

Strategic Plan
(2012-2014 Version 1)

Southeastern Universities Research Association Doing Business for Jefferson Science Associates, LLC (936)

Agency Plan

Mission Statement

As a national and international nuclear physics research facility, Jefferson Lab provides unique research capabilities at the forefront of nuclear physics and light source research and development (R&D) 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 (JSA)/Jefferson Lab (JLab) will continue to lead the world in exploring the complex dynamics by which quarks (elementary particles of matter) interacting via gluons (the strong force between quarks), form the stable and solid massive matter of everyday experience. To this end, Jefferson Lab 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 linear accelerators (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 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.

Information Technology

Current Operational IT Investments

JSA/Jefferson Lab receives its primary funding from the Department of Energy (DOE) Office of Science, which supports the information technology requirements of the facility.

Factors Impacting the Current Agency IT

see above

Proposed IT Solutions

see above

Financial Overview

Commonwealth financial assistance for educational and general services supports the Governor's Distinguished Continuous Electron Beam Accelerator Facility (CEBAF) Professorships, Scientists and Fellows, provides research support for development of new technologies including the Free Electron Laser, and leverages federal investment in the \$310 million 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. The Laboratory has received \$1.8 million in funding from the Commonwealth in the FY2013 and expects \$1.2 million in FY2014 (through Old Dominion University) to support upgrading the Free Electron Laser equipment, specifically the Cryogenic Unit and Buncher Cavity. Commonwealth support of \$6 million in FY2010 and \$3 million in FY2011, from the Higher Education Research Initiative in Chapters 879/781 and Chapters 874/890, supported the 12 GeV project. Hall D construction is now complete and ready for the installation of experimental equipment.

Budget Component	2013 GF	2013 NGF	2014 GF	2014 NGF
Base	1,149,891	0	1,149,891	0
Changes to Base	0	0	0	0
Total	1,149,891	0	1,149,891	0

Agency Goals

- Maintain a 90-1 ratio of federal/private matching funds to state provided funds for basic and applied research.

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, the lab is 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. This goal is aligned with Chapter 4.9:1 Virginia Higher Education Opportunity Act of 2011, purposes 5 (To promote university-based research that produces outside investment in Virginia, fuels economic advances, triggers commercialization of new products and processes, fosters the formation of new businesses, leads businesses to bring their facilities and jobs to Virginia, and in other ways helps place the Commonwealth on the leading edge in the knowledge-driven economy; and 6 (To support the national effort to enhance the security and economic competitiveness of the United States of America, and to secure a leading economic position for the Commonwealth of Virginia, through increased research and instruction in science, technology, engineering, mathematics, and related fields, which require qualified faculty, appropriate research facilities and equipment, public-private and intergovernmental collaboration, and sustained state support.

Long Term Goal

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

Societal Indicator: Business Climate

- Leverage Jefferson Lab's unique capabilities, expertise, facilities and resources to increase Virginia university participation in basic and applied science and emerging areas of research.

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, Jefferson Lab raises 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. This goal is aligned with Chapter 4.9:1 Virginia Higher Education Opportunity Act of 2011, purposes 2 (To take optimal advantage of the demonstrated correlation between higher education and economic growth by investing in a manner that will generate economic growth, job creation, personal income growth, and revenues generated for state and local government in Virginia), 4 (To enhance personal opportunity and earning power for individual Virginians by increasing college degree attainment in the Commonwealth, especially in high-demand, high-income fields such as science, technology, engineering, mathematics, and health care, and by providing information about the economic value and impact of individual degree programs by institution), 5 (To promote university-based research that produces outside investment in Virginia, fuels economic advances, triggers commercialization of new products and processes, fosters the formation of new businesses, leads businesses to bring their facilities and jobs to Virginia, and in other ways helps place the Commonwealth on the leading edge in the knowledge-driven economy), and 6 (To support the national effort to enhance the security and economic competitiveness of the United States of America, and to secure a leading economic position for the Commonwealth of Virginia, through increased research and instruction in science, technology, engineering, mathematics, and related fields, which require qualified faculty, appropriate research facilities and equipment, public-private and intergovernmental collaboration, and sustained state support).

Long Term Goal

Elevate the levels of educational preparedness and attainment of our citizens.

Societal Indicator: Educational Attainment

Programs and Service Areas for Agency

- 11004: Sponsored Programs

Customers

Pre-Defined Customer Group	User Specified Customer Group	Customers Served Annually	Potential Annual Customers	Projected Trend in # of Customers
Higher Education Institutions	Nuclear physics users	1,300	1,500	Increase
Higher Education Institutions	Free Electron Laser users	10	15	Increase
Higher Education Institutions	Commonwealth nuclear physics students and faculty	150	200	Increase
Higher Education Institutions	Commonwealth Free Electron Laser users	8	12	Increase

Key Risk Factors

The primary impediment to the accomplishment of goals is the availability of adequate federal funding to operate and upgrade Jefferson Lab. Newly mandated sequestration on federal budgets could pose a risk to lab operations and to the future FEL program. Pressure on the discretionary portion of the federal budget since 2009 will continue to impact the Lab and could delay or obstruct progress toward goals and initiatives.

Products and 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.

Provide research support and development of industry-university in emerging fields partnerships to explore and develop applications for lab-developed technologies that could provide economic benefit to the Commonwealth -- products are collaborations, partnerships, proposals, research papers and publications, patents, and licenses.

Trends

Rankings & Customer Trends

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

- Nuclear physics researchers in hadronic (particles of quarks and gluons) physics
- Nuclear physics faculty and students in the Commonwealth
- Free Electron Laser research and development community
- University faculty and students in Virginia who use advanced light sources for science research

It is expected that the first and second categories (United States and Virginia nuclear physics users and faculty) will increase as Jefferson Lab continues to deliver its forefront experimental program and construction continues on the 12 GeV upgrade of the facility. The upgrade, doubling the current energy of the accelerator, will enhance the capabilities available for the current program and allow researchers access to new discovery-caliber science. Because the upgrade includes a new experimental hall, it will increase by nearly one-fourth the number of scientific users (currently 1,300) and will result in a commensurate projected increase.

Trend Name	Trend Area
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Number of customers	Increase
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Performance Highlights: Service Performance & Productivity Initiatives

Jefferson Science Associates (JSA)/Jefferson Laboratory 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 \$310 million federal investment in the 12 GeV upgrade of Jefferson Laboratory.

Jefferson Science Associates (JSA)/Jefferson Lab has shown excellent scientific and technological productivity in its basic research and technology transfer missions. The lab has more than 1,300 active users from the international scientific community, including 133 on approved experiments led by scientists at Virginia research universities.

Note: "At A GLANCE" Performance -- Productivity ratio measuring federal to state funds is temporarily trending downward due to the tapering-off of additional federal funds for the 12 GeV project construction - the trend for the measure is "Maintaining" for Operational funding.

Note: The second measure below had a target of 10 through FY 2010, when it was based on Free Electron Laser (FEL) state funds vs. FEL non-state funds. The measure was revised in FY 2011 to compare total state-provided funds to total lab federal/private matching funds, with a current target of 90.

Management Discussion & Analysis

Future Direction, Expectations, and Priorities

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. JLab expects 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 its participation in photon science research and development (R&D) 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.

JSA/Jefferson Lab will continue to identify and develop emerging research opportunities that open new avenues for collaboration with university researchers and business/industry partners.

11004: Sponsored Programs

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.

Mission Alignment and Authority

Jefferson Science Associates (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.

Jefferson Lab is managed and operated via a performance-based contract by JSA, LLC for the U.S. Department of Energy. www.energy.gov

Customers for this Service Area

Anticipated Changes to Customers Base

Jefferson Lab is expecting that the customer base (United States 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 (FEL) customer group is also expected to increase as a result of the upgraded FEL capabilities and efforts to build on existing facilities and capabilities for a role in the development of a future next generation light source.

Current Customer Base

Pre-Defined Customer Group	User Specified Customer Group	Customers Served Annually	Potential Annual Customers	Projected Trend in # of Customers
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Partners for this Service Area

Partner	Description
United States Department of Energy	The United States Department of Energy 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

Jefferson Lab anticipates that the 12 GeV upgrade project will ramp up participation in the experimental program through the construction with significant new users (~1/4 increase) by planned completion in 2015.

Increased capabilities at the Jefferson Lab (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. Support development of industry-university partnerships in emerging research fields 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, patents, and licenses.

Financial Overview

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Objectives for this Service Area

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Objective

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.

Description

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

- Jefferson Lab uses 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.

Alignment to Agency Goals

- Maintain a 90-1 ratio of federal/private matching funds to state provided funds for basic and applied research.

Measures

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

Measure Class Preferred Trend Frequency

Data Source and Calculation

Ratio of federal/private matching funds to state-provided funds for basic and applied research - Amount of federal/private matching funds divided by the amount of state-provided funds appropriated to Jefferson Lab for the fiscal year. Sources: Jefferson Lab's Department of Energy (DOE) contract and Commonwealth of Virginia appropriation documents.

Objective

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.

Description

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

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

Alignment to Agency Goals

- Leverage Jefferson Lab's unique capabilities, expertise, facilities and resources to increase Virginia university participation in basic and applied science and emerging areas of research.

Measures

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

Measure Class Measure Type Preferred Trend Frequency

Data Source and Calculation

Percentage of Virginia university faculty and students out of total Jefferson Lab users actively participating in research; percent per year; number of Virginia university faculty/students during current fiscal year divided by total number of users during current fiscal year at Jefferson Lab. Source data is an internal Jefferson Lab user report.

Objective

Reduce administrative infrastructure support costs.

Description

Eliminate off-site, leased warehouse space and unnecessary property for JLab requirements in efforts to increase operational efficiency. By minimizing administrative and infrastructure support costs, burden on the funds provided by the Commonwealth is reduced, directly benefiting Jefferson Lab's university users and economic impact.

Objective Strategies

- Disposing of excess/unneeded property by the end of the Federal Government's Fiscal Year (GFY) 2013.

Alignment to Agency Goals

- Leverage Jefferson Lab's unique capabilities, expertise, facilities and resources to increase Virginia university participation in basic and applied science and emerging areas of research.

Measures

- Reduction of off-site space which will result in dollar savings.

Measure Class **Productivity** Preferred Trend **Stable** Frequency **Annually**

Data Source and Calculation

Measure would be verified by documentation (Quarterly Performance Evaluation report) provided by Jefferson Lab to the United States Department of Energy certifying its fulfillment of this objective during the GFY13 performance period.