U.S. Department of Energy

Office of Laboratory Policy

Fiscal Year 2024

Performance Evaluation Report of the Jefferson Science Associates, LLC for Management and Operations of Science and Technology at the Thomas Jefferson National Accelerator Facility

For the period October 1, 2023 to September 30, 2024

Table of Contents

I. OVERALL SUMMARY RATING/FEE

Performance-Based Score and Adjectival Rating

The basis for the evaluation of Jefferson Science Associates, LLC (JSA or the Contractor) management and operations of the Thomas Jefferson National Accelerator Facility (TJNAF or the Laboratory) during FY 2024 centered on the Objectives found within the following Performance Goals:

Goal 1.0: Provide for Efficient and Effective Mission Accomplishment

Goal 2.0: Provide for Efficient and Effective Design, Fabrication, Construction and Operations of Research Facilities

Goal 3.0: Provide Effective and Efficient Science and Technology Program Management

Goal 4.0: Provide Sound and Competent Leadership and Stewardship of the Laboratory

Goal 5.0: Sustain Excellence and Enhance Effectiveness of Integrated Safety, Health, and Environmental Protection

Goal 6.0: Deliver Efficient, Effective, and Responsive Business Systems and Resources that Enable the Successful Achievement of the Laboratory Mission(s)

Goal 7.0: Sustain Excellence in Operating, Maintaining, and Renewing the Facility and Infrastructure Portfolio to Meet Laboratory Needs

Goal 8.0: Sustain and Enhance the Effectiveness of Integrated Safeguards and Security Management (ISSM) and Emergency Management Systems

Each Performance Goal was composed of two or more weighted Objectives and most Objectives had a set of performance measures, which assisted in determining the Contractor's overall performance in meeting that Objective. Each of the performance measures identified significant activities, requirements, and/or milestones important to the success of the corresponding Objective. The following describes the methodology utilized in determining the Contractor performance rating.

Calculating Individual Goal Scores and Letter Grades

Each Objective is assigned the earned numerical score by the evaluating office as stated above. The Goal rating is then computed by multiplying the numerical score by the weight of each Objective within a Goal. These values are then added together to develop an overall numerical score for each Goal. For the purpose of determining the final Goal grade, the raw numerical score for each Goal will be rounded to the nearest tenth of a point using the standard rounding convention discussed below and then compared to Figure 1. A set of tables is provided at the end of each Performance Goal section of this document to assist in the calculation of Objective numerical scores to the Goal grade. No overall rollup grade shall be provided. The raw numerical score for S&T and M&O will be rounded to the nearest tenth of a point of purposes of determining fee. A standard rounding convention of x.44 and less rounds down to the nearest tenth (here, x.4), while x.45 and greater rounds up to the nearest tenth (here, x.5).

Score	0.0-0.7	0.8-1.0	1.1-1.7	1.8-2.0	2.1-2.4	2.5-2.7	2.8-3.0	3.1-3.4	3.5-3.7	3.8-4.0	4.1-4.3
Grade	F	D	C-	C	C+	B-	B	B+	A-	A	A+

Figure 1. FY 2024 Contractor Letter Grade Scale

The eight performance Goal grades shall be used to create a report card for the laboratory (see Figure 2, below).

Performance Goal	Grade
1.0 Mission Accomplishment	A-
2.0 Design, Fabrication, Construction and Operations of Research Facilities	B+
3.0 S&T Program Management	A-
4.0 Leadership/Stewardship	B
5.0 ES&H and Environmental Management	C+
6.0 Business Systems	B+
7.0 Infrastructure	B
8.0 Safeguards/Security	B+

Figure 2. Laboratory Report Card

Determining the Amount of Performance-Based Fee Earned:

SC uses the following process to determine the amount of performance-based fee earned by the Contractor. The S&T score from each evaluator shall be used to determine an initial numerical score for S&T (see Table A, below), and the rollup of the scores for each M&O Performance Goal shall be used to determine an initial numerical M&O score (see Table B, below).

Program	Numerical Score	Weight	Total Score
1.0 Mission Accomplishment	3.5	30.0%	
2.0 Design, Fabrication, Construction and Operations of Research Facilities	3.4	45.0%	
3.0 S&T Program Management	3.5	25.0%	
		Initial S&T Score	3.5

Summation of percentages may not always add up to 100% due to rounding.

Table A. Fiscal Year Contractor Evaluation Initial S&T Score Calculation

For Goals 1.0 and 2.0, the weights are based on fiscal year costs for each program distributed between Goals 1.0 and 2.0. For Goal 3.0, the weight is set as a fixed percentage of 25% for all laboratories.

M&O Performance Goal	Numerical Score	Weight	Total Score
5.0 ES&H and Environmental Management	2.4	30.0%	
6.0 Business Systems	3.3	25.0%	
7.0 Infrastructure	3.0	25.0%	
8.0 Safeguards/Security	3.4	20.0%	
		Initial M&O Score	3.0

Summation of percentages may not always add up to 100% due to rounding.

Table B. Fiscal Year Contractor Evaluation Initial M&O Score Calculation

While tables within the executive summary report show scores rounded at the goal level, in calculating the S&T and M&O scores all decimal places are carried over until the final calculation.

These initial scores will then be adjusted based on the numerical score for Performance Goal 4.0 (See Table C, below).

	Numerical Score	Weight	Total Score
Initial S&T Score	3.5	75%	
Leadership/Stewardship	2.9	25%	
		Final S&T Score	3.3
Initial M&O Score	3.0	75%	
Leadership/Stewardship	2.9	25%	
		Final M&O Score	3.0

Summation of percentages may not always add up to 100% due to rounding.

Table C. Fiscal Year Final S&T and M&O Score Calculation

The percentage of the available performance-based fee that may be earned by the Contractor shall be determined based on the final score for S&T (See Table C) and then compared to Figure 3, below. The final score for M&O from Table C shall then be utilized to determine the final fee multiplier (see Figure 3) which will determine the final percentage of fee earned (see Table D). The actual amount of performance-based fee earned for FY 2024 is then calculated AS shown in Table E.

Overall Weighted Score from Table C	Percent S&T Fee Earned	M&O Fee Multiplier
4.1 to 4.3	100.00%	100.00%
3.8 to 4.0	97.00%	100.00%
3.5 to 3.7	94.00%	100.00%
3.1 to 3.4	91.00%	100.00%
2.8 to 3.0	88.00%	95.00%
2.5 to 2.7	85.00%	90.00%
2.1 to 2.4	75.00%	85.00%
1.8 to 2.0	50.00%	75.00%
1.1 to 1.7	0.00%	60.00%
0.8 to 1.0	0.00%	0.00%
0.0 to 0.7	0.00%	0.00%

Figure 3. Performance Based Fee Earned Scale

Overall Fee Determination	
Percent S&T Fee Earned From Figure 3.	91.00%
M&O Fee Multiplier From Figure 3.	X 95.00%
Overall Earned Performance-Based Fee	86.45%

Table D. Final Percentage of Performance Based Fee Earned Determination

Earned Fee Calculation	
Available Fee	$3,345,296
Overall Earned Performance - Based Fee (Table D)	X 86.45%
Earned Fee	$2,892,008

Table E. Earned Fee Calculation

II. PERFORMANCE GOALS, OBJECTIVES, AND MEASURES/TARGETS

Goal 1.0 Provide for Efficient and Effective Mission Accomplishment

The science and technology programs at the Laboratory produce high-quality, original, and creative results that advance science and technology; demonstrate sustained scientific progress and impact; receive appropriate external recognition of accomplishments; and contribute to overall research and development goals of the Department and its customers.

SC Accelerator R&D and Production (ARDAP)

JEFFERSON LAB's efforts in Accelerator Stewardship continue to be outstanding. Collaborative efforts to develop industrial SRF accelerators, advance high-efficiency magnetron-based RF power sources, and advance material science for both SRF cavities and megawatt-class beam windows is innovative and outstanding. Engagement with industry is strong and serves as a positive model for lab-industrial technology transfer.

SC Nuclear Physics (NP)

TJNAF staff continued to have significant leadership on the science for the future Electron-Ion Collider (EIC) and the requirements for its baseline ePIC detector.

Continued and effective TJNAF support of high priority current and future experiments at CEBAF and related theoretical scope is notable.

Accomplishments in accelerator physics demonstrated the expertise and innovation of TJNAF staff.

TJNAF staff made impactful contributions to a range of activities in computational physics.

SC Workforce Development for Teachers and Scientists (WDTS)

The laboratory executes WDTS sponsored programs in support of the SC/DOE STEM workforce mission in manners that barely meet expectations, with areas of improvement.

The Laboratory is commended for effectively responding to the FY 2023 recommendations of increasing the participation in WDTS programs. Compared to the past year, the overall participation in WDTS programs has shown significant increase, especially in SULI. The laboratory is encouraged to continue the trajectory of increasing the participation in CCI, VFP, and SCGSR.

The laboratory has started to develop a focused outreach strategy to recruit more applicants to WDTS-sponsored programs through the Quark Quest Mini Semester: STEM Pathways to Jefferson Lab WDTS Programs. The Laboratory is commended for collaborating with BNL to secure a new award for WDTS RENEW Pathway Summer School for students.

Below are tables that show which Program Offices provided performance evaluation input for this Goal and the overall performance score for the Goal.

Science Program Office	Letter Grade	Numerical Score	Objective Weight	Overall Score
SC Accelerator R&D and Production				
1.1 Efficient Strategic Planning and Stewardship	A-	3.7	50.0%	
1.2 Leadership	B+	3.3	50.0%	
			Overall ARDAP Total	3.5
SC Nuclear Physics				
1.1 Efficient Strategic Planning and Stewardship	A-	3.5	50.0%	
1.2 Leadership	A-	3.6	50.0%	
			Overall NP Total	3.6
SC Workforce Development for Teachers and Scientists				
1.1 Efficient Strategic Planning and Stewardship	B+	3.1	80.0%	
1.2 Leadership	B+	3.2	20.0%	
			Overall WDTS Total	3.1

Table 1.1 Program Performance Goal 1.0 Score Development

Program Office	Letter Grade	Numerical Score	Weight	Overall Weighted Score
SC Accelerator R&D and Production	A-	3.5	4.2%	
SC Nuclear Physics	A-	3.6	88.6%	
SC Workforce Development for Teachers and Scientists	B+	3.1	2.0%	
			Performance Goal 1 Total	3.5

Table 1.2 Program Performance Goal 1.0 Score Development

Score	**0.0-0.7**	**0.8-1.0**	**1.1-1.7**	**1.8-2.0**	**2.1-2.4**	**2.5-2.7**	**2.8-3.0**	**3.1-3.4**	**3.5-3.7**	**3.8-4.0**	**4.1-4.3**
Grade	**F**	**D**	**C-**	**C**	**C+**	**B-**	**B**	**B+**	**A-**	**A**	**A+**

Table 1.3 Goal 1.0 Final Letter Grade

Goal 2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operations of Research Facilities

The Laboratory provides effective and efficient strategic planning; fabrication, construction and/or operations of Laboratory research facilities; and are responsive to the user community.

SC Advanced Scientific Computing Research (ASCR)

ASCR commends TJNAF for developing and employing effective practices to build a strong partnership with LBNL and other stakeholders such as the site office to advance the HPDF Hub project.

SC Basic Energy Sciences (BES)

TJNAF was an excellent partner to the Proton Power Upgrade (PPU) project.

TJNAF failed to meet its cryomodule delivery schedule to SLAC due to challenges in production and acceptance testing.

SC Nuclear Physics (NP)

EIC met its notable outcome. The project attained Critical Decision-3A (CD-3A), Approve Long-Lead Procurement, and initiated execution of CD-3A scope. The project made good progress on preliminary engineering and design activities and provided plans and documentation in support of its progressive elaboration of the acquisition strategy for EIC in accordance with DOE Order 413.3B.

Execution of CD-3A exposed possible weaknesses in the execution of design reviews. The project team needs to capture lessons learned from these experiences to avoid similar pitfalls.

EIC reached agreement with New York State to secure a $100 million grant for conventional construction. The project realized its first international in-kind funding commitment from the United Kingdom (UK) and continued making steady progress in soliciting international and domestic contributions.

The MOLLER MIE successfully supported a baseline and execution review in October 2023 and, after addressing recommendations related to baseline, achieved CD-2/3 approval in May 2024.

CEBAF met its performance measurement goal for planned hours in FY 2024, delivering 3,809 hours of beam operations with a reliability of 76%. Reliability of CEBAF operations remains a concern.

TJNAF continues to execute high impact, world class science experiments at CEBAF. The scientific user community is highly productive and has continued to publish significant results.

Notable Outcome(s)

SC Advanced Scientific Computing Research

(Objective 2.1) Notable 1: In accordance with appropriated funding levels and schedule, stand up an HPDF Hub integrated project team to design a high performance data facility hub in preparation for a successful Critical Decision 1.

Outcome: TJNAF achieved the Notable on standing up the HPDF Hub integrated project team. **- Achieved**

SC Basic Energy Sciences

(Objective 2.1) Notable 1: Effectively manage and safely execute the assigned LCLS-II-HE project scope in accordance with DOE Order 413.3B. Performance will be assessed based on the assigned project management responsibilities and cryomodule work planned and accomplished during FY 2024

Outcome: TJNAF has not been able to meet the cryomodule delivery schedule to SLAC (LCLS-II-HE project) due to shutdowns and technical difficulties. In 1Q FY 2024, work was halted at several assembly stations when two cryomodules failed the acceptance tests due to discovery of leaks and components overheating. In coordination with SLAC, TJNAF completed the root cause analysis that pointed to workmanship issues during assembly and inadequate oversight and quality control. TJNAF was able to resolve the issues through tailored workshops and enhancing its work planning and control process. After execution of the corrective measures, production was resumed by November 2023. However, the rate of cryomodule acceptance was also reduced due to a safety pause initiated in July 2024, further compounded by scheduled maintenance tied to the operations of CEBAF. Taken together, the lab was unable to meet its cryomodule delivery obligations. **- Not Achieved**

SC Nuclear Physics

(Objective 2.1) Notable 1: Within available funding, effectively manage the Electron-Ion Collider project in accordance with DOE Order 413.3B to safely deliver the project scope, including preliminary engineering design activities, preparation for a long-lead procurement Critical Decision, and execution of the long-lead procurement.

Outcome: The notable was met. The project attained Critical Decision-3A (CD-3A), Approve Long-Lead Procurement, and initiated execution of CD-3A scope. The project made good progress on preliminary engineering and design activities and provided plans and documentation in support of its progressive elaboration of the acquisition strategy for EIC in accordance with DOE Order 413.3B. **- Achieved**

Below are tables that show which Program Offices provided performance evaluation input for this Goal and the overall performance score for the Goal.

Science Program Office	Letter Grade	Numerical Score	Objective Weight	Overall Score
SC Advanced Scientific Computing Research				
2.1 Support Laboratory Programs	A-	3.7	100.0%	
			Overall ASCR Total	3.7
SC Basic Energy Sciences				
2.1 Support Laboratory Programs	B-	2.5	100.0%	
			Overall BES Total	2.5
SC Nuclear Physics				

2.1 Support Laboratory Programs	B+	3.4	20.0%	
2.3 Operation of Facilities	B+	3.4	65.0%	
2.4 S&T Results and Benefits to External User Communities	A-	3.6	15.0%	
			Overall NP Total	3.4

Table 2.1 Program Performance Goal 2.0 Score Development

Program Office	Letter Grade	Numerical Score	Weight	Overall Weighted Score
SC Advanced Scientific Computing Research	A-	3.7	1.6%	
SC Basic Energy Sciences	B-	2.5	3.3%	
SC Nuclear Physics	B+	3.4	95.0%	
			Performance Goal 2 Total	3.4

Table 2.2 Program Performance Goal 2.0 Score Development

Score	**0.0-0.7**	**0.8-1.0**	**1.1-1.7**	**1.8-2.0**	**2.1-2.4**	**2.5-2.7**	**2.8-3.0**	**3.1-3.4**	**3.5-3.7**	**3.8-4.0**	**4.1-4.3**
Grade	**F**	**D**	**C-**	**C**	**C+**	**B-**	**B**	**B+**	**A-**	**A**	**A+**

Table 2.3 Goal 2.0 Final Letter Grade

Goal 3.0 Provide Effective and Efficient Science and Technology Program Management

The Laboratory provides effective program vision and leadership; strategic planning and development of initiatives; recruits and retains a quality scientific workforce; and provides

outstanding research processes, which improve research productivity.

SC Accelerator R&D and Production (ARDAP)

JEFFERSON LAB's strategy for and execution of superconducting radiofrequency accelerator technology are effective.

SC Advanced Scientific Computing Research (ASCR)

ASCR recognizes the lab's (from senior management to the project team) strong efforts to ensure HPDF Hub project's success. ASCR also commends TJNAF's consistent attention to detail and coordination regarding the project related communications. ASCR encourages the lab to build strong collaborations with other Labs with more-established capabilities to strengthen its responses to ASCR research funding opportunities.

SC Nuclear Physics (NP)

TJNAF has a well-defined strategic planning process to inform annual planning and maintain core capabilities. The laboratory's mission is well aligned with NP's mission, and laboratory leadership effectively communicated their strategic vision with stakeholders.

TJNAF continued to struggle with establishing an appropriate safety culture. The laboratory needs to develop a program to continually assess the effectiveness of corrective actions as well as follow up on any subsequent preventative actions to prevent recurrence. Implementation of the new work planning system was a challenge and would have benefited from the utilization of proper change management.

The process TJNAF uses to optimize operations is not transparent and appears to not well account for the dynamic nature of year-to-year incremental operating costs. TJNAF leadership should develop a revised staffing plan for facility operations that considers the necessary staff to appropriately address work planning and control, control of hazardous energy, and safety in general.

Electron-Ion Collider project leadership needs to improve the efficiency and effectiveness of how they communicate with each other, with members of the integrated project team, and with level 2 control account managers.

Management of the MOLLER MIE has been effective at reaching CD-2/3. However, the slow response to review recommendations to reach CD-2/3, the slow timeline to baselining, and the delays in reporting EVM data were disappointing.

SC Workforce Development for Teachers and Scientists (WDTS)

The laboratory actively seek student and faculty participants for placement in hands-on learning and authentic research experience opportunities, helping ensure that DOE has a sustained, highly skilled talent pool for a future DOE science and technology workforce.

Notable Outcome(s)

SC Advanced Scientific Computing Research

(Objective 3.3) Notable 1: Ensure that all communications related to the HPDF Hub project, including the project and the Departmental cross-cut Integrated Research Infrastructure program, are aligned with DOE/ASCR goals, strategies, and guidance.

Outcome: TJNAF achieved the Notable on communications regarding the HPDF Hub project. **- Achieved**

(Objective 3.3) Notable 2: Ensure that all communications related to Artificial Intelligence between the lab and SC, DOE, vendors, the Administration and Congress are aligned with DOE/ASCR goals, strategies and guidance.

Outcome: TJNAF achieved the Notable regarding AI communications. **- Achieved**

Below are tables that show which Program Offices provided performance evaluation input for this Goal and the overall performance score for the Goal.

Science Program Office	Letter Grade	Numerical Score	Objective Weight	Overall Score
SC Accelerator R&D and Production				
3.1 Efficient Strategic Planning and Stewardship	A-	3.5	40.0%	
3.2 Project/Program/Facilities Management	B+	3.1	40.0%	
3.3 Effective Communications and Responsiveness	B+	3.3	20.0%	
			Overall ARDAP Total	3.3
SC Advanced Scientific Computing Research				
3.1 Efficient Strategic Planning and Stewardship	B+	3.4	20.0%	
3.2 Project/Program/Facilities Management	A-	3.7	30.0%	
3.3 Effective Communications and Responsiveness	B+	3.1	50.0%	
			Overall ASCR Total	3.3
SC Nuclear Physics				
3.1 Efficient Strategic Planning and Stewardship	A-	3.5	30.0%	
3.2 Project/Program/Facilities Management	A-	3.5	40.0%	
3.3 Effective Communications and Responsiveness	B+	3.4	30.0%	
			Overall NP Total	3.5
SC Workforce Development for Teachers and Scientists				

3.1 Efficient Strategic Planning and Stewardship	B+	3.1	20.0%	
3.2 Project/Program/Facilities Management	B+	3.4	50.0%	
3.3 Effective Communications and Responsiveness	A-	3.5	30.0%	
			Overall WDTS Total	3.4

Table 3.1 Program Performance Goal 3.0 Score Development

Program Office	Letter Grade	Numerical Score	Weight	Overall Weighted Score
SC Accelerator R&D and Production	B+	3.3	0.4%	
SC Advanced Scientific Computing Research	B+	3.3	2.0%	
SC Nuclear Physics	A-	3.5	94.4%	
SC Workforce Development for Teachers and Scientists	B+	3.4	0.2%	
			Performance Goal 3 Total	3.5

Table 3.2 Program Performance Goal 3.0 Score Development

Score	**0.0-0.7**	**0.8-1.0**	**1.1-1.7**	**1.8-2.0**	**2.1-2.4**	**2.5-2.7**	**2.8-3.0**	**3.1-3.4**	**3.5-3.7**	**3.8-4.0**	**4.1-4.3**
Grade	**F**	**D**	**C-**	**C**	**C+**	**B-**	**B**	**B+**	**A-**	**A**	**A+**

Table 3.3 Goal 3.0 Final Letter Grade

Goal 4.0 Provide Sound and Competent Leadership and Stewardship of the Laboratory

This Goal evaluates the Contractor's Leadership capabilities in leading the direction of the overall Laboratory, the responsiveness of the Contractor to issues and opportunities for continuous improvement, and corporate office involvement/commitment to the overall success of the Laboratory.

Headquarters (SC)

TJNAF reached an important milestone, delivering the last cryomodule for the Spallation Neutron Source Proton Power Upgrade.

An integrated plan, beyond the CEBAF Performance Plan (CPP), is needed to ensure that CEBAF can effectively and efficiently execute the planned science program.

JSA initiated key personnel changes including new lab director, new associate director for ES&H, and elimination of Chief Planning Officer position in an effort to improve overall Lab performance.

Jefferson Lab, in partnership with Lawrence Berkeley National Laboratory, was awarded the High Performance Data Facility in October 2023 which, once constructed and operational, will be an essential facility for the advancement of the SC mission. JSA is working to fill gaps in leadership to manage the project, including the Commonwealth of Virginia funded Jefferson Lab Data Center (JLDC) which will house the HPDF.

The Laboratory has not yet addressed overall project management performance gaps, which is essential given the large and ongoing project portfolio.

The Lab's contractor assurance system elements are in place at varying degrees of maturity. JSA leadership has initiated more meaningful reviews of the health of the CAS and the Lab's management systems. The Department is expecting marked improvement and demonstrable outcomes in areas including work planning and control, project management, procurement, and conduct of operations.

The JSA Board has been and is more actively engaged this performance period and is supporting lab leadership with conducting more rigorous assessments which are key to improving safe operations. This is an area that requires improvement to meet expectations, and the safety culture challenges remain a concern Jefferson Lab has demonstrably improved housekeeping and material conditions in many areas of the lab and is encouraged to continue to instill "pride of the laboratory" amongst the entire Laboratory community.

TJNAF is commended for the significant and intentional actions taken in FY 2024 to be responsive to the feedback from the SWI external peer review and input from the lab community, as part of a multiyear plan to foster a workplace culture of respect, trust, and belonging where everyone (employees, students, facility users, visiting researchers) can contribute, feel valued, and thrive. The lab's approach is informed by outside expertise, increases understanding and transparency of laboratory goals and actions, and is grounded in shared responsibility.

JSA leadership has made great strides to incorporate what was learned from the DOE DEIA Peer Report Feedback. In FY 2024, they committed to focusing on trust, communication, recognition, and pipeline development and introduced various DEIA activities to enhance community connection and psychological safety.

The Lab is expanding regional partnership efforts to broaden its role in the community, raising the profile of Jefferson Lab in Virginia and beyond. The Lab has established regular meetings and joint programming opportunities with

innovation partners around Hampton Roads, including entrepreneurial support organizations, university entrepreneurship and commercialization teams, and other federal agencies such as NASA and the Department of the Navy.

Jefferson Lab is commended for its Technology Commercialization Fund (TCF) Base engagement this year, partnering on three full applications. DOE encourages TJNAF to continue and strengthen its participation as a partner in collaborative projects with other labs and recognizes their consistent and effective participation in Energy I-Corps.

JSA's continued corporate investments are enhancing the support of the mission of the Laboratory. Examples include funds for Prestigious Fellowship Program, Electron-Ion Collider (EIC) Fellowship Program, graduate fellowships, and $500K in FY 2024 Initiatives Fund Program.

The Department recognizes that the JSA Board has become more engaged in driving overall laboratory performance improvement. The JSA Board commissioned and executed a safety culture review, and a leadership workshop intended to address responsibilities and accountabilities. In addition, Jefferson Lab has brought on an independent contractor to help management with work condition observations.

The Southeastern Universities Research Association Residence Facility continues to be of significant value to the Laboratory.

The assessment for each Objective under this Goal is provided below.

4.1 Leadership and Stewardship of the Laboratory

SC Nuclear Physics

Safety culture challenges remained a concern and need continuous attention by TJNAF leadership, where ownership of safety is shared across the organization.

SC Workforce Development for Teachers and Scientists

The laboratory has made efforts seeking partnerships with local communities and MSIs in support of DOE workforce development.

Site Office

JSA initiated some key personnel changes this year. A new lab director was appointed in August, bringing a recognized executive and operational management capability to Jefferson Lab. The associate director for ES&H, appointed in January 2024, was removed by JSA in September and has been replaced by the recently hired deputy chief operating officer. Further, the key position of chief planning officer has been eliminated with duties dispersed to other non-key personnel.

Jefferson Lab was awarded the High-Performance Data Facility (HPDF) Hub on October 16, 2023, and this achievement has been and should be celebrated. This represents a multi-year culmination of significant efforts. The HPDF Hub will eventually be a new scientific user facility specializing in advanced infrastructure for data-intensive science and is a partnership between Jefferson Lab and Lawrence Berkeley National Laboratory (LBNL). The commitment of $43M from the Commonwealth of Virginia to build the Jefferson Lab Data Center (JLDC) building, which will house the HPDF Hub, is essential to the success of this endeavor. JSA has recently appointed an experienced project director to lead the

delivery of HPDF. There is a gap in leadership to deliver JLDC and JSA is currently seeking to fill that position. The Department is concerned that the slow start to JLDC could result in overall HPDF project delays at Jefferson Lab. JSA leadership is encouraged to continue working on the science requirements while ensuring physical project requirements and the conceptual design for JLDC move at a pace supportive of the HPDF preliminary schedule, including a deliberate march towards CD-1 in FY 2025. Communications on the overall HPDF and JLDC activities have improved. JSA leadership was also active in reviews to support other Laboratories and community events.

While slow, JSA is moving to improve overall project management to include new and planned hiring to address existing and continuing gaps in capability and capacity. JSA leadership continues to fill known gaps in project related positions; however, it is not yet keeping pace or getting ahead of the demand, which is ever increasing as their investment in Jefferson Lab continues. JSA leadership established Director level monthly project and mid-year reviews. While such reviews have potential to be valuable if sufficiently self-critical in nature, the implementation has not yet produced apparent improvement in project performance. The Department is looking forward to demonstrable improvement in project management and execution.

JSA had 267 total hosted events during this period for a total of ~28,000 participants compared to ~8,300 participants during the same period in FY 2023. Over 9000 of the participants were from the successful Open House which was first held in six years. The lab is to be commended for such a successful and massive public outreach event. Another key event was for hosting Governor Glenn Youngkin, Senator Mark Warner, Senator Tim Kaine, Congressman Bobby Scott, and other local and state elected officials for the announcement of citing of HPDF at TJNAF.

4.2 Management and Operation of the Laboratory

SC Nuclear Physics

Absence of the position of CEBAF director in the TJNAF organizational structure is a potential weakness that should be addressed.

TJNAF should revisit the optimal staffing needed for sustainable CEBAF operations. Previous staffing plans that stepped to optimal budget only considered add-ons to current operations staff and did not implement a bottoms up assessment of technical needs and available skill sets.

CEBAF reliability continued to be below 80% in FY 2024. An integrated plan, beyond the CPP, is needed to ensure that CEBAF can effectively and efficiently execute the planned science program. Focus should be on optimizing CEBAF operations ahead of advancing new accelerator capabilities and scientific instrumentation.

SC Workforce Development for Teachers and Scientists

The laboratory provides adequate management of WDTS programs.

Site Office

The contractor assurance system (CAS) elements are in place at varying degrees of maturity. JSA leadership has initiated more meaningful reviews of the health of the CAS and M&O management systems. JSA is encouraged to continue identifying and using best practices from other national laboratories and elsewhere as was done to revamp the current iteration of CAS metrics/information. The Department is expecting marked improvement and demonstrable outcomes in areas including Work Planning and Control, Project Management, Property Management, Procurement, and conduct of operations.

JSA leadership is taking action to improve the implementation of work planning and control (WPC). Leadership is acknowledging the issues and emphasis on implementation and execution is still needed. While ePAS is touted as a major improvement to support WPC improved implementation, it is not used for all work groups. The Notable Outcome on WPC is discussed in Goal 5.

JSA Leadership was slow to recognize the need to improve conduct of operations and communications. The November 2023 Hall A beam dump cooling water leaks highlighted several areas of concern including lack of alarm monitoring, ignoring and clearing leak alarm (continuing to operate with 2nd active leak), and lack of system ownership, along with inadequate and inaccurate communications with the Department. The CEBAF was down starting Saturday morning, March 16, 2024, and lasted several days due to a vacuum leak. The Department learned that the User Facility was down at a routine meeting on the following Monday. JSA is taking this and other examples into account as they work to improve conduct of operations and communications.

The JSA Board is more active in its engagement with JSA leadership to improve the implementation of thorough and rigorous self-assessments. Rigorous self-assessments that accurately reflect actual state is essential to identifying best practices and performance issues such that any improvement actions are meaningfully impactful and supportive of effective, efficient, and safe delivery of mission. There continues to be room for improvement on behalf of JSA leadership to be self-critical and to ensure sustainable improvement. Pivoting to actively seek, understand, and implement best practices that are commensurate with Jefferson Lab's M&O needs is important.

JSA leadership is encouraged to hold themselves and management accountable for thorough event causal analysis and to ensure expectations penetrate through line management. TJSO has observed that management accountability is improving and commends the lab leadership on moving toward a culture where policy and procedural violations are judiciously evaluated and acted on.

JSA leadership is working to improve the material condition of the Laboratory and executing on the associated improvement plan that is intended to improve the habitability, housekeeping, cleanliness, and operating environment. Instilling "pride of the laboratory" is slowly taking hold. Housekeeping, for example, is improving in some areas. JSA has also brought in an independent contractor to assist management with workplace condition walkthroughs. JSA leadership is commended for introducing a new user-friendly tool to document observations that are tracked to closure.
This observation tool allows for transparency in identifying and tracking issues/concerns, which is appreciated by the Department.

The quality of some documents coming to the Department continues to be of poor quality and/or late. Examples have been provided to the Laboratory and range from the Integrated Safety Management self-assessment to Field Work Proposals to project reports to environmental reports.

4.3 Advancing Laboratory Diversity, Equity, Inclusion and Accessibility

SC Scientific Workforce Integrity

The lab is commended for developing a detailed and thoughtful response to the feedback from the 2023 SWI external peer review. It's evident that lab leadership has taken this feedback seriously, is committed to addressing identified areas of concern, and is seizing the opportunity to leverage or reposition existing efforts to better serve the laboratory community.

The lab has taken meaningful actions to update roles and responsibilities for developing and implementing the lab's shared goals for building a talented, diverse workforce and fostering a respectful, inclusive workplace culture. This has included redefining roles and responsibilities among the lab leadership, reenforcing the importance of the DEIA Council for increasing two-way communications, setting expectations of line-managers through more intentional and transparent communications of lab goals and actions, and updating guidance and resources regarding the annual performance appraisal process.

The lab continues to engage the lab community in a number of ways to solicit input and understand the needs and interests of employees and users, including:

(1) In FY 2024, TJNAF conducted a survey specifically tailored to facility users. While the survey response was low, it appears to be informative. The lab's establishment of a Scientific User Focus Group will hopefully establish a mechanism for constructive input to the lab to help improve and be responsive to the needs and experiences of facility users.

(2) The lab initiated a *Stay Interview* process to connect with new employees after 6 months of employment to help build trust and connection as an employee retention strategy.

(3) The lab has planned for a lab-wide inclusion survey in January 2025. This will be an opportunity for the lab to gain further insights on the lived experience of employees and also determine whether the visible and swift changes the lab has made in the past year have improved employees' sense of trust and willingness to speak up.

To be responsive to the peer review feedback regarding the lab's use of focus groups, the lab has better defined and clarified how focus groups will function as temporary task groups and has introduced the option of developing Community Resource Groups (CRGs), which are voluntary, self-organized groups that may serve to foster community and networking, professional development, and promote the lab's core values. Based on lab staff interest, two CRGs are planned to start in FY 2025.

Underpinning the lab's efforts in FY 2024 has been an intentional strategy to improve laboratory communications regarding how the lab is being responsive to the peer review and employee input, sharing updates on the lab DEIA vision and priorities, and reinforce roles and responsibilities. The DEIA Team developed a communications plan with input from DEIA Council and the user community. The lab has redesigned its DEIA website to update content and messaging; meeting minutes from DEI Council meetings are now promptly shared with members to further share with their respective divisions; and quarterly supervisors' meetings with the Directorate are being established in FY 2025 to increase consistency in safety and DEIA messaging, expectations, and accountability.

The lab is making meaningful efforts to build a culture of trust and respect. A significant part of this is demonstrating that the lab is willing to promptly respond to inappropriate or illegal behavior. In this regard, the lab's efforts to investigate complaints in recent years, take corrective actions, and communicate to the lab community (at a high level) how the lab has been responsive to complaints, are commendable.

The lab intends to hire an Ombudsperson in 2025, which is great. These individuals, who provide confidential and independent advice, can serve a valuable role in assisting employees and management with a range of issues regarding interpersonal communications and workplace conflicts.

The lab expanded its Rewards and Recognitions program in FY 2024, establishing several categories to recognize a broad range of achievements. These recognitions can go a long way in instilling staff with a sense that their contributions are impactful and valued.

TJNAF's efforts to broaden the audiences it engages in outreach and recruitment and establish enduring partnerships with faculty and students from regional institutions of higher education build on recognized best practices among the DOE national laboratories for broadening awareness of training and career opportunities at the DOE labs and creating sustaining pathways to attract new, diverse talent. The lab is participating in the annual meetings and career fairs of a broad range of affinity-focused scientific professional societies and engaging the lab S&T staff in these efforts. The lab has also hired an Outreach Specialist to serve a lead role in outreach, fostering institutional partnerships and relationships, and bridging between the labs Science Education office and HR.

SC Nuclear Physics

During the FY 2023 one-day site review, NP requested additional information on instances of violations of the Code of Conduct and requested the laboratory administer a survey of the research environment, including DEI issues. NP was initially rebuffed regarding these requests. To date, no further response was received from TJNAF leadership.

SC Workforce Development for Teachers and Scientists

The laboratory has made increased effort in developing diverse, highly skilled STEM talent pool in support of a future DOE workforce.

Site Office

JSA leadership has made great strides to incorporate what was learned from the DOE DEIA Peer Report Feeback. In FY 2024, they committed to focusing on trust, communication, recognition, and pipeline development. In FY 2024, the Laboratory introduced various DEIA activities to enhance community connection and psychological safety. They created a monthly DEIA Book Club, averaging 15 attendees per session, and introduced quarterly virtual training courses that were well received by the staff. JSA also enhanced the New Employee Orientation to include DEIA Representatives, helping new hires integrate into the laboratory culture.

JSA leadership sponsors facilitated Demographic Focus Group meetings for diverse groups, and JSA celebrated heritage events like Black History Month and Pride Month with speakers and mentoring sessions. A Human Resources Outreach Specialist was hired to build relationships with local universities and diversity organizations, resulting in participation in 22 events and interactions with over 1,000 individuals.

The DEIA website was redesigned for better accessibility, and "Scientific User Experience" surveys were launched to gather feedback, with 71% of respondents reporting an inclusive environment. Community Resource Groups were introduced, Demographic Focus Groups were redefined, and the Rewards and Recognition Program was updated. The Employee Concerns Program is well developed. Lastly, a Stay Interview process was launched.

4.4 Leadership of External Engagements and Partnerships

SC Nuclear Physics

The EIC project effectively used the EIC Advisory Board and EIC Resource Review Board (RRB) to maintain EIC's international engagement. TJNAF leadership actively supports both boards, and the TJNAF Director is chair of the Advisory Board.

The technical interfacing of in-kind contributions to the MOLLER program from principal investigators funded by the National Science Foundation and the Canadian Foundation for Innovation is going well.
TJNAF reached an important milestone, delivering the last cryomodule for the Spallation Neutron Source Proton Power Upgrade.

Office of Technology Transitions

OTT commends TJNAF for their support of OTT's programs. For TCF Base, TJNAF partnered on three full applications. OTT encourages TJNAF to continue and strengthen its participation as a partner in collaborative projects with other labs. One TJNAF TTO staff member attended and participated in the OTT-led National Lab Collaboration event. OTT commends TJNAF for their consistent participation in Energy I-Corps. TJNAF's collaborative efforts performed under these projects are notable and OTT celebrates TJNAF for their leadership. OTT also appreciates TJNAF's participation and support for the FY24 TCIP Intern.

Site Office

JSA is expanding regional partnership efforts to broaden its role in the community, raising the profile of Jefferson Lab in Virginia and beyond. The Research and Technology Partnership Office (RTPO) has established regular meetings and joint programming opportunities with innovation partners around Hampton Roads, including entrepreneurial support organizations, university entrepreneurship and commercialization teams, and other federal agencies such as NASA and the Department of the Navy. Neighboring HBCU's Hampton University and Norfolk State University were among the university teams.

JSA is beginning to participate in the "ACCESS" (Action Center for Community Energy System Solutions) initiative, with seven other core labs. The ACCESS effort is developing a framework for inter- and intra-lab coordination on community energy action items, such as technical assistance programs, energy policy challenges, and other energy transition goals. The work of ACCESS should enable closer contact with community partners and help establish Jefferson Lab as a local resource in Virginia and the greater southeastern U.S.

JSA has 10 active Cooperative Research and Development Agreements (CRADAs) with one in process, three active International Cooperative Research and Development Agreements (iCRADAs) with another three in process, and one international agreement.

In the 2nd Quarter, JSA hired an account manager for commercialization and partnerships. This role is important as JSA continues to centralize tech transfer and partnership functions in the two years since the RTPO was formed.

4.5 Contractor Value-added

Site Office

JSA's continued corporate investments are impactful and are enhancing JSA programs and support of the mission of the Laboratory. Examples include funds for Prestigious Fellowship Program, EIC Fellowship Program, graduate fellowships, and $500K in FY 2024 Initiatives Fund Program. The Southeastern Universities Research Association Residence Facility continues to be of significant value to the Laboratory.

The JSA Board and committees monitored the Laboratory's performance and risks while providing guidance and continuous feedback to JSA leadership on matters to enhance safety awareness, programmatic performance, and cost effectiveness.

The Department recognizes that the JSA Board has become more engaged in driving overall laboratory performance improvement. In addition to appointing new leadership noted above, the JSA Board has commissioned and executed a safety culture review that highlighted gaps and opportunities like those identified and communicated by TJSO to lab leadership and JSA Board including gaps in work planning and control, lack of self-critical self-assessments, awareness and communications of hazards, and workplace housekeeping. JSA then commissioned a leadership workshop intended to address responsibilities and accountabilities associated with those observations. This, coupled with the lab's independent contractor brought on to help management with work condition observations, are recognized by the Department as very good steps toward M&O improvement. JSA could further support the Laboratory by providing (even temporary) capability in operational areas of concern to the Department such as project management, WPC, conduct of operations, timely causal analysis and organization learning, and procurement management.

The Department is eager to see positive outcomes with the ongoing efforts to improve CAS from both JSA and Laboratory leadership.

Corporate investments or corporately coordinated investments are recognized and appreciated by the Department and include Commonwealth of Virginia funds eventually totaling $49.0M for the Jefferson Lab Data Center for the HPDF project, $6.0M of which have been provided for pre-design and design work, $43.0M has not yet been provided but is intended for building the Jefferson Laboratory Data Center which will house HPDF; $1.05M for lab support and projects including fellowships, post docs, and data science program development; $0.5M for Center for Nuclear Femtography activities, including post docs, seminars, graduate fellowships, and research projects.

Investment in the projects include undergraduate and graduate fellowships, scientific meeting support, educational and career development activities, and student prizes and awards. Over two-thirds of the award funds support the lab's user community and includes 23 fellowship and student stipend recipients and 180 travel stipends for students and early career researchers to attend and participate in two dozen different scientific meetings. This year's program also provided for the K-12 STEM program Jefferson Lab Science Activities for Teachers (JSAT), Jefferson Lab Users Graduate Student and Post-Doc Association activities including monthly lunch seminars, ARC history exhibit, and Patents award celebration.

The SURA Residence Facility continued to be a highly valued corporate investment, and affordable housing for lab users. Through August 2024, 354 users stayed at the Facility while on-site working on their experiments, as meeting participants, and as part of the lab's educational programs. The Residence Facility Great Room and Field were used for lab-sponsored events and employee morale activities.

Below are tables that show which Program Offices provided performance evaluation input for this Goal and the overall performance score for the Goal.

Science Program Office	Letter Grade	Numerical Score	Objective Weight	Overall Score
Headquarters				
4.1 Vision and Planning	B	2.9	30.0%	
4.2 Responsive and Accountable Leadership	B-	2.6	25.0%	
4.3 Advancing Laboratory Diversity, Equity, Inclusion and Accessibility	A-	3.7	10.0%	
4.4 External Engagements and Partnerships	B+	3.3	10.0%	
4.5 Corporate Support	B	2.9	25.0%	
			Overall SC Total	2.9

Table 4.1 Program Performance Goal 4.0 Score Development

Program Office	Letter Grade	Numerical Score	Weight	Overall Weighted Score
Headquarters	B	2.9	100.0%	
			Performance Goal 4 Total	2.9

Table 4.2 Program Performance Goal 4.0 Score Development

Score	**0.0-0.7**	**0.8-1.0**	**1.1-1.7**	**1.8-2.0**	**2.1-2.4**	**2.5-2.7**	**2.8-3.0**	**3.1-3.4**	**3.5-3.7**	**3.8-4.0**	**4.1-4.3**
Grade	**F**	**D**	**C-**	**C**	**C+**	**B-**	**B**	**B+**	**A-**	**A**	**A+**

Table 4.3 Goal 4.0 Final Letter Grade

Goal 5.0 Sustain Excellence and Enhance Effectiveness of Integrated Safety, Health, and Environmental Protection

This Goal evaluates the Contractor's overall success in deploying, implementing, and improving integrated ES&H systems that efficiently and effectively support the mission(s) of the Laboratory.

Site Office (Site Office)

TJNAF did not meet expectations of this objective. TJNAF has not yet fully implemented an effective work planning and control program across all work groups. The ePAS tool, intended to assist with effective WPC, is not fully embraced nor effectively implemented across the lab.

TJNAF did not take a comprehensive view of serious and continuing hazardous energy control issues which required site office intervention. TJNAF has since responded with a much more comprehensive improvement plan and implementation that is underway.

The annual integrated safety management assessment self-assessment was not self-critical and led TJNAF to a conclusion of effective performance that was not substantiated.

The Laboratory worked well with the site office to develop a reasonable implementation plan for revised Accelerator Safety Order that incorporated a graded approach. The Laboratory is making progress on implementation and is also supporting other laboratories with this endeavor.

The Laboratory is recognized for implementing an easy-to-use observation tool that includes documentation and trending capability. Once fully functional and widespread, this will be an important element of an effective ISMS.

TJNAF met expectations of performance in effectively and efficiently managing their ISO-14001 Environmental Management System (EMS) throughout FY24, highlighted by an external evaluation with no non-conformance findings.

The Lab received the Hampton Roads Sanitation District 2023 Gold Award for proper management of wastewater and stormwater discharges.

Participation in the Laboratory's "Green Team," improvements in hazardous material management and chemical labeling, are success areas in FY 2024.

The assessment for each Objective under this Goal is provided below.

5.1 Provide an Efficient and Effective Worker Health and Safety Program

The work planning and control tool (ePAS) has been rolled out across most work groups with varying degrees of effectiveness. JSA has identified opportunities for enhancement through contributions from the ePAS advisory committee, ongoing training, and the involvement of a dedicated subject matter expert. Despite the allocation of substantial resources to ePAS, gaps remain in the day-to-day implementation. The Department interactions with the Laboratory reveal that some personnel are still struggling not only with the preparation of ePAS processes, but also with interpreting permits to work and other associated documentation. The ePAS tool can be an effective enabler of a good WPC system since it is less cumbersome and has better logic incorporated. JSA recognizes its shortcomings and is

working to improve it. Addressing these inconsistencies will be vital to ensure comprehensive understanding and adoption of safety protocols across all levels of the workforce.

The Integrated Safety Management System (ISMS) Annual Effectiveness Review shared in the 1st Quarter was not self-critical and led JSA to a conclusion of effective performance that is not substantiated. The results did not match the evidence included in the assessment. Examples include an outdated QAPD referenced, lack of line management involvement (all interviewees listed were ES&H personnel), a trend analysis that points to the limited value of TRC/DART rates, holding Director's Safety Council meetings listed as a key performance metric, and a pressure systems program that contained corrective actions that were long overdue with no emphasis in the report. JSA would be well served to conduct more rigorous self-assessments overall, especially with such critical programs that the Department relies on for effective implementation such as ISMS.

The Laboratory had two recordable injuries and the FY 2024 Total Recordable Case (TRC) and Days Away, Restricted, or Transferred (DART) rates as of September 9, 2024, are 0.24 for both — well below the average of 0.85 and 0.44, respectively, for all SC labs over the same period. As expressed by the Department in the past, the Laboratory would be well served with routine and thorough analysis of first aid injuries, near misses as well as the small number of recordable injuries coupled with the good observation tool information discussed below.

The TJSO Manager has authorized the Laboratory to continue to operate under DOE O 420.2C until December 1, 2024, per an approved implementation plan that implements version DOE O 420.2D. The Laboratory worked well with the site office to develop a reasonable implementation plan that incorporated a graded approach. This was especially important given other laboratories that operate accelerators also rely upon a relatively small pool of experts for independent readiness reviews, of which Jefferson Lab SMEs participate as well. The Laboratory underwent two tailored Accelerator Readiness Reviews (ARR), led by outside experts, which provided some pre/post operational findings and supports the pending new accelerator safety envelope (ASE) (DOE O 420.2D) which is to be submitted to the Department no later than November 1, 2024. Those findings included: Departmental approval of upcoming ASE Rev. 10, revised ODH analysis pertaining to SF6 in the LERF, and review hazards and applicable credited controls to ensure harmonization in the SAD, CEBAF/LERF ASE, and AOD/LOD.

Overall, the review team found that the Laboratory is well positioned to operate CEBAF and LERF under DOE Order 420.2D following completion of the preoperational findings. JSA is active in the accelerator community, including participating in the accelerator safety community conference call and participating in the accelerator safety workshop organizing committee and enterprise interactions.

A DOE assessment of the fall protection/scaffolding program concluded that the Laboratory's practices complied with safety regulations under 10 CFR 851, although recommendations were made for improvements in hazard recognition related to employee exposure when walking and working at heights. A summary of the four (4) level 2 findings:

- L2-01: hazard analysis documentation and observed pre-job briefing were not relevant hazards which is contrary to ES&H Manual Chapter 3210 (WP&C).
- L2-02: roof hatchway on ESR2 not properly guarded.
- L2-03: Cave 1 & 2 roof edge not properly guarded.
- L2-04: multiple trip hazards on ESR2 scaffolding.

CATS show findings/items with an estimated completion date of December 30, 2024.

The Laboratory underwent their ProActive Peer review in May 2024, and it revealed some significant at-risk electrical safety behaviors and conditions that were reminiscent of the 2019 electrical event at Jefferson Lab, which resulted in a shock with first and second degree burns. The May 2024 review, conducted by well qualified persons from around SC lab system, identified missing isolation certificates and/or worker lacking knowledge of isolation certificate, inadequate personal protective equipment (PPE) inspected prior to use, substandard PPE and/or absent of proper donning, and workers not following written procedures. On May 23, 2024, TJSO intervened with both the lab director and JSA Board to ensure the laboratory responded in a comprehensive manner when it was observed that lab leadership was taking a narrow and uncoordinated response that was not commensurate with the significance of the issues. Considering this TJSO intervention and last year's seemingly ineffective LOTO Restart in May 2023 when the Lab Director had then issued a pause on electrical hazardous energy control methods/ procedures and the 2019 event response mentioned above, the Laboratory reevaluated their approach and determined a more thorough plan was needed. The lab leadership developed a plan that included evaluation of qualified electrical workers competency, line management competency, review and rewrite of applicable procedures as well as associated worker training on WP&C and the associate ePAS tool. Leading and lagging indicators and/or historical data are necessary for trending analysis and JSA is commended for their tracking of this information. Continuing to learn and act on this information will be useful to improving ES&H performance.

The Department encourages JSA to obtain an on-staff fire protection engineer capability that the Department can rely on as an Authority Having Jurisdiction. The current situation where JSA (and therefore the Department) relies on a subcontracted resource that can be conflicted as an engineer of record on design is not optimal.

It is recognized that JSA has decreased response time of an incident investigation by promptly convening fact-finding meetings; however, JSA is encouraged to conduct fact-finding meetings the day of the event whenever possible to ensure needed details are captured. JSA has been proactive in the application of their safety program. Work groups like RadCon technicians and safety professionals identify issues, investigate, evaluate and ensure corrective actions are taken. Lab leadership has been proactive in positively recognizing those that identify issues and help improve workplace safety.

JSA satisfactorily addressed the Level 2 findings that were identified in the Office of Safety and Security report in a timely manner. Recently, JSA installed guardrails on top of the guard house which was prompted from a July 2022 Site Office Observation.

The Laboratory has achieved several improvements, including the rollout and follow on enhancements of the observation tracking tool, Systematic Process for Enhanced Compliance Through Risk Understanding and Management (SPECTRUM). This tool incorporates easy to use pie charts and color-coded metrics that effectively highlight key areas of concern. Additionally, ongoing efforts have focused on strengthening the tool's dashboard and increasing its functionality, such as expanding the photo upload capacity. This tool is a great asset to a comprehensive safety program and beneficial to the Laboratory as they gather their data, trend it, track it and analyze it (as well as the Site Office entries). Continuing to learn and act on this information will be useful to improving ES&H performance. The Department is looking forward to JSA leadership's analysis and use of actionable information gained from this tool.

Departmental observations have identified repeated instances of cigarette smoking in unauthorized areas. Most recently, in mid-September, an individual was observed smoking near an evergreen pine tree with dried pine needles on the ground and a similar incident was reported at the same location in March and May 2024. Additionally, cigarette butts were found in the beds of golf carts. The last recorded sitewide review of the smoking policy (208.7) was January 19, 2019. Lab leadership and line management are not effectively ensuring accountability of this policy implementation. This example, along with other examples included housekeeping, eating in work areas such as machine shops, etc., points to a culture that is inconsistent to that expected of a national laboratory.

Over the past year, JSA has demonstrated increased attention to detail in crane operations, including documentation, inspection, setup, rigging, and lifting. Laboratory personnel have been diligently overseeing subcontractors/vendors and providing immediate on-the-spot corrections while clearly communicating the safety standard expectations.

During Departmental walkthroughs, it was noted that there is an increase of Laboratory oversight of subcontractors, which promotes situational awareness. The oversight increase was shown as an uptick in subcontractor audits, which are recorded in the Laboratory subcontractor safety audit system. Safety job boards are installed at construction-type job sites to display relevant documents, including Activity Hazard Analysis (AHA), Site Safety and Health Plans, and OSHA guidance, ensuring these safety-related materials are readily accessible to all workers for reference. One example is the recent retaining wall replacement at Hall A hillside. This was an exemplary job site for work planning and control, information posting at job site, access control, tidiness, and use of properly maintained and serviceable equipment.

Facilities Management and Logistics (FM&L) Division Safety Officer received a Certificate of Appreciation from the DOE Office of Environmental, Health, Safety and Security (EHSS) for speaking at the DOE EHSS-11 Web-Ex Series on the topic entitled “Fall Protection and Prevention.” The participation of the Laboratory in DOE safety & health series demonstrates a commitment to safety culture and work practices and gaining insight from others in the DOE complex.

FM&L developed and implemented a new safety training LMS module entitled “Subcontractor Site Safety and Health Responsibilities (SAF199).” The training helps subcontractors and site safety and health professionals understand their specific responsibilities within the Laboratory. Also, FM&L DSO has provided OSHA 10-hour construction training for 18 employees (supervisors, technical representatives, engineers and safety wardens) from the Physics and EHS divisions.

The OSHA10-hour training, as well as other safety training, provides a deeper understanding of the standards and use for preparing and executing occupational activities.

5.2 Provide an Efficient and Effective Environmental Management System

JSA implements an effective Environmental Management System (EMS). It is notable that there is an active “Green Team,” which has an outstanding participation to help with meeting objectives and targets. A recent EMS external review found the Laboratory’s EMS program to be in conformance with the ISO 14001 standard.

JSA’s Environmental reports’ timeliness has improved. The Annual Site Environmental Report (ASER) that was submitted to the Governor, Senators, Congressional members, and DOE headquarters was of good quality.

Management of the Municipal Separate Storm Sewer (MS4) Permit and Hampton Roads Sanitation District (HRSD) discharges, and monitoring has been excellent, the Laboratory received a HRSD 2023 Gold Award for no wastewater non-compliances, or civil penalties for a calendar year.

The annual HRSD inspection was successful with positive feedback from the auditor, and no discrepancies were noted. The lab finished calendar year 2023 with perfect compliance, earning an HRSD Gold Award presented in the 4th Quarter of FY 2024.

The Hazardous Material Management Lockers have shown organizational, housekeeping, and regulatory compliance improvements particularly regarding Universal Waste 40 CFR part 273 labeling.

Stormwater management and inspection of construction sites was excellent, with all Best Practices adhered to as evidenced by the Hall A retaining wall project.

The Environmental Management Team Lead was very responsive to Departmental requests, clarification, data calls and suggestions.

Environmental, Safety and Health and Industrial Hygiene areas that can have potential for deleterious effects on worker safety and significant environmental risks that need improvement are:

Hazardous material management at Jefferson Lab should be improved. Multiple instances were observed during the fiscal year regarding improper use of secondary containers, labeling, and marking of universal waste containers. The Department acknowledges JSA is working to improve in this area and acknowledges efforts to modify training materials, in-person training, and a robust culture shift in accountability.

Multiple rusting drums with liquid contents that were leaking were discovered in the radioactive material storage area. In JSA's investigation process, it was determined that these unmarked drums had been on site outdoors without spill containment since 2012. This represents a long-standing lack of accountability and control of potentially hazardous and/or radiological material. It further demonstrates a systemic lack of periodic inspections that are codified in 40 CFR 264.174 Inspections.

An inspection of the Consolidated Material Storage Area resulted in the finding of multiple drums and containers with liquid contents that were not characterized, labeled, or on spill containment.

Attention to detail in and accuracy of reporting needs improvement. The Emergency Planning and Community Right-to-Know Act (EPCRA) Tier II report was provided to the Department for review/approval with major data omissions. The "amounts" section of all the listed chemical products at each location was not accounted for coupled with large quantities of battery acid.

Municipal Separate Storm Sewer System (MS4) Permit was submitted to the Department with a significant amount of spelling and grammatical errors, font inconsistencies, and missing information from tables. Review of documents prior to Departmental submittal needs to improve.

Notable Outcome(s)

Site Office

(Objective 5.1) Notable 1: Ensure implementation of an effective work planning and control system that addresses lessons learned from Jefferson Lab notable events and best practices along with significant lessons learned from other Office of Science laboratory significant events from FY 2022 and FY 2023. Conduct a credible effectiveness review by September 30, 2024, that includes, at a minimum, that staff, subcontractors, students, users, and visitors fully understand the hazards of their work and workspaces as well as the expected safety culture and work controls.

Outcome: JSA did not achieve this Notable Outcome. JSA has taken steps in part, to satisfy the Notable Outcome and apply continuous improvement by taking a pulse on their safety culture though a review being conducted by an independent entity. JSA leadership should focus more on implementation of WPC across all work groups. Furthermore, JSA is claiming to have accelerated ePAS implementation in support of WPC. The Department's observation is that ePAS implementation, a commitment from a significant 2019 event, has been over four years in the making and is still not fully implemented. **- Not Achieved**

Below are tables that show which Program Offices provided performance evaluation input for this Goal and the overall performance score for the Goal.

Science Program Office	Letter Grade	Numerical Score	Objective Weight	Overall Score
Site Office				
5.1 Integrated ES&H	C+	2.1	80.0%	
5.2 Environmental Management System	A-	3.6	20.0%	
			Overall Site Office Total	2.4

Table 5.1 Program Performance Goal 5.0 Score Development

Program Office	Letter Grade	Numerical Score	Weight	Overall Weighted Score
Site Office	C+	2.4	100.0%	
			Performance Goal 5 Total	2.4

Table 5.2 Program Performance Goal 5.0 Score Development

Score	**0.0-0.7**	**0.8-1.0**	**1.1-1.7**	**1.8-2.0**	**2.1-2.4**	**2.5-2.7**	**2.8-3.0**	**3.1-3.4**	**3.5-3.7**	**3.8-4.0**	**4.1-4.3**
Grade	**F**	**D**	**C-**	**C**	**C+**	**B-**	**B**	**B+**	**A-**	**A**	**A+**

Table 5.3 Goal 5.0 Final Letter Grade

Goal 6.0 Deliver Efficient, Effective, and Responsive Business Systems and Resources that Enable the Successful Achievement of the Laboratory Mission(s)

This Goal evaluates the Contractor's overall success in deploying, implementing, and improving integrated business systems that efficiently and effectively support the mission(s) of the Laboratory.

Site Office (Site Office)

As of October 1, 2023, JSA has successfully completed its full integration as a contractor. During this transition, all entries were processed successfully.

The provisional rates for FY 2024 have been approved and are monitored closely, on a monthly basis, to ensure they remain consistent with projected targets.

A formal PERT Review was conducted on the Laboratory's purchasing system and identified 55 weaknesses, about half of which were also self-identified by TJNAF. The Department revised the Laboratory's purchasing system from "approved" to "conditionally approved' and will reevaluate the purchasing system once all the corrective actions have been completed.

For the eight consecutive year, the Laboratory earned DOE's 2024 EPAT Purchasers Award for its commitment to choosing more sustainable electronics.

Strong commitment to the Department's Small Business Program, the Laboratory exceeded five of their six mandated small business goals and came close to meeting their other small business goal (HUBZone).

TJNAF's property management system remains "conditionally approved" because of concerns identified during the 2023 triennial DOE assessment of personal property management system.

TJNAF is making progress on completing corrective actions associated with the plan and will seek full property management approval in the 1st Quarter of FY25.

TJNAF concluded FY 2024 hiring efforts with the addition of 166 new employees.
The Supervisor Academy continues to receive positive feedback. In FY 2024, 73% of supervisors successfully completed the program.

TJNAF is developing the project plan and conducting detailed requirements analysis for the Human Capital Management System (HCMS) which is intended to enable efficient management of HR operations across TJNAF.
Internal Audit:

The Federal Managers Financial Integrity Act (FMFIA) A-123 Internal Controls testing was finalized in May 2024, identifying five control deficiencies. None of the deficiencies qualified as significant or material weaknesses.

Significant focus and efforts towards meeting public access requirements were demonstrated, and the Laboratory achieved accepted manuscript rate of 95.4% in 2024.

Effective technology transfer program (10 Invention Disclosures and 3 Patents) and strong commitment to the Department's Small Business Program (26 letters of support resulting in 5 proposals receiving funding of approximately 3.8M).

The assessment for each Objective under this Goal is provided below.

6.1 Provide an Efficient, Effective, and Responsive Financial Management System

October 1, 2023, JSA fully integrated as a contractor. Throughout this transition, all submissions of financial data via Statement of Cash Activity (SOCA) and Standard Accounting and Reporting System (STARS) were effectively managed, ensuring smooth adaptation to the integration requirements. This involved successfully incorporation 46 distinct accounting and finance policies, necessitating the adjustment of existing procedures to align with new standards. The process required careful coordination to ensure compliance with both internal and regulatory financial practices, resulting in a seamless transition with no disruptions to reporting accuracy or financial integrity.

Provisional rates for FY 2024 were subject to monthly monitoring to ensure rates remain aligned with projected budgets and financial expectations. These rates were reviewed to facilitate effective cost management throughout the fiscal year. The Laboratory actively adjusted these rates proactively and retroactively, as needed, to mitigate the risk of over or under collection, thereby ensuring a balanced approach to cost recovery. This proactive rate adjustment process is crucial for maintaining financial stability and preventing significant variances that could impact the overall contract performance.

The Laboratory has been diligent in meeting its reporting obligations, having submitted 10 financial reports as required, while the Chief Financial Officer (CFO) Division has demonstrated efficiency by promptly addressing 16 data requests. The organization remains focused on maintaining strong financial oversight and ensuring all processes adhere to established standards during this critical period of transition.

6.2 Provide an Efficient, Effective, and Responsive Acquisition Management System and Property Management System

Acquisition Management:

The Laboratory executed almost 3000 procurement actions valued at ~$60M, and over 4000 e-commerce transactions valued at over $2M and completed 65 transactions using DOE Integrated Contractor Purchasing Team (ICPT) agreements for computer products valued at just over $1M through the end of August. The Laboratory achieved strategic source savings of almost $5M. The Laboratory received the 2024 EPEAT Purchasers Award for the eighth straight year for its commitment to choosing more sustainable electronics, which demonstrates the Laboratory's commitment to the Department's sustainability goals.

As it relates to the Department's Small Business program, the Laboratory exceeded five of their six mandated small business subcontracting goals (Small Business, Small Disadvantaged Business, Women-owned Small Business, Veteran-Owned and Service-Disabled Veteran Owned) and came close to meeting their other mandated small business goal (HUBZone), which was excellent. A total of $30.3M of small business procurements in FY 2024 led to the accomplishment of these goals which are established by the Department and feed directly into the Department's overall small business procurement goals established by the U.S. Small Business Administration.

The Laboratory continued to support a formal Small Business Mentor Protégé Agreement with Momo's Cafe (a small, disadvantaged women-owned business) to assist the Protégé in identifying, developing, and promoting capabilities,

experience and technical expertise that will help foster growth and business development for its future catering services. Momo's Cafe seeks to increase the capability and capacity of its full-service restaurant and vending machine operations to provide greater food services capabilities to the Mentor's future catering requirements. These mentoring arrangements are established by the Laboratory without any additional DOE funding and demonstrate the Laboratory's commitment to the Department's small business program.

A formal Procurement Evaluation and Reengineering Team (PERT) Review was conducted on July 31-August 4, 2023, and issued their final report on May 8, 2024. The PERT review team identified a total of 55 weaknesses (26 were identified by the Laboratory's Self-Assessment and 29 that the PERT Team found). On May 30, 2024, the Contracting Officer transmitted the final report to JSA and required a Corrective Action Plan (CAP) to be developed. In addition, the Department revised the Laboratory's purchasing system from "approved" to "conditionally approved" given the significance and numbers of issues and will reevaluate the purchasing system once all the corrective actions have been completed. On July 6, 2024, the Laboratory provided their CAP for the 55 weaknesses and is working with the Contracting Officer and the DOE HQ P-Card Administrator to resolve the outstanding issues/weaknesses. In addition, the Laboratory has hired a Senior Procurement Manager and intends to hire a Senior Contract Compliance Officer and Small Business Liaison Officer to address their continued staffing issues.

Property Management:

JSA's property management system remains *conditionally approved* because of concerns identified during the 2023 triennial DOE assessment of the personal property management system. JSA's February 2024 corrective action plan was reviewed and concurred on by the Property Officer and the SC's Organizational Property Management Officer. JSA is making progress on completing corrective actions associated with the plan and has submitted corrective actions for review September 2024 and will subsequently seek full property management system approval October 2024, pending successful review and closeout of the corrective action plan. JSA has safely removed over 17 tons of metal and recyclable materials while also properly disposing of $1.3M in equipment at this point in the performance period.

6.3 Provide an Efficient, Effective, and Responsive Human Resources and Talent Management Systems

Talent Acquisition:

JSA concluded FY 2024 hiring efforts by filling almost 200 positions with over 160 of them being new employees to the lab. This effort is anticipated to provide a balance of new talent and existing experienced talent to better serve the Laboratory. The Laboratory has maintained positive outreach initiatives, with a particular focus on engaging Historically Black Colleges and Universities (HBCUs) and other Minority-Serving Institutions (MSIs). As part of these efforts, JSA participated in 13 recruitment events and has also hired a dedicated Human Resources Outreach Specialist. The Department continues to encourage lab leadership to inculcate the many new hires over the past four years (almost half the lab staff were hired in this window) into a safety and operations culture befitting of a national laboratory. JSA introduced a revamped onboarding program that emphasizes Laboratory values and culture, with a focus on senior leadership engagement, safety, diversity, equity, inclusion, and supervisor awareness.

Benefits:

JSA's benefits open enrollment was smooth and efficient. The company's inaugural Wellness Program achieved a 47% participation rate. Total Compensation Statements were created and distributed to "benefits" eligible employees, which provided a detailed overview of both direct and indirect compensation. This is part of JSAs retention efforts.

Talent Management:

The Supervisor Academy continues to receive positive feedback. In FY 2024, 73% of supervisors successfully completed the program. Participants were surveyed and asked whether the information shared "increased their understanding of the Laboratory and what is expected as a supervisor," the rating was 4.25 (out of 5). When asked whether they are "better able to perform their job as a supervisor," the rating was 4.02 (out of 5). The program sets the baseline for supervisor knowledge and performance across disciplines from safety leadership, budgeting, and inclusive leadership to managing within the law. The Department commends having the Supervisor Academy and encourages JSA to establish measurements as to the effectiveness over time.

Overall, the Laboratory is enhancing its talent management program by continuing efforts to build relationships with HBCUs and other MSIs and aiming to strengthen the STEM pathway for students and meet DEIA Peer Review milestones.
JSA is embarking on a Human Capital Management System (HCMS) project and is currently developing a project plan and conducting a detailed requirements analysis. The desired outcome is a scalable HCMS solution that ensures the efficient management of HR operations across JSA's multi-programmatic activities. The Department remains interested in receiving regular updates on the scope, cost, schedule, and risks associated with this initiative.

6.4 Provide Efficient, Effective, and Responsive Contractor Assurance Systems, including Internal Audit and Quality

JSA worked to improve its contractor assurance system (CAS) after feedback from the site office to both lab leadership and the Board regarding gaps in CAS effectiveness, including lack of rigorous self-assessments that are essential to understanding actual performance across management systems. The Board engaged with lab leadership to help improve overall CAS. The Department acknowledges and supports the lab's effort to learn from other SC labs on how to implement rigorous self-assessments and create informative measures around CAS effectiveness. As one example, the lab revamped how its management system "owners" present the health of their systems to lab leadership at their quarterly review meeting. These meetings provide a broader level of assurance per the contract clause H.50 and allow the three entities to have better transparency regarding performance, risks and challenges of the Laboratory. The Department encourages JSA to continue to address shortcomings in CAS implementation.

Laboratory leadership and management lack operational knowledge on what "good" looks like in various areas. The Department encourages the lab to learn from others across the complex as they rigorously review their management systems. Some management systems owners are active with their own community, such as the CFO, and bring in solid practices.

The Laboratory continued Human Performance Improvement (HPI) training, the application of which enhances root cause analysis (example: fact-finding leading into RIA), ability to identify performance gaps, and plans for improvement and corrective actions with an emphasis on recognition and prevention prior to occurrence.

The Laboratory has a decentralized approach to quality assurance program implementation with no apparent or actively engaged management system owner. An early FY ISMS assessment, that included reference to an active but outdated QA program description, concluded that there was an effective program. This conclusion demonstrated a lack of rigorous self-assessment in the QA program itself. Another example is the ongoing pressure systems non-compliance which is acknowledged by the Laboratory. Further examples of inadequate field implementation is the recent MOLLER bellows failed testing (inadequate receipt inspection, inadequate pre-testing checks) that resulted in a near miss when threaded rods catastrophically failed and were made airborne, and the recent Hall A fire suppression pneumatic testing set-up where, while required, there were no calibrated gages, no automatic relief device to ensure system would not be over pressurized, and no available standards that were referenced in the procedure.

Internal Audit:

As outlined in the FY 2024 Internal Audit Plan, JSA completed the final Knowledge Management report for in the second Quarter of FY 2024. The audits for Subcontracts, IT Access, and Labor Charges are completed, though JSA is following up on the subcontract audit due to TJSO questions. The Federal Managers Financial Integrity Act (FMFIA) A-123 Internal Controls testing was finalized in May 2024, identifying five control deficiencies. However, these deficiencies were part of broader mitigating controls, meaning the overall control sets were deemed effective. Additionally, none of the deficiencies qualified as significant or material weaknesses. The JSA Assurance Memorandum on the A-123 testing was submitted to the Department in August 2024.

The FY 2025 Internal Audit Plan was developed using a risk-based approach and received approval from the JSA CFO and Finance Committee Chair on June 25, 2024. It was submitted to the Department on June 26, 2024.

6.5 Demonstrate Effective Transfer of Knowledge and Technology and the Commercialization of Intellectual Assets

Several critical Strategic Partnership Projects/Cooperative Research and Development Agreements (SPPs/CRADAs) were entered into this fiscal year and successfully administered. In FY 2024, 10 Invention Disclosures and 3 Patents were awarded which relate directly to the Laboratory's core competencies. The Laboratory continued to participate in the Department's Technology Transfer Working Group (TTWG) as it relates to the transfer of technology and commercialization of intellectual assets of the Laboratory.

Numerous small business companies requested letters of support for their Small Business Innovation Research/Small Business Technology Transfer Research (SBIR/STTR) proposals and 26 support letters were sent for actual proposals that were submitted to DOE with 5 proposals receiving funding of approximately $3.8M. This demonstrated the Laboratory's continued commitment to the Department's Small Business and Technology Transfer Programs. Overall, the Laboratory continued to have an effective technology transfer program as evidenced by the significant number of intellectual assets generated during this period.

Significant focus and effort towards meeting public access requirements was demonstrated, and the Laboratory achieved accepted manuscript submission rate of 95.4% in FY 2024. The Laboratory's strong commitment to public access, including its focus on comprehensiveness and staff outreach, is to be commended. The Laboratory has a long-standing, effective Scientific and Technical Information (STI) management process, and accepted manuscripts have been efficiently incorporated into the routine submission of STI to the Office of Scientific and Technical Information (OSTI). The Laboratory continued the process of engaging the Associate Laboratory Directors when authors did not use the approval process, which leads to an increased understanding of, and compliance with, the standard process. Below are tables that show which Program Offices provided performance evaluation input for this Goal and the overall performance score for the Goal.

Science Program Office	Letter Grade	Numerical Score	Objective Weight	Overall Score
Site Office				
6.1 Financial Management Systems	A	3.9	20.0%	
6.2 Acquisition and Property Management Systems	B	3.0	20.0%	
6.3 Human Resources	B+	3.4	20.0%	
6.4 Contractor Assurance Systems	B	2.9	25.0%	
6.5 Technology Transfer	B+	3.3	15.0%	
			Overall Site Office Total	3.3

Table 6.1 Program Performance Goal 6.0 Score Development

Program Office	Letter Grade	Numerical Score	Weight	Overall Weighted Score
Site Office	B+	3.3	100.0%	
			Performance Goal 6 Total	3.3

Table 6.2 Program Performance Goal 6.0 Score Development

Score	**0.0-0.7**	**0.8-1.0**	**1.1-1.7**	**1.8-2.0**	**2.1-2.4**	**2.5-2.7**	**2.8-3.0**	**3.1-3.4**	**3.5-3.7**	**3.8-4.0**	**4.1-4.3**
Grade	**F**	**D**	**C-**	**C**	**C+**	**B-**	**B**	**B+**	**A-**	**A**	**A+**

Table 6.3 Goal 6.0 Final Letter Grade

Goal 7.0 Sustain Excellence in Operating, Maintaining, and Renewing the Facility and Infrastructure Portfolio to Meet Laboratory Needs

This Goal evaluates the overall effectiveness and performance of the Contractor in planning for, delivering, and operations of Laboratory facilities and equipment needed to ensure required capabilities are present to meet today's and tomorrow's mission(s) and complex challenges.

Site Office (Site Office)

TJNAF met expectations of performance in effectively and efficiently managing facilities and infrastructure at the Lab throughout FY24.

TJNAF conducted performance of repair and maintenance activities which included numerous preventive maintenances, corrective maintenance, service-related, and modification tasks that optimize facility and infrastructure usage and support the Lab's ability to meet mission needs.

TJNAF performance on the development and implementation of the Material Condition Improvement Plan reflects a marked improvement in attention to the overall condition of Jefferson Lab campus.

TJNAF did not meet expectations throughout FY24 to plan for and acquire the facilities and infrastructure required to support the continuation and growth of the Laboratory's Missions and Programs. There continues to be a lack of project management and project support talent, a long-standing concern. The Laboratory has difficulty meeting routine project commitments of quality with most projects (MOLLER, CRE, JLDC, GPP projects).

TJNAF played a vital role in working with the Site Office, DOE Headquarters, the USDOE Real Estate Contracting Officer (RECO) and the City of Newport News to complete the DOE acquisition of the Applied Research Center (ARC).

TJNAF completed the $9.5M End Station Refrigerator 2 General Plant Project (GPP) with an admirable overall safety performance record but continued to struggle with challenges associated with mitigating risks that resulted in schedule delays and cost growth on other ongoing GPPs.

The assessment for each Objective under this Goal is provided below.

7.1 Manage Facilities and Infrastructure in an Efficient and Effective Manner that Optimizes Usage, Minimizes Life Cycle Costs, and Ensures Site Capability to Meet Mission Needs
Facilities Maintenance

The Laboratory has managed Facilities and Infrastructure by maintaining systems supporting accelerator operation through continued performance of repair and maintenance activities which included over 2500 preventive maintenance, over 2200 corrective maintenance, over 2300 service-related, and over 170 modification tasks that optimized facility and infrastructure usage and supported the Laboratory's mission execution. Uptime for systems supporting accelerator operations was reported to exceed 98%.

Highlights of the Laboratory's maintenance and repair performance is as follows:

- Hall A Retaining Wall repair completed and noted as a model for quality construction on site.

- Low Energy Recirculator Facility (LERF) Experimental Chill Water system replacement improved performance and capacity with significant upgrades to both mechanical and electrical systems.
- Completed Low Conductivity Water (LCW) leak repair in the Hall A Beam Dump Cooling in building 91.

Facility Safety

The Laboratory continued to strive for safety posture improvement as evidenced by the following highlights of facility safety related activities supported by the Facilities Management and Logistics Division:

- Construction Permit and Activity Hazard Analysis (AHA) Safety Job Boards were built and implemented for use at subcontractor projects to heighten awareness of and access to important job-site specific safety-related documentation.
- The design and replacement of Fire Suppression Systems in Halls A and C.
- Upgrade of the Fire Alarm panels in the Low Energy Recirculator Facility (LERF).

Sustainability

The Laboratory continues to focus on identifying and taking advantage of sustainability initiatives that are designed to minimize the Laboratory's environmental impact. The following highlights reflect the Laboratory's commitment to having a robust program dedicated to becoming a leader in sustainability:

- More than 143 tons of scrap material was removed from the site and recycled, and more than $8.1M in indirect investment was used to improve the condition of the lab overall, reducing life-cycle costs in the long term.
- The Laboratory received its eighth consecutive EPEAT Purchaser Award for 2024 (based on 2023 purchases).
- Replaced three light-duty gasoline trucks with electric vehicles.
- Hired new Certified Energy Manager (sustainability engineer) to further the Laboratory's sustainability efforts.
- Supported TJSO with required information to support the Federal Energy Management Program (FEMP) Utility Waiver for Electricity, Utility Procurement Plan (UPP) for all utilities, and Utility Summary Documentation.

Material Condition

The condition of the Laboratory facilities continues to improve and benefit from the efforts outlined in the Material Condition Improvement Plan (MCIP) to address the notable outcome associated with Objective 7.1.

Many necessary repairs were completed in FY 2024, representing significant investment in condition improvement projects. Notably, a fire suppression system for the experimental halls was fast tracked to meet FY 2024 SAD constraints, the Hall A retaining wall replacement was a model in quality construction management and ESR2 ODH Fans and Controls were successfully installed to support ESR2 commissioning. In addition to completed construction activities, FY 2024 study and design efforts will benefit the Laboratory in the coming years. These efforts include replacing a chilled water pipe to the data center, North and South Access Building cooling upgrades and future phases of Sustainability Meter installations.

7.2 Provide Planning for and Acquire the Facilities and Infrastructure Required to Support the Continuation and Growth of Laboratory Missions and Programs

The Laboratory has made progress in hiring project management needed to deliver the project portfolio. The Laboratory should ensure succession planning for projects, specifically for the EIC Jefferson Lab Project Manager

position which is essential for the ~$2.8B Electron Ion Collider Project. For conventional projects, the Laboratory has been challenged with maintaining project personnel to manage the portfolio especially as it relates to the CEBAF Renovation and Expansion (CRE) Project, the Jefferson Lab Data Center (JLDC) project and the High Performance Data Facility (HPDF) project. Hiring and Retaining project personnel to ensure project execution is vital to ensure DOE (and non-DOE) investments are appropriately managed. This also extends to essential project support staff including project controls capacity, and project risk analysts.

The Laboratory's internal process for evaluating project performance (project assurance) is not yet producing outcomes that are evident to the Department. The Laboratory has difficulty meeting routine project commitments of quality with most projects (MOLLER, CRE, JLDC, GPP projects). The laboratory is continuing to struggle with small project implementation as well, examples noted below on the Cryogenic Test Facility Upgrade and Laydown Yard Expansion project. JSA is encouraged to provide rigorous self-assessments of project execution and lab leadership is encouraged to provide needed resources.

The Laboratory successfully completed its required Earned Value Management System (EVMS) surveillance performed by the DOE Office of Sciences' Office of Project Assessment (OPA) which supports their ability to maintain their required EVMS certification. The preparation for that surveillance played a key role in the successful completion of that surveillance.

Major Capital Projects Performance:

CEBAF Renovation and Expansion (CRE) Project: The acquisition of the Applied Research Center (ARC) Building was completed on October 25, 2023, and a Transfer of Ownership ceremony was completed on December 5, 2023. The Laboratory's work to support completion of the donation was well done and marked a major milestone toward completion of the CRE project.

Electrification 100% design work for the ARC building, an element of scope that was added to the CRE baseline planning in late FY 2023, was completed in June 2024 and the final design was completed shortly thereafter. Efforts continued to update the associated procurement documents for the ARC building renovation subcontract.

In June, JSA completed its efforts to apply for funding through the program entitled Assisting Federal Facilities with Energy Conservation Technologies (AFFECT). This was evidence of the Laboratory's proactive approach to implementing strategies to offset construction costs for the CRE project and advance the TJNAF energy efficiency, net-zero, and decarbonization goals set forth in Executive Order 14057 and the Energy Act of 2020.

As of the end of August 2024, the CRE project which has a Total Project Cost (TPC) of $90.3M, which has not yet been baselined was at 13.1% complete and reported a Cost Performance Index (CPI) of 1.07 and the Schedule Performance Index (SPI) of 0.87. For the majority of FY 2024, the project has been working toward approval of Critical Decision 2/3a in the 2nd Quarter of FY 2025. However, as a result of a suggestion by DOE to consider a change to instead seek a CD-2/3 approval and eliminate an additional cycle of reviews and approval, the project has been evaluating that approach to provide a recommendation to the DOE FPD and SOM about whether that change is the most effective and efficient path forward. Laboratory leadership will need to apply renewed and significant focused attention to re-filling the Project Director position, preparing a modified schedule including the appropriate durations and resources needed to obtain approval of the next critical decision in FY 2025, and deliver this project.

High Performance Data Facility (HPDF) Project and Jefferson Laboratory Data Center (JLDC): JSA has initiated the development of a High-Performance Data Facility (HPDF) project. The HPDF will support data-intensive research, and data science to existing and future SC research projects. The CD-0, Approve Mission Need was approved with a cost

range of $300-500M in the 1st Quarter of FY 2022 with the TJNAF site chosen in the 1st Quarter of FY 2024. The HPDF contains a key project dependency known as the JLDC, which will house all the HPDF equipment/systems. To support building the JLDC, the HPDF team has drafted a set of requirements for the data center building (i.e., preliminary power, cooling, and space requirements). The integrated HPDF-JLDC data center team (representatives from Computational Sciences & Technology and FM&L) conducted site visits at external data centers to consult with experts and derive lessons learned and best practices. The integrated HPDF-JLDC data center team coordinated to have these requirements reviewed by data center subject matter experts (SMEs) at Oak Ridge National Laboratory (ORNL), Argonne National Laboratory (ANL), Lawrence Berkeley National Laboratory (LBNL), Sandia National Laboratories and Idaho National Laboratory (INL). The feedback from the external reviewers was incorporated into a Recommendation and Assumption document used as a design of the JLDC, which was turned into a request for proposal (RFP) then awarded to a Design A&E firm.

The integrated HPDF-JLDC data center team experienced delays in processing documents due to the abrupt departure of the JLDC Project Director. As of September 30, 2024, JSA is in the process of finding/hiring a replacement, which has continued to delay project activities.

JSA's HPDF team initiated several key activities which has resulted in a positive start on the HPDF Project. Examples:

- Assisted the TJSO's HPDF Federal Project Director in the establishment of an Integrated Project Team (IPT) with regular weekly planning. The IPT is documented in the IPT Charter.
- Worked on scope documentation; toward conceptual design, CD-1 documentation (i.e., draft project management plan (PMP), draft preliminary project execution plan (PPEP), draft acquisition strategy plan (ASP) that are undergoing various internal reviews.
- Participated with key stakeholder groups. The FPD, JSA's executive leadership, and facilities personnel, conducted a site visit to LBNL in March of 2024 for integration and alignment across the labs and federal stakeholders.
- Published a "Status and Plans" document and conducted user engagement through webinars, direct contact, and a three-day stakeholder meeting in July 2024.

The Department is encouraged by the recent HPDF project director hire and encourages JSA to redouble efforts to fill JLDC project director position, be more aggressive with CD-1 plan, and accelerate JLDC project overall. The Department remains concerned that JLDC could become a critical path for HPDF project overall without proper senior leadership attention. JSA should continue to improve open and transparent communications regarding execution and status regarding HPDF and JLDC.

Thomas Jefferson Infrastructure Improvements (TJII) Project: This project will receive no new funding until FY 2028 at the earliest; therefore, the forecast date of the 2nd Quarter of FY 2025 to receive approval of CD-1, *Approval of Cost Range and Alternatives Analysis*, has been changed to the 1st Quarter of FY 2028.

General Plant Projects Performance:

- **End Station Refrigerator 2 (ESR2):** The Laboratory completed construction and turnover to operations and safely and successfully delivered the completion of the ESR2 GPP as required by the Jefferson Science Associates, LLC Contract (Contract No. DE-AC05-06OR23177).

The safety performance on the project was strong, having executed more than 67,000 hours with no recordable injuries and no reportable safety incidents throughout its lifecycle.

- **Cryogenic Test Facility (CTF) Upgrade:** As of the end of August FY2024, this $5.2M project was 79.3 % complete. The Schedule Performance Index (SPI) was 0.92 and the Cost Performance Index (CPI) was 1.01. In March the project realized a risk, vendor delay, that impacted the planned project completion date of November 2024 when the cold box fabrication and installation was to have been completed. A baseline change request (BCR), 24-001, was approved on June 3, 2024, which authorized the use of cost contingency to cover increased costs in cold box 1(CB1N) fabrication and project management and the delay of the DOE milestone for project completion from the 1st Quarter of 2025 to the 1st Quarter of 2026. An additional BCR was approved on July 11, 2024, BCR-24-002, to authorize the use of an additional contingency to address the combination of the Euro exchange rate fluctuation on the DEMACO contract for fabrication of the distribution box and the increased installation cost for the distribution box leaving the project reasonably well positioned to manage remaining project risks.

The project made progress in removal of the old distribution box and installation of the new distribution box, transfer line, and junction box. Cold box fabrication using the Laboratory's resources is now scheduled for completion in FY 2025 although there continues to be a high risk associated with the availability of personnel resources to complete the cold box fabrication.

Given this project started in August 2020 and is now forecast for completion in January 2025, it continues to require rigorous management attention to maintain its safety posture, accurately forecast any upcoming challenges, mitigate risk associated with project completion.

- **Laydown Yard Expansion (LDYE) – Canon:** As of the end of August FY 2024, the project is behind schedule and on budget. The project completed the acquisition for the laydown yard expansion construction contract with an award in August of 2024 which took much longer than the planned October 2023 initial completion target date. The project team completed the PMP and submitted the document to the Department which was approved in June 2024. On July 16, 2024, a BCR, 24-001, was approved which authorized the use of $100,000 of project contingency to establish Management Reserve (MR). This BCR also authorized a drawdown of $71,078 of that newly created MR to fund permit required nutrient credits – a cost that was missed in developing the baseline and serves as an important lesson learned for this project and for future projects with permit-related activities like this. Construction began in September 2024.

Given this project started in September 2022 and now has a forecasted completion date of February 2025 with only 3 months of the original 6 months of schedule contingency remaining, it continues to require rigorous management to achieve construction completion in November and bring the project to substantial completion in 2024 within the 2-year window expected by the TJSO and the Office of Science Laboratory Infrastructure (SLI) for SLI-sponsored General Plant Projects.

- **Central Utility Plant (CUP) Upgrade:** In FY 2024 this project's cost estimate increased from the original value of $4.2M to $5.5M primarily because market conditions, while having been determined as fair and reasonable, were higher than the Laboratory's estimate (~$600k). Pricing impacts were noted in several areas, particularly regarding equipment and sitework costs. The inclusion of a bid option to remove chiller from the Test Lab basement (~$350k) and project contingency being to project estimate (~260k) also contributed to the cost increase.

In August the project schedule to complete slipped from the 4th Quarter of FY 2025 into 1st Quarter of FY 2026 because the planning for the demolition of the old chillers in the Test Lab basement changed and is now base scope on the contract which happened because the Laboratory determined that removal of those chillers is necessary to support the need for improved cooling in the LINAC.

Much of the progress on this project is associated with the ongoing procurement phase including several long lead procurements purchased as Government Furnished Equipment which was seen as a prudent risk mitigation attempt to offset potential vendor delivery delays. It will be crucial for the project team to work proactively with vendors to mitigate further delays like the one that occurred in January 2024 on the long lead procurement items. With the impending award of the construction subcontract and the remaining challenge of achieving the target to safely complete commissioning and turnover to operations in April of 2025, the Laboratory must continue to closely monitor the project's execution to ensure no further cost growth or additional schedule delays occur and to achieve the overall successful completion and delivery of the project takes place on or before the 1st Quarter of FY 2026.

Notable Outcome(s)

Site Office

(Objective 7.1) Notable 1: Develop and submit to TJSO for approval a prioritized TJNAF-wide material condition improvement plan, including a schedule for implementation, by Q1 to be based on a credible assessment of experimental and supporting facilities both owned and leased. This should include experimental halls and a tunnel condition assessment (e.g. water intrusion impacts to electrical equipment and structural integrity), known existing hazards (e.g. sidewalk repairs), and cleanliness and habitability of the laboratory.

Outcome: JSA met this notable outcome in large measure. The Material Condition Improvement Plan was approved in 1st Quarter of FY 2024 with description of prioritization, actions taken, studies conducted and summarizes projects identified for FY 2024 and FY 2025. Ground water intrusion remains a continued concern to the Department given the potential impact to the safety of personnel and the large investment in infrastructure, equipment, and systems. JSA has not conducted or shared a meaningful condition assessment of water intrusion impacts to electrical equipment as part experimental halls and tunnel condition assessment. Focus is needed on the implementation of a robust plan to address and affirm the structural integrity, safety of electrical systems and other impacted equipment. **- Achieved**

Below are tables that show which Program Offices provided performance evaluation input for this Goal and the overall performance score for the Goal.

Science Program Office	Letter Grade	Numerical Score	Objective Weight	Overall Score
Site Office				
7.1 Usage and Life Cycle Cost	B+	3.1	40.0%	
7.2 Planning and Acquisition	B	3.0	60.0%	
			Overall Site Office Total	3.0

Table 7.1 Program Performance Goal 7.0 Score Development

Program Office	Letter Grade	Numerical Score	Weight	Overall Weighted Score
Site Office	B	3.0	100.0%	
			Performance Goal 7 Total	3.0

Table 7.2 Program Performance Goal 7.0 Score Development

Score	**0.0-0.7**	**0.8-1.0**	**1.1-1.7**	**1.8-2.0**	**2.1-2.4**	**2.5-2.7**	**2.8-3.0**	**3.1-3.4**	**3.5-3.7**	**3.8-4.0**	**4.1-4.3**
Grade	**F**	**D**	**C-**	**C**	**C+**	**B-**	**B**	**B+**	**A-**	**A**	**A+**

Table 7.3 Goal 7.0 Final Letter Grade

Goal 8.0 Sustain and Enhance the Effectiveness of Integrated Safeguards and Security Management (ISSM) and Emergency Management Systems

This Goal evaluates the Contractor's overall success in safeguarding and securing Laboratory assets that supports the mission(s) of the Laboratory in an efficient and effective manner and provides an effective emergency management program.

Site Office (Site Office)

TJNAF met expectations of performance in effectively and efficiently managing their emergency management system throughout FY 2024.

TJNAF took the lead in the preparation of JEFFERSON LAB's FY 2024 Emergency Readiness Assurance Plan (ERAP) and the Continuity Readiness Assurance Report (CRAR) and put much effort into these document development to the benefit of the Laboratory.

TJNAF successful conducted three quarterly DOE HQCOOP accountability drills in January 2024, April 2024, and July 2024 with 100% accountability reached during each drill. JSA made improvements in communication with the Site Office that added efficiency to TJNAF reporting to DOE HQCOOP.

Cyber security risk posture is well managed. Downward trend towards the end of the year for the time needed to respond to identified alerts. No identified root-level compromises or use of the Laboratory to platform to external systems.

There was a significant increase in bandwidth to accommodate newer/more farm nodes approaching in FY25. Work with the ESnet upgrade increased the data rate to 100 gb/s (gigabits per second).

The lustre parallel filesystem for experimental physics was replaced, delivering a capacity increase from 4.7PB (petabytes) to 11.2PB of usable storage.

The Lab did an outstanding job preparing a comprehensive security plan for the successful Lab Open House with thousands of visitors. This entailed a multi-agency effort with local law enforcement partners and subcontractors.

The assessment for each Objective under this Goal is provided below.

8.1 Provide an Efficient and Effective Emergency Management System

JSA has continued to work on developing an efficient and effective Emergency Management System per DOE O 151.1D, *Comprehensive Emergency Management System* and Continuity of Operations per DOE O 150.1B, *Continuity Programs*. The Laboratory prepared the FY 2024 Emergency Readiness Assurance Plan (ERAP) and the Continuity Readiness Assurance Report (CRAR) and improved document development to the benefit of the Laboratory.

JSA successfully conducted four quarterly DOE HQ Continuity of Operations (COOP) accountability drills in October 2023, January 2024, April 2024, and July 2024. The October 2023 accountability drill ended with approximately 97% accountability. JSA redoubled their efforts and achieved 100% accountability for the latter three accountability drills. JSA made improvements in communication with the Department that added efficiency to TJNAF reporting to DOE HQ COOP.

JSA executed two full participant exercises; 1) “Active Threat with Shots Fired” on November 1, 2023, with the Newport News Police Department (NNPD) participation and 2) “Fall Arrest and Domestic Issue in Hall A” on August 7, 2024. Shortcomings were noted during the “Fall Arrest and Domestic Issue in Hall A” exercise. The objectives of the exercise were not fully achieved due to off-site support NNPD and Newport News Fire Department (NNFD) being pre-staged before the exercise begun adding artificiality to the exercise.

JSA completed a Joint TJSO/JSA Emergency Management COOP Assessment in the 2nd Quarter of FY 2024. The assessment identified four findings and five opportunities for improvement (OFI). JSA prepared and is executing a Corrective Action Plan (CAP) to address the findings. As a repeat observation by the Department from 2023, JSA continues to struggle with executing true full participation exercises in a rigorous manner.

JSA hosted the NNPD in October 2023. The NNPD provided training regarding CRAZE (Civilian Response to Active Shooter Events) to forty JSA participants. The training provided good situational awareness for the participants about best practices to follow when employees find themselves with a dangerous situation at Jefferson Lab. The training has helped JSA to better respond to situations and be able to assist local emergency responders.

On March 7, 2024, JSA participated in the statewide tornado drill with the Hampton Roads Emergency Management Committee (HREMC) which involved the entire Laboratory. JSA’s participation in the local HREMC has allowed the Laboratory to be better trained in natural disaster responses and be integrated into the Newport News community response and recovery efforts. These actions have aided in JSA being a positive and integral part of the overall community.

JSAs positive relationship and partnership with local first responders is commendable and very much appreciated by the Department.

8.2 Provide an Efficient and Effective Cyber Security System for the Protection of Classified and Unclassified Information

Scanning efficiency for cyber vulnerabilities was demonstrated in the measure of scans of hosts with high or critical vulnerabilities. This is demonstrated with reductions from 1st Quarter to 2nd Quarter, and 3rd Quarter to 4th Quarter. The 3rd Quarter increased in percentage, but this change is attributed to improved/increased scanning methods (credentialed scanning), which identified more weaknesses. In the 4th Quarter, this percentage leveled down as the new method matured and the amount of remediation for those increased. The supporting statistics are as follows: 1st Quarter = 2%, 2nd Quarter = 1.8%, 3rd Quarter = 3.8%, and the 4th Quarter = 2.7%.

The time to respond to alerts has reduced from over 25 hours to the current level of 19.5 hours. Most importantly from a posture perspective, there were no root-level compromises or use of the Laboratory to platform to external systems. Internet availability remained at 100%, and there were no major network outages in FY 2024.

There were highlights in the Program which demonstrated support to Laboratory mission, regarding response to compliance audits, and supporting Departmental initiatives. There was a significant increase in bandwidth to accommodate newer/more farm nodes approaching in FY 2025. In addition, work with the ESnet upgrade increased the data rate to 100 gb/s (gigabits per second). Storage system upgrades for experimental nuclear physics were completed in August. In addition, the Lustre parallel file system for experimental physics was replaced, delivering a capacity increase from 4.7PB (petabytes) to 11.2PB of usable storage. Four new LTO8 tape drives were added to support higher data rates from the Halls. Ethernet switches in the farm were upgraded to enhance Open Science Grid (OSG) capabilities (increase bandwidth).

An increased amount of time was devoted to the facilitation of compliance reviews. Corrective actions were deployed to address two findings from both the 2023 and 2024 Inspector General (IG) audits. This included updates to the Laboratory's vulnerability management program by implementing credentialed scans of web services and of installed applications not accessible from the network. This year developers implemented authenticated web applications which scan for MIS (Management Information Services) lab-wide web services. Scanning agents using the application Tenable, were deployed on desktops and servers to scan third-party applications for known vulnerabilities.

The FY 2024 Inspector General (IG) Federal Information Security Modernization Act (FISMA) audit and vulnerability assessment included the two repeat findings from FY 2023, and a new finding where it was identified that yearly audits of the firewall rules were not being conducted. During the week of the audit, the Laboratory developed a script to automate the identification of unused firewall rules and conducted an audit of the firewall rules, which will be performed annually. The two repeat findings are tracking on schedule in accordance with the FY 2023 corrective action plan. JSA also worked with iJC3 to have Synackconduct multiple penetration tests of the Laboratory's publicly available servers using services. The vulnerabilities that Synack identified were addressed with system owners.

Regarding Departmental initiatives, the Laboratory has made progress in implementing DOE's Continuous Diagnostics and Mitigation (CDM) Program utilizing Carbon Black to develop reports and disable known vulnerabilities.

Furthermore, JSA is using BurpSuite to see what scanned vulnerabilities exist, and to see what scanned vulnerabilities exist, as there is now automated reporting versus manual. The software is also identifying obvious issues and providing hypothetical scenarios for the analysts to investigate.

Work is ongoing to validate and organize scanning data into separate repositories to better manage the reporting process. The application process has now moved to another phase for Supply Chain Resource Management (SCRM), with Authorization Official approval.

The Laboratory provided excellent response to the August CrowdStrike event; JSA staff identified the problem and began restoring impacted servers. There was little impact on lab operations. Communications with TJSO on this event is discussed below.

There are challenges identified that the Laboratory needs to address. Communication should be improved to ensure timely and thorough reporting to the Department. An example of this was evident in the process involving the CrowdStrike incident. Timeliness and providing identification and status to TJSO was not handled efficiently. In account management, an opportunity for improvement has been identified, where research is needed to develop a process to automate the identification of accounts not in use and have them disabled after a defined number of days.

Continued vigilance will be needed to maintain advancement and completion of corrective actions for audits. Progress on these are tracked on a quarterly basis in the Department's DART (Department of Energy Audit Report Tracking System) and will continue to be monitored by the Department. Another challenge is around phishing where attempts are increasing in sophistication. While advancements in technical tools such as monitoring capabilities can be implemented, they can still be offset by user behavior. The enhancement of social engineering training will be tested as threats continue to deceive victims. An analysis of the phishing exercise campaign could be conducted to determine if additional training is needed.

The Laboratory has not yet fully implemented DOE Order 417.7, Control of Unclassified Information. The Laboratory should ensure this is implemented.

8.3 Provide an Efficient and Effective Physical Security Program for the Protection of Special Nuclear Materials, Classified Matter, Classified Information, Sensitive Information, and Property

The Laboratory has updated several key documents and appointments to include the Site Security Plan with a more comprehensive Intrusion and Detection System inspection log and Sensitive Science and Technology Protection Plan, Counterintelligence Plan, Physical Protection Medical Director (PPMD) Delegation, and Foreign Access Central Tracking (FACTS) exemption letter.

A Security Posture Review team was assembled to explore improvement possibilities for protection of assets and personnel. During the review, unannounced performance tests were conducted of the Unarmed Security Officer subcontractor, Top Guard, during multiple shifts resulting in failing to identify and respond to alarms, erratic driving, and inappropriate parking near a loading dock. The Security Posture Review team was able to access the ARC building without the use of an access card and walked the halls on all seven floors without any intervention. As a result, the Laboratory's Security Management Team contacted the subcontractor leadership, Top Guard, emphasizing the need for retraining and increased oversight to improve performance.

The Laboratory's response to an external Security Posture Review resulted in instituting several after-action items from the close out briefing to address shortcomings of the uniformed subcontractor to include the hiring of a new Site Security Supervisor, increased oversight from the subcontractor's project manager, curtailing of non-security related functions by the uniformed subcontractor, and a more robust training program with quality assurance metrics. A Laboratory entry gate was permanently secured to limit unauthorized access to the site.

The Laboratory has continued to upgrade the Video Access and Surveillance System (VASS), notably improving video coverage at the Accelerator Gate Post 2 and adding additional key card access readers as part of the ongoing physical security system modernization initiative.

The Laboratory has begun to stand up a DOE O 473.1A HSPD-12 Badge/Credential team to meet upcoming PIV card implementation.

The Laboratory has invested significant time and resources in support of the successful execution providing security for the Laboratory Open House event. The Laboratory held multiple inter-agency and inter-departmental planning meetings, which involved participants from Newport News Police Department, FBI Norfolk Field Office, Canon, Inc., and several security and event logistical sub-contractors for transporting thousands of people safely from offsite parking areas to the Lab. This effort is commended and appreciated by the Department.

The Security Team provides excellent response and service to the TJSO requests, is instituting multiple programmatic improvements in an increasing threat environment in the local environments to the Laboratory, and growth in staff and users. They have instituted one-hundred percent ID display and development of a near term plan with a comprehensive integrated priority list project funding request for substantial physical security infrastructure improvements and executed a realignment plan. They hired five new employees with a new central focus on safeguards and security, vice multiple logistical contract supervision roles, e.g., the solid waste subcontract being managed by the S&S division.

Below are tables that show which Program Offices provided performance evaluation input for this Goal and the overall performance score for the Goal.

Science Program Office	Letter Grade	Numerical Score	Objective Weight	Overall Score
Site Office				
8.1 Emergency Mgmt	B+	3.4	25.0%	
8.2 Cyber-Security	B+	3.3	50.0%	
8.3 Special Nuclear Materials, Classified Property	B+	3.4	25.0%	
			Overall Site Office Total	3.4

Table 8.1 Program Performance Goal 8.0 Score Development

Program Office	Letter Grade	Numerical Score	Weight	Overall Weighted Score
Site Office	B+	3.4	100.0%	
			Performance Goal 8 Total	3.4

Table 8.2 Program Performance Goal 8.0 Score Development

Score	**0.0-0.7**	**0.8-1.0**	**1.1-1.7**	**1.8-2.0**	**2.1-2.4**	**2.5-2.7**	**2.8-3.0**	**3.1-3.4**	**3.5-3.7**	**3.8-4.0**	**4.1-4.3**
Grade	**F**	**D**	**C-**	**C**	**C+**	**B-**	**B**	**B+**	**A-**	**A**	**A+**

Table 8.3 Goal 8.0 Final Letter Grade

APPENDIX

List of programs:

SC Accelerator R&D and Production

SC Advanced Scientific Computing Research

SC Basic Energy Sciences

SC Nuclear Physics

SC Workforce Development for Teachers and Scientists

SC Accelerator R&D and Production

Thomas Jefferson National Accelerator Facility

2024 Performance Evaluation

Office of Laboratory Policy

Goal 1.0 Provide for Efficient and Effective Mission Accomplishment

Weight: 75.00% **Score:** 3.5 **Grade:** A-

Goal Evaluation:

JEFFERSON LAB's efforts in Accelerator Stewardship continue to be outstanding. Collaborative efforts to develop industrial SRF accelerators, advance high-efficiency magnetron-based RF power sources, and advance material science for both SRF cavities and megawatt-class beam windows is innovative and outstanding. Engagement with industry is strong and serves as a positive model for lab-industrial technology transfer.

Objective 1.1: Provide Science and Technology Results with Meaningful Impact on the Field

Weight: 50.00% **Score:** 3.7 **Grade:** A-

Objective Evaluation:

JEFFERSON LAB efforts in ARDAP programs to develop industrial SRF accelerators, advance high-efficiency magnetron-based RF power sources, and advance material science for both SRF cavities and megawatt-class beam windows is innovative and outstanding. Engagement with industry has been strong and advantageous.

Objective 1.2: Provide Quality Leadership in Science and Technology that Advances Community Goals and DOE Mission Goals

Weight: 50.00% **Score:** 3.3 **Grade:** B+

Objective Evaluation:

JEFFERSON LAB staff have worked collaboratively to designate UITF among the founding facilities of BeamNetUS.

Goal 3.0 Provide Effective and Efficient Science and Technology Program Management

Weight: 25.00% **Score:** 3.3 **Grade:** B+

Goal Evaluation:

JEFFERSON LAB's strategy for and execution of superconducting radiofrequency accelerator technology are effective.

Objective 3.1: Provide Effective and Efficient Strategic Planning and Stewardship of Scientific Capabilities and Program Vision

Weight: 40.00% **Score:** 3.5 **Grade:** A-

Objective Evaluation:

JEFFERSON LAB has developed a strategy for industrializing superconducting radiofrequency accelerator technology and is pursuing the strategy effectively. The business plan led by JEFFERSON LAB for domestic SRF cavity manufacturing is comprehensive and well considered, with an excellent balance of lab, university and industry perspectives.

Objective 3.2: Provide Effective and Efficient Science and Technology Project/Program/Facilities Management

Weight: 40.00% **Score:** 3.1 **Grade:** B+

Objective Evaluation:

Business services have improved.

Objective 3.3: Provide Efficient and Effective Communications and Responsiveness to Headquarters Needs

Weight: 20.00% **Score:** 3.3 **Grade:** B+

Objective Evaluation:

Communications between PIs and ARDAP are generally good.

SC Advanced Scientific Computing Research

Thomas Jefferson National Accelerator Facility

2024 Performance Evaluation

Office of Laboratory Policy

Goal 2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operations of Research Facilities

Weight: 45.00% **Score:** 3.7 **Grade:** A-

Goal Evaluation:

ASCR commends TJNAF for developing and employing effective practices to build a strong partnership with LBNL and other stakeholders such as the site office to advance the HPDF Hub project.

Objective 2.1: Provide Effective Facility Design(s) as Required to Support Laboratory Programs (i.e., activities leading up to CD-2)

Weight: 100.00% **Score:** 3.7 **Grade:** A-

Objective Evaluation:

Since the Department's announcement of the High Performance Data Facility (HPDF) Hub Project selection in October 2023, TJNAF has consistently demonstrated effective practices to build its partnership with LBNL and to build constructive trust-based relationships with the TJSO and BSO Federal Project Directors assigned to the project. ASCR commends TJNAF for supporting the joint HPDF Hub technical team in the successful melding and deepening of ideas from the two labs' HPDF proposals into a pre-conceptual design and to the standup of an effective Integrated Project Team. ASCR is concerned about the tepid pace of progress of the TJNAF Data Center (JLDC) design, site preparation, and site power upgrade negotiations with Dominion Power. ASCR looks forward to TJNAF's leadership driving the full integration of JLDC into a holistically managed HPDF Hub project.

Notable 1: In accordance with appropriated funding levels and schedule, stand up an HPDF Hub integrated project team to design a high performance data facility hub in preparation for a successful Critical Decision 1.

Outcome: TJNAF achieved the Notable on standing up the HPDF Hub integrated project team. **- Achieved**

Goal 3.0 Provide Effective and Efficient Science and Technology Program Management

Weight: 25.00% **Score:** 3.3 **Grade:** B+

Goal Evaluation:

ASCR recognizes the lab's (from senior management to the project team) strong efforts to ensure HPDF Hub project's success. ASCR also commends TJNAF's consistent attention to detail and coordination regarding the project related communications. ASCR encourages the lab to build strong collaborations with other Labs with more-established capabilities to strengthen its responses to ASCR research funding opportunities.

Objective 3.1: Provide Effective and Efficient Strategic Planning and Stewardship of Scientific Capabilities and Program Vision

Weight: 20.00% **Score:** 3.4 **Grade:** B+

Objective Evaluation:

TJNAF continues to lead the Accelerate project to develop a novel superconducting logic with collaborators at NY CREATES, and the lab researchers seem to have done their best to make progress during the not-unexpected delays in establishing CRADAs. However, the process for establishing the CRADAs has now dragged on for nearly a year, and while seems near completion, it will be essential for the project to execute in an expedient and highly competent fashion once all CRADAs are in place and all of the needed IP can be exchanged between institutions.

TJNAF has competed for ASCR Research funding and clearly expressed an interest in building its research capabilities in areas relevant to ASCR. However, TJNAF might strengthen responses to funding opportunities by collaborating more with other Labs with more-established capabilities.

Objective 3.2: Provide Effective and Efficient Science and Technology Project/Program/Facilities Management

Weight: 30.00% **Score:** 3.7 **Grade:** A-

Objective Evaluation:

ASCR recognizes the lab management's strong efforts to ensure HPDF Hub project's success.

Objective 3.3: Provide Efficient and Effective Communications and Responsiveness to Headquarters Needs

Weight: 50.00% **Score:** 3.1 **Grade:** B+

Objective Evaluation:

ASCR recognizes the HPDF project team's consistent attention to detail and coordination regarding HPDF project communications. ASCR commends the HPDF project team for moving with appropriate pace and progress to stand up of the hpdf.science web presence, to undertake community webinars, engage with key stakeholders, and co-organize and co-facilitate the July 2024 IRI/HPDF Coordination Kickoff meeting.

Notable 1: Ensure that all communications related to the HPDF Hub project, including the project and the Departmental cross-cut Integrated Research Infrastructure program, are aligned with DOE/ASCR goals, strategies, and guidance.

Outcome: TJNAF achieved the Notable on communications regarding the HPDF Hub project. **- Achieved**

Notable 2: Ensure that all communications related to Artificial Intelligence between the lab and SC, DOE, vendors, the Administration and Congress are aligned with DOE/ASCR goals, strategies and guidance.

Outcome: TJNAF achieved the Notable regarding AI communications. **- Achieved**

SC Basic Energy Sciences

Thomas Jefferson National Accelerator Facility

2024 Performance Evaluation

Office of Laboratory Policy

Goal 2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operations of Research Facilities

Weight: 45.00% **Score:** 2.5 **Grade:** B-

Goal Evaluation:

TJNAF was an excellent partner to the Proton Power Upgrade (PPU) project.

TJNAF failed to meet its cryomodule delivery schedule to SLAC due to challenges in production and acceptance testing.

Objective 2.1: Provide Effective Facility Design(s) as Required to Support Laboratory Programs (i.e., activities leading up to CD-2)

Weight: 100.00% **Score:** 2.5 **Grade:** B-

Objective Evaluation:

TJNAF continued its partnership with SLAC to provide assembly and testing of cavities and cryomodules for the LCLS-II-HE project. However, the lab faced significant challenges with the LCLS-II-HE cryomodule production and testing, failing to meet the delivery schedule to SLAC. Cryomodule production resumed after addressing workmanship and quality control deficiencies, but challenges remained with acceptance testing due to a safety pause late in FY 2024.

Notable 1: Effectively manage and safely execute the assigned LCLS-II-HE project scope in accordance with DOE Order 413.3B. Performance will be assessed based on the assigned project management responsibilities and cryomodule work planned and accomplished during FY 2024

Outcome: TJNAF has not been able to meet the cryomodule delivery schedule to SLAC (LCLS-II-HE project) due to shutdowns and technical difficulties. In 1Q FY 2024, work was halted at several assembly stations when two cryomodules failed the acceptance tests due to discovery of leaks and components overheating. In coordination with SLAC, TJNAF completed the root cause analysis that pointed to workmanship issues during assembly and inadequate oversight and quality control. TJNAF was able to resolve the issues through tailored workshops and enhancing its work planning and control process. After execution of the corrective measures, production was resumed by November 2023. However, the rate of cryomodule acceptance was also reduced due to a safety pause initiated in July 2024, further compounded by scheduled maintenance tied to the operations of CEBAF. Taken together, the lab was unable to meet its cryomodule delivery obligations. **- Not Achieved**

SC Nuclear Physics

Thomas Jefferson National Accelerator Facility

2024 Performance Evaluation

Office of Laboratory Policy

Goal 1.0 Provide for Efficient and Effective Mission Accomplishment

Weight: 30.00% **Score:** 3.6 **Grade:** A-

Goal Evaluation:

TJNAF staff continued to have significant leadership on the science for the future Electron-Ion Collider (EIC) and the requirements for its baseline ePIC detector.

Continued and effective TJNAF support of high priority current and future experiments at CEBAF and related theoretical scope is notable.

Accomplishments in accelerator physics demonstrated the expertise and innovation of TJNAF staff.

TJNAF staff made impactful contributions to a range of activities in computational physics.

Objective 1.1: Provide Science and Technology Results with Meaningful Impact on the Field

Weight: 50.00% **Score:** 3.5 **Grade:** A-

Objective Evaluation:

TJNAF scientific accomplishments in nuclear physics included determination of the gluonic mass radius within the proton from the gluonic gravitational form factors; measurements using the CEBAF Large Acceptance Spectrometer (CLAS) to define the strong force at an unprecedented scale; a new theoretical description of the emergence of a pair of correlated hadrons from high-energy collisions; global QCD analysis of dihadron production for a comprehensive set of world data to demonstrate the universal nature of transversity distributions and tensor charges of the nucleon for the first time; and determination of scalar and tensor resonances in charmonium from coupled-channel scattering using Lattice QCD to find that, contrary to several other studies, only a single resonance in each is required.

TJNAF nuclear physics instrumentation research demonstrated a longer lifetime photocathode with "robust" chemistry; fabrication of the first multi-cell niobium cavity with a conduction-cooling niobium ring; design of a high-power target for positron beam generation; and understanding of the impact of superconducting radiofrequency (SRF) surface topology SRF cavity performance.

There is excellent engagement between TJNAF nuclear theorists and the CEBAF experimental community. The group is encouraged to continue measured efforts to venture beyond these traditional engagements and pursue higher risk activities of importance to the broader nuclear theory community.

TJNAF scientists publish in leading peer-reviewed journals and make invited and contributed presentations at national and international meetings. According to the Laboratory, the number of peer reviewed publications by TJNAF staff in nuclear physics related research in FY 2024 totaled 98 with 185 invited talks. There were 27 theses

based on research activities at TJNAF during FY 2024. This year, TJNAF staff took lead roles in organizing and hosting 24 workshops and meetings.

Objective 1.2: Provide Quality Leadership in Science and Technology that Advances Community Goals and DOE Mission Goals

Weight: 50.00% **Score:** 3.6 **Grade:** A-

Objective Evaluation:

TJNAF scientists led the development of in-situ cryomodule plasma processing. The successful implementation of plasma processing for four C100 cryomodules is being extended to other cryomodule types. The method will have a positive impact for other SC accelerator laboratories.

Core capabilities at TJNAF in superconducting radiofrequency (SRF) technology continued to be a valued, high demand resource across the DOE complex.

TJNAF leads the Lattice QCD Collaboration for the Scientific Discovery Through Advanced Computing program. Members of the TJNAF nuclear theory group continued to lead the Nuclear Physics Lattice QCD Initiative. A five-year plan was panel reviewed and generated constructive feedback.

TJNAF co-organized and hosted the Workshop on Software Infrastructure for Advanced Nuclear Physics Computing. The Information Technology Division and the lattice QCD research staff contributed significantly to the NP computing program's strategic planning.

TJNAF has done well in engaging young scientists in research opportunities. The following workforce development statistics were reported for junior scientists: Undergraduate Students – 66; Graduate Students – 177; Postdoctoral Associates – 51. FY 2024 saw a significant jump in the number of postdocs engaged in research activities at TJNAF.

Staff at TJNAF have been appropriately recognized for their contributions through numerous awards. A scientific staff member was named a Fellow of the American Physical Society. Three staff scientists received DOE Early Career Research Awards. A graduate student completing research at TJNAF received the 2024 J.J. and Noriko Sakurai Dissertation Award sponsored by the American Physics Society. A staff scientist received the Guido Altarelli Award in experimental physics for their outstanding contributions to investigations of color transparency and other nuclear manifestations of QCD.

Goal 2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operations of Research Facilities

Weight: 45.00% **Score:** 3.4 **Grade:** B+

Goal Evaluation:

EIC met its notable outcome. The project attained Critical Decision-3A (CD-3A), Approve Long-Lead Procurement, and initiated execution of CD-3A scope. The project made good progress on preliminary engineering and design activities and provided plans and documentation in support of its progressive elaboration of the acquisition strategy for EIC in accordance with DOE Order 413.3B.

Execution of CD-3A exposed possible weaknesses in the execution of design reviews. The project team needs to capture lessons learned from these experiences to avoid similar pitfalls.

EIC reached agreement with New York State to secure a $100 million grant for conventional construction. The project realized its first international in-kind funding commitment from the United Kingdom (UK) and continued making steady progress in soliciting international and domestic contributions.

The MOLLER MIE successfully supported a baseline and execution review in October 2023 and, after addressing recommendations related to baseline, achieved CD-2/3 approval in May 2024.

CEBAF met its performance measurement goal for planned hours in FY 2024, delivering 3,809 hours of beam operations with a reliability of 76%. Reliability of CEBAF operations remains a concern.

TJNAF continues to execute high impact, world class science experiments at CEBAF. The scientific user community is highly productive and has continued to publish significant results.

Objective 2.1: Provide Effective Facility Design(s) as Required to Support Laboratory Programs (i.e., activities leading up to CD-2)

Weight: 20.00% **Score:** 3.4 **Grade:** B+

Objective Evaluation:

The Electron-Ion Collider (EIC) underwent an independent project review in November 2023, where the panel had a favorable impression of the project's status and readiness to proceed with the proposed long-lead procurements. This successful outcome positioned the project well for both technical risk mitigation and timely expenditure of Inflation Reduction Act funds.

The orderly rush to conduct component design reviews in advance of the Critical Decision-3A (CD-3A) long-lead procurement overlooked the fabricability of the 591 MHz superconducting cavity first article and the prevailing market for beam screen material. The former now requires redesign while the latter requires additional scope. Recovery will absorb schedule and cost contingency for the baselined CD-3A scope. It is important that the project team captures lessons from these early missteps and shares the lessons to avoid similar pitfalls as design and procurement activities advance.

The EIC project ended the year with significant new uncertainty concerning previously established aspects of the accelerator. The project team introduced this year these scope options that await resolution. This uncertainty has potential schedule, cost, and performance impacts that remain undefined. While appropriate to introduce this uncertainty during the current life cycle phase, it should come with a time-based plan for resolving that uncertainty.

The MOLLER MIE successfully supported a baseline and execution review in October 2023 and, after addressing recommendations related to baseline, received CD-2/3 approval in May 2024. Overall, the process of addressing the review recommendations was slow. Even though the MIE had deployed earned value management (EVM) data analysis with their CD-3A scope, establishing the performance baseline for the full MIE took longer than the team and NP anticipated. The release of EVM data has not met the timeline established in the system description. EVM data delays have been reduced in the following months Timely submission of this accounting is expected in future months.

The schedule performance index (SPI) for MOLLER baselined CD-3A scope was less than 0.9 through June 2024. The project team was initially challenged with preparing final designs for procurement packages across all CD-3A scope. In FY 2024, the lag in SPI was mainly attributed to poor performance by a subcontractor. The project team managed to implement mitigations, and the SPI has slowly recovered.

The execution of MOLLER scope has been impeded by safety issues. Laboratory-wide shortfalls in managing hazardous energy conditions resulted in a long safety pause requiring the retraining of staff in lock-out, tag-out. The full implications on the MOLLER baseline schedule are unknown, but it is likely no less than the two-month duration of the safety pause. A failure of a bellows during acceptance testing has led to delays in testing vacuum components. It is important that appropriate corrective and preventatives measures are taken, and their effectiveness assessed to ensure the wellbeing of staff and protection of equipment.

Notable 1: Within available funding, effectively manage the Electron-Ion Collider project in accordance with DOE Order 413.3B to safely deliver the project scope, including preliminary engineering design activities, preparation for a long-lead procurement Critical Decision, and execution of the long-lead procurement.

Outcome: The notable was met. The project attained Critical Decision-3A (CD-3A), Approve Long-Lead Procurement, and initiated execution of CD-3A scope. The project made good progress on preliminary engineering and design activities and provided plans and documentation in support of its progressive elaboration of the acquisition strategy for EIC in accordance with DOE Order 413.3B. **- Achieved**

Objective 2.3: Provide Efficient and Effective Operation of Facilities

Weight: 65.00% **Score:** 3.4 **Grade:** B+

Objective Evaluation:

CEBAF delivered 3,809 hours of beam operations in FY 2024 with a reliability of 76%. The delivered hours exceeded the planned goal of 3,243 hours, but reliability remains short of 80%.

There continued to be evidence of a lack of a safety-minded culture at CEBAF. The start of the scheduled accelerator downtime (SAD) began with a safety stand down due to issues regarding hazardous energy control observed during a PROactive review. The response was to retrain and recertify the workforce, which delayed the start of shutdown activities. The impact of the delay on the planned FY 2025 operations and MOLLER project schedules is not fully understood.

The CEBAF operations authorization process is well defined and follows DOE O 420.2C. Operations communications has been timely and effective. Operations activities are informed by detailed, short-term and high-level, long-term experimental schedules.

During the FY 2024 Operations Review of CEBAF, staff had difficulty articulating the reliability of the operations of the experimental halls in response to committee queries. The recommendation to develop a common set of comparable availability statistics for the experimental facilities and accelerator in terms of operating hours, uptime, etc. should help improve representations made on facility availability.

Funding of the CEBAF Performance Plan (CPP) is derived from facility operations and its management is not directly visible from the lab's organization structure and its financial work breakdown structure (WBS). CPP is not being managed as a formal project, and there is limited visibility on its execution and risk mitigation.

The CPP scope covering critical spares and additional weeks has been completed, but cryomodule refurbishment remains behind schedule. CPP delays were driven by budget priorities and technical constraints; however, the CPP needs to be refocused on sustainable gradient recovery. In situ plasma processing of C100 cryomodules was implemented during the FY 2023 SAD, and the processed cryomodules have experienced only limited gradient degradation during FY 2024 operations. Plasma processing capabilities should be strengthened as a cost-effective way toward gradient maintenance.

The availability of a critical spare vacuum chamber made the recovery from a beam burn-through incident take a week rather than a month if a new chamber had to have been fabricated.

CEBAF has implemented an operation condition where up to 4-6 RF trips per hour is acceptable. Maintaining an RF trip rate of 4-6 trips per hour will limit any gains of reliability. A reduced trip rate and/or recovery time should be considered, especially when the beam energy better meets scientific needs.

The CEBAF Accelerator Configuration Control employing the Central Element Database and its applications is commended. Reduced availability in FY 2024 was partially attributed to a misplaced e-gun laser shutter, which should have been caught by the configuration control.

CEBAF management took several actions to strengthen the operations group. A day-to-day schedule manager was hired, along with additional operators to ensure appropriate coverage in cases of staff situations such as illness or departures.

TJNAF makes appropriate use of a Program Advisory Committee (PAC), a best practice at scientific user facilities, to assess and recommend experiments for beam time. The PAC has established four recommendation categories for proposals: approved, conditionally approved, deferred, and rejected. The 52nd PAC meeting held in July 2024 considered 33 submissions, of which 12 were new proposals, 3 were approved or conditionally approved experiments requesting additional considerations, 6 were jeopardy proposals, and 11 were letters of intent. The PAC granted approval to 8 of the new proposals and confirmed its support for 5 of the jeopardy proposals, moving one to conditionally approved. The recommended actions by the PAC are being responsibly acted on by TJNAF leadership to execute a high-quality science discovery program at CEBAF.

Objective 2.4: Utilization of Facility(ies) to Provide Impactful S&T Results and Benefits to External User Communities

Weight: 15.00% **Score:** 3.6 **Grade:** A-

Objective Evaluation:

TJNAF has a highly engaged user community, the Jefferson Lab Users Organization (JLUO), which has over 1,900 members. TJNAF leadership interacted effectively with JLUO through its Executive Committee. Executive Committee members are active on TJNAF advisory committees including the Program Advisory Committee, the DEIA council, and the Space and Renovation committee. A total of 37 peer-reviewed publications based on research at CEBAF were realized in FY 2024, on par with last year's output.

TJNAF continued to execute high impact, world class science experiments at CEBAF. The scientific user community was productive and continued to publish significant results. The scientific interest in the facility remains strong, sustained by new research proposals submitted to the Jefferson Lab (PAC) this year.

The EIC Advisory Board recommended the formation of an Accelerator Collaboration, and an event held during the International Particle Accelerator Conference received enthusiastic support for this new endeavor. The Accelerator Collaboration is a positive step to keep the national and international accelerator communities engaged in EIC.

Two in-person meetings of the EIC RRB took place in FY 2024, including a meeting hosted in Rome by the National Institute for Nuclear Physics in Italy, where initial planning for EIC computing, outreach, and ePIC support were presented. It is important that EIC leadership appropriately and effectively communicate that the EIC as a future SC user facility will be a shared resource for the scientific community, with access determined on a competitive basis

using peer review, and that user fees are not charged for non-proprietary work if the user intends to publish the research results in the open literature.

Scientists in the UK received notification that their proposal to contribute to the EIC accelerator and detector scope was recommended for award at a planned funding level of £58.8 million. Realization of the first international in-kind contribution is an important milestone for the project, and when combined with intentions from other international partners puts the project on track to meet its in-kind goals.

TJNAF has a historically strong record in education and outreach, and the laboratory continued these outstanding efforts in FY 2024 to reach pre-college students, undergraduates, and increase science literacy. TJNAF hosted activities for teachers and students in the Hampton Roads region: the Jefferson Lab Science Activities for Teachers (JSAT) and the Becoming Enthusiastic About Math and Science (BEAMS) programs, supporting 5th, 6th, and 8th grade students and teachers in the sciences. In FY 2024, 49 teachers and 1,039 students participated. TJNAF hosted the Jefferson Lab High School Summer Honors Program, and the Jefferson Lab Mentorship Program, and the Virginia Summer Residential Governor's Mentorship in Engineering program. Combined, these programs brought 31 summer students to the laboratory in FY 2024. TJNAF hosted the DOE-funded regional science bowl, with 132 middle school students participating in FY 2024. In FY 2024, TJNAF hosted 27 Science Undergraduate Laboratory Interns, and 10 students participated in the Research Experience for Undergraduates. TJNAF hosted two students through the Community College Internship program. TJNAF also hosted the Hampton University Graduate Studies summer school and the Virginia Physics Consortium. Jefferson Science Associates funded several Lab Graduate Fellowships during the FY 2024 academic year.

TJNAF is prolific in producing news features and press releases, keeping the community well informed on activities at the laboratory. The laboratory published five science highlights again in FY 2024.

Goal 3.0 Provide Effective and Efficient Science and Technology Program Management

Weight: 25.00% **Score:** 3.5 **Grade:** A-

Goal Evaluation:

TJNAF has a well-defined strategic planning process to inform annual planning and maintain core capabilities. The laboratory's mission is well aligned with NP's mission, and laboratory leadership effectively communicated their strategic vision with stakeholders.

TJNAF continued to struggle with establishing an appropriate safety culture. The laboratory needs to develop a program to continually assess the effectiveness of corrective actions as well as follow up on any subsequent preventative actions to prevent recurrence. Implementation of the new work planning system was a challenge and would have benefited from the utilization of proper change management.

The process TJNAF uses to optimize operations is not transparent and appears to not well account for the dynamic nature of year-to-year incremental operating costs. TJNAF leadership should develop a revised staffing plan for facility operations that considers the necessary staff to appropriately address work planning and control, control of hazardous energy, and safety in general.

Electron-Ion Collider project leadership needs to improve the efficiency and effectiveness of how they communicate with each other, with members of the integrated project team, and with level 2 control account managers.

Management of the MOLLER MIE has been effective at reaching CD-2/3. However, the slow response to review recommendations to reach CD-2/3, the slow timeline to baselining, and the delays in reporting EVM data were disappointing.

Objective 3.1: Provide Effective and Efficient Strategic Planning and Stewardship of Scientific Capabilities and Program Vision

Weight: 30.00% **Score:** 3.5 **Grade:** A-

Objective Evaluation:

TJNAF has a well-structured planning process, connecting the laboratory's vision and mission with the laboratory's annual plan, departmental plans, and agenda (including LDRD). The four major pillars that drive their scientific strategies are in nuclear physics, accelerator science and technology, its partnership on the EIC project, and computational science and technology. The vision and mission are well aligned with the NP mission.

TJNAF has established a vision for nuclear physics at CEBAF that includes 5-7 Year Goals. Achievement of these goals should be aligned within realistic budget targets.

TJNAF continued to struggle with establishing an appropriate safety culture. Processes are in place whereby hazards are identified, analyzed, and appropriately mitigated, but the effectiveness of these processes is questionable. Recent shortfalls in hazardous energy control points to a need for the Laboratory to develop a program to continually assess the effectiveness of corrective actions as well as follow up on any subsequent preventative actions that result from safety stand downs to prevent recurrence in the future.

Roles and responsibilities for CEBAF facility operations are well defined at the department leader level, although the tie to CEBAF facility operations is sometimes implied rather than explicitly stated. The accountability for CEBAF facility operations is not clear from the high-level organizational chart, and the reporting lines of the division directors to the directorate are not clear.

The process TJNAF uses to optimize operations is not transparent and appears to not well account for the dynamic nature of year-to-year incremental operating costs. Risks associated with CEBAF operations have been captured, but an introspective assessment of current staffing with anticipated future needs that would align with the goals of increasing facility reliability is needed. TJNAF leadership should reflect on the actual expenditures and work accomplishments for FY 2023 and develop a revised staffing plan for facility operations that considers the necessary staff to appropriately address work planning and control, control of hazardous energy, and safety in general. One-level depth in several key technical areas has been reported and succession planning and cross-training of additional staff are encouraged.

The priority among CPP, capital equipment (CE), AIP, and accelerator R&D has been dynamic from successive presentations to NP at the annual laboratory management budget briefings (LMBBs). For instance, CPP with spare C100 cryomodule was at the highest priority presented to NP at the LMBB held in 2022, yet R&D related to the proposed 22 GeV upgrade of CEBAF became the highest priority in later years. It is not clear whether these changes are guided by a systematic approach with periodic merit-based reviews and harmonized with the science program. While this approach allows for agility in addressing changes, it also bears the risk of inconsistency and potential loss of efficiency.

TJNAF nuclear theory researchers lack a strategic vision whereby staff could lead theory core-competencies nationwide. They currently relies heavily on joint appointments. While collaborations are encouraged, it is

imperative that the group develop plans that would help the staff lead in core competency scope while also considering recommendations from past comparative reviews. Capitalizing on TJNAF's strategic location to recruit and retain theorists, leveraged by DOE competitive initiatives and funding opportunities, could be part of a recruitment strategy that could be used to leverage the resources needed for a successful implementation. Modest investments in early career staff recruitment and development have been made, but a long-term strategy for sustainability guided by funding realities should be considered.

Discussions with the TJNAF management regarding the proposed SoLID MIE showed a strategic vision for research that was not properly integrated with the planning of funding and personnel resources to achieve the technical goals. Mention of redirection of operations funds to advance SoLID did not align with documentation provided by TJNAF at their LMBB.

TJNAF joined BNL in a series of EIC dependencies reviews for the accelerator, detector, and host laboratory to clarify the off-project scope and the activities needed to prepare and execute work necessary for a successful EIC. While these are valuable discussions, the pathway to identify and document all scope in a comprehensive and trackable way remains unclear.

The EIC Project Director held a strategy workshop that included the chairs of relevant EIC advisory committees and boards, the spokespersons of the ePIC collaborations, and the directors of other SC projects of similar complexity to EIC. The workshop focused on plans for delivering the EIC facility and securing an early science program and should be valuable to the project in progressively elaborating its acquisition strategy.

Objective 3.2: Provide Effective and Efficient Science and Technology Project/Program/Facilities Management

Weight: 40.00% **Score:** 3.5 **Grade:** A-

Objective Evaluation:

Implementation of the new work planning system was seen by TJNAF management as an answer to address past safety shortfalls. However, implementation of the Electronic Permit Administration System (ePAS) did not go smoothly. Utilizing proper change management techniques with appropriate support and established milestones may have better served the laboratory by ensuring stakeholders found value in the system at the start of implementation.

While the CPP and contemporaneous implementation of in-situ plasma processing has mitigated further CEBAF energy degradation, the pathway to realize improvement in energy reach remains unclear. The effectiveness of refurbishing SRF cavities in preventing electron beam energy degradation remains inconclusive. The outlook for CPP to extend the electron beam energy from approximately 11 GeV to 12 GeV is uncertain. Current evidence suggests that the levels of availability and beam energy achieved in previous years are likely to persist in the coming years, regardless of whether the effort remains constant or the budget is optimized. The cost and effort required to achieve this marginal increase in energy by pushing CEBAF to its limits might not be worth the potential scientific gains.

Of concern is the use of CEBAF operations funds to support the creation of a scientific research group focused on the Electron-Ion Collider (EIC). This is an inappropriate stewardship of operations funds that undermines transparency and accounting for facility operations budget that was only revealed to the NP Facilities and Project Management Division during the FY 2024 Operations Review . The Medium Energy Program and its research proposal, which included EIC scope, was reviewed in 2023 by a different committee. While TJNAF management was aware of the outcome of the earlier review, it has proceeded without approval from the cognizant NP research program.

TJNAF management responded positively to the NP Medium Energy 2023 Laboratory Comparative Review through two encouraging action items. Management conducted a self-assessment to better define research activities and operational responsibilities with a preliminary definition set as a notable outcome. The second action is described in the specific milestone "Research Structure Development" which was incorporated in the full research plan. Further dialogue with NP should continue regarding a fully developed research plan.

TJNAF's management of the Lattice QCD hardware system is efficient and provides an important service to the NP and HEP lattice QCD research communities.

Leadership in the Computational Science and Technology Division (CST) is applauded for taking a positive step in recognizing the need for data management and is starting to hire data experts to fill this needed skill gap. However, the TJNAF Data Management Plan that outlines a researcher's data responsibilities was last revised three years ago and is likely outdated. The Laboratory should review the CEBAF data architecture (how data flows through the different systems), assess potential security issues, and appropriately capture identified risks in the CEBAF operations risk register.

EIC project leadership needs to improve the efficiency and effectiveness of how they communicate with each other, with members of the integrated project team, and with level 2 control account managers. Weekly project meeting agenda topics and assigned speakers do not reflect current activities or who plans to attend or miss meetings. Shared discussion among leadership has demonstrated a lack of cohesiveness and unified purpose.

The completed New York State $100 million grant for conventional facilities and prospective further in-kind contributions to the EIC project remain a relatively small portion, from a funding perspective, of the estimated project cost, but solicitation and document preparation activities absorbed a disproportionate amount of the project leadership's time.

The EIC project effectively used a database for its schedule. However, the project has not deployed an integrated system for cataloging requirements, linking requirements to scope, detailing the attributes of scope, and attributing scope to funding sources, which has led to inefficient planning and communication within and external to the project team.

The reorganization of the CEBAF-operations-focused engineering groups from the Engineering Division to the Accelerator Division during FY 2024 was a commendable decision. It achieves greater alignment between the line management and organizational responsibilities.

Management of the MOLLER MIE has been effective at reaching CD-2/3 in FY 2024 as planned. However, the slow response to review recommendations to reach CD-2/3, the slow timeline to baselining, and the delay and failure of the project to meet their own timeline for reporting EVM data in the first two months of that commitment has been disappointing.

The MOLLER MIE recently experienced an equipment test failure with bellows 4 that was investigated as a safety event. The response to this event has been managed well and a final report is expected soon.

TJNAF provided roughly $2.4 million in Laboratory Directed Research and Development investments across 10 projects in FY2024, including five new projects that look to expand the laboratory's efforts in future accelerator and experimental capabilities at CEBAF, data acquisition capabilities, and advanced detector R&D.

Objective 3.3: Provide Efficient and Effective Communications and Responsiveness to Headquarters Needs

Weight: 30.00% **Score:** 3.4 **Grade:** B+

Objective Evaluation:

Monthly progress reports covering the EIC project have followed aspects of the guidance provided by NP, such the status of scope elements, but for other aspects, like the highlights and finances sections, the project team has not followed the guidance resulting in the project missing opportunities to promote key accomplishments and demonstrate fiscal responsibility. Monthly project reports give the impression that any activity shared and claimed to support the project belongs in the report.

Monthly meetings on CEBAF operations are good with honest assessments of challenges and progress both in the accelerator and the experimental halls. Recent inclusion of the experimental support leads has provided additional insight into experimental support activities.

TJNAF scientists who received awards in response to accelerator R&D and artificial intelligence and machine learning (AI/MI) targeted funding opportunities provided timely and comprehensive updates to the relevant NP program managers. These TJNAF scientists attended and actively engaged in the annual NP Principal Investigator (PI) exchange meetings, effectively showcasing their work to the NP community and NP and SC program managers.

Communications and responsiveness have improved between the Experimental Nuclear Physics Division Associate Director and the relevant NP physics research division program manager. Quarterly briefings are now scheduled. Further improvement in communication and obtaining approvals is necessary to ensure appropriate use of research funds.

The Information Technology Division and the Lattice QCD SciDAC collaboration PIs were responsive to requests from the relevant NP program manager, and actively engaged in PI exchange meetings. They also contributed significantly to discussions about the AI/ML in nuclear physics research.

The Nuclear Theory group leader met quarterly the relevant NP program manager. The group leader was receptive to recommendations from last year's comparative review.

Communication from MOLLER MIE management has been thorough and timely in monthly meetings and calls. The team raised risks in a proactive manner. However, when risks have been realized, such as in the bellows incident, or the MIT Bates negotiations, full details on the issues and potential impacts were not immediately revealed. Bluntness is preferred. MOLLER leadership has already shown improvement in this respect.

The medium energy section of the TJNAF annual progress report did not meet expectations. Including duplicated text from the response to last year's comparative review in the progress report is not appropriate and should not be done in future annual reporting.

The nuclear theory section of the TJNAF annual progress showed improvement in terms of budget descriptions, assigned responsibilities, and communication, but fell short in the reporting of publications and associated accomplishments. Accomplishment in the annual progress report were duplicated in reports by faculty for their university awards. Highlighting synergistic research is appropriate, but clear attribution and delineation of funded scope is critical.

SC Workforce Development for Teachers and Scientists

Thomas Jefferson National Accelerator Facility

2024 Performance Evaluation

Office of Laboratory Policy

Goal 1.0 Provide for Efficient and Effective Mission Accomplishment

Weight: 75.00% **Score:** 3.1 **Grade:** B+

Goal Evaluation:

The laboratory executes WDTS sponsored programs in support of the SC/DOE STEM workforce mission in manners that barely meet expectations, with areas of improvement.

The laboratory is commended for effectively responding to the FY23 recommendations of increasing the participation in WDTS programs. Compared to the past year, the overall participation in WDTS programs has shown significant increase, especially in SULI. The laboratory is encouraged to continue the trajectory of increasing the participation in CCI, VFP, and SCGSR.

The laboratory has started to develop a focused outreach strategy to recruit more applicants to WDTS-sponsored programs through the Quark Quest Mini Semester: STEM Pathways to Jefferson Lab WDTS Programs. The laboratory is commended for collaborating with BNL to secure a new award for WDTS RENEW Pathway Summer School for students.

Objective 1.1: Provide Science and Technology Results with Meaningful Impact on the Field

Weight: 80.00% **Score:** 3.1 **Grade:** B+

Objective Evaluation:

The Laboratory has made considerable improvement toward achieving WDTS programmatic expectation of executing the workforce training programs to deliver quality training experiences for students and faculty across the complex.

Objective 1.2: Provide Quality Leadership in Science and Technology that Advances Community Goals and DOE Mission Goals

Weight: 20.00% **Score:** 3.2 **Grade:** B+

Objective Evaluation:

The Laboratory is commended for identifying, recruiting, and training research/technical staff that serve as mentors/advisors for WDTS program participants.

Goal 3.0 Provide Effective and Efficient Science and Technology Program Management

Weight: 25.00% **Score:** 3.4 **Grade:** B+

Goal Evaluation:

The laboratory actively seek student and faculty participants for placement in hands-on learning and authentic research experience opportunities, helping ensure that DOE has a sustained, highly skilled talent pool for a future DOE science and technology workforce.

Objective 3.1: Provide Effective and Efficient Strategic Planning and Stewardship of Scientific Capabilities and Program Vision

Weight: 20.00% **Score:** 3.1 **Grade:** B+

Objective Evaluation:

The Laboratory has started to develop a focused outreach strategy for recruiting a more participants and increase diverse, inclusive applicant and participant pool to WDTS sponsored programs. The laboratory is encouraged to continue the effort.

Objective 3.2: Provide Effective and Efficient Science and Technology Project/Program/Facilities Management

Weight: 50.00% **Score:** 3.4 **Grade:** B+

Objective Evaluation:

Laboratory staff leading the execution of WDTS sponsored programs are commended for their responsiveness to programmatic direction and willingness to share with other labs on management experience.

Objective 3.3: Provide Efficient and Effective Communications and Responsiveness to Headquarters Needs

Weight: 30.00% **Score:** 3.5 **Grade:** A-

Objective Evaluation:

Laboratory staff leading the execution of WDTS sponsored programs are commended for their responsiveness to headquarters inquiries and requests.