferson Lab is an international leader in the field of hadronic nuclear physics, a branch of science studying the forces that hold subatomic particles together. It is currently the only facility of its kind in the world exploring the structure of nuclear matter, putting Virginia in a high profile leadership position as a science and research and development (R&D) provider in nuclear and accelerator physics and related technologies. The importance and quality of Jefferson Lab's scientific program is measured via a performance-based contract with the Department of Energy, and is documented in several DOE and Office of Science documents including the DOE Strategic Plan, Opportunities in Nuclear Science developed by the DOE/NSF Nuclear Science Advisory Committee, and Facilities for the Future of Science, a 20-year plan for the DOE Office of Science.

- *Summary of Customer Trends and Coverage*

  JSA/Jefferson Lab has four specific categories of customers served by activities funded by the Commonwealth:

  - Nuclear Physics researchers in hadronic physics

  - Nuclear Physics faculty and students in the Commonwealth

  - Light source (laser) research and development community

  - University faculty and students in Virginia who use advanced light sources for science research

  We are expecting that the first and second categories (US and Virginia Nuclear Physics users and faculty) will increase significantly as Jefferson Lab continues to deliver its forefront experimental program and construction continues on the 12 GeV Upgrade of the facility. The Upgrade, which will double the current energy of the accelerator, will enhance the capabilities available for the current program and allow access for new discovery-caliber science. Because the Upgrade includes a new experimental hall, it will increase by one-third the number of scientific users (currently 1,300) and will result in a projected annual increase of $30 Million in federal operating budget.

The Free Electron Laser and light source user customer group is also expected to increase as a result of the upgraded FEL capabilities, the beginning of the Navy's planned Innovative Naval Prototype for shipboard self-defense and current development of the science case for a new light source at Jefferson Lab, JLAMP.

Future Direction, Expectations, and Priorities

- *Summary of Future Direction and Expectations*

  JSA/Jefferson Lab will continue to be a national and international center for Nuclear Physics research and with the 12 GeV Upgrade, will remain at the forefront of the field for the next several decades. We expect to sustain or increase our scientific productivity in terms of Ph.D.s produced and in scientific papers and journal articles based on this program expansion. Jefferson Lab is also well-positioned to compete for another planned machine that is currently in the latter portion of the Office of Science 20-year plan.

  JSA/Jefferson Lab will continue to grow its program in photon science and technology using the capabilities of the FEL, building on the investments made by the Navy and leveraging Commonwealth funds to develop applications that will ultimately benefit economic development in Virginia.

- *Summary of Potential Impediments to Achievement*

  The primary impediment to accomplishment of goals is the availability of adequate federal funding to operate and upgrade Jefferson Lab. Pressure on the discretionary portion of the federal budget in 2009 and beyond could delay or obstruct our progress toward our goals and initiatives.

Service Area List

Service Number	Title
936 110 04	Sponsored Programs

Agency Background Information

Statutory Authority

N/A

Customers

Customer Group	Customers served annually	Potential customers annually
Commonwealth light source (free electron laser) users	60	100
Commonwealth nuclear physics students and faculty	150	200
Light source (free electron laser) users	200	500
Nuclear physics users	1,300	1,700

Anticipated Changes To Agency Customer Base

We are expecting that our customer base (US and Virginia Nuclear Physics users and faculty) will continue to increase as Jefferson Lab continues to deliver its forefront experimental program and as construction continues on the 12 GeV Upgrade of the facility. The Upgrade, which will double the current energy of the accelerator, will enhance the capabilities available for the current program and allow access for new discovery-caliber science. Because the Upgrade includes a new experimental hall, Nuclear Physics users are expected to increase gradually over the next several years as the project is planned and constructed and when 12 GeV operations begin.

The Free Electron Laser and light source user customer group is also expected to increase as a result of the upgraded FEL capabilities.

Jefferson Lab is a world-class research facility conducting basic research into the structure of matter. Our work is not relevant to aging population impacts.

Partners

Partner	Description
U.S. Department of Energy	The U.S. DOE is the landlord and primary funding source for the infrastructure and operations of

Jefferson Lab. Some funding for the Free Electron Laser is provided by the Department of Defense.

Products and Services

- *Description of the Agency's Products and/or Services:*
  To provide world-class unique facilities for research in Nuclear Physics - Products are Ph.D.s; papers in refereed journals, invited talks and scientific and technical prizes or awards.

  Emerging fields research support- development of industry-university partnerships to explore and develop applications for the Free Electron Laser and other lab-developed technologies that may provide economic benefit to the Commonwealth - Products are collaborations, partnerships, proposals, research papers and publications, and patents.
- *Factors Impacting Agency Products and/or Services:*
  Declining federal funding levels in the physical sciences could:

  Negatively impact the number of students entering Nuclear Physics,

  Reduce the number of experiments that can be done at Jefferson Lab,

  Impact completion of the 12 GeV Upgrade.

  Significant power cost increases could impact scientific output of Jefferson Lab, competitiveness for future projects and expansion.
- *Anticipated Changes in Products or Services:*
  We anticipate that the 12 GeV Upgrade project will ramp up participation in our experimental program through the construction with significant new users (~1/3 increase) by planned completion in 2015.

  Increased capabilities at the JLab Free Electron Laser will generate additional interest by users. Applications will be developed in the areas of defense, bioscience, nanotechnology, micromachining, and laser processing that may result in additional patents or products with economic development impact.

  Emerging areas of technology will be identified and developed.

Finance

- *Financial Overview:*
  Financial assistance for educational and general services supports the Governor's Distinguished CEBAF Professorships, Scientists and Fellows, provides research support for development of new technologies including the Free Electron Laser, and leverages federal investment in the $310M 12 GeV Upgrade. A critical component of the 12 GeV Upgrade is a new experimental Hall D, which will provide capabilities to explore new scientific avenues that address some of the most pressing fundamental questions regarding the quark structure of matter and the force that holds matter together. Commonwealth support of $6M, residing in Item 254 of the Higher Education Research Initiative, will be transferred to the Lab in FY2010 to begin construction of Hall D and leverage the $310M federal investment for the 12 GeV Upgrade.
- *Financial Breakdown:*

	FY 2011		FY 2012	
	General Fund	Nongeneral Fund	General Fund	Nongeneral Fund
Base Budget	$1,277,657	$0	$1,277,657	$0
Change To Base	$0	$0	$0	$0
Agency Total	$1,277,657	$0	$1,277,657	$0

This financial summary is computed from information entered in the service area plans.

Human Resources

- *Overview*
  N/A
- *Human Resource Levels*

Effective Date	9/1/2009	
Total Authorized Position level	0	
Vacant Positions	0	
Current Employment Level	**0.0**	
Non-Classified (Filled)	0	
Full-Time Classified (Filled)	0	*breakout of Current Employment Level*
Part-Time Classified (Filled)	0	
Faculty (Filled)	0	
Wage	0	
Contract Employees	0	
Total Human Resource Level	**0.0**	*= Current Employment Level + Wage and Contract Employees*

- *Factors Impacting HR*
  N/A
- *Anticipated HR Changes*
  N/A

Information Technology

- *Current Operational IT Investments:*
  N/A
- *Factors Impacting the Current IT:*
  N/A
- *Proposed IT Solutions:*
  N/A
- *Current IT Services:*

  Estimated Ongoing Operations and Maintenance Costs for Existing IT Investments

	Cost - Year 1		Cost - Year 2	
	General Fund	Non-general Fund	General Fund	Non-general Fund
Projected Service Fees	$0	$0	$0	$0
Changes (+/-) to VITA Infrastructure	$0	$0	$0	$0
Estimated VITA Infrastructure	$0	$0	$0	$0
Specialized Infrastructure	$0	$0	$0	$0
Agency IT Staff	$0	$0	$0	$0
Non-agency IT Staff	$0	$0	$0	$0
Other Application Costs	$0	$0	$0	$0
Agency IT Current Services	$0	$0	$0	$0

Comments:
[Nothing entered]

- *Proposed IT Investments*

  Estimated Costs for Projects and New IT Investments

	Cost - Year 1		Cost - Year 2	
	General Fund	Non-general Fund	General Fund	Non-general Fund
Major IT Projects	$0	$0	$0	$0
Non-major IT Projects	$0	$0	$0	$0
Agency-level IT Projects	$0	$0	$0	$0
Major Stand Alone IT Procurements	$0	$0	$0	$0
Non-major Stand Alone IT Procurements	$0	$0	$0	$0
Total Proposed IT Investments	$0	$0	$0	$0

- *Projected Total IT Budget*

	Cost - Year 1		Cost - Year 2	
	General Fund	Non-general Fund	General Fund	Non-general Fund
Current IT Services	$0	$0	$0	$0
Proposed IT Investments	$0	$0	$0	$0
Total	$0	$0	$0	$0

Appendix A - Agency's information technology investment detail maintained in VITA's ProSight system.

Capital

- *Current State of Capital Investments:*
  N/A
- *Factors Impacting Capital Investments:*
  N/A
- *Capital Investments Alignment:*
  N/A

Agency Goals

Goal 1

Maintain a 90-1 ratio of federal/private funds to state funds

Goal Summary and Alignment

Enhancement of Virginia's economy requires that new science and technology is moved from the laboratory and university to the marketplace. By effectively leveraging Commonwealth-provided funds to yield new applications and developments from Jefferson Lab, we are helping university researchers to identify and develop new products and services to stimulate high-tech economic development in Virginia based on the unique research capabilities at Jefferson Lab. Commonwealth funds were also utilized to leverage federal investment in the $310 million 12 GeV Upgrade.

Goal Alignment to Statewide Goals

- Be a national leader in the preservation and enhancement of our economy.

Goal 2

Increase participation at Jefferson Lab by Virginia universities in high-profile experiments and applications development, and to increase Virginia university participation in emerging research areas such as medical imaging.

Goal Summary and Alignment

By increasing the number of Virginia university faculty and students in high-profile experiments and in exploring and

developing technologies for application, we raise the profile of the research conducted, attract more and better students and faculty to Virginia and advance the development of applications with economic development impact for the Commonwealth.

Goal Alignment to Statewide Goals

- Elevate the levels of educational preparedness and attainment of our citizens.
- Be a national leader in the preservation and enhancement of our economy.

Goal 3

Strengthen the culture of preparedness at Jefferson Lab in coordination with local, regional and state authorities.

Goal Summary and Alignment

This goal ensures compliance with federal and state regulations, policies and procedures for Commonwealth preparedness, as well as guidelines promulgated by the Assistant to the Governor for Commonwealth Preparedness, in collaboration with the Governor's Cabinet, the Commonwealth Preparedness Working Group, the Department of Planning and Budget and the Council on Virginia's Future. The goal supports achievement of the Commonwealth's statewide goal of protecting the public's safety and security, ensuring a fair and effective system of justice and providing a prepared response to emergencies and disasters of all kinds.

Goal Alignment to Statewide Goals

- Protect the public’s safety and security, ensuring a fair and effective system of justice and providing a prepared response to emergencies and disasters of all kinds.

Goal Objectives

- We will be prepared to act in the interest of the citizens of the Commonwealth and its infrastructure during emergency situations by actively planning and training.

  Objective Strategies

  - Jefferson Lab's Emergency Manager will stay in continuous communication with the Office of Commonwealth Preparedness and the Virginia Department of Emergency Management.

  Link to State Strategy

  - nothing linked

  Objective Measures

  - Conduct Emergency Management Exercises

    Measure Class: Other Measure Type: Outcome Measure Frequency: Annual Preferred Trend: Maintain

    Measure Baseline Value: Date: 7/1/2008

    Measure Baseline Description: The extent and level of implementation should be proportional to the nature and magnitude of threats to JLab and its interaction with off-site emergency responders.

    Measure Target Value: 1 Date: 6/30/2010

    Measure Target Description: Conduct one emergency management exercise. Participate in at least one local emergency preparedness exercise assisting a local entity in their preparedness.

    Data Source and Calculation: Conduct emergency management exercises as identified in the Emergency Readiness Assurance Plan (ERAP) for FY09. Participate in at least one local emergency preparedness exercise assisting a local entity in their preparedness.

Service Area Strategic Plan

Jefferson Science Associates, LLC (936) 3/17/2014 11:46 am

Biennium: 2010-12

Service Area 1 of 1

Sponsored Programs (936 110 04)

Description

As a national and international nuclear physics research facility, Jefferson Lab provides unique research capabilities at the forefront of nuclear and light source physics for university users, provides research opportunities for Virginia faculty and students, and explores and develops core technologies for the economic benefit of the Commonwealth.

Background Information

Mission Alignment and Authority

- *Describe how this service supports the agency mission*
  JSA/Jefferson Lab, as a basic research facility for university users, provides unique educational and research opportunities for students and faculty in the Commonwealth enhancing the educational and research and development (R&D) infrastructure of the Commonwealth.
- *Describe the Statutory Authority of this Service*
  Jefferson Lab is managed and operated via a performance-based contract by Jefferson Science Associates, LLC, for the U.S. Department of Energy.

Customers

Agency Customer Group	Customer	Customers served annually	Potential annual customers
Commonwealth light source (free electron laser) users	Commonwealth light source (Free Electron Laser) users	60	100
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Partners

Partner	Description
U.S. Department of Energy	The U.S. DOE is the landlord and primary funding source for the infrastructure and operations of Jefferson Lab. Some funding for the Free Electron Laser is provided by the Department of Defense.

Products and Services

- *Factors Impacting the Products and/or Services:*
  Declining federal funding levels in the physical sciences could:

- Negatively impact the number of students entering Nuclear Physics,

- Reduce the number of experiments that can be done at Jefferson Lab,

- Impact completion of the 12 GeV Upgrade.

Significant power cost increases could impact scientific output of Jefferson Lab, competitiveness for future projects and expansion.

- *Anticipated Changes to the Products and/or Services*
  We anticipate that the 12 GeV Upgrade project will ramp up participation in our experimental program through the construction with significant new users (~1/3 increase) by planned completion in 2015.

  Increased capabilities at the JLab Free Electron Laser will generate additional interest by users. Applications will be developed in the areas of defense, bioscience, nanotechnology, micromachining, and laser processing that may result in additional patents or products with economic development impact.

  Emerging areas of technology will be identified and developed.
- *Listing of Products and/or Services*
  - To provide world-class unique facilities for research in Nuclear Physics - Products are Ph.D.s; papers in refereed journals, invited talks and scientific and technical prizes or awards. Emerging fields research support- development of industry-university partnerships to explore and develop applications for the Free Electron Laser and other lab-developed technologies that may provide economic benefit to the Commonwealth - Products are collaborations, partnerships, proposals, research papers and publications, and patents.

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- *Human Resources Overview*
  N/A
- *Human Resource Levels*

Effective Date	
Total Authorized Position level	0
Vacant Positions	0
Current Employment Level	**0.0**
Non-Classified (Filled)	0

Full-Time Classified (Filled)	0	*breakout of Current Employment Level*
Part-Time Classified (Filled)	0	
Faculty (Filled)	0	
Wage	0	
Contract Employees	0	
Total Human Resource Level	**0.0**	*= Current Employment Level + Wage and Contract Employees*

- *Factors Impacting HR*
  N/A
- *Anticipated HR Changes*
  N/A

Service Area Objectives

- We will make Jefferson Lab available to Virginia universities for high-profile experiments and applications development, and increase Virginia university participation in emerging research areas such as medical imaging and nanotechnology.

  Objective Strategies

  - We are seeking to increase the participation of Virginia university faculty and students in research at Jefferson Lab to enhance Virginia's economic development and to attract the best and brightest students and faculty to pursue these opportunities.

  Link to State Strategy

  - nothing linked

  Objective Measures

  - Percentage of participation by Virginia university faculty and students in research at Jefferson Lab

    Measure Class: Agency Key Measure Type: Outcome Measure Frequency: Annual Preferred Trend: Up

    Measure Baseline Value: 17.7 Date: 7/1/2009

    Measure Baseline Description: Percent of all users actively participating in research at Jefferson Lab that represent Virginia universities

    Measure Target Value: 18.0 Date: 6/30/2011

    Measure Target Description: Virginia university representation among all users actively engaged in research at Jefferson Lab

    Data Source and Calculation: Percentage of Virginia university faculty and students out of total Jefferson Lab users actively participating in research; percent per year

- We will increase the total funding for the support of basic and applied research by leveraging state funds from all other non-state sources by a factor of 90 or greater.

  Objective Strategies

  - We use state funds to develop proposals, foster collaborations and for targeted experiments used to develop new applications with potential economic development impact for the Commonwealth and to leverage further federal investment.

  Link to State Strategy

  - nothing linked

  Objective Measures

- Ratio of federal/private matching funds to state-provided funds

  Measure Class: Agency Key Measure Type: Outcome Measure Frequency: Annual Preferred Trend: Maintain

  Measure Baseline Value: 0.1 Date: 10/1/2001

  Measure Baseline Description: A ratio of 90 to 1 demonstrates good leveraging of state dollars. Given the uncertainties in federal discretionary budget and the present state of the national economy, this target measure will represent an aggressive goal for the next biennium

  Measure Target Value: 90 Date: 6/30/2011

  Measure Target Description: Ratio of 90 to 1 (federal/private funds to state funds) received throughout the fiscal year

  Data Source and Calculation: Ratio of federal/private matching funds to state-provided funds - Amount of federal/private matching funds divided by the amount of state-provided funds

- Ratio of federal/private matching funds to state-provided funds for the support of basic and applied research.

  Measure Class: Productivity Measure Frequency: Annual Preferred Trend: Maintain

  Measure Baseline Value: 0.1 Date: 10/1/2001

  Measure Baseline Description: A ratio of 90 to 1 demonstrates good leveraging of state dollars. Given the uncertainties in federal discretionary budget and the present state of the national economy, this target measure will represent an aggressive goal for the next biennium.

  Measure Target Value: 90 Date: 6/30/2010

  Measure Target Description: Ratio of 90 to 1 (federal/private research funds to state research funds) received throughout the fiscal year

  Data Source and Calculation: Ratio of federal/private matching research funds to state-provided research funds - Amount of federal/private matching research funds divided by the amount of state-provided research funds