



**NATIONAL NUCLEAR SECURITY  
ADMINISTRATION**

**FISCAL YEAR 2012  
PERFORMANCE EVALUATION REPORT**

**OF**

**SANDIA CORPORATION**

**FOR THE MANAGEMENT AND OPERATION OF  
SANDIA NATIONAL LABORATORIES**

**Contract No. DE-AC04-94AL85000**

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# NNSA FISCAL YEAR 2012 PERFORMANCE EVALUATION REPORT OF SANDIA NATIONAL LABORATORIES

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## EXECUTIVE SUMMARY

This Performance Evaluation Report (PER) represents the National Nuclear Security Administration's (NNSA) evaluation of Sandia Corporation's (Sandia) performance against the Performance Objectives (PO) and Performance Based Incentives (PBI) defined in the Fiscal Year 2012 (FY12) Sandia Performance Evaluation Plan (PEP) under Contract Number DE-AC04-94AL85000.

### **Structure and Organization:**

The FY12 PEP is organized into three areas: Mission Focused POs, Mission Support POs, and PBIs. Mission Focused POs document the objectives and evaluation criteria of Sandia's programmatic work and describe the performance expectations to execute the mission of Sandia National Laboratories (SNL), while ensuring performance is conducted in a safe, secure, and environmentally sound manner. These POs include both nuclear and non-nuclear mission activities. Mission Support POs document the objectives and evaluation criteria of critical operations and infrastructure to support the mission and describe the performance expectations to support the mission of the SNL. PBIs consist of measures and targets tied to incentive fee. PBIs incentivize the achievement of stretch goals, new initiatives, problem areas, and multi-site performance.

Consistent with the PEP issued pursuant to the contract, Sandia's performance was assessed against the applicable evaluation criteria using a variety of different approaches including, but not limited to, peer review, external reviews, achievement of milestones relevant to targets, customer feedback, program reviews, and the self-assessment provided by Sandia. The overall FY12 assessment ratings will be communicated to Sandia in accordance with the performance assessment schedule as outlined in Special Provision H-10, "Performance Based Management."

Sandia's self-assessment of its performance was submitted October 1, 2012 as the *FY12 Sandia Performance Evaluation Assessment Report (PEAR)*. Although, Sandia's assurance processes identified and addressed issues and challenges throughout the year, the majority of the PEAR lacked a self-critical analysis of the pertinent issues and challenges affecting mission accomplishment and Sandia management's efforts to address these challenges. The impact of this omission raises concern by NNSA regarding Sandia's self-criticism and that the NNSA PER had to address these issues to ensure a balanced, overall assessment of Sandia's performance against documented expectations. In addition, Sandia management has not addressed long-standing, systemic issues in Assurance, Environment, Safety and Health (ES&H), and Quality. Though Sandia has undertaken numerous initiatives, significant improvement in these areas has not been demonstrated. Sandia's ability and willingness to evaluate themselves, balancing accomplishments and challenges, and address systemic issues in a timely manner, becomes vitally important as we operate in the Strategic PEP environment.

### **Overall Performance Summary:**

Sandia's overall performance in **Mission** is rated as Very Good for FY12. Sandia supported key stockpile milestones including the W78/88-1 120 day study and establishing an executable program for the B61-12 Life Extension Program (LEP) and W88 Alteration (ALT) under constrained funding limitations. Sandia has sustained and further strengthened the science, technology, and engineering (ST&E) base across a broad spectrum of science and engineering disciplines to enable effective execution across all Sandia mission areas. Sandia continues to push the frontiers of science and engineering to sustain a state of readiness and unique capabilities, including modeling and simulation, extreme environment testing, and nuclear weapons systems engineering and integration for the United States (U.S.) nuclear deterrent, defense nuclear nonproliferation, and broader national security missions. These national security capabilities are enabled through scientific and engineering competencies fostered by strategic investments in world-class science that expand the envelope of science and engineering to underpin and enable technology development in anticipation of future emerging threats and technology surprise. Sandia continues to improve their Management Assurance Systems across all line organizations and Strategic Management Units (SMUs) providing additional transparency into all mission areas, thereby further establishing mission support as an integral element of mission execution. While Sandia has greatly improved its communication and transparency with NNSA, especially on the Defense Programs (DP) side, there are still lingering issues with their Production Agency mission and surveillance activities that if not

corrected could potentially affect deliveries or other NNSA sites, the Department of Defense (DoD), and other customers. Sandia has made measurable and favorable progress in supplier management, product realization, and the development of new processes that support continuous weapons quality improvements but continued leadership and management attention are necessary to further improve performance. It is imperative for Sandia to address remaining supplier quality gaps. Efforts toward this progress have yielded a benefit to product realization and product quality. However, these benefits are localized to a subset of Sandia processes, products, and vendors, and continued effort will be required to institutionalize these improvements. It is critical that systemic improvements are completed and institutionalized across Sandia prior to the significant production increases expected within the next several years.

Sandia's overall performance in **Operations** is rated as Good for FY12. Sandia continues to maintain Environment, Safety and Health (ES&H), Emergency Management (EM), Integrated Safeguards & Security (IS&S), and Facilities Operations programs to support successful accomplishment of the mission. Sandia supported line efforts such as the removal of waste materials at Technical Area V, review of Engineered Safety documents, and removal of plutonium isentropic compression experiments (PuICE) and uranium shot waste material from the Z Machine. Sandia successfully met 100% of Critical Performance Indicators (CPIs) for Security, exceeding their 90% goal and have provided effective leadership and management in partnering with line organizations to ensure mission success and to reduce the security footprint. Although Sandia is maintaining effective programs in Operations, Sandia continues to have difficulty in several areas. Sandia continues to struggle with demonstrating a safety conscious work environment and line implementation of Work Planning and Control (WP&C) requirements as evidenced by both operational events and external assessments. Although Sandia recognizes these concerns and has initiated actions to address them, effective line implementation has not been achieved. Sandia needs to identify and understand the aggregate causes of the recent events (e.g., Halon cylinder, fume hood, etc.) in order to identify and address underlying safety concerns. With regard to IS&S, the Safeguards & Security Integrated Assessment Program has not resulted in measurable improvements in security-related assessments of line operations.

Sandia's overall performance in **Business & Institutional Management** is rated as Very Good for FY12. Sandia demonstrated enterprise-wide leadership and excellent performance in the areas of Human Resources (HR), Information Management (IM) (including Information Technology (IT), Cyber Security, and Records Management), and Supply Chain Management (SCM). Sandia significantly exceeded their efficiency targets by achieving at least \$42.1M in cost savings and avoidances. Sandia revamped an antiquated compensation structure and implemented a new compensation system, which is expected to assist in retention of critical skills and institute pay for performance. SCM continues to strive to be Best in Class in all areas of Procurement and Logistics and was recognized through International Organization for Standardization (ISO) recertification, national recognition, New Mexico Quality Awards, and Department of Energy (DOE) Procurement Evaluation and Reengineering Team best practices. Cyber Security successfully completed milestone objectives identified in their Annual Operating Plan while supporting and enhancing the DOE and Enterprise's forensic capability. Sandia continued to provide outstanding support to the Department of Justice (DOJ) in the *Deepwater Horizon* and *Bayou Choctaw* litigation cases in furtherance of the interests of the U.S. A Compliance Based Assessment (CBA) was performed of Sandia's Quality Management System (QMS) in FY12. Subsequent to the CBA, Sandia had been proactive in the development, implementation, and improvement of a Corporate Quality Assurance (QA) system. Although Sandia leadership is now engaged to address long-standing issues in this area, the results of initiatives to improve the effectiveness and efficiency of the QA system will take time to be fully implemented and institutionalized. As a follow on to the FY11 Sandia Maturity Assessment, Sandia Executive Leadership established maturity element target levels for FY12. Sandia was successful at improving assurance maturity both by Executive Leadership attention and Corporate Governance support of Management Entities in the form of coaching sessions and awareness activities. Although many improvements have been made to Sandia's assurance process, Sandia continues to struggle with self-assessment. The systemic value of self-assessments is uncertain as evidenced by continued program execution and performance issues despite numerous self-assessments conducted. Contributing factors include line self-assessments do not always observe work being performed or assess implementation of policy, and findings are frequently categorized as observations and therefore miss the opportunity for laboratory-wide system improvements.

Adjectival Rating Scale

<b>Adjectival Rating</b>	<b>Adjectival Rating Common Definition</b>	<b>Award Fee Pool Available to be Earned</b>
Excellent	Contractor exceeded substantially all of the significant performance criteria and has met overall cost, schedule, and technical performance requirements as defined and measured against the criteria for the evaluation period.	91 – 100%
Very Good	Contractor exceeded many of the significant performance criteria, has met overall cost, schedule, and technical performance requirements as defined, and measured against the criteria for the evaluation period.	76 – 90%
Good	Contractor exceeded some of the significant performance criteria and has met overall cost, schedule, and technical performance requirements and has measured against the criteria for the evaluation period.	51% – 75%
Satisfactory	Contractor met overall cost, schedule and technical performance as defined and measured against the criteria for the evaluation period.	No Greater than 50%
Unsatisfactory	Contractor failed to meet overall cost, schedule, and technical performance requirements of the contract as defined and measured against the criteria for the evaluation period.	0%

**Note:** For the purposes of overall laboratory performance evaluation, POs will be considered collectively. The expected minimum level of performance (gateway) on POs to be eligible to earn incentive fee is the “Very Good” adjectival rating level.

<b>RATING OF FY12 PERFORMANCE</b>	<b>RATING</b>
<b>Programs/Mission</b>	
PO-1: National Security Mission – Nuclear Weapons	Very Good
PO-2: National Security Missions – NonNuclear Weapons	Excellent
PO-3: Science, Technology & Engineering	Excellent
PBI-1: Nuclear Weapons – Stretch Goals	Excellent
PBI-2: Nuclear Weapons Quality Assurance	Very Good
PBI-5: FY 2012 Multi-Site Targets	Very Good
<b>Operations</b>	
PO-4: Operations	Good
PBI-3: Management of Materials – Stretch Goals	Excellent
<b>Business and Institutional Management</b>	
PO-5: Business Management	Very Good
PO-6: Corporate Governance	Good
PBI-4: Mission Support Efficiencies – Stretch Goals	Excellent
<b>Overall Rating:</b>	Very Good
<b>Earned Incentive Fee Awarded:</b>	\$8,991,588
<b>Recommended Total Earned Fee (Fixed and At-Risk) Awarded:</b>	\$27,093,336

## PERFORMANCE EVALUATION PLAN (PEP) ELEMENTS

### PO-1: National Security Mission – Nuclear Weapons

**Sandia Corporation (Sandia) will diligently and successfully execute mission work based on the programmatic requirements established by customers in alignment with Multi-Year Performance Expectations as measured through the line organizations. This Objective includes Critical Performance Measures, and other evidence, contributing to the success of the Nuclear Weapons (NW) mission.**

**Adjectival Rating: Very Good**

#### Summary of Performance

Sandia supports a wide range of areas across the NW mission, including science and technology, weapons design, internal and external production, and support of secure transportation. NNSA ratings for the broad spectrum of activities in this PO range from Excellent to Satisfactory with an overall rating as noted above.

Sandia continued to build upon the successes of the previous year with significant Science Campaign (SC), Inertial Confinement Fusion (ICF) Campaign, and Advanced Simulation and Computing (ASC) Campaign stockpile relevant accomplishments during FY12. All 28 SC, ICF and ASC Campaign Level II Milestones were successfully achieved on or ahead of schedule. Key efforts supporting Stockpile Stewardship included obtaining materials property data to ensure the safety and surety of stockpiled weapons, determining the opacity of weapons-relevant materials, scoping studies for mechanical and thermal safety scenarios, and assessing the response of non-nuclear components to hostile radiation environments. Sandia succeeded in numerous collaborative efforts across NNSA including demonstrating routine Plutonium (Pu) shots at Z Machine, material properties/equation of state experiments for various materials, and the Cygnus radiography which supported the Castor confirmatory shot for the Gemini subcritical experiment at the U1a Complex. Sandia successfully deployed and utilized advanced computing capabilities in support of LEP design activities and the Annual Assessment Reports (AAR) including quantification of the probability of loss of assured safety in a worst-case handling drop. Sandia also made advances in the maturation of simulation capabilities for future stockpile stewardship.

The Readiness in Technical Basis and Facilities (RTBF) Program included major efforts in Operations of Facilities, Program Readiness, and Containers. All 10 RTBF Level II Milestones were successfully achieved. The operations of facilities provided essential support to DP capabilities for Major Environmental Testing (normal, hostile, and abnormal), Microelectronics Manufacturing, the Primary Standards Laboratory (PSL) function for the Nuclear Security Enterprise (NSE), and Facilities and Infrastructure work that directly supported the DP mission. Program Readiness supported a wide variety of research and development projects for technology maturation and nurturing of critical expertise as well as foreign technology assessment, the Weapon Intern Program, and support for DOE's Nuclear Criticality Safety Program (NCSP). RTBF supported container development for Special Nuclear Material transport. With the exception of the Aerial Cable Facility (ACF) Cable Pull-Down (CPD) test, the RTBF Program was able to meet or exceed all mission needs for DP.

All 11 Engineering and Readiness Campaigns (EC and RC) Level II Milestones were successfully completed. Sandia continues to communicate well with NNSA to achieve efficiencies within and outside these programs. Sandia's mid-year and year-end program reviews were excellent and commended by NNSA. Sandia worked with NNSA to re-prioritize the RC technical work to support the neutron generator (NG) development and production activities. The EC successfully completed the annual stockpile aging and lifetime assessment input for the AAR while developing and testing improved lifetime models and predictive capabilities for solder, thin films for neutron tubes, and firing sets for future annual stockpile assessment and certification. The EC collaborated with other programs to enhance simulation and evaluation through computer modeling, as well as worked on the development of a common tester capability. Sandia continues to develop technologies to meet the future needs of the stockpile.

Communications between NNSA and Sandia on the Directed Stockpile Work (DSW) improved and Sandia is now

more proactive in bringing new issues and proposed recommendations to NNSA. Coordination between Sandia, NNSA, and other sites for design and technical issues has continued to be excellent. Sandia provided innovative cost saving design trade-offs to meet the submittal of the B61-12 Weapons Development and Cost Report (WDCR) refined cost estimate realizing significant cost reduction over the life-of-program relative to earlier estimates. The W76-1 LEP production continued to be at risk through FY12. Deliveries to the DoD were not affected due to renegotiated schedules and requirements with the DoD and Atomic Weapons Establishment. Sandia has not fully embraced their Production Agency role and has not utilized staff from Lockheed-Martin or other NNSA sites with production experience to support their mission, which has affected Sandia's ability to fully partner with the Kansas City Plant (KCP) in their Production Agency mission. Sandia missed eight of their 44 Level II Milestones with several being green throughout the year and projected to be blue until the last quarter when they went red, a further indictment of the Sandia Management Assurance System and self-assessment process. Sandia showed improvement in response to obstacles for each Weapons Reliability Report release. Sandia assisted the Weapon Dismantlement and Disposition program to remove the last legacy trainer with unique hazards. In response to the NNSA/NA-10 Program Review, Sandia completed Integrated Weapons Evaluation Team-like Surveillance Implementations Plans and provided Need-To-Know verification for distribution of the Significant Finding Investigation (SFI) database and procedural guidelines for document control. There were initial concerns with the program management staff in new positions during critical out year budget planning but this appears to be on track for FY13. The W87 System Testbed qualification was not met due primarily to ambiguity in the Sandia design drawing, which resulted in the testbed cable being manufactured to a configuration unusable by Sandia. Due to this, the drawings must be revised and a new date for qualification will be established.

Sandia supported the DSW Research & Development (R&D) and Certification & Safety (C&S) programs effectively consistent with previous performance. Sandia successfully achieved all 27 Level II Milestones in these programs. Sandia continued technology maturation for the B61 LEP, provided the Cycle 17 AARs and the Laboratory Director Annual Assessment Letter to the President and briefings to the U.S. Strategic Command Stockpile Assessment Conference, restructured the Technical Basis for Stockpile Transformation Program document, reworked the Independent Nuclear Weapon Assessment Program (INWAP) schedule consistent with funding, and completed the W78 and W87 INWAP documents. One issue with all three laboratories is development on some technologies continues (i.e. Direct Optional Initiation) but concurrence from NNSA is needed after an opportunity/risk presentation is provided to NNSA. Sandia should provide monthly reports to the DSW R&D and C&S Federal Program Manager consistent with monthly reports being provided for weapons systems.

The NW SMU provided valuable support with the Defense Nuclear Facility Safety Board (DNFSB) site visits and with document requests that required coordination and planning. Sandia supported briefings and responses to two letters to support a sustained positive dialog with the DNFSB.

### Significant Accomplishments

- The importance of materials property data obtained from Z Machine experiments to understanding weapons physics was recognized by the External Review Panel. The data from Z Machine resulted in new weapon design code models to be developed for several metals and gases. NNSA was especially pleased with the Equation of State experiments for noble gases conducted at the Z Machine as well as the data obtained from the Pu experiments and referred to the data as "spectacular".
- Completed the development and testing of an improved Z Machine containment for FY13 Pu experiments at higher currents/pressures, which is of high programmatic value for NNSA, and also collaborated with the Los Alamos National Laboratory (LANL) to evaluate potential approaches for conducting molten Pu experiments in FY17.
- Z Machine significantly increased the shot rate from 118 in FY11 to 161 in FY12, and adjusted seamlessly to schedule changes outside their control (e.g. Pu shot schedule change). Additionally, several new experimental platforms/capabilities (e.g. dual Marx trigger, gas puff) and diagnostics were fielded on Z Machine.
- Made advancements in the linear transformer driver (LTD) technology, doubling the power output generated by a single LTD cavity, which reduces the size and cost of future LTD-based accelerators by a factor of two. LTD Architecture is the basis for a next-generation pulsed power accelerator, which was documented in the Short-Pulse Accelerator and Reactor Center proposal submitted to NNSA.



## Significant Accomplishments

- Partnered with LANL and overcame challenges to successfully achieve production capability readiness for the Cielo capability computing platform in FY12 and also completed architecture development work for the Trinity platform.
- Computing improvements and new program integration strategies resulted in enhanced B61-12 LEP simulation support including early integration of simulation into the design process, supporting the radar nose impact, Lightning Arrest Connector (LAC) capability, spin rocket motors, and glass-to-metal seals. Supported the B61-12 LEP with numerous design trades-offs analyses and detailed design studies, as well as simulation support of environmental specification determinations for components and sub-assemblies.
- Continued technology maturation despite inconsistent funding due to Congressional holdbacks and DoD design changes. Reduced the total estimated cost by using a risk reduction approach and leveraging other programs. Reduced staff by 200 FTEs to meet funding targets while maintaining a core team as needed to meet FY12 commitments and protect the ability to meet the FY19 First Production Unit (FPU).
- Through the past 20 years, Sandia has been required to perform at least one major acquisition (e.g. W76-1 LEP) and several ALTs. During FY12, Sandia supported the B61-12 LEP and W88 ALT through Phase 6.3, the W78-1/W88-1 LEP through Phase 6.1, the W87/W88 common fuze, and multiple NG and Gas Transfer System ALTs for the W80, B83, W87, and B61-11. This is an unprecedented amount of activity to be balanced especially in light of the large number of retirements with experience that occurred during Calendar Year 2011.
- Supported nuclear design teams in the development of advanced technology and system concepts in the W78-1/W88-1 LEP 120 day cost study.
- Baseline 22 unique Microsystems and Engineering Sciences Applications components for the B61-12 LEP and W88 ALT, including three application-specific integrated circuits (ASICs) for the B61-12, four ASICs shared between the B61-12 and W88 ALT, and four ASICs unique to the W88 ALT. Fabricated and tested Complementary Metal-Oxide Semiconductor (CMOS7) compatible radiation hardened memory elements and improved ASIC wafer and die yield in the Silicon Fab from 15% to 50%.
- Through the RTBF Program Readiness NCSP, provided support on an independent review team for the National Criticality Experiments Research Center at the Nevada National Security Site (NNSS) that identified the problem and led to the facility being able to regain fully operational status.
- Successfully completed a joint RTBF and SC milestone for the refurbishment of the dual-axis Cygnus radiographic system in support of the scaling and surrogacy initiative Gemini experiments. The effort resulted in Sandia delivering “exquisite radiographs” for the Castor confirmatory shot. Sandia also developed several options for low cost NNSS radiography for NNSA.
- Prepared a portfolio of short papers that have been used extensively to brief NNSA Senior Management, Office of Management and Budget, and Congress on DSW R&D and C&S. Participated as a key role in the development of a formal process to evaluate safety and security technologies in various venues, a joint effort with the DoD. Participated with LANL in a multi-site effort to mature relevant technologies for multi-venue Integrated Surety Solutions to extend the protective envelope of weapons to its surrounding environment.
- Demonstrated the highest priority component to a technical readiness level (TRL) of 4, where key elements were demonstrated in a controlled laboratory-like environment. Completed several definitive tests of this component technology with excellent and predicted results, and also demonstrated an advanced strong-link to TRL-3 by analysis and modeling.
- Physically experimentally produced x-rays in spectrums previously unattainable outside of underground tests. Additionally, completed the largest yet experimental series at Z Machine dedicated to understanding the physics of blow-off impulse testing requirements.
- Exceeded the number of planned Heritage visits for the FY. The W62 Joint Test Group was delivered to the DoD providing them with a valuable training asset and saving the dismantlement program the cost of disassembly. Completed the disposal of the Be contaminated items from the 2004 incident that occurred in Building 809 under budget, disposing of 8,367 lbs of Be contaminated and 6,328 lbs of contaminated material.
- Exceeded expectations during the unplanned mission for Operation Harpoon Crab; worked with a NNSA and DoD team to successfully execute and complete the mission, which was a high priority for NNSA.
- Met an aggressive project schedule in response to the 2012 Draft Graded Security Protection Policy and completed major test efforts for the Office of Secure Transportation Vulnerability Assessment (VA) team and Follow-On Destructive tests 1 and 2. Completed the Bomb Safe/Secure Shipper study by designing, building,

## Significant Accomplishments

and testing a prototype. The VA team took on an aggressive schedule with VA peer review, Transportation Safeguards Security protection strategy improvement analysis, Command Briefings, Cargo Recognition and Hazards project, five Force-on-Force validation testing events, Modeling/Simulation study, convoy communications analysis, armored vehicle analysis, Overland Palletized Unit Shipper delay study, and Active Security Risk Assessment Model refinements.

## Opportunity for Improvement

- Did not deliver on the W87 Small Ferroelectric NG (SFENG) FPU in 2012 due to multiple technical issues (External High Voltage Breakdown [eHVB] and Internal High Voltage Breakdown [iHVB]) resulting in a Code Blue. The impact is a possible delay in the FPU. In addition, there are now possible delays in other programs. Sandia lacks the technical experience to resolve multiple, significant issues concurrently as was demonstrated when trying to resolve both the Loss of Bias and eHVB concurrently.
- Had more red milestones than in previous years with several of the milestones being green throughout the year with a projection of blue at the end of the year only to end with a red status. Because of this, NNSA is concerned about Sandia's ability to demonstrate program management at a higher level.
- Did not complete the ACF CPD B61-11 test after two years of effort. When the Sled Track Facility (STF) was shut down after the accident in 2009, Sandia decided to start up the STF before the ACF without consulting the NNSA about the mission need for the ACF to be restarted. As a consequence, Sandia lost much of their expertise during the restart of the STF and Sandia has had to reconstitute a new team the last two years with almost no expertise from previous ACF CPD tests. Sandia should consult with NNSA on decisions that could affect mission needs.
- The progress made on the Weapons Evaluation and Test Laboratory (WETL) tester did not meet schedule. The tester upgrade completion schedule was ambitious and success oriented, but it was based on the knowledge gained in the recent past by those at Sandia who manage this work. NNSA will work with Sandia to re-establish a new plan and schedule that are challenging, but achievable and allow for time to address unforeseen issues that commonly occur during development. Sandia did not complete testing for six B61-7/11 testbeds at WETL due to this delay. The upgrade schedule was known, as well as the questionable condition of the old tester. A decision was made to wait on testing until the new schedule was available to give Sandia maximum opportunity to meet the schedule; maintaining the old schedule would have required the same resources. Successful project management continues to be a struggle for the WETL tester upgrade project. On significant decisions, Sandia needs to continue to obtain NNSA concurrence in advance of the possible impacts.
- Although the number of 10 CFR 824 type incidents has decreased from FY11 to FY12, SSO remains concerned with the number of cyber security incidents. Many of these incidents involved program specific activities as highlighted in a Sandia letter dated July 23, 2012. In addition to the impact of computer unavailability when incidents occur, this trend increases the risk of impacting work if a security breach or external investigation were to occur. This needs to be mitigated to reduce the risk of an impact to mission work.
- Did not meet all deliverables associated with the Transportation Command and Control System (TCCS) software. Deliverable dates were revised from June to September, and major deliverables such as the Map Display Application and Graphical User Interface components were not delivered until September 28 which did not allow NNSA the opportunity to test and evaluate components to determine if Sandia met requirements and function without errors prior to implementation. Not delivering TCCS impacted other programs. For the Iridium Global Positioning System (GPS) Communications System Update, Sandia did not complete the software work and source code was not delivered. Sandia delivered the Iridium GPS System Version Two (IGS2) as agreed during this performance period including hardware, software and related documentation in a timely manner; however, the IGS2 end-to-end testing could not be completed because components for the TCCS were not delivered. For the TCCS Transition to C5, Sandia has not delivered the software code for the new External Communications Process components. Integration of key deliverables needs to be better coordinated.
- There has been some improvement in the collaboration between ES&H policy area and the line organization, but major work is still necessary to demonstrate a safety conscious work environment and to reduce the Days Away, Restricted or Transferred (DART) and Total Recordable Case Rates (TRCR) across Sandia, and to improve WP&C efforts to lower risk to mission execution. Sandia should ensure line organizations are

contributing to the Site-Wide Environmental Impact Statement effort to forecast growth in the NW SMU mission area due to the potential increases in capabilities at the Z Machine and Radioactive Mixed Waste Management Facility (RMWMF).

- While communications between NNSA and Sandia have improved over the past year, there is still room for improvement in order to more effectively manage project/program costs and schedule commitments. For example, NNSA notification and concurrence should be obtained prior to any internal Approved Funding Program changes identifying possible impacts due to unanticipated changes in cost, schedule, and scope of work activities due to any technology changes, funding changes, and/or schedule changes.

## PO-2: National Security Missions – NonNuclear Weapons

**Sandia Corporation (Sandia) will diligently and successfully execute mission work based on the programmatic requirements established by customers as measured through the mission areas. This Objective includes Critical Performance Measures and other evidence contributing to the success of the following missions: Energy, Climate, and Infrastructure Security (ECIS), International, Homeland and Nuclear Security (IHNS), and Defense Systems and Assessments (DSA).**

**Adjectival Rating: Excellent**

### Summary of Performance

Sandia continues to deliver top quality research results and technology deployments for a broad spectrum of national security applications for numerous DOE, NNSA, other government agencies, foreign governments, academia, and industrial partners. Sandia continues to excel in executing their non-nuclear weapons missions, delivering technology options to a broad range of customers.

Sandia's achievement was reached through: active management; developing, monitoring, and executing programs/projects; meeting customer goals and objectives in a timely manner; ensuring appropriate resources are available; ensuring policies and procedures are followed; and continually working to improve its business acumen and relationships with industry. Sandia continually exceeds customer expectations by providing unique, superior solutions to current and anticipated national security threats.

Continued excellent technical performance is evident throughout the customer satisfaction surveys, improving on prior year marks, and the ability to retain and expand its customer base which led to a significant increase over FY11 revenue. Sponsors time and again concluded that the unique capabilities, resources, and ingenuity available at Sandia are critical to the success of their programs and mission.

Sandia's mission supports the military, assessment, and non-proliferation community by applying its engineering, science, and technology capabilities to develop innovative systems solutions for the toughest national security challenges. These challenges require innovative systems solutions to aid in conventional force-on-force war and reducing the role of nuclear weapons; reducing urban and guerilla warfare; preventing the acquisition, possession, and use of Weapons of Mass Destruction (WMD); and understanding emerging technologies that can change the capability balance between forces such that they drive changes in doctrine of force employment. Sandia delivered advanced science and technology solutions that deter, detect, track, defeat, and defend against threats to our national security for DoD and the intelligence community.

Sandia's mission to protect nuclear assets, nuclear materials, nuclear emergency response, nonproliferation, counter terrorism and arms control, was accomplished through their counter WMD (chemical, biological, radiological, nuclear, and explosives threats) programs, enabling high-level customer engagement and leverage. They championed the development of lab capabilities to support mission needs. They delivered effective technology solutions to support decisions makers, provided state-of-the-art physical protection for military installations housing nuclear weapons, trained war fighters to defeat improvised explosives, and supported non-proliferation and arms control work.

Sandia's mission is to research and develop priorities to accelerate development of reliable, affordable and sustainable sources of energy to be prepared for and understand potential consequences of climate change, and to ensure a safe, secure, and reliable energy delivery infrastructure. They provided excellent expertise and unique modeling supporting energy assurance, energy surety, climate modeling, nuclear reactor safety, severe incidence response, and smart grid development.

### Significant Accomplishments

## Significant Accomplishments

Sandia, with its diverse customer base, conducts research to protect our homeland, provides technology to aid our war fighters, develops technology to ensure our energy security, and secures and tracks nuclear material around the world. This research led to many accomplishments in several disciplines of science and engineering. The following are examples of the unique and innovative technologies pioneered at Sandia.

- Demonstrated high quality work and productivity in above ground antineutrino detectors and flexible space computing with joint architecture standard.
- Excellent technical support to the Highly Enriched Uranium Transparency Program for successful transparency monitoring activities and to the Warhead and Fissile Materials Transparency Program
- Exceeded targets for the Global Threat Reduction Initiative's Domestic and International Radiological Material Protection subprograms helping to meet Presidential and Department goals.
- Provided significant engineering and security analytic support of onsite Russian nuclear warhead storage and handling sites ensuring protection of nuclear warheads against diversion.
- Improved the design, materials, and manufacturing processes for Microsystems Enabled Photovoltaics (MEPV) cells to achieve increased efficiency at a reduced cost, aiding DOE in reaching SunShot goals.
- Developed technology to remove radioactive material from contaminated wastewater at the damaged Fukushima Daiichi plant.
- Lead on investigation of a May 4, 2012, hydrogen release event at the Bay Area's Alameda-Contra Costa Transit District hydrogen fueling station in Emeryville, identifying pressure relief and material concerns that contributed to the event.
- Developed use of technologies to directly support the war-fighter in-theater.
- Launched off targets to train and enhance missile defense units and systems.
- Analyzed, developed, fielded, and maintained capabilities to detect and counter various threats such as the advance-technology, hypersonic glide body design and launch platform study.
- Supported multiple agencies in key technology development critical to our national security like the CORONA project; selected as the best cyber and simulation project at the 7th Annual Intelligence Community Tech Expo.
- Increased transparency into program development and management of Work for Others (WFO) activities, providing access to more reviews and improving reporting tools.
- Invaluable in the Lean Six Sigma study on WFO providing important data on processing efficiencies.

## Opportunity for Improvement

- Improved communication, requirements documentation, quality control, and schedule definition may assist in avoiding the issues encountered with the manufactured U.S. Nuclear Detonation Detection System satellite payloads. While payload performance met specification in FY12; all cost, performance and schedule margins were reduced to zero to accomplish NNSA requirements.
- There have been some improvements in the collaboration between ES&H policy areas and the line organizations but major work is still necessary to demonstrate a safety conscious work environment, to reduce DART and TRCR across Sandia, and to improve WP&C to lower risk to mission execution. While the investigation, report and associated lessons learned from the Lithium Fire event were good, the response was not as proactive as it could have been and the impacts to mission were understated in the PEAR. In addition, the outcome of the Office of Enforcement (OE) review may have further impact to mission.
- Increase DOE mission connection with Sandia's science base and research foundations to strengthen its support of DOE sponsored programs, including Energy Efficiency and Renewable Energy programs.

## PO-3: Science, Technology & Engineering

**Sandia Corporation (Sandia) will effectively execute Science, Technology and Engineering (ST&E) to enable and support the Laboratories' national security missions and to advance the frontiers of ST&E. This Objective includes Critical Performance Measures used to assure effective management of ST&E.**

**Adjectival Rating: Excellent**

### Summary of Performance

Sandia significantly exceeded expectations in four of five performance measures and continues to maintain a strong ST&E base across a broad spectrum of science and engineering disciplines to enable effective execution of missions across all laboratory mission areas. Sandia continues to demonstrate numerous advances in science and engineering, and continues to push the frontiers of science and engineering. Strategic investments made in research across seven core research foundations have proven very successful across a broad spectrum of mission areas.

A comprehensive external review of all research foundations was completed this past year, confirming Sandia is maintaining a world-class research portfolio that provides critical differentiation in the delivery of mission commitments, enabled by strong Industrial and University Partnerships and Laboratory Directed Research and Development (LDRD) Programs. Demonstrated strategic investments have been made in LDRD projects that undertake ground-breaking interdisciplinary research challenges that create transformational opportunities in technology development. Sandia made considerable strategic investment in LDRD, whereas LDRD continues to help accelerate discovery and innovation that has led to breakthroughs in ST&E, which leads to broader strategic partnerships with Other Federal Agency, industry and academia. In addition, the Early Career LDRD Research Program is progressing very well and helps to foster early career development of next generation scientists and engineers. Sandia successfully hosted the NNSA sponsored 2012 LDRD Symposium in Washington, DC.

The formation of the Sandia Research Leadership Team has proven very effective, providing the leadership and strategic direction for laboratory programmatic research strategy across seven core research foundation areas. These research foundations bring together Sandia's highly specialized research staff and bring these competencies into the forefront of innovation that ultimately deliver significant impact on U.S. national security.

Sandia continues to focus on capabilities and critical skills following a year of increased attrition and various management changes. Sandia continues to deliver innovative technologies that: help sustain, modernize and protect the nuclear arsenal; prevent the spread of WMD; protect national infrastructures; defend against terrorism threats; enhance capabilities to the armed forces and national defense; lead the way to ensure the stability of the nation's energy and water supplies; and contribute toward the creation of a firm platform for increased U.S. economic security and development.

Industrial and University Partnerships continue to excel across Sandia and further promote Technology Transfer, commercialization, entrepreneurship, and ultimate economic development for our nation. Partnership programs such as Sandia Science & Technology Park, Entrepreneurial Separation for Technology Transfer, New Mexico Small Business Assistance, Technology Ventures, University Partnerships, and Technology Transfer have all produced numerous and impressive technology transfer outcomes.

Sandia continues to perform external peer reviews of overall research strategy, with a focus on the LDRD Program this past year. Results of external reviews confirmed a research strategy that is relevant, of excellent quality, and dependent on a strong competent workforce that provides impressive scientific and engineering impact results. These results help to build a state of readiness for Sandia to prepare for national security challenges of the 21<sup>st</sup> century, including competencies to address: economic security, asymmetric threats (terrorism, cyber and bio); science and technology surprise; and countering nuclear or chemical proliferation.



Although Sandia demonstrated overall success within this Performance Objective, two issues were addressed this FY regarding Intellectual Property and Licensing: an Inspector General (IG) audit suggested that there were shortcomings associated with Sandia's management of Organizational Conflict of Interest in association with Lockheed-Martin sponsored work activities; and an internal control weakness in intellectual property management and licensing resulted in several patents in Sandia's license portfolio lapsing due to non-payment of maintenance fees. However, both of these issues were resolved to include corrective actions and mitigation plans to avoid future shortcomings.

## Significant Accomplishments

Sandia successfully achieved numerous accomplishments toward advancing the frontiers of science and engineering, providing innovative science-based technology solutions for a broad spectrum of applications. Select examples of notable accomplishments are described below.

- Four R&D100 Awards: Neutristor, Sandia Cooler, MEPV, and the Sandia Digital Microfluidic Hub. All four technologies are rooted in LDRD projects.
- Federal Laboratory Consortium (FLC) National Award for Excellence in Technology Transfer for the Fuel Cell Mobile Light, and FLC in State and Local Economic Development Award for the Sandia Science & Technology Park.
- Two Sandia employees were selected to receive a Presidential Early Career Award for Scientists and Engineers, the highest honor bestowed by the U.S. government on science and engineering professionals in the early stages of their independent research careers.
- Secretary of Energy Achievement Award for construction of the new Ion Beam Laboratory (IBL); completed six months ahead of schedule and \$5.5 million under budget.
- Society Fellows: examples include American Institute of Medical and Biological Engineers; Society of Automotive Engineers; Society for Industrial and Applied Mathematics; and Society of Photographic Instrumentation Engineers.
- The Department of Homeland Security, Undersecretary for Science & Technology, specifically requested Sandia's assistance on an advanced diagnostics project because of its unique combination of capabilities in microfabrication, biology, and systems analysis.

### *Select Examples of Advancing Frontiers of Science & Engineering*

- Research at the Combustion Research Facility was chosen as a "HOT" paper in the *Journal of Physical Chemistry Chemical Physics*, "New mechanistic insights to the O(<sup>3</sup>P)+ propene reaction from multiplexed photoionization mass spectrometry." The research will improve predictive simulation of combustion chemistry, thus playing an increasing role in the rapid computer-based design of new, efficient combustion engines.
- In support of multi-junction solar cells, MEPV Grand Challenge research has demonstrated a III-nitride nanowire arrayed solar cell that can tap the higher energy portion of the visible light spectrum, thus increasing overall photovoltaic efficiency.
- A paper on the first experimental observation of the integer quantum Hall Effect in graphene was selected as one of the Applied Physics Letters 50<sup>th</sup> Anniversary Collection: Editor's Picks of Most Recent Publications (editor's top 50 new papers).

### *Select Examples to Enable National Security Missions*

- A new Unified Creep Plasticity model for predicting structural polyurethane foam response to impact loading events has been developed for simulation of impact events for the B61 system. Mechanical response predictions were found to be accurate, thus demonstrating the value of this modeling tool for foam failure.
- The Albany 2.0 integrated suite of component-based, scientific applications (Trilinos, Dakota and Sierra) is transforming the computational science community's ability to build new application tools, such as the quantum device computer aided design application and the Laboratory for Computational Mechanics application.
- Qualification Alternatives for the Sandia Pulsed Reactor (SPR) NW Level 2 Milestone 4484 was completed after a final review panel meeting for the density functional theory assessment of defects in neutron-irradiated III-V materials.
- The effectiveness of a commercial (real-time) cyber defense tool (SPLUNK) has been improved to detect and

### **Significant Accomplishments**

block spear phish emails. Org. 9310 has been testing this capability and is moving toward including it in Sandia's production environment.

- Research in the Predicting Performance Margins project has supplied B61 LEP designers with an improved model for welds in stainless steel.

### **Opportunity for Improvement**

Following the development of a comprehensive research strategy for the laboratory this past year, Sandia should focus on implementation of approved research strategy, specifically in the areas of Technology Partnerships, LDRD, and Mission Integration, with ongoing support of the Mission Leadership Team.



## PO-4: Operations

**Sandia Corporation (Sandia) will maintain effective and efficient Environment, Safety, and Health (ES&H), Emergency Management (EM), Integrated Safeguards and Security (IS&S), and Facilities Operations, such that the appropriate infrastructure, tools, training, policies, and guidance are in place to fully support successful accomplishment of the mission.**

**Adjectival Rating: Good**

### Summary of Performance

Performance in the areas of ES&H, IS&S, and Facilities were measured through negotiated performance measures developed for each of these programs, in conjunction with a subjective assessment of Sandia's overall policy area program performance. Performance results associated with each of the separate performance measures were taken into consideration when providing the rating for the overall objective. NNSA's evaluation of the Sandia PEAR determined that the assessment results for this PO did not provide evidence of a genuinely self-critical performance review by virtue of not including key opportunities for improvement that exist in ES&H, IS&S and Facilities.

ES&H - Sandia continues to make improvements in and increase awareness of the safety and health programs through the implementation of tools such as LiveSafe, Challenge and ErgoTool. For the second year, there was an increase in TRCR and DART rates across Sandia; however, the focused efforts on safety awareness in August and September appear to have had a positive impact based on the downward trend of reportable cases. ES&H has supported many line efforts, but continues to struggle with line implementation of WP&C requirements as evidenced by both external assessments and operational events. Although ES&H recognizes these concerns and has initiated actions to address them, effective line implementation has not been achieved. Sandia has not provided evidence that actions to address these concerns include assurance processes (self-assessments, metrics, etc) that will ensure effective WP&C and demonstration of a safety conscious work environment throughout SNL.

Sandia self-discovered a non-compliance issue with their internal wastewater permitting process (an inappropriate discharge to the sanitary sewer) and NNSA is concerned about the extent of similar conditions in the program. In addition, the New Mexico Environment Department performed a Safe Drinking Water Act inspection in June and indicated a potential violation. The significance of the potential violation has yet to be determined as it is now associated with the Kirtland Air Force Base underground fuel leak and has been elevated to the Environmental Protection Agency (EPA).

EM - No significant issues for the Sandia EM program were identified in FY12. Issues are being worked and the appropriate progress is being made. Sandia EM continues to successfully implement their self-assessment program, which identifies issues, and utilizes an effective issues management process for developing and tracking corrective actions. Overall Sandia EM continues to maintain and implement an effective EM program that meets the requirements of DOE Order 151.1C.

IS&S - Sandia Security successfully met 100% of the CPIs established for the FY12 baseline, exceeding their 90% goal. Additionally, Sandia Security provided effective leadership and management in partnering with line organizations to ensure mission success and to effectively reduce the security footprint. Sandia Security successfully: 1) streamlined and optimized some Safeguards and Security (S&S) processes to achieve cost savings/avoidances; 2) gained operational and process efficiencies through innovative approaches; and 3) improved system performance and reliability. IS&S continues to mature the Security management review process which has resulted in a strengthened S&S assurance program.

Facilities - Sandia Facilities performance was inconsistent for FY12. Sandia had strong management of the Test Capabilities Revitalization (TCR) Phase II project, maintenance metrics, office utilization rates, and the Sustainability Program. However, improvements are needed in the management of General Plan Projects (GPP)

projects, Facilities Information Management System (FIMS) validation, and support of projects such as the alternatively financed Mission Support Complex. The Fire Protection program performed well with completion of high quality scheduled assessments, timely support of the Building 6588 Life-Safety compliant staircase and the explosive metal dust ventilation system projects, and continued leadership in the DOE Fire Protection community. Sandia's PEAR (self-assessment) for Facilities did not address a significant number of project management related issues.

## Significant Accomplishments

### ES&H:

- Received ISO14001 recertification at both the New Mexico (NM) and California (CA) sites and was selected by the EPA as a Waste Wise Gold Achievement-Sustainable Procurement winner. Sandia also received an Environmental Stewardship and Best in Class award, a DOE Sustainability Award, and six Gold Awards from the Albuquerque/Bernalillo County Water Utility Authority.
- Successfully received a five year recertification for the H1616 packaging container which will allow continued transportation of weapons-related materials. In addition, Sandia successfully negotiated an approval extension for the use of the DT-23 packaging, supporting future disposition of SPR III fuel plates.
- There was excellent collaboration amongst divisions to move and stage PuICE and uranium shot waste material from the Z Machine while achieving significant program savings.
- The Halon cylinder accident investigation, including causal analysis and extent of condition review, was a significant improvement over similar investigations this FY.
- Sandia Security coordinated, managed, and funded the destruction of 15,970 pounds of legacy mixed waste.

### IS&S:

- As a result of operational and process efficiencies the Security Program submitted a planned budget of \$1.6M less than the FY12 target of \$68.8M.
- With support from NNSA and Defense Nuclear Security (DNS), reallocated \$3.6M in existing Security Program FY11 FS-20 DNS carryover funds for the removal of the remaining No Defined Use (NDU) Pu-bearing mixed oxide (MOX) fuel. This investment ultimately yields approximately \$2M in annual security, safety, and operational savings and reduces risk from both a Nuclear Safety and Security perspective.
- The SNL/NM Protective Force successfully reduced holdings of surplus ammunition, smoke, and firearms by providing a notable quantity of these items to eligible agencies.
- The new Contractor Badge Request application streamlines the processing of contractor badge requests, eliminates manual entry of badge requests faxed to the Sandia Badge Office, automatically enforces business rules, and reduces turnaround time for badge requests.
- The outdated and unsupported Processes & Procedures Infrastructure application was replaced by the IBM® Rational® DOORS® (Dynamic Object Oriented Requirements System) application on the Sandia Restricted Network. This application resulted in increased quality and efficiency by optimizing requirements communication and collaboration in addition to an approximate annual cost savings for Requirements Traceability from \$3k to less than \$500.
- Ammunition purchases and time on Live Fire ranges are being kept to a minimum while officer training (marksmanship and weapons manipulation) opportunities are being maximized through deployment of the Protective Force Firearms Training Simulator.
- The Classified Virtual Library project resulted in the conversion of 100 classified reels and destruction of 490,000 classified pages.
- The SNL Security System Replacement Program was completed one year ahead of schedule and has significantly improved system reliability. False Alarm Rate and Nuisance Alarm Rate rates have dramatically improved from the former rate of ~2000/day in FY06.
- Utilizing Automated Control Enabling System, Central Personnel Clearance Index and USAccess, Sandia Personnel Security has been able to electronically reconcile over 12,000 records. This weekly reconciliation process will help expedite the reprint/reissuance process for credentials expected to expire in 2013 with a reduced risk of errors.

## Significant Accomplishments

### Facilities:

- The IBL project was awarded the DOE Secretary's Achievement Award for completion six months ahead of schedule in FY11 and \$5.5 million under budget.
- Maintenance metrics were exceeded with respect to proactive maintenance (71.5% vs. 65%), which is above industry standards.
- The TCR Phase II project received approval of a level 1 Baseline Change Proposal for \$3.8M of scope that had been previously removed in earlier years due to budget constraints.
- The Sandia space utilization rate of 91% in FY12 reflects positively, representing a 3% improvement from FY11.
- Sandia Facilities successfully briefed the Mission Leadership Team and received approval for use of energy savings (indirect dollars) to invest in sustainability activities during the next four years to help meet Site Sustainability Plan goals. This investment is expected to result in up to a 25% decrease in overall site energy use.
- Z Machine has improved transparency of operations. They have installed multiple cameras that take real-time pictures of operations. NNSA can easily view the cameras without having to use special passwords. In addition, the Z Machine homepage shows in a pictorial fashion which procedural steps have been completed toward an upcoming shot.

## Opportunity for Improvement

### ES&H:

- NNSA remains concerned with the lack of demonstration of a safety conscious work environment and the lack of consistency in implementation of WP&C programs by the line organizations and the lack of assurance evidence of assessments on line implementation of the ES&H programs.
- Concern remains with the effort to address Industrial Hygiene, Integrated Safety Management, and WP&C concerns brought forth by the OE, the IG and NNSA.

These opportunities for improvements, coupled with several recent events (Halon cylinder, fume hood, etc.), underscore the need for Sandia to understand the aggregate causes in order to identify and address underlying safety concerns.

### IS&S:

- Sandia has experienced quality management issues regarding material control and accountability documentation (Form 741), security plans, controlled documents, and comments and feedback regarding new and revised DOE/NNSA requirements.
- Implementation of the *S&S Integrated Assessment Program* has not resulted in measurable improvements in security-related performance assessments of line operations. Although this effort was implemented in response to the Settlement Agreement signed in 2011 with the OE, NNSA has not seen marked evidence of improvements in line security performance.
- The level of formality and rigor being applied to highly sensitive programs require additional attention in order to ensure these programs meet applicable administrative and security protection requirements.

### Facilities:

- FIMS validation received a RED scorecard due to Deferred Maintenance condition inspections not being up-to-date. This was the second year in a row there was a FIMS deficiency.
- Again this year, Sandia management did not provide the economic analysis requested by NNSA/NA-16 for the Mission Support Complex. The project had been proposed by Sandia as a high priority line item in fall 2010. At that time, NNSA directed Sandia to bring forward the economic analysis to support approval of an NNSA Critical Decision 0 for alternative financing of this project and Sandia never completed this. This issue was also not addressed in the PEAR.
- There has been a decline in performance in Sandia Project Management resulting in the following issues:
  - Did not act proactively to maximize use of FIRP funding at the site.
  - Exceeded the original Work Authorization for Roof Asset Management Program Site Support.

- Need improved self-assessment to effectively identify/address issues and meet self-assessment due dates.
- Need to work closely with NNSA to ensure clear interpretation of requirements for GPP funding; i.e., Building 840.
- Delays were experienced in the submittal of several permit renewal real estate packages due to the lack of tracking and tracing of U.S. Air Force environmental documents. Consistent tracking of the environmental documents would have prevented these delays from occurring and would have better supported the Air Force's review/approval process.
- There needs to be an increased focus on reducing the attainment risk for High Performance Sustainable Buildings due to sustainable acquisition requirements and Data Center Metering.
- The only on-site destruction facility for classified matter has been decommissioned due to safety concerns and the alternative destruction location is at full capacity at this time and not accepting any more incoming shipments resulting in a backup of classified matter marked for destruction.

## PO-5: Business Management

**Sandia Corporation (Sandia) will maintain effective and efficient infrastructure and business services, ensuring the appropriate tools, training, policies and guidance are in place to fully accomplish the mission.**

**Adjectival Rating: Very Good**

### Summary of Performance

While Sandia demonstrated enterprise-wide leadership and excellent performance in the areas of Finance, Human Resources (HR), Information Management (IM) (including Information Technology (IT) and Cyber Security), and Supply Chain Management (SCM). Sandia management has not addressed long-standing, systemic issues in Assurance, ES&H and Quality. It is recognized that Sandia has undertaken numerous initiatives to address these issues; however, Sandia has not demonstrated significant improvement. Performance was measured through negotiated performance objectives developed for each of these programs, in conjunction with a subjective assessment of the overall Policy Area's program performance. The Finance program was evaluated through objectives and measures established by the NNSA Chief Financial Officer within the Office of Field Financial Management (OFFM). Sound business practices were integrated into all work activities throughout SNL to maintain effective and efficient operations and support mission objectives as are noted throughout the PEAR. Although Sandia highlighted accomplishments in their FY12 PEAR, they did not provide a balanced evaluation through identification of areas requiring improvement and critical management issues/challenges.

OFFM provided an overall annual rating of "Good" (highest rating). Sandia resolved all previously identified Cost Accounting Standard (CAS) concerns; however, more partnering between Sandia and NNSA is required to help resolve the CAS 405 Executive Compensation issue on burdening policy. NNSA has not accepted the Sandia justification on its Executive Compensation burdening policy. Finance rolled out several new business tools, identified cost savings in indirect pools, and provided Enterprise-wide lessons learned in their implementation of the business system Oracle Version R12. HR revamped their antiquated compensation structure and implemented a new compensation system, which is expected to assist in retention of critical skills and institute pay for performance providing for market integrity and pay equity. Additionally, Sandia continued their focus on workforce development and medical benefit cost containment while retaining quality benefits. Cyber Security successfully completed all milestones and most objectives identified in their Annual Operating Plan while supporting and enhancing the DOE and the Enterprise's forensic capability. Additionally, Sandia made strides to improve their posture on all networks through better tools and updated operating systems. PEP metrics for IT (10 items) averaged excellent ratings in all four quarters and supported the NNSA Enterprise IT transformation initiatives. SCM strives to be "Best in Class" in all areas of Procurement and Logistics and was recognized through ISO recertification, national recognition, New Mexico Quality Awards, and DOE Procurement Evaluation and Reengineering Team (PERT) best practices. SCM made significant improvements in managing the Purchase Card (P-Card) and Funds-Out Interagency Agreement programs. Opportunities exist for increased transparency of risks in the Assurance Information System (AIS) and self-identification of issues in the PEAR pertaining to records management and cyber security incidents under 10 CFR 824.

### Significant Accomplishments

- Incorporated a new cost estimating tool that improves technical basis of the estimates and increased automation with electronic invoicing.
- Developed a new Conference Tracking Tool to meet increased scrutiny and to answer timely reporting requirement demands.
- Increased financial transparency with NNSA and executed a retroactive variance redistribution process to answer CAS compliance concerns.
- Created a cross-functional team to address budget risk and identify potential financial levers (Budget Emergency Response Team [BERT]).
- Drove indirect cost pool savings through engaged management and resource stewardship.

## Significant Accomplishments

- Supported the Contractor Assessment and Program Evaluation team review with data mining for over 50 years worth of historical weapons funding and cost data.
- Provided extensive lessons learned to Enterprise partners on implementation of Oracle R12 business application.
- Revised travel policy to allow non-refundable and 14-day advance tickets resulting in \$603K in savings.
- Implemented a new compensation system, TotalComp, within an aggressive timeline, which is expected to assist in retention of critical skills and institute pay for performance providing for market integrity and pay equity.
- Through thorough benefit analysis and implementation of benchmarked programs, contained healthcare costs when compared to national industry trend; half the national trend.
- Developed the workforce through innovative mentoring programs, web-based courses, and a “one stop shop” web portal for training.
- Continued as a national leader in cyber security forensics, analysis, incident remediation and response to cyber security incident remediation activities across DOE.
- Provided outstanding leadership and support to the Enterprise Secure Network in engineering the solution for reducing the Secret Internet Protocol Router Network (SIPRNET) point-to-points into an effective and secure gateway.
- Created a dynamic virtual cloud environment to enable/facilitate collaboration with other sites for malware analysis.
- Demonstrated its commitment to improving workforce awareness of common threats by conducting a “phishing” awareness training exercise and immediately redirected identified employees to supplemental training.
- Successfully migrated SIPRNET to the NNSA Secret Network.
- Provided critical support to the overall design of the ONEvoice solution for the NNSA Enterprise that will dramatically reduce the amount of paperwork needed to facilitate enterprise solutions.
- Led the mobility sub-IPT in RightPath that will enable mobile workers throughout the DOE/NNSA to leverage enterprise services in a device agnostic way.
- Accomplished Lync 2010 federation in support of RightPath; first DOE/NNSA site.
- Received numerous Chief Information Officer awards and ISO certifications.
- Enhanced reporting and accountability SCM leadership, and key personnel.
- Drove significant improvements in management, review, and reporting of the P-Card Program.
- Educated customers on the importance of advance planning for Funds-Out Interagency Agreements.
- Received best practice peer recognitions from the DOE PERT review.
- Exceeded all other sites in NNSA SCM Center participation, which included providing active team members for four commodity teams as well as eight other sub-teams, and was instrumental in achieving DOE Secretary’s \$450M savings goal.
- Achieved all but one Small Business goal, missed by .4%.
- Logistics earned the Quality New Mexico Roadrunner award, and was again recognized by Government Fleet Magazine as a “Top 100 Fleet”.
- Awarded the New Mexico Commission for Community Volunteerism the Corporate Volunteer Award for support of veterans.

## Opportunity for Improvement

- Improve communications with NNSA when requesting approvals required by the contract, and provide sufficient substantiation for proposed actions and adequate processing time, particularly for those actions that may bring precedence setting business decisions with potential complex-wide implications.
- Continue to work with NNSA as NNSA completes its analysis of the CAS 405 information provided by Sandia.
- Improve export-control processes.
- Improve management of Non-Federal Entity deposit recordings and balanced financial reports to avoid potential legal and administrative funds violations.
- Reconcile the significant delta between Standard Accounting and Reporting System and Financial Management

System reports.

- Communicate the results of the third-party equity/adverse impact analysis of TotalComp.
- Continue to implement controls and effectively manage the Special Leave of Absence (SLOA) program with appropriate rigor to reduce risk and ensure no increase in costs to the government while recognizing the important contribution SLOA participants deliver in the national interest.
- Provide additional emphasis on continuous monitoring of cyber security controls and on an assurance strategy for those controls whose monitoring cannot be automated.
- Increase input from line organizations in the form of mission risks and business impact analysis to help achieve substantial corporate gains in overall business operations.
- Improve management and reporting of subcontractor performance while ensuring data integrity with subcontractor business size and socio-economic status.
- Ensure all applicable flow-down requirements are included in subcontracts with all accurate references.



## PO-6: Corporate Governance

**Sandia Corporation (Sandia) will efficiently and effectively operate its quality assurance system, decision-making framework, and implement rules governing employee and business conduct while demonstrating improvement to the Contractor Assurance System (CAS) through formal assessment, causal analysis, and improvement action planning and monitoring supporting NNSA's continued transformation to Governance oversight reform.**

**Adjectival Rating: Good**

### Summary of Performance

During FY12, a CBA was performed of Sandia's QMS due to the number of corporate QA deficiencies, lack of an integrated QA system, and no Sandia self-assessment. The NNSA CBA, the concurrent QA assessment by Lockheed-Martin and the concurrent Sandia corporate QA self-assessment provided Sandia with numerous findings/issues for resolution and indicated that significant improvements were necessary to move toward an effective Corporate QA program. Subsequent to the CBA, Sandia established a Quality Steering Council, revised the Quality Management System Description (QMSD), and reassigned management responsibilities for the QA program. Although Sandia leadership is now engaged to address long-standing issues in this area, the results of initiatives to improve the effectiveness and efficiency of the QA system will take time to be fully implemented and institutionalized.

In the initial versions of the Assurance Improvement Plan (AIP), it was not clear that the activities within the plan could be accomplished in a way that would affect improvement within the Contractor Assurance System. Early in FY12, Sandia dedicated effort toward revising the AIP to ensure that it could be effectively managed as a project. These changes allowed Sandia to complete AIP key activities according to schedule. Regarding Sandia's assessment of assurance maturity, Sandia Executive Leadership used the FY11 maturity assessment results as a baseline and established maturity element target levels for FY12. Sandia was able to demonstrate improvement in assurance maturity for those entities that were found to be the least mature in FY11. 90% of the 55 elements assessed in FY12 were found to be at a maturity level of 3, which is an improvement from the 29% of elements that were found to be at a level 3 in FY11. This nears the element target levels that were established by Sandia Executive Leadership for FY12.

In the area of Legal Management, Sandia has exceeded substantially all of the significant performance criteria in FY12.

Overall, Sandia has exceeded many of the significant performance criteria in this performance objective and although NNSA has seen improvement, continued effort will be required to institutionalize these across Sandia.

### Significant Accomplishments

- Revised the QMSD by setting corporate quality requirements and quality performance expectations.
- Demonstrated progress in the implementation of the Corporate QA Suspect/Counterfeit Items program (e.g., new management for development/implementation responsibilities, training revision, recent benchmarking, and increased transparency.)
- Assurance process was revised to include a discussion of line implementation of policy; however, an effective set of metrics will be needed to demonstrate this initiative
- Revised the AIP to address logic inconsistencies and to ensure that it was managed as a project; dedicating an individual to provide project management and status updates.
- Released a new version of AIS that includes modules for risk management, assessments, and corrective actions that was deployed slightly ahead of time and under budget, and allowed for the retirement of the Corrective Action Tracking System and the Laboratory Enterprise Self-Assessments system.
- Demonstrated improvement in assurance maturity for those entities that were found to be the least mature in



## Significant Accomplishments

FY11.

- Matured its Litigation Lessons Learned process to include an annual review incorporating assessment of effectiveness of implementation of corrective actions. This process is expected to substantially mitigate future legal liability risks.
- Provided outstanding support to the U.S. DOJ in the *Deepwater Horizon* and *Bayou Choctaw Salt Dome* litigation cases. In both cases, Sandia produced extensive document collections, often under severe time constraints, and provided fact and expert witnesses, enabling DOJ to meet court-imposed deadlines.
- In recognition of the leading-edge performance of Sandia's e-discovery team, the DOE General Counsel has tapped Sandia to lead a Department-wide initiative to develop the Department's e-discovery capabilities, an area long in need of attention.
- The Sandia Legal Division notably increased its visibility across the laboratories by providing an impressive array of timely legal presentations on a broad variety of emerging legal issues and topics, as well as continuing the noteworthy practice of regularly briefing Executive Leadership on litigation. This is a critical component of an effective corporate strategy to manage legal risk.
- The level of litigation remains low. The number of new cases filed was the same as in FY11.
- Enhancements to Sandia's litigation management processes and extensive benchmarking activities this year demonstrate Sandia's responsiveness to NNSA's concerns about managing legal risk and outside counsel costs. Most noteworthy is Sandia's participation in the Association of Corporate Counsel Value Challenge--Managing Litigation as a Business, the focus of which is well-aligned with the objectives and policies of DOE/NNSA for litigation management and oversight, 10 CFR Part 719.

## Opportunity for Improvement

- Corporate QA has several opportunities for improvement. A few examples include: clear roles, responsibilities, authorities and accountabilities are not completely defined or in place; the QA program is not fully integrated into the current contractor assurance system; QA performance metrics for assurance system implementation and improvement remain limited; and lack of effective lessons learned programs that drive systemic improvements.
- QA is being interpreted as the delivery of products that pass inspection versus a process that ensures repeatable and predictable product quality.
- Operating Experience was not evaluated in FY12 because Sandia recognized that major element changes were needed before Management Entities could improve in this area. The effective use of operating experience is essential to fostering a learning environment and currently a major gap exists within the assurance system in this area.
- The systemic value of self-assessments is uncertain as evidenced by continued program execution and performance issues in spite of the numerous self-assessments conducted. Contributing factors include many line self-assessments do not observe work being performed or assess implementation of policy, and findings are frequently categorized as observations which require less rigor to address. As a result, causal analyses are not conducted when warranted, trending of findings across Sandia is more difficult, and system corrections are not instituted. However, several Sandia organizations, such as Centers 1700 and 2700, have excellent self-assessment programs that could serve as benchmarks.

## PBI-1: Nuclear Weapons – Stretch Goals

Achieve stretch goals (exceed Level II milestones) to demonstrate Sandia Corporation's (Sandia) leadership within the Nuclear Security Enterprise (NSE). Evaluation of these stretch goals will consider the availability of sufficient funding needed to complete such additional work.

**Adjectival Rating: Excellent**

### Summary of Performance

ASC/ICF/SC goals - Sandia continues to push themselves to achieve impactful FY12 accomplishments in the ASC, ICF and SC campaigns such as excellent integration and design support between the Sandia modeling and component design efforts, development of containment for higher current Pu test shots, innovative new target designs, and refinement of computational simulation capabilities.

RTBF goal – Sandia met or exceeded expectations for the three RTBF stretch goals. Sandia delivered a list of programmatic equipment in RTBF funded mission critical facilities vital to sustaining capabilities. This list was completed on time and further refined over the last two quarters. Sandia also applied funding to support the Tonopah Test Range (TTR) revitalization and Silicon Fabrication Recapitalization (SSiFR), which exceeded expectations.

W88 ALT goal – Sandia submitted input to the WDCR in June for the three-point estimate that was beneficial and necessary to perform the Monte Carlo simulation to assist in arriving at a high confidence program cost estimate. In addition, Sandia generated a comprehensive basis of estimate that supported their WDCR estimate.

Kansas City Responsive Infrastructure Manufacturing Sourcing (KCRIMS) – Sandia's weapon systems programs utilized existing FY12 funding allocations to support Sandia's planning, response to materials dispositioning, and high priority requalification activities. Sandia responded to all KCP disposition calls, including a review of surplus items in KCP stores. Sandia identified 70 defined KCRIMS related risks and increased communications and support in the partnership with KCP counterparts to assure a successful move execution. Sandia provided requalification plans and released a review of the Transportation Study for transportation environments for the move to the new facility.

B61 Goal – Sandia provided innovative cost saving design trade-offs to meet the submittal of the B61-12 WDCR refined cost estimate realizing significant cost reductions over the life-of-program relative to earlier estimates. Sandia's transparency into the cost development allowed NNSA to understand the trade-offs and decisions made in the development of the WDCR.

### Significant Accomplishments

- ASC Modeling & Simulation provided excellent integration and design support for the B61-12 LEP Program. Significant engineering analysis results were delivered including numerous analyses supporting design tradeoffs, simulations supporting the environmental specification determination for components and sub-assemblies, and determination of worst-case accident scenarios for system test design. Additionally, Sandia made great strides in simulation credibility and Verification and Validation (V&V) as reflected by their revised V&V plans and Predictive Capability Maturity Model assessments conducted of their models and capabilities.
- ICF demonstrated an established Pu dynamic materials shot as routine work on the Z Machine by conducting three Pu shots in FY12, including both ramp compression and flyer plate experiments. The fourth Pu shot was deferred into the first week of October 2012 due to delays associated with the sample preparation at LANL; however, Sandia and LANL collaborated very well on this effort throughout the year. Additionally, Sandia completed the development and testing to demonstrate the capability of the next-generation containment system at 16 mega-amperes, despite the increased work and testing that were required due to the explosive Ultrafast Closure Valve (UCV) not meeting the leak rate specification during higher current containment testing. The

## Significant Accomplishments

UCV evaluation effort included development of additional capabilities to perform ultrasound imaging, x-ray radiography, and material analyses of each UCV, which resulted in a more thorough investigation of the underlying issues with the legacy UCV. In addition, new tools for the R&D efforts of the program were created. Sandia completed a comprehensive evaluation of higher pressure Pu experimental conditions needed to address critical long-term SC needs, including both pulsed power and other NSE facilities which could meet the desired conditions. The documentation included experimental plans to reduce risks and demonstrate feasibility of diagnostics, drivers, targets, and containment, and was presented to NNSA.

- Applied \$6.4M funding above the \$4M target to the SSiFR facility per the risk ranked study. The funds provided upgrades to the uninterrupted power system and the clean room controls, design of the replacement solvent fans and ducting, removal of obsolete equipment and room prep in anticipation of FY13 recapitalization funds, and the replacement of two CMOS7 Diffusion Furnaces with the associated engineering design and construction required for installation. This succeeded in replacing some of highest risk equipment in the facility early in the recapitalization project.
- Applied \$4M funding above the \$2M target to TTR revitalization needs in accordance with the revitalization study. The funds provided Depot Level Maintenance for two tracking radars, replacement of a mobile telemetry system to allow for future B61-12 LEP testing, and a backup generator system for critical test infrastructure as well as smaller improvements. Additionally Sandia funded and completed a Master Plan Study to evaluate Green Field versus Brown Field options.
- Allocated FY11 carryover funds to support FY12 project team program management efforts. Sandia released 42 KCRIMS related Qualification Plans in FY12. Of these 42 releases, 18 met Sandia's FY12 planned commitment. The remaining 24 released qualification plans exceeded expectations as they were early FY13 releases. These qualification plans were released without affecting core weapon system activities.
- Performed exceptional work on the W88 ALT 370 in FY12.

## Opportunity for Improvement

None

## PBI-2: Nuclear Weapons Quality Assurance

Sandia Corporation (Sandia) will continue to improve its quality assurance (QA) methods and focus on the identified opportunities for improvement, as identified below. These areas, if successfully addressed, would significantly benefit product realization and product quality delivery at Sandia and its Nuclear Security Enterprise (NSE) partners (Kansas City Plant, Pantex, suppliers, etc).

**Adjectival Rating: Very Good**

### Summary of Performance

Sandia has made measurable and favorable progress in supplier management, product realization, and the development of new processes that support continuous quality improvement but continued management attention is necessary to ensure that remaining quality gaps are addressed and systemic improvements are completed and institutionalized across Sandia prior to the significant production increases expected in the next several years. Nearly all of the minimum required elements of the Quality Improvement Plan were put in place to address systemic issues. Efforts have yielded a benefit to product realization and product quality. These benefits are localized to a subset of Sandia processes, products, and vendors, and continued efforts will be required to institutionalize these improvements across Sandia. Sandia should continue to implement preventive quality measures such as mistake proofing to other product lines. Sandia and NNSA have identified several opportunities to improve the QMS by incorporating new processes to reduce weapon product defects and eliminate reoccurring quality issues.

### Significant Accomplishments

- The Sandia Design Governance Board became functional and will work to improve design quality.
- The training of Product Realization Team (PRT) members is formally tracked by the new Knowledge Development Program Training System which provides metrics and completion rates. Completion rates for training are very good.
- Processes and scoring criteria have been established to risk rank each supplier's QMS. Sandia will finalize the draft procedure and implement "Supplier Risk Based Monitoring" in FY13.
- The Realize Produce Subsystem was upgraded to improve usability.
- A process to evaluate external suppliers' technical capabilities was developed and piloted.
- An NNSA QA survey (NA-121.3) documented noteworthy practices for the W88 ALT program's requirements flow-down and management and risk management.
- Design Peer Reviews are well documented and institutionalized.

### Opportunity for Improvement

- NNSA QA surveys identified the following in FY12: a repeat issue concerning control of product definition changes; issues related to conformance to (and control of) work instructions for product assembly; and weaknesses in the handling of in-process piece-parts released from bonded stores at a Sandia vendor.
- Evidence demonstrates good progress on the development of institutional tools; however, in some cases, Sandia has not yet demonstrated implementation.
- New and improved systems have been recently deployed but evidence that the improved QMS is preventing defects, addressing recurring issues and improving cost effectiveness is pending.
- Design metrics are in use for some applications but are not yet institutionalized.
- Metrics for weapons quality have not been developed to monitor efficiency or effectiveness (cost of nonconformance, scrap rates, turnover rates, etc.). Corporate metrics currently focus on acceptance rates and schedule.
- Lower level product quality metrics exist at the component level and vary in implementation. These lower level metrics are not shared or integrated throughout the program.
- Corrective actions from a 2010 Pantex tooling issue were significantly late. Action was taken after it was identified as open by the DOE Office of Inspector General.

- Opportunities exist to proactively identify risks to product quality at the component, next assembly, and system levels. Sandia can improve their processes that analyze and document their rationale for preventing, accepting, or mitigating significant risks to product quality.

## PBI-3: Management of Materials – Stretch Goals

**Sandia Corporation (Sandia) will safely and efficiently manage materials that pose inherent risks at National Nuclear Security Administration (NNSA) / Sandia National Laboratories (SNL) sites.**

**Adjectival Rating: Excellent**

### Summary of Performance

Sandia substantially exceeded expectations in the preparation and disposal of NDU nuclear material, explosives and unneeded chemicals in a safe, secure, and efficient manner. Sandia exceeded this year's disposition goals, thereby saving on future storage and disposal costs. Sandia downgraded one Hazard Category 3 (HC3) nuclear facility and made significant progress toward downgrading two additional nuclear facilities/activities. Sandia developed a multi-year disposition strategy for NDU nuclear material to continue to reduce the nuclear facility footprint and implemented a formal process for life-cycle management of accountable nuclear materials. The removal of materials from building 927 at SNL/CA reduced the radioactive material liability at that site, reduced security costs, and cleared the way for open campus enhancements to the site. Sandia collaborated with numerous external organizations to achieve their disposition goals. The completion of the last legacy Transuranic waste shipment required relentless coordination with personnel from the Waste Isolation Pilot Plant (WIPP), the Central Characterization Project, NNSS, and the Idaho National Laboratory. The Sandia nuclear criticality safety program continued to mature this FY. The nuclear criticality safety classes continued to be conducted at the SPR/Critical Experiment facility for a variety of students, including international students. Additionally, Sandia provided three subject matter experts to support an independent investigation team reviewing control system anomalies at two critical assemblies at the National Criticality Experiments Research Center in Nevada.

Although Sandia dealt with problems and generally recognized them, the details of how these issues are being addressed were not clearly described in the PEAR.

### Significant Accomplishments

- Exceeded expectations by removing eight HC3 or remote-handled, non-MOX NDU items, and a number of other legacy nuclear material containers, which represents substantial progress toward reducing the need for the Manzano Nuclear Facilities, one of Sandia's HC3 nuclear facilities.
- Removed radioactive materials from Building 927 at the SNL/CA site, further reducing the radioactive material liability, reducing security costs, and clearing the way for open campus enhancements to the site.
- Through careful inventory analysis and aggressive disposal activities, Sandia substantially reduced the number of containers of chemicals that have been on site over ten years by over five times the target goal.
- Despite numerous challenges, successfully completed the removal of the final inventory of non-certified Cobalt-60 source pins from the Gamma Irradiation Facility (GIF). During the follow-on efforts to change GIF operating processes, Sandia coordinated emergent, mission-related work regarding the replacement of aging Cobalt-60 sources in, and refurbishment of, a Gamma Cell device. Sandia has planned to perform the work at the GIF utilizing the shielded cells, transportation infrastructure, and facility expertise.
- Provided a "Feasibility Study" that communicates a multi-year approach to further reductions of NDU nuclear material that will achieve a substantial reduction in the nuclear facility footprint. Key meetings and data collection activities were completed prior to the close of FY12, and were critical to further progress on this approach.
- Formally implemented a life-cycle process for the management of accountable nuclear materials and shared this process with other NNSA sites as a "cradle-to-grave" approach to emulate.
- Beyond the scope of this incentive, proactively developed and integrated a Z post-shot material management plan that incorporated the needs/requirements of Z Machine, SPR, Nuclear Materials Management, Radioactive Mixed Waste Management Facility, as well as LANL and WIPP.

### Opportunity for Improvement

Although Sandia has downgraded the GIF, the remainder of the scheduled, supplementary activities was not completed by the end of FY12, as originally scheduled. These activities, which include procedure revisions, revision to the primary hazard screening, stand-alone hazards analysis and a Management Self-Assessment, are now scheduled to be completed by the end of December 2012. In anticipation of future nuclear facility downgrade activity, Sandia should ensure this type of activity is fully integrated in order to minimize conflicts with other priorities.



## PBI-4: Mission Support Efficiencies – Stretch Goals

Establish enduring Sandia Corporation (Sandia) practices that achieve operational efficiency, while sustaining effectiveness, through reform of Laboratory-wide processes and the implementation of Governance.

**Adjectival Rating: Excellent**

### Summary of Performance

Sandia exceeded the significant performance criteria in this PBI including cost savings and avoidances of at least \$42.1M and established an organization to implement an Operational Innovation Program to identify and track savings and their reutilization. In addition, Sandia engaged in multiple efforts to benchmark current operations and increase transparency, while making important progress with integrating efficiency principles in its business operating culture. Although Sandia achieved cost savings/avoidances exceeding the targets, the link to Sandia's reinvestments remains unclear and actual plans for cost-reduction from the benchmarking efforts remain pending. Overall, Sandia's FY12 efforts may yield positive results in FY13 and beyond that bring down costs and rates.

Sandia successfully addressed its workforce needs by exceeding its hiring target, ensuring future critical mission capability despite large numbers of calendar year retirements and separations.

Sandia identified the necessary funds to cover the FY12 costs associated with the Site Wide Environmental Impact Statement (SWEIS) and responded well to the data calls from the contractor performing the work on NNSA's behalf. It is unclear if line organizations are continuing to update and forecast Sandia's growth for the SWEIS effort because potential increases in capabilities at the Z machine and the RMWMF were not identified by Sandia.

### Significant Accomplishments

- Significantly exceeded their efficiency targets (i.e., performance measures 4.1 and 4.3) by achieving at least \$42.1M in cost-savings and/or avoidances.
- Created an Operational Innovation Office whose mission is to drive increased integration and efficiencies across Sandia. The office is implementing an Operational Innovation Program to identify, drive, and track savings and their reutilization.
- Developed a stronger method to monitor and account for Division Support costs using common definitions and more visible reporting and analysis mechanisms.
- Through a 2012 in-depth analysis of indirect costs including fringe, Sandia is laying the foundation for future potential cost savings for areas such as space management, pension, and healthcare.
- Greatly improved its transparency efforts for financial and budget management of indirect costs.
- Hired 102.2% of its FY12 hiring target.

### Opportunity for Improvement

- While FY12 projected cost savings and their associated projects for this incentive are available in the Division 10000 performance assurance data, the information provided was limited until July. There are still improvement opportunities and Sandia is putting in place a program to address this.
- A stronger mechanism and communication process is needed that directly links cost savings realization with reinvestments, so that a one-for-one (or close) match exists to demonstrate how each dollar saved translates into each dollar invested.
- Initial efforts to reduce mission support costs via FY12 initial budget reductions were difficult to track and verify as changes were made but not communicated clearly or documented in an easily identifiable manner. However, there were cost savings realizations that were clearly articulated during the FY, such as Corporate Governance and Facilities savings, and Site Office staff verified those cost savings. In many cases it is unclear whether Sandia validated items on their cost savings list prior to including them in the PEAR.



- There should be a stronger association between benchmarking programs and their costs with developing a clear path for how resulting recommendations will achieve cost savings and bring down indirect rates. As examples, the Emergency Management baseline analysis and accompanying workgroup efforts do not lay out a clear path for bringing down costs and rates. The fringe and space benchmarking analyses resulted in cost shifts from one indirect cost pool to another, but no clear path to bring down costs and rates. In addition, Sandia's benchmarking efforts could yield more effective results by: 1) benchmarking against best practices across industry, rather than benchmarking internally within Sandia or with other NNSA entities; and 2) including cost analysis as part of the benchmarking effort.

## PBI-5: FY12 Multi-Site Targets

Achieve multi-site goals as approved by the Deputy Administrator for Defense Programs to demonstrate Sandia Corporation's (Sandia) collaboration and leadership within the Nuclear Security Enterprise. Demonstrate successful performance against Multi-Site Targets as documented in NNSA's Milestone Reporting Tool (MRT).

**Adjectival Rating: Very Good**

### Summary of Performance

Surveillance – Sandia continued improvements for throughput at the WETL including increasing test complexity for all systems and meeting lab test requirements, consistent with funding. As of September 30, 2012, Sandia executed 25 stockpile flight tests and 53 stockpile laboratory tests under the Core Surveillance Program. Sandia established planning tools for Component and Material Evaluation (CME) for work scope definition, prioritization, and resources to facilitate integration with KCP. Sandia established a formal transition process for CME to Core Surveillance and validated the guidelines across LACs and the MC4217 detonator. Sandia conducted ~1140 subsequent tests at the WETL on firesets, radars, inertial switches, stronglinks and command disable components across each legacy weapon system. Sandia also fully supported ongoing Joint Test Assembly (JTA) development work for the B61 and B83 and completed Quantification of Margins and Uncertainties analysis on numerous components. Sandia is commended for leveraging work for the B61, B83, and B61 LEP JTA development resulting in significant cost savings and streamlined schedules and excellent support through a detailee in Washington, DC.

W76-1 - Issues with the MC4682 capacitor withheld Lots 5 and 6 from production during FY11, creating a critical demand schedule for FY12 lots. Sandia implemented schedules to minimize the impact to KCP. Both the Navy and NNSA agreed to the reduced schedules and weekly video teleconferences monitored progress and issues. Lot 7 and 8 were late one month and one week and Lot 7 was short by 30 of 90 capacitors resulting in KCP adjusting work to a compressed schedule. Lot 9 was on time with 9 extra capacitors. An unsatisfactory quality audit finding was documented against the MC4682 capacitor vendor due to configuration management. Vendor qualification, oversight, and management for capacitor production remain concerns. Qualification of the second vendor for the production of the MC4682 capacitor remains a concern as well. All FY12 Arming, Firing & Fuzing (AF&F) shipments met the NNSA reduced negotiated schedule.

B61 LEP – Sandia completed the Option 3B design allowing the completion of the WDCR by all sites within schedule. Sandia develop an Integrated Master Schedule (IMS) to meet the deadline of the WDCR and developed the technology maturation roadmaps for the Option 3B design.

W78-1 LEP – Sandia efficiently executed their portion of the W78/88-1 LEP Phase 6.1 study with Lawrence Livermore National Laboratory (LLNL), NNSA, and the Air Force. Beginning in June when Nuclear Weapons Complex approval was granted, Sandia sustained their momentum by transitioning to the Phase 6.2. Additionally, Sandia successfully completed work outside of the Level II Milestones by completing the 120 day study. This challenging task added scope and complexity to the results derived from Phase 6.1. Sandia worked simultaneously with LANL and LLNL to develop solutions, illustrated in two full scale rapid prototype models from each of the design teams, documented the work in reports and provided countless briefings to senior NNSA, DoD and Congressional staff.

National Ignition Facility (NIF) – Though ignition was not achieved at the NIF, NNSA was pleased with Sandia's support for the National Ignition Campaign (NIC) effort. Sandia participated broadly in the design, fielding, and post-shot analysis of NIC indirect-drive tuning experiments in the areas of convergent-ablator physics, shock timing, and neutron physics. Additionally, Sandia's designed x-ray burn history diagnostic, the Streaked Polar instrumentation for Diagnosing Energetic Radiation (SPIDER), was fielded at NIF and obtained data during FY12.

SFI Support – Sandia’s excellent simulation and computing efforts delivered computational tools and support for Predictive Capability Framework commitments and were utilized to resolve SFIs.

U1a - Sandia’s refurbishment of the Cygnus accelerators and commission for radiography in support of the Gemini subcritical experiments. Sandia contributed to the successful execution of CASTOR subcritical experiment at the U1a Complex at the NNSS on August 29, 2012.

Sandia supported successfully achieving the DOE Secretary’s \$450M Savings Goal in the third quarter; Sandia’s FY12 contribution was instrumental with \$40M or 36% of the total FY12 Q1-Q3 Supply Chain Management Center savings.

### **Significant Accomplishments**

Did an exceptional job in developing and presenting their 120 day study results, which were tasked by NNSA. Sandia accomplished these additional activities without additional funding and at considerable sacrifice and gave repeated 120 day study briefings to senior leaders at NNSA, DoD, and Congressional staff.

### **Opportunity for Improvement**

- The W76-1 LEP continued to be at risk through FY12. NNSA remains concerned about the start-up of the second supplier which slipped from June 2013 to October 2013. As a consequence, capacitors will continue to be limited throughout FY13 and there is risk should any new problem occur in FY13. Although the Code Blue for Launch Accelerometers was closed in FY12, recent failures in July have implications that could impact shipments of AF&Fs in FY13. Deliveries were not affected due to renegotiated schedules and requirements. Sandia has not utilized resources of Lockheed- Martin staff or other NNSA sites with production experience to support their mission. This has affected Sandia’s ability to fully partner with KCP in their production mission.
- The B61 LEP – While Sandia has developed an IMS for the program, it cannot be effectively utilized by the complex to identify schedule concerns. There is concern over the ability to properly role up PRT tasks and support critical path assessments. The IMS must be refined during Phase 6.3 to improve the overall usefulness of the system by the Federal Program Manager and to improved capabilities for schedule risk assessment. Continue to work with NNSA to improve the stability of the IMS and usability over the life of the program.