



Department of Energy
 National Nuclear Security Administration
 Washington DC 20585

OFFICE OF THE ADMINISTRATOR

December 4, 2018

MEMORANDUM FOR JEFFREY P. HARRELL
 MANAGER
 SANDIA FIELD OFFICE



FROM: WILLIAM I. WHITE
 ASSOCIATE PRINCIPAL DEPUTY ADMINISTRATOR

SUBJECT: National Technology and Engineering Solutions of Sandia, LLC
 (NTESS) DE-NA0003525 Fiscal Year 2017-2018 Final Award Fee
 Determination

The National Nuclear Security Administration (NNSA) has completed its assessment of NTESS' performance of the contract requirements for the period of May 1, 2017, through September 30, 2018, as evaluated against the Leadership Performance Based Approach defined in the Performance Evaluation and Measurement Plan (PEMP). Based on assessments provided in the NNSA Performance Evaluation Report, the award fee amount is as follows:

	<u>At Risk %</u>	<u>Available</u>	<u>Final</u>	<u>Percent</u>
Leadership	100%	\$8,299,167	\$7,552,242	91%

In addition, the fixed fee and total fee summaries are provided below for your information:

Fixed Fee	\$20,738,750	\$20,738,750
SPP (Fixed Fee)	\$13,369,206	\$13,369,206
Total Fixed Fee	\$34,107,956	\$34,107,956
Total Summary	\$42,407,123	\$41,660,198





National Nuclear Security
Administration

National Technology &
Engineering Solutions of Sandia
Performance Evaluation Report
(PER)

NNSA Sandia Field Office

Evaluation Period:
May 1, 2017 – September 30, 2018

December 3, 2018

This Performance Evaluation Report (PER) provides the assessment of National Technology & Engineering Solutions of Sandia, LLC (NTESS) performance in meeting contract requirements for the period of May 1, 2017-September 30, 2018, as evaluated in accordance with the Fiscal Year 2017-2018 Department of Energy (DOE)/National Nuclear Security Administration (NNSA) Strategic Performance Evaluation and Measurement Plan (PEMP). NNSA used a leadership performance-based approach that entailed evaluating NTESS' performance in strategically partnering with DOE/NNSA and demonstrating leadership success in achieving positive results through a set of seven performance elements, as described in the contract clause B-7 Leadership Performance Evaluation. NNSA took into consideration all input provided from NTESS and NNSA Program and Functional Offices.

NTESS earned an Excellent rating during this performance period. While experiencing a high level of difficulty associated with assuming the new Sandia National Laboratories contract, NTESS strategically partnered with DOE/NNSA and demonstrated outstanding leadership, achieving many significant accomplishments that significantly outweigh performance issues. NTESS achieved positive results in all seven performance elements as documented in the following sections.

(a) Achieving site mission deliverables while supporting and enabling the overall DOE/NNSA mission.

In achieving site mission deliverables, NTESS achieved many significant accomplishments and experienced several issues.

Overall, NTESS executed its Nuclear Weapons (NW) modernization program, stockpile stewardship mission, and Weapons Science and Technology (WS&T), successfully completing 148 of 150 FY18 NW Level 2 milestones. NTESS successfully delivered Nonproliferation and Counterterrorism technical solutions, which enhanced radiological detection, material security, and national preparedness. NTESS successfully advanced applied energy and science technologies to meet national energy security priorities and challenges.

Accomplishments:

NTESS fully engaged with the Kansas City National Security Campus (KCNSC) Production Agency and detailed numerous NTESS staff to KCNSC in response to NNSA direction. For example, NTESS verified Commercial-Off-The-Shelf parts, resolved nonconformance reports, issued Conditional Qualification Evaluation Releases (QERs), and established Tiger Team reviews. NTESS' actions resulted in program risk reduction and produced a limited amount of schedule recovery for the B61-12 Life Extension Program (LEP) and W88 ALT 370 First Production Units (FPUs).

In response to technical and production challenges at KCNSC, NTESS recognized a shortfall in Power Assembly Production capabilities and worked with KCNSC to develop a transition plan for moving the production responsibilities to the Sandia National Laboratories (SNL). NTESS also effectively managed production responsibilities for multiple weapon system components, including custom electronics, explosive devices, neutron generators (NGs), and batteries. These actions mitigated external vendor risks and reduced the B61-12 and W88 ALT 370 program risks.

NTESS successfully released multiple QERs for Major Components for the B61-12 and W88 ALT 370 programs, which enabled the timely completion of component FPUs. This achievement marks the first Major Component FPUs for these programs and is noteworthy since several of the components were on schedule recovery plans.

NTESS successfully executed W80-4 LEP commitments on schedule while proactively addressing fiscal challenges and programmatic constraints that included an extended continuing resolution and multiple NNSA LEPs. NTESS submitted Weapons and Design Cost Report deliverables that aligned with existing modernization program profiles, and advanced design options and definition. NTESS initiated an enterprise-wide effort to resolve schedule challenges to preserve a 2025 FPU. NTESS' extensive interactions with two competing United States Air Force missile contractors supported seamless warhead-to-missile interface integration.

NTESS successfully managed stockpile sustainment work in accordance with NNSA-mandated performance, schedule, and cost requirements. NTESS successfully assessed the safety, reliability, and performance of each nuclear weapon type in the U.S. stockpile and completed all Annual Assessment deliverables. NTESS performed well in executing nuclear stockpile system mission work with on schedule weapon surveillance, maintenance, disposition, and limited-life component deliveries per the Defense Programs (DP) FY18 Getting the Job Done List (GTJDL). Significant accomplishments included: achieving the W80 Alt 369 System FPU ahead of schedule; maintaining the W80 warhead refurbishment delivery schedule while addressing a potential component issue; completing a NG QER ahead of schedule; selecting the new W76 JTA3 design; and positively responding to critical Integrated Surety Architecture (ISA) taskings.

NTESS made several other major advancements in WS&T experimental capabilities to provide weapon component testing in higher fidelity conditions and obtain enhanced data to provide increased assurance in validated computational models. NTESS completed considerable work supporting development of the Advanced Sources and Detectors Project CD-1 package. NTESS led a Tri-Lab Team to acquire the Arm-based Vanguard-Astra advanced architecture high-performance computing (HPC) system, which will enable NNSA to evaluate the feasibility of emerging HPC architectures. NTESS contributed to the completion of CD-4 for the large-scale Trinity computing platform in support of Annual Assessment computing needs.

NTESS seamlessly transitioned multiple new technologies to the NW stockpile modernization programs. NTESS advanced NW component technologies to preserve future insertion opportunities for improving weapon performance and enhancing surety. NTESS rapidly stood up its Stockpile Responsiveness Program (SRP) capability and demonstrated national leadership for the SRP challenge problem. NTESS successfully conducted the High Operational Tempo (“HOT SHOT”) flight, which provided vital data on numerous technologies in a flight relevant environment and demonstrated the ability to enable accelerated NW component design, development, and certification.

In support of the nonproliferation research and development mission, NTESS: co-led production and delivery of the Global Burst Detector III-8 payload; completed several significant efforts under the Low Yield Nuclear Monitoring venture; and successfully deployed borehole accelerometers in support of the Source Physics Experiment. NTESS improved the design of radiation detection equipment to enhance treaty monitoring capabilities. NTESS provided outstanding support to the Dilute and Dispose Waste Program in support of the long-term Waste Isolation Pilot Plant (WIPP) Performance Analysis. NTESS advanced NNSA’s nonproliferation objectives, providing high quality subject matter expertise to support foreign engagements and train foreign partners. NTESS successfully performed radiological security site upgrades and sustainment verification.

NTESS improved its nuclear forensics capabilities while sustaining operational proficiency and deployment readiness. NTESS demonstrated technical leadership in executing nuclear threat information assessments. Additionally, NTESS provided engineering assessments of new counterterrorism tools and predictive capabilities that are used to inform national policy development efforts. NTESS added significant value to the Technology Integration Program and demonstrated concepts that enhanced the capability of the nuclear incident response mission. NTESS effectively managed the Radiological Assistance Program according to national policy. NTESS supported special requests of national importance and strengthened interagency partnerships.

NTESS maintained a national leadership role in support of DOE-sponsored programs to advance energy systems that are secure and resilient, and provided technical solutions for abundant, sustainable, and affordable energy for our nation’s overall energy security. NTESS achieved numerous accomplishments that directly align to DOE strategic goals and objectives to deliver grid modernization and resiliency, and national energy independence. NTESS’ strong science and engineering capabilities reinforced U.S. policy decisions on energy and climate priorities to safeguard and assure a sustainable energy future for the nation.

Issues:

NTESS did not execute all recovery plans per schedule for multiple components in the B61-12 LEP and W88 ALT 370 weapon systems, resulting in two missed production milestones that increased risk to the FPU schedules.

NTESS did not effectively manage technical issues associated with the manufacturing of a major semiconductor component, which negatively impacted NNSA's Defense Nuclear Nonproliferation portfolio costs and increased risk for other NNSA missions.

Safety Basis Documentation: NTESS' safety basis documentation for a new transportation container did not meet DOE orders and regulatory requirements, causing the extension of the certificate for a second time. NTESS developed and implemented a corrective action plan that is forecast to meet DOE regulatory requirements and avoid impacts to the B61-12 LEP schedule.

(b) Improving safety culture.

In improving safety culture, NTESS achieved several significant accomplishments and experienced several issues.

Accomplishments:

Leadership Promoting Safety: NTESS senior leadership routinely emphasized safety during tier accountability meetings, informing managers at all levels of current operational risks and engaging staff to be accountable for process improvement and issue resolution. Safety-related events and trends were routinely discussed and actions for resolution were assigned and tracked.

Leadership Involvement in Criticality Safety: NTESS updated its Criticality Safety Program Description Document that elevated the importance of the program by assigning executive oversight responsibilities to the Deputy Laboratories Director. In addition, NTESS now requires all designs for fissile material activities to include a review by a qualified Nuclear Criticality Safety Engineer, which exceeds DOE requirements and emphasizes safety early in the design process.

Leadership Engagement in Legacy Issues: NTESS leadership was actively engaged in identifying and addressing legacy issues at Technical Area V (TA-V) and the Tonopah Test Range (TTR), particularly in the area of Facility Management to include fire alarm maintenance and testing, Annular Core Research Reactor (ACRR) re-start, and facility maintenance coordination. NTESS leadership was also proactively engaged in efforts to replace aging infrastructure.

Benchmarking as a Learning Organization: NTESS benchmarked safety practices at Bettis Laboratory, Thomas Jefferson National Accelerator Facility, KCNSC, Pantex Plant, and the Nevada National Security Site (NNSS). NTESS reviewed the fire suppression system at the NNSS Device Assembly Facility to gain a better understanding of how a similar system may be installed in a critical experiments facility such as the Sandia Pulsed Reactor Facility. In addition, NTESS arranged an external review by Honeywell of its Advanced Science and Technology safety practices to benchmark organizational safety performance.

Improved Safety Training: NTESS made significant enhancements to its Environment, Safety, and Health (ES&H) Coordinator training and qualification program, improving support for ES&H implementation in the line organizations.

Issues:

Employee Engagement: NTESS held an initial communication forum for employees regarding a potential health and safety issue. The forum was poorly planned and coordinated, leading to unnecessary employee apprehension and confusion regarding the health and safety of the work environment.

Hazard Recognition: NTESS experienced multiple operational incidents due to inadequate recognition of hazards, which revealed a lack of controls. Several examples include electrical energy incidents at the Coyote Test Field, Thunder Range, and the Scaled Wind Farm Technology Facility. In addition, recent near-miss explosive events highlighted the need for further improvements in NTESS' explosive safety operations. Other areas associated with hazard recognition that require improvement include modeling to determine building arc flash hazards and legacy inventories for hazard materials.

(c) Maintaining critical skills and infrastructure.

In maintaining critical skills and infrastructure, NTESS achieved one accomplishment and experienced no issues.

Facility Management System: NTESS proactively implemented a new Facility Management System that provided additional facility support and coordination. This initiative allowed line organizations to focus on conducting program work.

(d) Advancing Science, Technology & Engineering (ST&E), including Laboratory Directed Research and Development (LDRD) and Tech Transfer.

In advancing ST&E, LDRD, and Tech Transfer, NTESS achieved many significant accomplishments and experienced no issues.

Accomplishments:

Overall, NTESS executed an effective research strategy to advance ST&E across all SNL mission areas. NTESS continued to sustain and construct a strong ST&E foundation, supported by its seven fundamental Research Foundations. NTESS conducted fundamental and discovery research in disciplines relevant to, and inspired by, national security. NTESS' commitment to sustaining these research foundations was evident through its investments in a diversified portfolio of strong LDRD projects, and through partnerships with other national laboratories, industry, and academia. NTESS demonstrated transformative and high-impact research results through wide-ranging peer-reviewed publications, journals,

journal covers, and invited talks. NTESS earned various awards and commendations for impactful science and engineering breakthroughs, to include five Research and Development (R&D) 100 awards and five DOE Secretary Honors. In addition, NNSA recognized NTESS for its leadership role in the NNSA Center of Excellence in Cyber Threat Intelligence.

NTESS effectively managed its LDRD program by implementing a research strategy directly aligned with mission needs, supporting nuclear deterrence, defense nuclear nonproliferation, energy security, homeland security, and broader national security missions. NTESS conducted transformative discovery science which led to significant LDRD accomplishments in a number of research areas.

NTESS successfully managed one of the largest Technology Transfer programs in the DOE and was recognized for its leadership in best practices and impactful technology transitions. NTESS successfully transferred numerous technologies to the public and private sectors by increasing the number of Cooperative Research and Development Agreements (CRADAs), Non-Federal Entity Agreements, Licensing, and Government Use Notices. NTESS received numerous awards for Technology Transfer.

(e) Operating the Laboratories effectively, efficiently, safely, and securely to meet current mission requirements and to accomplish additional Strategic Investments that enhance or develop new capabilities, address long-standing challenges, or respond to new or emerging threats.

In operating the Laboratories and accomplishing Strategic Investments, NTESS achieved many significant accomplishments and experienced several issues.

Accomplishments:

Strategic Investments: NTESS developed, enhanced, and sustained NNSA's current and future mission capabilities through its state of the art, high impact, Strategic Partnership Projects (SPP) portfolio valued at approximately \$1.2B. The SPP portfolio enabled NTESS to enhance investments in critical NNSA capability areas.

Business Operations: The Supply Chain Management Center (SCMC) recognized NTESS in FY17 for total strategic savings of \$69.1M, representing 39 percent of the SCMC total savings. NTESS achieved a strategic savings rate of 6.38 percent, exceeding its annual goal of 4 percent. For FY18, NTESS strategic savings was 8.28 percent, representing 42.6 percent of the SCMC total savings.

The Small Business Administration completed its legislatively-mandated Small Business Program Compliance Review and rated NTESS' small business subcontracting program as "Highly Successful." NTESS exceeded all five small business socioeconomic goals.¹

Cyber Security: NTESS discovered zero-day vulnerabilities (i.e., vulnerabilities not previously identified by a vendor) in Microsoft, Oracle, and IBM products through penetration testing of these products on NTESS systems. NTESS reported the vulnerabilities to the vendors, facilitating timely remediation actions for customers worldwide. NTESS also received a perfect score and an outstanding rating for the NNSA Command Cyber Readiness Inspection of the Enterprise Secure Network (ESN) Enclave.

Safeguards and Security: NTESS completed several important security improvement initiatives such as the Manzano and Vault Type Room alarm enhancement projects. These improvements decreased the number of security incidents and dependence on the protective force, achieving an estimated cost avoidance of \$2M per year.

NTESS engineered and implemented the Sandia Total Access Request Tool to streamline the clearance/badging/access control process across eight different applications and multiple database systems, enabling NTESS to reduce processing times by 35-75 percent.

NTESS improved Protective Force integration between the New Mexico and California sites by enhancing Performance Assurance testing through broadening the scope of performance tests, increasing the frequency of after-hours tests, and developing more in-depth test scenarios.

Eliminating Environmental Liabilities: NTESS identified and eliminated unneeded aging radioactive sources in Technical Area I, reducing the risk of exposure and environmental liabilities. In addition, NTESS conducted a clean-up effort on eight different sites within Technical Area III, removing over 647,060 lbs. of unneeded legacy materials such as lead and scrap metal.

Environmental Management System: NTESS continued to maintain a mature and compliant program as demonstrated by its completion of the ISO 14001:2015 recertification ahead of schedule. With its mature environmental programs, NTESS continued to demonstrate its commitment to reducing impacts to the environment. NTESS was recognized for its efforts by receiving a DOE sustainability award, six NNSA sustainability awards, and six "Gold Awards" from the Albuquerque Bernalillo County Water Utility Authority.

Disposition of Remote Handled (RH) Transuranic Waste (TRU): NTESS effectively managed the disposition of RH TRU from the Auxiliary Hot Cell Facility. While RH TRU is not currently being shipped to the Waste Isolation Pilot Project (WIPP), NTESS acquired shielded containers to repackage and dispose of approximately half of the materials as

¹ This information was not considered for the award fee because the Contract has a separate small business incentive fee.

Contact Handled TRU. NTESS remained on budget with an aggressive schedule and worked productively with the Office of Nuclear Material Integration to plan for disposal of the waste and eventual shipment to WIPP.

Issues:

Safeguards and Security: NTESS experienced an increase in Category A security incidents. NTESS leadership initiated several efforts to address this issue including the development and implementation of an accountability model, though performance improvements have yet to be realized.

Emergency Management: NTESS experienced issues with formality of operations, particularly in performance assurance (e.g., self-assessments, issues management, and performance metrics) and remote site integration with corporate practices (e.g., hazard assessments, exercise plans, training and drills). In response to a previously identified issue with DOE O 151.1D implementation, NTESS developed and implemented emergency planning documents ahead of schedule.

Reporting and Response to Safety Events: NTESS demonstrated inconsistencies in the timeliness of event reporting, fact-finding, causal analyses, and coordination with NNSA, impacting NTESS' ability to quickly determine extent of conditions, implement necessary actions, and communicate with stakeholders.

Fire Protection: NTESS experienced issues related to the implementation of the fire protection program. NTESS did not complete a fire protection program self-assessment, facility assessments, fire hazard analysis, and inspection, testing, and maintenance at the required frequencies specified in DOE Order 420.1C, *Facility Safety*. Further, NTESS continued to experience issues with providing adequate means to notify building occupants of a fire or emergency. NTESS developed corrective action plans and is making progress in addressing the issues, though some issues will require additional time, resources, and sustained management attention.

The fire alarm failures at TA-V caused a work pause, adversely impacting mission operations by delaying the ACRR restart, repackaging transuranic waste, TA-V construction, and two criticality safety training classes.

Formality and Integration of Operations: NTESS experienced a number of issues that indicate a lack of formality of operations and inadequate integration across NTESS organizations. Specific areas include: nuclear operations at TA-V; maintenance, testing, and inspection of fire alarm systems at TA-V, MESA, and SNL/CA B910; maintenance activities at TTR; and safety documentation at accelerator facilities.

(f) Resolving issues and ensuring continuous improvement internally and across the DOE/NNSA while meeting Contract requirements.

In resolving issues and ensuring continuous improvement, NTESS achieved several significant accomplishments and experienced several issues.

Accomplishments:

Leadership Approach to Systemic Issues: The NTESS senior leadership team demonstrated positive engagement with several laboratory-wide continuous improvement efforts. Through leadership prioritization, data-driven decision-making, and a cohesive Associate Laboratories Director team, NTESS addressed areas of systemic lagging performance and areas where performance was inconsistent. Several examples include: providing increased transparency, cost optimization, and accountability for direct and indirect costs by simplifying the financial model; deploying a new integrated Laboratory Policy System that significantly reduced the number of documents and pages in the system, increased usability, and reduced information discovery time by 70 percent; and leveraging expertise in quality assurance to reduce the number of aged open corrective actions by 75 percent.

Weapon Quality Marking and Stamping: NTESS led the Nuclear Security Enterprise in the development and implementation of revised policy related to weapon quality marking and stamping. NTESS also developed and shared training materials for implementing the revised policy to help support proper implementation at other NNSA sites.

Conditional QERs: To better understand and characterize risks associated with Conditional QERs, NTESS developed a process to thoroughly assess mission requirements and technical basis.

Issues:

Project Management Assurance: NTESS' efforts to standardize a project management assurance model across the Laboratories resulted in the elimination of several informative project management assurance systems. Consequently, the transparency needed for effective NNSA oversight was significantly compromised in several program areas. NTESS' interim solution to reestablish transparency by reinstating the Management Review process has not been fully effective.

Contractor Assurance System (CAS): Several issues within CAS include: lack of quality of self-assessments and lack of effective risk management. NTESS implemented an Assessor Qualifications Program and added a more disciplined structure to its assessment planning and management efforts. To improve risk management effectiveness, NTESS is deploying an Enterprise Risk Management Framework, and initiating an Executive Risk Review Board. NNSA recognizes the complexity and significant time involved with achieving measurable progress in addressing issues in these CAS areas. Though most of the CAS

improvement efforts were successfully completed, measurable improvements have yet to be realized.

Organizational Conflict of Interest (OCI): NTESS was slow to recognize the complexity of OCI issues, requiring NNSA intervention and delaying completion of the OCI management plan. Consequently, NTESS' development of a key OCI mitigation plan is delayed, increasing NW OCI-related production risk and requiring interim risk reduction measures. NTESS is applying lessons learned by leading OCI awareness efforts with M&O contractors at other sites.

Weapon Components: NTESS experienced delays in identifying the cause(s) of weapon quality issues associated with some components that adversely impacted Production Agency manufacturing processes.

National Environmental Policy Act (NEPA): NTESS line implementation of NEPA is inconsistent. NTESS took positive steps and increased leadership attention to ensure NEPA reviews are performed early in the program and project planning process.

(g) Demonstrating parent company involvement/commitment to the overall improvement of the Laboratories and the DOE.

In demonstrating parent company involvement/commitment, NTESS achieved several significant accomplishments and experienced no issues.

Accomplishments:

The most notable example of parent company involvement was the assistance Honeywell provided to NTESS in adopting elements of the Honeywell Operating System to create the Laboratory Operating System (LOS). The first major element of LOS deployed by NTESS was the Labs-wide tiered accountability process, which encompasses over 1,000 organizations, and supports regular and rapid communications to assess, align, and ensure accountability. The level of employee engagement with tiered accountability was significant, as was the flow of information up and down the organizational tiers. NTESS deployed additional elements of LOS with encouraging results. For example, NTESS deployed 13 improvement projects with user-centered design methodologies to enhance key processes, products, and services. The LOS is enabling NTESS to increase its capability to learn, innovate, and respond in rapidly changing environments.

NTESS is implementing a Honeywell performance management practice that allocates an equal weighting to an employee's results and behaviors, with the intention of holding employees accountable for demonstrating strong ethics, safety-focused problem-solving, and creative thinking. Other examples of Honeywell's positive involvement include negotiating reduced pension plan fees and leveraging corporate relationships to increase travel rebates.