



National Nuclear Security
Administration

Mission Support and Test
Services, LLC

Performance Evaluation
Report (PER)

NNSA Nevada Field

Office Evaluation Period:
October 1, 2018 –
September 30, 2019

December 12, 2019

Executive Summary

This Performance Evaluation Report (PER) provides the National Nuclear Security Administration (NNSA) assessment of Mission Support and Test Services, LLC's (MSTS) performance of the contract requirements for the period of October 1, 2018 to September 30, 2019, as evaluated against the Goals defined in the Performance Evaluation and Measurement Plan (PEMP). The NNSA took into consideration all input provided (e.g. CAS, Program Reviews, etc.) from NNSA Program and Functional Offices both at Headquarters and in the field.

MSTS commitments to the NNSA included increasing operational cadence on experiments, enhancing capabilities to execute an expanded program portfolio, and significantly improving the NNSA infrastructure. As a result of these commitments, MSTS workload significantly increased this performance period and was arguably higher than has been witnessed in over 25 years. With the operational tempo and workload increases, MSTS (similar to other sites) saw increased operational upsets. MSTS leadership took appropriate work pauses to evaluate each upset and develop a path forward, including extent of condition reviews and corrective actions to mitigate a potential repeat of the upset. A commitment to safe and secure enterprise mission execution was also demonstrated through the continued improvement in safety performance and strong overall security performance. The NNSA took into consideration the dynamic work environment and all input provided (e.g. CAS, Program Reviews, etc.) from NNSA Program and Functional Offices both at Headquarters and in the field. Overall, performance against the Goals summarized below resulted in an overall rating of **Very Good** and a score of **87.8%** for MSTS. Specific observations for each Goal are provided in the following pages.

Goal 1: Mission Execution: Nuclear Weapons-- Successfully execute Nuclear Stockpile mission work for Defense Programs work in a safe and secure manner in accordance with DOE/NNSA priorities, Work Authorizations, and Execution/Implementation Plans.
MSTS Amount of At-Risk Fee Allocation: \$5.52M

MSTS exceeded most of the Defense Program Objectives and Key Outcomes earning a rating of **Very Good and 89%** of the award fee allocated to this goal, as accomplishments greatly outweighed issues and there were no significant issues in performance. MSTS completed all assigned science/stockpile and infrastructure national Level 2 milestones for work within their control and all MSTS actions on the *FY19 Defense Programs Getting the Job Done List*. MSTS successfully executed stockpile stewardship (SS) and stockpile management (SM) experiments; continued development, implementation, and expansion of cutting-edge diagnostics; grew collaboration with the National Weapons Laboratories (NWLs); and effectively managed the U1a Complex, Joint Actinide Shock Physics Experimental Research (JASPER) facility, Device Assembly Facility (DAF), Big Explosives Experimental Facility (BEEF) and the Dense Plasma Focus (DPF) Facility. These SS and SM experiments and the suite of next-generation, transformational diagnostics developed by MSTS enable linkages between past underground nuclear tests, full-scale hydrodynamic experiments, subcritical experiments (SCEs), and materials property experiments for nuclear weapons predictive modeling and assessment of performance. MSTS was awarded seven Defense Program Awards of Excellence this year.

MSTS initiated the development of an integrated schedule at U1a to integrate facility maintenance, recapitalization, mining with increased experiment cadence and address the requirements of the Enhanced Capabilities Subcritical Experiments (ECSE) line-item construction needs. The integrated schedule has already provided information identifying critical path conflicts from numerous U1a projects which can now be worked by the program and NvE community. In addition, ECSE- Advanced Sources & Detectors (ASD)-Scorpius Major Item of Equipment Project met overall expectations and is working together as a strong team. Although the project is behind schedule (due to vendor lead-times and laboratory resources) and over budget, MSTS worked effectively with Las Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL), and Sandia National Laboratory (SNL) to implement a re-plan of the project to incorporate the program teams' technology down-select to Solid State Pulsed Power systems.

MSTS successfully supported four Subcritical Experiments (SCE) series simultaneously and served as an integrating partner for NNSA work in diagnostics, test data analysis, and radiographic source development, assisting efforts at LANL and LLNL. MSTS engaged corporate partners to address legacy quality issues on confinement vessels necessary for Ediza and to minimize impacts to the future SCE program. For the Lyra series, MSTS successfully executed an aggressive plan for resumption of Ediza fielding delayed by the legacy quality assurance (QA) issues, to successfully execute Ediza with ~100% data return including new types of data captured from 1st time diagnostic development and deployment. MSTS effectively managed the Ediza radiological contamination issues by completing appropriate reviews for root cause, decontaminating the vessel and room, and successfully entombing the vessel. For Red Sage, MSTS effectively integrated planning and experiment design incorporating a new U1a Timing & Firing system, vessel components, and diagnostics with National Security Enterprise Laboratories (NSEL)/ Atomic Weapons Establishment (AWE) stakeholders; however, inconsistent work planning for critical lifts caused the Red Sage team to drop a large zoom camera in the zero room causing a multi-week work pause. MSTS developed strategies like mining on the backshift at U1a to minimize impacts of this incident and the continued vessel

quality issues closures on Red Sage; however, the impact to Red Sage and other U1a construction schedules has not yet been determined by MSTS and the cognizant Laboratory. In addition, due to work process incidents across NNSS, MSTS implemented new work package requirements that created challenges with the development/approval of work packages delayed work on the project at U1a. For the Nimble series, MSTS supported the first experiment in Muir Woods off-site. For the Excalibur series, MSTS initiated integrated diagnostic and baseline planning, completed Neutron Diagnosed SCE (NDSE) conceptual design to enable FY20 long lead procurements, finalized the conceptual Excalibur detector wall and worked with SRS to obtain tritium best handling practices. MSTS successfully executed experiments using the DPF pulsed energy source to continue full characterization of the source above ground prior to use on an NDSE underground at U1a and the future ECSE.

MSTS work in the area of Stockpile Management supporting Life Extension Programs increased this year with the planning, execution and successful data collection of some of the first hydrodynamic experiments at the NNSS on the Legacy Frag, Fuel Fire, and LT-19 series of experiments. Successful data return on these experiments exercised a capability that had not been demonstrated for nearly two decades. This required MSTS to continually deconflict these experiments at BEEF with others at the Dry Alluvium Test Bed that included simultaneous and overlapping Operational Restriction Zones for several months.

MSTS efficiently and effectively met Dynamic Materials Properties, Secondary Assessment Technologies, and High Energy Density requirements including the conduct of the first ever experiment, testing the LANL eject production model from a double shocked liquid metal at the Special Technologies Laboratory Powder un; support of 37 experiments for plutonium characterization work on Z, including the first Z shock-ramp plutonium pyrometry experiment; calibration of ~600 National Ignition Facility (NIF) components and systems (60% more from 2nd to 3rd quarter), delivery of hCMOS detector characterization, next generation streak camera capability, and improved x-ray spectrometer designs for opacity measurements that that reduced risk of data loss and increased data fidelity for NIF; C3 launcher conducted campaigns on additively manufactured 304 steel to cast and wrought process samples to study comparisons of old and new manufacturing methods; and significant milestone closure beamline work at the Stanford Synchrotron Radiation Lightsource. In support of the Archiving and Support program, MSTS completed a significant undertaking to conduct a statistical survey to assess the amount of weapons related historical records that are still awaiting digitization within their holdings that is now being used to develop plans and strategies for accelerating the digitization efforts across the NNSA Enterprise.

MSTS' cutting edge diagnostic development activities that revolutionize and improve many data collection systems across numerous NNSA sites increased with the request for additional MSTS diagnostics to be used at LLNL's High Explosives Application Facility (HEAF) (infrared spectrometer for extended range characterization of HE detonations), LLNL's Site 300 (Broadband Laser Ranging system to increase hydrodynamic experiment capability, LANL's DHART (time resolved spot size diagnostic improved imaging), LLNL's Fixed X-Ray (FXR) (advanced radiography) and many more. MSTS also set the pace for NNSA for the development of cameras and architecture for future experimental diagnostics such as pRad (a field transverse x-ray radiography diagnostic that will reduce operating costs), Kraken (an imager designed for visible and radiographic imaging applications) as well as a Doghouse camera (for non-confinement vessels at FXR). In addition, MSTS high performance optical designs and imaging enabled high resolution holographic ejecta measurements for numerous experimental platforms;

gamma reaction history, neutron imaging and velocimetry on High Energy Density (HED) experiments; and is implementing concepts for high-brightness soft x-ray imaging and low-distortion tomography that will all enable better data quality for NNSA experiments.

MSTS successfully completed infrastructure planning initiatives to align with NNSA program needs to improve the efficiency and effectiveness of both nuclear and non-nuclear facility and programmatic operations. This included U1a.03 Drift mining initiation, increased DAF classified computing capabilities, restored the DAF downdraft table, completed laboratory upgrades at Livermore Operations and Las Alamos Operations, and initiated DPF facility upgrades to increase mission safety and efficiency while long term utilization is determined.

Although JASPER operations experienced challenges with planned maintenance schedules and several conduct of operations issues, MSTS successfully conducted 23 experiments (three actinide), tested the new flash x-ray FXR and new launch tube, increased PDV channels for better measurement of surface velocity, and deployed the new Compact-6 pyrometer which is more sensitive to lower temperature on slower velocity experiments. The MSTS milestone for JASPER was to complete five actinide experiments. This was not possible as the material for the targets was not available from LLNL to complete the last two experiments coupled with operational issues at the DAF.

Of particular note for the Nuclear Material Integration (NMI) missions, MSTS proposed re-scope of NMI resources allocated to the site that were freed due to a change in NNS operational policy with regard to waste management that avoided the time consuming effort of repatriating funding back to headquarters while achieving mission needs.

Goal 2: Mission Execution: Global Nuclear Security-- Successfully execute authorized global nuclear security mission work in a safe and secure manner to include the Defense Nuclear Nonproliferation, Nuclear Counterterrorism, and Counter Proliferation and Incident Response missions in accordance with DOE/NNSA priorities, Work Authorizations, and Execution/Implementation Plans.
MSTS Amount of At-Risk Fee Allocation: \$3.68M

MSTS exceeded most of the Objectives and met the overall cost, schedule, and technical performance requirements related to the successful execution of the Defense Nuclear Nonproliferation (DNN) as well as Counterterrorism & Counterproliferation (CTCP) work and actions on the *FY19 CTCP Make It Happen List* at the NNS and other locations, earning a rating of **Very Good and 90%** of the award fee allocated to this goal. MSTS' accomplishments greatly outweighed issues and there were no significant issues in performance. MSTS efforts demonstrated far reaching national and international implications in reducing global nuclear security threats and improved science, technology, and expertise in areas including the Global Material Security (GMS) program, underground nuclear explosion detection, radioactive material detection, foreign nuclear weapons programs, and the national response to nuclear incidents.

MSTS conducted multiple foreign visits to support the Defense Nuclear Nonproliferation mission area of protecting and removing radioactive material, including the successful removal and decommissioning of two Cesium-137 Research irradiators in Belarus. In support of the Detecting Foreign Nuclear Programs, MSTS hosted the Facility Exercise and Acceptance Testing exercise and initiated planning for facility expansion, and operated and analyzed the first 30 days of spectroscopic analysis of each anomalous (unexpectedly large volume over 27,000 anomalies) set of data points from each of the sensors that are part of a network of radiological sensors along various highways.

Overall, MSTs demonstrated effective leadership of a multi-laboratory team advancing U.S. capabilities to discriminate and characterize low yield nuclear tests; contributing both scientific expertise and experimental test bed capabilities; and exercising several underground test readiness capabilities. For the Dry Alluvium Geology (DAG) experiments, MSTs with laboratory participants, completed successful planning, preparation and execution of the DAG-2, -3, and -4 experiments with over 98% data return and implementation of the Large-N (500 small seismic stations). There were significant delays in the DAG-2 schedule, and DAG-2 costs were above planned. These delays and costs were caused by MSTs' lack of conduct of operations savvy (i.e., personnel not adhering to barricades) and lack of an appropriate readiness process for key hazardous operations (i.e. inexperienced crane operators). These concerns were addressed and the later tests (DAG-3 and DAG-4) were subsequently completed. For the Underground Nuclear Explosion Signatures Experiments program, MSTs continued extensive planning of the Low Yield Nuclear Monitoring test bed for P-Tunnel. For Viceroy, MSTs provided outstanding planning, facility reconfiguration, and execution support with ~100% sensor data recovery that covered a frequency range from direct current to 18 GHz measurement both magnetic and electric fields. Areas for improvement include delivering quality estimates on time to meet customer demands and accurate/timely financial reporting, the lack of which complicated the Program's ability to effectively manage budget.

MSTs provided excellent Counterterrorism and Counterproliferation program response in support of real world national security events which required significant multi-agency pre-planning and extensive coverage before, during and after each of these events (i.e. Las Vegas New Year's Eve Celebration, 12 day Super Bowl 53 operation, Pan Am Games in Peru, G20 Summit). MSTs' Consequence Management personnel successfully supported ingestion pathway exercises at multiple nuclear power plants, continued planning for Cobalt Magnet 19 and the real world Woolsey fire in California. MSTs also provided outstanding support to the emergent University of Washington cesium source recovery and cleanup and the Portsmouth, Ohio response. The MSTs Aviation Program continued to exceed expectations as maintenance and repair activities on aged aircraft was constantly executed to a level that minimized mission downtime as well as received continued ISBAO certification (as one of only a handful of government agencies that have achieved the highest level of safety, Stage III). MSTs provided outstanding technical support to multiple the International conferences/workshops in support of the Nuclear Incident Policy and Cooperation program. The Nuclear/ Radiological Advisory Team, in coordination with the Federal Bureau of Investigation (FBI), worked with the US Coast Guard for at-sea maritime response to radiological incidents and successfully completed the Midnight Capstone exercise. In coordination with the FBI and supported by Emergency Communications Network (ECN) Program, the Disposition Forensic Evidence and Analysis Team successfully completed the interagency Diamond Thunder 19-01 and 19-02; the ECN Program provided outstanding response to a NNSA Nevada Field Office (NFO) Operations Coordination Center (OCC) site-wide communications outage; and provided telecommunications support during the four-day, real world unauthorized "Storm Area 51" event. In addition to daily operational scope, the ECN Program team completed three Department of Defense (DoD) outside continental United States (OCONUS) locations for high-importance "no fail" missions; completed two significant infrastructure projects: Field Site Upgrade Project to meet current security, reliability, and expandability standards (49 fixed continental United States (CONUS) and OCONUS field sites and seven mobile/fixed satellite sites); and Direct Video Broadcasting-Satellite-Second Generation Project a satellite terminal upgrade of the CONUS network providing a performance gain of over 30% at substantial savings; completed installation of video walls in the Consolidated Emergency

Operations Center Executive Team Room (ETR) and in the Unclassified ECN Operations Center at the Remote Sensing Laboratory – Nellis (RSL-N); operationalized NNSA SharePoint and Kansas City Plant Spaces Document Management sites; all without impacting mission, and supporting exercises and real-world events. MSTS achieved a major milestone in the Network Modernization Project gaining authorization/approval of special equipment room for ECN equipment at the SWITCH Data Center. Areas for improvement include better integration of communications between MSTS, NNSA/NFO, and NNSA Program and early identification of potential technical resource gaps and risks before they impact national response readiness.

Goal 3: DOE and Strategic Partnership Projects Mission Objectives--Successfully execute high-impact work for DOE and Strategic Partnership Projects Mission Objectives safely and securely. Demonstrate the value of the work in addressing the strategic national security needs of the U.S. Government.
MSTS Amount of At-Risk Fee Allocation: \$ -0- AF/\$3.1M FF

MSTS exceeded the Objectives related to the successful execution of the mission objectives of the DOE Environmental Management Program, Strategic Partnership Projects (SPP) and Strategic Intelligence Partnership Projects (SIPP), earning a rating of **Excellent and 95%** of the allocated award fee for the goal. MSTS' accomplishments significantly outweighed very minor issues and there were no significant issues in performance. The MSTS SPP/SIPP work demonstrated an integration of activities/operations to leverage and sustain NNSA's unique science and engineering capabilities for the NNSA. As such, MSTS provided excellent support to many SPP/SIPP customers with products of far reaching national security impacts.

MSTS execution of work in support of DoD projects associated with the Joint Improvised-Threat Defeat Organization (JIDA), Department of Homeland Security (DHS), and Defense Threat Reduction Agency (DTRA) is providing nearly 100% data recovery for immediate use in the national and international security community (diagnostic and software development for hardware, software, and CONUS and OCONUS deployment). Project examples include: multiple Crane Operations (DTRA), Neptune (DoD/Air Force) training, JIDA testing using unmanned aircraft systems and explosives, and US Army 20th CBRNE training. Customers acknowledged MSTS's responsiveness to effectively complete some of the difficult work, and appreciated MSTS senior management attention to effectively integrate these projects into the overall NNSA schedule. For the DHS, MSTS Counter Terrorism Operations Support (CTOS) trained over 14,500 first responders this FY via resident courses at the NNSA, mobile training teams that visit requesting jurisdictions, web based training, and train-the-trainer programs and for DHS Countering Weapons of Mass Destruction 215 students were trained as part of the Securing the Cities Program. MSTS also successfully hosted the Veolia Test (by Veolia formerly DuPont and Chemours), a fuming acid mitigation training. While execution of SPP/SIPP work was successful, cost estimates and critical procurements for Other Government Agency (OGA) sponsors continued to be a challenge.

MSTS exceeded national security complex and legacy cleanup waste disposal challenges through operation of the Radioactive Waste Management Complex (RWMC) and support to environmental characterization activities at the NNSA. MSTS successfully reopened the Area 3 Radioactive Waste Management Site (RWMS) and began receiving low-level waste from the Tonopah Test Range providing enhanced logistical support to the Clean Slate III project and significant future cost avoidance for waste disposal activities (using existing disposal capacity vs. constructing new capacity); completed relocation of the water line that runs through the Area 5 RWMS western expansion; received and disposed of the SEFOR vessel; supported underground test area sampling activities; and conducted Real Time Radiography (RTR) activities to validate

that waste acceptance criteria prohibited items were not received. The RTR activities were implemented to support meeting NNSA's commitments in a settlement agreement with the Nevada Department of Environmental Protection (NDEP). These new inspection activities resulted in four waste packages requiring additional information from the generator. MSTS support and coordination for the Y-12 waste issues was outstanding resulting in appropriate handling of nuclear safety issues with a Potential Inadequacy of the Safety Analysis, evaluation of the safety of the situation, and in-situ analysis leading to the preparation of six coordinated letters to NDEP, meetings with the State of Nevada Governor, and numerous tours and site visits.

Goal 4: Mission Execution: Science, Technology, and Engineering (ST&E)-- Successfully advance national security missions and advance the frontiers of ST&E. Effectively manage Site Directed Research and Development (SDRD) and Technology Transfer, etc. in a safe and secure manner in accordance with DOE/NNSA priorities, Work Authorizations, and Execution/Implementation Plans.
MSTS Amount of At-Risk Fee Allocation: \$-0-

MSTS exceeded the Objectives related to the management of Site Directed Research and Development (SDRD) and Technology Transfer programs to advance national security missions and the frontiers of ST&E, earning a rating of **Excellent and 95%** of award fee allocated to this goal. MSTS' accomplishments significantly outweighed very minor issues and there were no significant issues in performance. On a very limited budget, MSTS continued emphasis on high-quality and high-impact publications, lending credence to ST&E performance and enhancing credibility in the national security sciences.

Through SDRD and university investments, university partnerships are increasing with more than 20 active collaborations between SDRD, NNSA mission programs, and special partnership projects. This is helping MSTS to create pipelines for attracting scientists and engineers to support a next generation Science, Technology, Engineering, and Mathematics (STEM) workforce. The results are promising as MSTS recently recruited two radiography post-docs.

The Silicon Strip Cosmi Muon Detector, which was developed through the SDRD, won a prestigious 2018 R&D 100 Award. MSTS also won the NNSS's very first Presidential Early Career Award for Scientists and Engineers.

Also through SDRD strategic investments, MSTS continued to add capabilities to the C3 launcher testing high entropy alloys that hold out promise for being lightweight materials with very high strength, ductility, corrosion resistance, etc., and successfully completed the first dynamic shot of x-ray phase contrast imaging of an experiment. MSTS also leveraged multiplexed Photon Doppler Velocimetry to develop an Ultra-high Speed Photon Doppler Velocimetry that, for the first time, diagnosed the inside of an inertial confinement fusion shell. Additionally, MSTS developed a new x-ray crystal polarization spectroscopy instrument for Sandia Z and other platforms.

During this period, MSTS had eight new journal articles published and many more submitted awaiting acceptance. MSTS also two new patents issued.

Goal 5: Mission Enablement-- Effectively and efficiently manage the safe and secure operations of the NNSA while maintaining an NNSA enterprise-wide focus; demonstrating accountability for mission performance and management controls; successfully executing cyber and physical security requirements, and assure mission commitments are met with high-quality products and services while partnering to improve the site infrastructure. Performance will be measured by the contractor's assurance system, NNSA metrics, cost control, business and financial operations, project baselines, implementation plans, assessment and audit results, etc., with a focus on mission enablement.

MSTS Amount of At-Risk Fee Allocation: \$5.52M

Overall, MSTS exceeded most of the Objectives and Key Outcome by ensuring safe, secure and effective execution of program and site operations, as well as infrastructure sustainment and improvements, while executing at an increased operational tempo earning a rating of **Very Good and 85%** of award fee allocated for this goal. MSTS' accomplishments greatly outweighed issues and there were no significant issues in performance. MSTS supported achievement of most of the NNSA actions on the *Office of Safety, Infrastructure, and Operations FY2019 Make It Happen List* as they successfully advanced capital projects, progressed on arresting the declining site infrastructure, furthered the plan to shrink the infrastructure footprint, implemented NNSA infrastructure management system improvements, and met most of the assigned Infrastructure Level 2 national milestones. MSTS focused on maintaining and improving mission critical infrastructure, support systems and equipment, personnel, and facilities, including information technology (IT), utilities and emergency management. Realizing that safety and risk management are a key piece of mission success, MSTS focused on making safety, security, and risk management a part of the workforce culture with the implementation of Integrated Operations Nevada (ION) and BeyondZero. MSTS also met or exceeded expectations in delivering service in the functional areas of business, legal, human resources (HR), energy efficiency, safety, Material Control and Accountability, personnel security, incidents of security concern program, information security, quality assurance, infrastructure, construction, and maintenance.

As a result of the receipt of increased funding, MSTS intensified their efforts to improve infrastructure and mission critical facilities to address mission requirements, risk reduction, workforce safety and site user services at Mercury, U1a, DAF, NNSA Area 6 and North Las Vegas; and improve infrastructure portfolio planning and execution methods adding subcontracting vehicles and corporate reach-back opportunities. This year, MSTS completed the five-year long DAF Lead-in Line Project, the Area 6 Data Center, the U1a Classified modular building, the Mercury sewer and water line relocations and upgrades, Mercury Modernization Building-1, the first Mercury dorm cooling & heating asset management project (CHAMP), roofing asset management project (RAMP) roofs on two buildings, U1a new refuge chamber mining, DAF personnel contamination monitor installation, Mercury Building-2 design, and U1a Building-1 design award, demolished 3 buildings (including asbestos abatement); as well as initiated Phase 1 (mining) of the U1a Refuge Chamber; started design of the both the U1a and DAF campus strategies; restarted the DAF Downdraft Table; completed nuclear material management staging activities including some test readiness materials; and modified the contract to include SUBCLIN 00003, Capital Asset Projects, to allow for the inclusion of the 138kV Power Transmission System project. In addition, MSTS was asked by NNSA HQ to lead an enterprise-wide common building design strategy that is accelerating NNSA modernization. The Mercury solar field effectively delivered power to enable the first NNSA new construction Net-Zero Energy Facility, Mercury Building 1. Due to the accelerated maintenance planning program initiated last year, MSTS executed \$13M in additional direct maintenance this year. MSTS proactively supported and was an instrumental element to the NA-52 working group for State Historical Preservation Offices/ *National Environmental Policy Act* issues, including being a key presenter for the team. Although

MSTS completed a great deal more work and associated planning efforts than in previous years, execution of recapitalization projects was somewhat behind schedule.

MSTS provided efficient Environment, Security, Health & Quality management and continuously looked to improve mission enablement. MSTS' safety performance continued to improve even in light of the increased workload experienced this year. MSTS successfully achieved Voluntary Protection Program (VPP) Certification and earned a VPP Star of Excellence Award for their superior safety performance. In addition, MSTS consistently looked to improve integration with stakeholders such as the NSELs on conduct of operations at the DAF and pausing work when safety issues arise; developed the Unreviewed Emergency Management Question process to review changes against the EMP baseline of identified hazards and avoid facility shutdowns; created the "Tag Your Bag" campaign to reduce the potential for facility evacuations due to "unattended/suspicious packages"; and self-identified, self-reported, and effectively managed a fully integrated resolution of a legacy QA issue (Ediza Vessel).

MSTS maintained 13 critical safety systems with up times of 99.9% exceeding the established goal of 99.75%.

For security, MC&A provided outstanding support onsite (processing 1354 actions affecting over 22,000 items without any findings, failures, compromises or issues) as well as offsite at the Washington source recovery response. The Vulnerability Assessment Lab had two best practices identified by the DOE-EA assessment team. Additionally, MSTS' support with "Storm Area 51" preparations and NNSC support during the event were excellent. Some effort is still required to overcome overall integration issues, both internally and externally.

Overall, MSTS delivered efficient and effective management of legal risk & practices, business operations and systems. In the area of Financial Management, MSTS received a rating of Excellent for the evaluation period delivering exceptional financial management budget formulation and execution, with appropriate internal controls. MSTS' cybersecurity and information technology programs met expectations. Of the six small business goals, MSTS exceeded expectations in four small business categories year-to-date (Small business, VOSB, HUB Zone, and SDVOSB), while not meeting two of the subcategories.

MSTS was awarded seven NA-50 Excellence Awards and one DOE Sustainability Award during this performance period.

Performance on capital line item projects was mixed. MSTS exceeded expectations on one project, was below expectations on two projects, and met expectations on two projects. The DAF Argus project is executing 36 days ahead of schedule and \$2.9M under budget exceeding expectations. Both of the U1A Complex Enhancements Projects (UCEP) 010 and 020 subprojects are behind schedule against the approved baseline with the potential to significantly impact the ECSE program. MSTS did not fully implement EVMS for the line item projects which is not consistent with the FY 2019 deliverable.

MSTS' work planning, conduct of operations and various safety management program implementations (i.e. rad protection) were at times inconsistent and very slow across differing NNSC facilities leading to operational and construction execution issues. These included operational upsets such as the DAG crane operations issue, drop of the zoom lens at U1a, silica issue at U1a, JASPER nuclear credited door repair without appropriate Unreviewed Safety

Question approval, an incorrect design for the DAF uninterruptible power supply (UPS) change out, etc. Subject Matter Expert (SME) integration into work planning also needs to be enhanced to ensure adequate project planning upfront in order to avoid rework and/or schedule delays.

The timely submission and poor quality of documents submitted to NFO (i.e., documented safety analysis, work authorizations, procurement packages, security Future Year Nuclear Security Plan and Annual Operating Plan submissions, real estate documents, and security plans) were a challenge throughout the year. In addition, cost variance corrections were required in G2 and improvements are needed in spend plan and milestone updates to be more timely.

Goal 6: Mission Leadership-- Successfully demonstrate leadership in supporting the direction of the overall DOE/NNSA mission, cultivating a Performance Excellence Culture that encompasses all aspects of operations and continues to emphasize safety and security, improving the responsiveness of MSTS leadership team to issues and opportunities for continuous improvement internally and across the Enterprise, and parent company involvement/commitment to the overall success of the NNSS and the Enterprise.
MSTS Amount of At-Risk Fee Allocation: \$3.68M

MSTS leadership exceeded expectations by demonstrating a management team commitment to safe and secure enterprise mission execution while experiencing significant workload increases as a result of an increased operational tempo, earning a rating of **Very Good and 88%** of award fee allocated for this goal. Overall, MSTS's performance met or exceeded expectations in executing the DOE/NNSA mission by effectively managing programmatic/enterprise mission and site risk while safely and securely executing mission and site operations. MSTS' accomplishments greatly outweighed issues and there were no significant issues in performance.

MSTS leadership took strong ownership of the NvE integration role to enhance communications supporting the safe, secure, efficient and effective mission execution. MSTS leadership continued to proactively seek out and meet with NNSA/NFO, National Laboratory partners, and Other Government Agency sponsors to discuss their strategies and goals for operating the NNSS and to understand individual program expectations, issues, and requirements, opening communication pathways between all of the partners of the NNSS and NvE. MSTS leadership also engaged positively to respond to the large increase in mission requirements for the SCE program shot rate of two per year. In addition, MSTS leadership acceptance of challenging goals and execution to a mutually agreed upon schedule while managing competing priorities is noteworthy. Leadership by the MSTS team exceeded expectations as advanced intellectual effort and planning really became the foundation for the FY 2019 successes on a high priority emergent work scope. MSTS leadership acceptance of milestones that can drive efficiencies through robotics and learning from other storage programs is also indicative of a leadership culture focused on continuous improvement.

MSTS also planned and supported a number of integrated, high-level tours (i.e, Secretary of Energy, NNSA Administrator, NV Governor, Congressional Representatives, etc.) to provide detailed information on NNSS operations, missions, culture, and economic impact to the state in response to various high-profile events that occurred during the year.

MSTS significantly enhanced their collaboration with the local community as well as local schools and state-level Nevada universities to improve the perception of the NNSS and enhance the future employee pipeline. MSTS collaborated with a Clark County high school and local union to develop a multi-disciplined apprenticeship program that will provide alternative opportunities for at-risk high school students while increasing the pool for NNSS's difficult-to-fill trade positions. MSTS collaborated with the University of Nevada Reno (UNR) to

develop an on-campus casual employment opportunity for engineering and science undergraduate students designed for undergraduate students to perform direct NNSC pre-engineering work in FY 2020 and beyond. MSTC also re-established a relationship with the University of Nevada – Las Vegas (UNLV) business and engineering schools and renewed their awareness of the important national security mission and growing need for resources.

MSTC leadership leveraged corporate parent programs such as BeyondZero®, an approach to enable worker ownership of a culture of caring and accident free work execution; nuclear safety basis improvements with stakeholder integration, and implementation of ION which takes the Contractor Assurance System (CAS) from a compliance culture to one of continuous improvement designed to eliminate waste, streamline processes, and simplify work. MSTC implemented a Risk and Issues Board to provide a method of identify and preventing operational upsets through mitigation actions and restoring through root-cause corrective actions should an operational upset occur. MSTC's implementation of CAS continues to mature with the submission of more robust performance information. Additional transparency with other NvE contractors and HQ customers still needs to be strengthened.

MSTC successfully used parent company reach-back for expertise in safety, design engineering, water distribution, asset management, mining and external assessments to improve processes. These resources are proving extremely successful in solving NNSC issues and potential issues.

The MSTC Board agreed to support the development and attempt at negotiation of the first firm-fixed-price design/construction project on a Management & Operating contract for the 138kV Power Transmission System Replacement Project.

MSTC's efforts in supporting the Nuclear Security Enterprise Recruitment Strategy Group were instrumental in the rapid progress and development of the Nuclear Security Enterprise Workforce Recruitment Strategy Plan. Their engagement in recruitment fairs through the year was commendable.

MSTC experienced numerous operational upsets and inconsistent safety management program implementation challenges. Communication of operational upsets and responses to requests for information with NNSC leadership was not always timely. Appropriate pauses, stop works, and critiques were implemented as a result of these incidences, however, the restart process (including changes of work package process) of many of the upsets/challenges caused unnecessary delays in project restarts and impacted mission and construction milestones. MSTC did have a major DAF UPS power problem that impacted security and program. To minimize the chance of reoccurrence on such a significant system MSTC leadership brought in outside resources to critique the design and path forward.

MSTC senior management was not adequately engaged with the capital line item and infrastructure projects to ensure successful project execution. Improvement is also necessary in the engagement and integration with the Laboratories to ensure successful project completion on multi-site projects such as UCEP and ASD. This lack of leadership impeded consistent application of project management principles and practices across the organization. MSTC's progress in achieving Earned Value Management System (EVMS) certification is also behind the schedule submitted in FY2018. MSTC established a Project Execution Office to enhance support to the capital line item projects with the results yet to be determined.

MSTS enhanced the number of employee hires and instituted a number of employee development initiatives, achieving an approximate 12% increase in their workforce. While MSTS struggled to hire, retain, and/or procure all of the high-quality staff needed to support the existing workload the workforce increase achieved is recognized in light of the intense competition throughout the NNSA complex for the needed skills. A significant unresolved issue during the year was the failure to replace the Vice President position vacated in March 2019.

Rollout of the FY2019 Cost Model changes and rate changes late in the FY was a challenge for programs and customers across the board. MSTS did not effectively communicate the impact of the cost model and rate changes to the programs and other customers. Other changes to the Cost Model also resulted in a lack of transparency that impacted the customer's ability to understand the costs currently being incurred and the ability to budget for future years.