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## **1.0 General.**

Inasmuch as the assigned missions of the Lawrence Livermore National Laboratory (Laboratory) are dynamic, this Statement of Work (SOW) is not intended to be all-inclusive or restrictive, but is intended to provide a broad framework and general scope of the work to be performed at the Laboratory. This SOW does not represent a commitment to, or imply funding for, specific projects or programs. The National Nuclear Security Administration (NNSA) and Department of Energy (DOE) work requirements are developed through strategic planning and program plans.

The Contractor shall, in accordance with the provisions of this Contract, provide the resources, intellectual leadership and management expertise necessary and appropriate to: (1) manage and operate the Laboratory; (2) accomplish the missions assigned by the National Nuclear Security Administration (NNSA) to the Laboratory and perform work from other sponsors; (3) enhance and promote communications, cooperation, integration, and interdependency across the Nuclear Weapons Complex (Weapons Laboratories, Production Plants and Test Site) that will result in improvements in performance of the Nuclear Weapons Complex; and, (4) foster and strengthen the Laboratory's role as a lead participant in the nuclear weapons program; and (5) emphasize cross-site coordination with NNSA's other nuclear design laboratory, Los Alamos National Laboratory. The Contractor shall integrate performance of world-class science and technology with laboratory operations, business operations and laboratory management.

Work under this Contract shall be conducted in a manner that will protect the environment; assure the safety and health of employees and the public; safeguard classified information; and, protect special nuclear material. In performing the Contract work, the Contractor shall assure and maintain: (1) that through its Management Systems, the products and services meet or exceed customer expectations, including using an integrated and effective Quality Assurance Program; (2) an earned-value management system for program activities and projects across the Laboratory to track progress and increase cost effectiveness of work activities; (3) integrated, resource-loaded plans and schedules to achieve program objectives and incorporate input from NNSA, DOE and stakeholders; (4) sufficient technical depth to manage activities and projects throughout the life of a program; (5) appropriate technologies to reduce costs and improve performance; (6) a system of management and business internal controls to assure the safeguarding of government funds and assets; and, (7) Laboratory facilities to accomplish assigned missions.

## **2.0 Laboratory Mission and Scope of Work.**

The Contractor shall manage, operate, protect, sustain and enhance the Laboratory's ability to function as a NNSA Multi-Program Laboratory, while assuring accomplishment of the Laboratory's primary mission - strengthening the United States' security through development and application of world-class science and technology to enhance the nation's defense and to reduce the global threat from terrorism and weapons of mass destruction. The Contractor shall, with the highest degree of vision, quality, integrity and technical excellence, maintain a strong, multi-disciplinary scientific and engineering base responsive to scientific issues of national importance in addition to national security responsibilities, including broadly based programs in such areas as the environment, national infrastructure, health, energy, economic and industrial competitiveness, and science education. The scope of work of this Contract includes:

- Conducting major NNSA research and development programs including using an earned-value management system;
- Fostering an environment of scientific skepticism and peer review of research programs;
- Assuring the safety, security, reliability, and performance of the national nuclear weapons stockpile pursuant to national security policy and Presidential and Congressional directives;
- Demonstrating design and development capabilities to support a Reliable Replacement Warhead strategy, and stockpile and complex transformation;
- Providing scientific, engineering, and computational capabilities that support assessment, dismantlement, manufacturing, and refurbishment of the enduring stockpile at a number of sites;
- Operating major facilities including the National Ignition Facility that support broad national interests and users.
- Ensuring the secure handling and safe disposition of plutonium, highly enriched uranium, and tritium;
- Helping to deter, detect, and respond to the proliferation of weapons of mass destruction;
- Conducting fundamental science research, nuclear energy development, and nuclear waste management technology in support of other DOE programs;
- Contributing to civilian and industrial needs and non-NNSA defense activities through a work for others program by using the scientific and technical expertise that derives from carrying out the Laboratory mission;
- Providing access to the capabilities of the laboratory to further Department of Homeland Security mission objectives;
- Advancing of science, mathematics, and engineering education;
- Advancing science through technological innovation, public and private sector collaboration, and technology transfer to enhance U.S. economic competitiveness and national security;

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- Managing and operating the Laboratory facilities and infrastructure in an efficient, cost effective, and innovative manner;
- Remediating and restoring the Lawrence Livermore National Laboratory sites;
- Managing waste minimization, treatment, storage, and disposal of all wastes; and
- Assisting the nuclear weapons complex in waste stabilization, storage and disposition technologies.

The Contractor shall engage in the strategic and institutional planning necessary to assure that the Laboratory maintains a posture aimed at anticipating the national technical and scientific needs and is dedicated to providing practical solutions. The Contractor shall carry out these plans consistent with NNSA planning guidance and strategic planning material to assure uniformity with DOE and NNSA missions and goals. The Contractor shall also study and explore innovative concepts to minimize or mitigate possible national security threats, current and future.

The Contract's Scope of Work activities are in support of scientific and technical programs sponsored by major NNSA and DOE organizations. Primary NNSA and DOE sponsors include:

- Defense Programs
- Defense Nuclear Nonproliferation
- Emergency Operations
- Infrastructure and Environment
- Nuclear Safeguards and Security
- Environmental Management
- Science
- Nuclear Energy, Science and Technology
- Energy Efficiency and Renewable Energy
- Fossil Energy
- Intelligence

Additionally, the Contractor will pursue other DOE and non-DOE science and technology initiatives that derive from the Laboratory missions and use the Laboratory's core competencies in nuclear weapons science and technology, earth and environmental science, nuclear and atomic physics, materials, bioscience and biotechnology, nuclear science, plasmas and beams, complex experimentation and measurements, theory, modeling, high-performance computing, and analysis and assessment.

This SOW covers four general Performance Group activities critical to the Laboratory's management of corresponding programs, projects and processes. These Performance Groups are: Science & Technology, Laboratory Operations, Business Operations and Laboratory Management.

### **3.0 Science & Technology.**

In support of major DOE sponsor organizations, the Laboratory is to serve as a national resource in science and engineering, focused on national security, energy, the environment, and bioscience, with special responsibility for nuclear weapons stockpile stewardship. The Laboratory will continue to use its multidisciplinary capabilities and apply its expertise to conduct research for the civilian and industrial sectors and conventional defense activities.

#### **3.1 Defense Programs.**

The Contractor shall support the NNSA's Defense Programs to ensure long-term safety, reliability and security of the nation's nuclear weapons stockpile. This includes support for the current stockpile and support for transformation activities leading to a future stockpile and infrastructure. The Contractor shall support Defense Programs in the development of an overall strategic plan and shall execute the plan as it pertains to the Laboratory. The Defense Programs strategic plan integrates programmatic work to maximize scientific and technical work accomplishment, to minimize duplication between programs and sites while providing for major investments in facilities.

##### **3.1.1 Stewardship of United States Nuclear Weapons.**

The Contractor shall support the science-based Stockpile Stewardship Program that underpins the technical basis for designing and certifying the safety, security and reliability of all nuclear weapons in the United States stockpile. In addition, this Program sets all technical specifications for manufacturing and surveillance operations as well as for maintenance activities conducted by the Department of Defense (DOD).

###### **3.1.1.1 Stockpile Certification.**

The Contractor shall provide elements of Stockpile Certification to include the following:

1. Laboratory Director's annual assessment of the stockpile;
2. A nuclear weapons quality control and stockpile evaluation program to detect defects and determine their effect on safety, security and reliability of the stockpile; support joint Department of Defense (DOD)/NNSA weapons system testing; perform reliability assessments and calculations; prepare reliability reports for all Laboratory assigned nuclear weapons in the stockpile; and

3. Continue technical support, and military liaison and training programs for the DOD in support of Laboratory assigned nuclear weapons in the stockpile.

#### **3.1.1.2 Stockpile Stewardship.**

The Contractor shall meet the near-term scientific and technical demands of the Laboratory's stockpile stewardship goals while strengthening its longer-term, technical, capability-based deterrent posture. Under this Program, the Contractor shall conduct the fundamental research, the development of physical models, the integration of these models into computer simulation codes, the experimental validation, and the engineering that are required to maintain the stockpile in a safe, secure and reliable manner. The Contractor shall provide technical specifications, engineering drawings and releases that direct planned and corrective activities both by NNSA production activities and by the DOD depots that support warhead and bomb component weapon manufacturing, maintenance, assembly and surveillance operations. The Program relies on three interconnected areas of surveillance activity which examine and diagnose aging phenomena in stockpile weapons, assess physical observations by calculations and experiments to evaluate safety and performance, and develop responses to assessments to provide the basis for continued stockpile certification and reliability assurance. These three areas are: (1) simulation codes and computational resources; (2) surveillance and surety; and (3) scientific capabilities, experiments and tests:

1. Simulation Codes and Computational Resources
  - A. Support the design, development and engineering stockpile life-cycle acquisition phases with modeling and simulation activities;
  - B. Develop high-performance computing and computational simulations to validate and certify the safety, reliability, and performance of the nuclear package in the absence of nuclear testing;
  - C. Conduct stockpile assessment of nuclear weapons components and the analysis of surveillance findings through the use of nuclear weapon simulation codes, computational resources, full-scale flight tests, and experiments;

- D. Participate in the Advanced Simulation and Computing program to enable model-and simulation-based life-cycle engineering that meets the NNSA vision for responsiveness; and
  - E. Archive previously recorded nuclear weapons data for assessment of stockpile weapons systems and improving models and codes.
2. Surveillance and Surety
- A. Participate in the Enhanced Surveillance Campaign to develop a capability to predict age-related phenomena in stockpile warheads and provide enhanced diagnostic tools;
  - B. Conduct core stockpile surveillance to evaluate safety, security, and reliability of the stockpile and develop design changes to correct findings; and
  - C. Evaluate current and develop new surety technology to address the safety, security, and control of nuclear warheads that extend over the entire weapons life cycle.
3. Scientific Capabilities, Experiments and Tests
- A. Improve the scientific basis for stockpile assessment through a balanced experimental and theoretical approach. This includes maturing scientific tools and capabilities that address fundamental questions relating to the stockpile;
  - B. Conduct experiments including hydrodynamic tests at Site 300 and the Nevada Test Site that provide non-nuclear testing capability to address the functionality and safety of the nuclear weapon primary;
  - C. Develop high-energy density physics and inertial fusion ignition to provide nuclear reaction information relevant to the nuclear portion of warhead performance, and lead the development of high-energy density physics and inertial fusion for

stockpile applications and for other national science and technology applications;

- D. Conduct experiments at the Nevada Test Site, consistent with U.S. policy, to validate models and codes that expand knowledge of dynamic properties of nuclear materials and reduce the need for underground nuclear tests;
- E. Participate in the Stockpile Readiness, High Explosives Manufacturing and Weapon Assembly/Disassembly Readiness, Non-nuclear Readiness, and Tritium Readiness campaigns which are designed to reestablish, maintain, and enhance manufacturing and other capabilities needed for the future production of weapons components for both the near-term Life Extension Programs and the Reliable Replacement Warhead Program; and
- F. Activities necessary to maintain nuclear underground test readiness according to defined National timelines.

### **3.1.1.3 Research and Development (R&D).**

The Contractor shall develop R&D program plans, in conjunction with and approved by NNSA, for nuclear weapons R&D activities, and perform nuclear weapons R&D in accordance with the program plans. The Contractor shall explore and document nuclear weapons technology and systems concepts and perform and document feasibility studies and engineering development of nuclear weapons to meet NNSA and DOD mission requirements. The Contractor shall perform and document R&D to support the NNSA technology base and engineering that will assure nuclear competency and effectively support the varied demands of nuclear weapon activities and enhance the ability to anticipate significant scientific or technological advances that impact national security. The Contractor shall provide R&D and engineering support related to international mutual defense agreements.

The Contractor shall maintain state-of-the-art technologies and capabilities to support high-performance computing, modeling, and simulation; communications; and information management. The Contractor shall participate in the Advanced Simulation and Computing Campaign and

other associated research on complex and large-scale national problems in computational science.

#### **3.1.1.4 Support to Nuclear Weapons Complex (NWC) Production Mission.**

The Contractor shall provide technical support to the NNSA at nuclear weapon production sites. The Contractor shall support the NWC production sites by:

1. Developing, maintaining and providing specialized manufacturing technologies and expertise to support production of systems and components. This includes providing technical support in developing and implementing necessary tooling and procedures to perform production that meets Seamless Safety for the 21st Century (SS-21) standards;
2. Developing and providing engineering, testing and production process development guidance for systems and components.;
3. Designing, developing, and certifying systems and components to support assigned activities for Life Extension Programs and Reliable Replacement Warhead Program;
4. Performing all life cycle management responsibilities in design, engineering development, component acceptance and stockpile certification to support weapon alterations, modifications, refurbishments and replacements;
5. Evaluating weapon response to hazard analysis scenarios in support of the SS-21 activity;
6. Participating in the development of the Documented Safety Analyses to support safe operations at the Pantex Plant;
7. Providing development of specialized facility criteria; recommending and managing R&D and testing for emerging technologies;
8. Providing technical support and independent technical oversight for needed physical rearrangements;

9. Establishing testing and acceptance criteria; participating in approval of test procedures and results;
10. Contributing to the development of training requirements;
11. Supporting the implementation of steps that support the NNSA responsive infrastructure vision that supports the complex of the future; and
12. Providing the necessary documentation for the items listed above to support nuclear weapons production.

### **3.1.1.5 Nuclear Materials Management and Dismantlement.**

The Contractor shall conduct a Nuclear Materials and Stockpile Management Program. The Contractor shall support the following activities of that program:

1. Stockpile evaluation;
2. Weapons dismantlement and component disassembly including weapon component material characterization, material disposition processes;
3. Safety analysis of disassembly techniques and tools;
4. Providing prescriptions and technical assistance for nuclear materials recovery and reuse, storage, processing, and disposition;
5. Residue elimination, waste minimization, and environmental and mixed-waste management;
6. Test-component remanufacture;
7. Materials characterization; site cleanup and materials stabilization;
8. Contamination control;
9. Health and safety issues;
10. Operating highly specialized facilities that are key to Laboratory efforts in this program; and,

11. Providing support to NNSA for stabilizing nuclear materials and overseeing a core technology program that will improve the understanding of underlying material interactions.

#### **3.1.1.6 Device Assembly Facility.**

The Contractor shall conduct research and support activities related to NNSA's Stockpile Stewardship Program, including test readiness and assembly of subcritical experiments at the Device Assembly Facility (DAF).

#### **3.1.1.7 Joint Actinide Shock Physics Experimental Research**

At the Joint Actinide Shock Physics Experimental Research (JASPER) gas gun, the contractor shall conduct research in material physics.

#### **3.1.1.8 Site 300 Operations.**

The Contractor shall operate the Site 300 to support hydrodynamic testing and other experiments in accordance with program plans approved by the NNSA.

### **3.1.2 Inertial Confinement Fusion.**

The Contractor shall conduct an inertial confinement fusion program that maintains United States leadership in high energy density physics. This includes achieving ignition and using ignition facilities to gather information relevant to stockpile stewardship. The program of ignition is a national effort that depends on cooperation and collaboration with multiple NNSA contractors and includes major experimental activities at the National Ignition Facility (NIF) and other NNSA sites. As part of this effort, the Contractor will participate as a leading member of a national team that supports all aspects of the national program; including target physics, target fabrication, diagnostics, experimental planning, and any other activities necessary to achieve the ignition program goals.

### **3.1.3 National Ignition Facility.**

The Contractor shall complete construction of NIF. The NIF is a Laboratory micro fusion experimental facility for defense and civilian applications. The Contractor shall operate the NIF (i) to conduct science-based stockpile stewardship experiments for the purpose of simulating, analyzing, and validating the safety, reliability, and performance of

nuclear weapons in the absence of nuclear testing; and (ii) for the national user community to support research and simulation in high-energy density physics, atomic and nuclear physics, fusion energy, and astrophysics as well as other defense and civilian applications.

#### **3.1.4 Building 332 Plutonium Facility**

The Contractor shall conduct research and development on Special Nuclear Material and operate Building 332 Plutonium Facility consistent with the current Authorization Agreement, including any revisions.

#### **3.1.5 Long-Range Planning and Systems Integration.**

The Contractor shall support Sandia National Laboratories in the long-range planning and systems integration activities for the Nuclear Weapons Complex. This will include independent research, trade-off studies, cost analyses, systems analyses.

#### **3.1.6 Stockpile and Infrastructure Transformation.**

The Contractor shall support NNSA's transformation plans to reduce the nuclear weapons stockpile and NWC infrastructure, NWC infrastructure modernization, and to also achieve efficiencies and savings from improved methods, modern technologies, and adoption of modern management systems and techniques. Transformation of the NWC may involve NNSA assigning work from its NNSA's laboratories, production plants, or Test Site to the Contractor or reassigning work from the Contractor to another NWC contractor in order to capitalize on integration and interdependencies within the NWC.

##### **3.1.6.1 Reliable Replacement Warheads (RRW)**

The Contractor shall support NNSA initiatives in partnership with the Department of Defense to transform the nuclear stockpile through design and development of RRWs.

##### **3.1.6.2 Closure of Site 300**

If directed by NNSA, the Contractor shall support the closure of Site 300.

##### **3.1.6.3 Removal of Category I and II materials from LLNL**

If directed by NNSA, the Contractor shall plan for and implement the elimination of Category I and II materials from LLNL

consistent with the availability of repository sites, but no later than 2014, while preserving the materials skills for Category III and below.

#### **3.1.6.4 Closure of Building 332**

If directed by NNSA, the Contractor shall support the removal of Special Nuclear Material and closure of Building 332 Plutonium Facility in accordance with NNSA direction.

### **3.2 Defense Nuclear Nonproliferation.**

The Contractor shall develop and apply the science and technology, and perform appropriate related analytical tasks required to detect, deter, prevent and respond to proliferation of weapons of mass destruction worldwide.

#### **3.2.1 Global Threat Reduction Programs.**

The Contractor shall develop and apply the science and technology, and perform appropriate related analytical tasks required to reduce inventories of weapons-useable nuclear materials and dangerous radiological materials, including: (1) converting U.S. and foreign research reactors to the use of low enriched uranium fuel or other proliferation-resistant technologies, (2) repatriating Highly Enriched Uranium and Low Enriched Uranium to countries of origin for secure storage, disposition or blend-down, and (3) securing, transporting, storing or dispositioning radiological materials.

#### **3.2.2 Nonproliferation Research and Engineering.**

The Contractor shall develop and apply the science and technology, and perform appropriate related analytical tasks required to develop advanced remote sensing, monitoring and assessment technologies to address the most challenging problems related to detection, location, and analysis of global proliferation of nuclear weapon technology, and the diversion of special nuclear materials. This includes detecting and identifying emanations, effluents, and other distinctive signatures of potential nuclear weapons research and development efforts.

#### **3.2.3 Nuclear Risk Reduction.**

The Contractor shall develop and apply the science and technology, and perform appropriate related analytical tasks required to eliminate surplus inventories of weapons-useable materials, including materials from dismantled weapons and production reactors and facilities, to support

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verification of international agreements, and to strengthen foreign and international efforts to respond effectively to nuclear emergencies.

### **3.2.4 Nonproliferation and International Security.**

The Contractor shall develop and apply the science and technology, and perform appropriate related analytical tasks required to support the application and strengthening of international nuclear safeguards, support United States (U.S.) Government negotiations and policy analysis, strengthen U.S. and allied export control diplomacy and policy development, improve workforce transition and scientist engagement efforts around the world, improve regional and international security, permit intelligence monitoring and arms control treaty verification, strengthen global controls on nuclear materials and weapons, protect nuclear materials from theft or diversion, assess foreign Weapons of Mass Destruction programs, and develop tools and techniques to encourage proliferation-resistant fuel cycle technologies.

### **3.2.5 International Material Protection and Cooperation.**

The Contractor shall develop and apply the science and technology, and perform appropriate related analytical tasks required to secure nuclear weapons and materials in Russia and other weapons states, including both military and civilian facilities, support the blenddown of excess weapons-useable Highly Enriched Uranium to Low Enriched Uranium, deploy radiation detection monitors at strategic border crossings and transit points, and to expand the capacity of other countries to properly secure their nuclear weapons and materials.

### **3.2.6 Fissile Materials Disposition.**

The Contractor shall develop and apply the science and technology, and perform appropriate related analytical tasks required to eliminate surplus plutonium and Highly Enriched Uranium.

### **3.2.7 Nonproliferation, National Security and Verification Technology.**

The Contractor shall conduct a nonproliferation, national security, treaty verification technology program, and dismantlement verification program; including the development of methods for detection/verification of underground nuclear testing and of undeclared enrichment and reprocessing activities. The Contractor shall perform R&D for nuclear security, nonproliferation of weapons of mass destruction (nuclear, chemical and biological, and of missile delivery systems), and treaty verification technologies. This can include the application of remote sensing, monitoring and assessment technology to identify emanations, effluents, and other distinctive signature of potential nuclear, biological,

and chemical weapons efforts, as well as to the detection of nuclear explosions and other national security applications. The Contractor shall perform and assist with the application of security technology to international nuclear materials and weapons protection.

### **3.2.8 Nuclear, Biological, and Chemical Weapons**

The Contractor shall apply science and engineering technologies to reduce the threat of nuclear, radiological, biological and chemical weapons proliferation and terrorism. The Contractor shall provide a scientific and technological knowledge base in chemistry and materials science to support security needs, and development of new areas for science based stockpile stewardship, NIF, and other programs.

### **3.2.9 National Atmospheric Release Advisory Center (NARAC)**

The Contractor shall conduct operational and research activities for the National Atmospheric Release Advisory Center (NARAC). NARAC is the national capability for emergency response assistance following the release of radioactive or toxic materials into the atmosphere resulting from accidents at nuclear reactors or in nuclear weapons handling and transport, and industrial or transportation releases in the United States.

## **3.3 Science Programs.**

### **3.3.1 Basic Science Programs.**

The Contractor shall conduct research in the areas of materials sciences, chemistry, and geosciences, providing knowledge essential to defense, energy efficiency, industrial competitiveness, engineering sciences, atomic physics, computational sciences, biological sciences, nanoscience, and other areas of national interest, including scientifically tailored materials and mathematics, and advancing the state of science for the benefit of DOE/NNSA.

### **3.3.2 Fusion Energy Sciences.**

**3.3.2.1** The Contractor shall conduct modest scale experimental, theoretical, and technological studies to advance plasma science, fusion science, and fusion technology.

**3.3.2.2** The Contractor shall conduct an inertial confinement fusion program to understand the science and develop the technology of inertial confinement fusion with the goal of demonstrating controlled thermonuclear fusion ignition and energy gain.

**3.3.2.3** The Contractor shall conduct a magnetic fusion energy program that advances the physics and technologies required for magnetic fusion and that advances international cooperation in magnetic fusion energy to share the cost and technical risks of large-scale fusion devices.

**3.3.3 High Energy and Nuclear Physics.**

The Contractor shall conduct high energy and nuclear physics research involving experimental and theoretical programs in nuclear and particle physics.

**3.3.4 Lasers and Electro-Optics.**

The Contractor shall conduct research in lasers and electro-optics technologies for astronomical imaging, and other defense and civilian needs.

**3.3.5 Advanced Scientific Computing Research (ASCR).**

The Contractor shall conduct the ASCR program by supporting research in applied mathematics, computer science and high-performance networks and providing high-performance computational and networking resources.

**3.3.6 Atmospheric Research**

The Contractor shall conduct research on climate and atmospheric processes in the study of human effects on global climate including a program for climate model diagnosis and intercomparison that studies atmospheric models to diagnose and improve the predictive credibility of climate models.

**3.3.7 BioScience Research**

The Contractor shall conduct research supporting bioscience, biodefense, biotechnology and health of the nation. The Contractor provides support to study the consequences of adverse environments on living systems, DNA mutations, understanding the role in reducing health risks from environmental exposures such as radiation, improvements in technology for human health care diagnoses such as cancer, biological pathogens, and toxins.

### **3.4 Energy Technology Programs.**

The Contractor shall conduct research and studies to address national energy needs in fundamental areas including integrated chemical and materials processing, energy supply and the environment, and transportation and infrastructure.

#### **3.4.1 High-Temperature Superconductivity.**

The Contractor shall develop practical high-temperature, high-current-density superconductors and form partnerships with U.S. industry to expedite the development of commercially feasible high-temperature superconductor technology.

#### **3.4.2 Energy Supply.**

The Contractor shall conduct research that addresses energy supply issues by applying capabilities in the areas of exploration, reservoir modeling, integrated assessments, and environmental transport. The Contractor shall support DOE/NNSA's efforts in the broad areas of energy efficiency, renewable energy, fossil energy, and nuclear energy.

#### **3.4.3 Transportation and Infrastructure.**

The Contractor shall conduct research, development, and demonstration of alternative and advanced energy programs including fuel cell and hydrogen production, delivery, and storage technologies to accelerate the introduction of these technologies into the transportation sector.

### **3.5 Environmental Technologies Development.**

The Contractor shall apply scientific and engineering capabilities to develop new technologies for timely, cost-effective, and comprehensive solutions for local, regional, and global environmental problems. This includes waste management, environmental stewardship, and environmental resource problems. This also includes new approaches to treatment, disposal, storage, and reduced generation of waste and the safety, security, reliability and sustainability of environmental resources, technologies, engineered systems, and public policies to produce, deliver and use the resources where needed. The Contractor shall apply, with Contracting Officer approval, capabilities to waste management, environmental restoration, and facility stabilization problems at the Laboratory, within the NNSA Nuclear Weapons Complex and other locations.

### **3.6 U.S. Department of Homeland Security Programs.**

The Contractor shall make Laboratory resources available and perform work for the U.S. Department of Homeland Security.

#### **3.6.1 Forensic Science Center.**

The Contractor shall enhance the disciplines of forensic science/chemical and material sciences by conducting a program of research and development in advanced analytic methods and shall provide forensic support to investigations conducted by the domestic law enforcement, counter terrorism, intelligence, and regulatory agencies as well as support to the Organization on the Prohibition of Chemical Weapons (OPCW).

### **3.7 Work for Others.**

The Contractor shall conduct a Work for Others (WFO) Program, as approved by the Contracting Officer. Some of the major WFO sponsors include DOD, National Aeronautics and Space Administration, National Institutes of Health, the National Science Foundation, the Department of State, non-federal entities, local and state governments, and academia.

### **3.8 Laboratory-Directed Research and Development.**

The Contractor shall conduct an NNSA approved Laboratory Directed Research and Development program that encourages multidisciplinary, multidivisional, and innovative research on complex scientific and engineering problems and on individual basic and applied research projects to enhance the core capabilities and competencies required to fulfill the Laboratory's missions.

### **3.9 Industrial Partnerships and Technology Transfer Programs.**

The Contractor shall, as approved by the Contracting Officer, establish industrial partnerships that transfer new technologies from the Laboratory to public and private sector collaboration and make available to private industry the unique capabilities of the Laboratory in order to enhance the Laboratory's ability to meet mission requirements and improve the industrial competitiveness and national security of the U.S.

### **4.0 Laboratory Operations.**

The Contractor shall operate the Laboratory to; function as a NNSA multi-program laboratory, provide the infrastructure and support activities, and support the accomplishment of the Laboratory's missions.

#### **4.1 Security.**

The Contractor shall conduct a security program that fosters an institutionalized security conscious culture that performs work securely and assigns unambiguous roles, responsibilities, authorities, and accountability while integrating excellence in safeguards and security into all Laboratory activities. The Contractor shall support NNSA and DOE overarching security initiatives such as (1) the study of alternative contracting arrangements for the protective force including the feasibility of a single protective force unit for LLNL and Sandia National Laboratories - California; and (2) security technology deployment efforts including the ARGUS complex-wide deployment.

#### **4.2 Environment, Safety and Health.**

The Contractor shall conduct an Environment, Safety and Health (ES&H) program that (1) achieves an institutionalized ES&H conscious culture that embraces Conduct of Operations and allows work to be performed safely, (2) assigns unambiguous roles, responsibilities, authorities, develops appropriate work controls and ensures accountability for the performance of work in a manner that ensures protection of workers, the public and the environment, and (3) integrates excellence in ES&H into all Laboratory activities. Through an Integrated Safety Management System, ES&H management processes, formal work control and work performance processes, the Contractor shall ensure the safe performance of all Laboratory work. The Integrated Safety Management System shall be applied to all Contractors, including subcontractors or other entities' activities conducted at the Laboratory.

The Contractor shall conduct a hazard categorization and analysis process, a startup and restart process, as well as a safety authorization basis process for non-nuclear facilities that includes approval by the Contracting Officer for moderate hazard facilities/operations and high hazard facilities/operations. The Contractor shall ensure implementation of a formal ES&H performance based self-assessment process addressing both ES&H program and line management implementation that is (1) risk based and has the requisite depth, breadth, rigor and defensibility, (2) conducted with the appropriate subject matter expertise, (3) performance and behavior based, and (4) tied to an institutional issues management program that ensures closure of findings and opportunities for improvement.

The Contractor shall cooperate with worker health studies conducted by other Federal agencies and contract researchers under NNSA/DOE sponsorship.

### **4.3 Nuclear Safety**

The Contractor shall conduct a safety management system addressing nuclear safety requirements including: (1) achieving an institutionalized nuclear safety conscious culture that embraces Conduct of Operations and allows work to be performed safely, (2) assigning unambiguous roles, responsibilities, authorities, developing appropriate work controls and ensuring accountability for the performance of work in a manner that ensures protection of workers, the public and the environment, (3) integrating excellence in nuclear safety into all appropriate Laboratory activities, (4) using a robust safety authorization basis process, (5) using system engineering and configuration management of structures, systems and components important to safety, (6) assuring quality, (7) stabilization and disposition of nuclear materials, and (8) startup and restart of nuclear facilities.

The Contractor shall also conduct activities in accordance with those DOE commitments to the Defense Nuclear Facilities Safety Board (DNFSB) contained in Secretary of Energy's implementation plans and other DOE correspondence to the DNFSB. The Contractor shall support, as directed by the Contracting Officer, preparation of DOE responses to DNFSB issues and recommendations accepted by the Secretary of Energy which affect Contract work. The Contractor shall fully cooperate with the DNFSB and provide access to facilities, information and Contractor personnel. The Contractor shall maintain a document process consistent with the DOE Manual on interfacing with the DNFSB. The Contractor shall ensure that subcontractors adhere to these requirements.

### **4.4 Counterintelligence and Counter Terrorism.**

The Contractor shall conduct a comprehensive counterintelligence and counter terrorism program to assess, detect and deter foreign intelligence, espionage, and international terrorist threats to the personnel, facilities, and technologies within the Contractor's purview.

### **4.5 Emergency Operations.**

#### **4.5.1 Emergency Management**

The Contractor shall conduct an emergency management program that encompasses all laboratory activities and includes planning, preparedness, response, and readiness assurance as well as an emergency occurrence notification and reporting system, and operation of an Emergency Operations Center (which includes support to the County of Alameda).

#### **4.5.2 Emergency Response**

The Contractor shall maintain emergency response capabilities for local, regional, and national missions to include a Radiological Assistance Program and support to the NNSA Nuclear Emergency Support Team, and the Accident Response Group in the areas of nuclear weapons expertise, nuclear weapons surety, atmospheric modeling and projections, consequence management, radiation monitoring and sampling, dose assessment, radiation protection, sample processing and analysis, environment, safety, and health, waste management, transportation, and other areas requiring specialized planning, training, and response to nuclear weapons accidents or incidents.

#### **4.6 Environmental Management.**

For all work performed at the Laboratory or Nevada Test Site, the Contractor shall: (1) conduct environmental restoration activities, including characterization and remediation, in accordance with regulatory and enforceable agreements requirements and milestones (2) conduct environmental compliance activities, including management of cultural resources, threatened and endangered species and their habitats, designated critical habitats, and National Environmental Policy Act (NEPA), in accordance with programmatic agreement requirements and milestones, biological opinions, and federal regulations; (3) manage waste and facilities to support Laboratory missions including treatment, storage, and disposal of solid, hazardous, mixed, and radioactive wastes; (4) decontaminate and decommission facilities and infrastructure; (5) coordinate and implement waste minimization and pollution prevention initiatives; and (6) implement International Organization for Standards (ISO) 14001: 2004, and any revisions.

#### **4.7 Facility Operations, Infrastructure, Design and Project Management.**

##### **4.7.1 Facility Operations and Infrastructure.**

The Contractor shall manage Government-owned facilities and infrastructure, both provided and acquired, to further national interests and to perform NNSA/DOE statutory missions. The Contractor shall use a performance-based approach to real property life-cycle asset management to perform overall integrated planning, acquisition, maintenance, operations, upgrades, and management of Government-owned, leased or controlled facilities and infrastructure, and real property accountable to the Laboratory. The Contractor shall employ facilities management practices that are best-in-class and integrated with mission assignments and business operations. The Contractor's maintenance management program shall be based on best practices to maintain Government property in a manner which: (1) promotes and continuously improves operational

safety, environmental protection and compliance, property preservation and cost effectiveness, (2) ensures continuity and reliability of operations, fulfillment of program requirements and protection of life and property from potential hazards, and (3) ensures the condition of all assets will continuously improve over the period of performance; and, (4) assists NNSA/DOE through direct participation and other support in achieving DOE's energy efficiency goals and objectives in electricity, water, and thermal consumption, conservation, and savings, including goals and objectives contained in Executive Order 13423 "Strengthening Federal Environmental, Energy, and Transportation Management." Facility and infrastructure planning and performance shall be documented in a Ten-Year Comprehensive Site Plan that is updated annually, for review and approval by the Contracting Officer, and covers a ten-year planning horizon. The Site Plan should include detailed plans and milestones for achieving site-specific energy efficiency goals and objectives. With respect to 4.7.1 paragraph (4) above, the Contractor shall maximize the use of private sector, third-party financing applied on a life-cycle cost effective basis, particularly from Energy Savings Performance Contracts and Utility Energy Services Contracts awarded by DOE and supported by the Contractor with minimal DOE funding.

#### **4.7.2 Facility Design and Project Management.**

The Contractor shall use a resource loaded Earned-Value Project Management System across the Laboratory. The Contractor shall provide design and risk analysis, value engineering, configuration management, conceptual designs, preliminary designs, material testing, and surveying in support of engineering designs; final designs and construction drawings; and as-built drawings pursuant to construction inspections, surveying, and material testing services for activities supporting NNSA and its programmatic customers. The contractor shall perform all support activities for DOE/NNSA small business construction contracts and Energy Savings Performance Contracts (ESPC) from the initial proposal phase through the performance period. These support activities include and are not limited to engineering and design review, providing security escorts, construction inspection, project and construction management, maintenance and operations commissioning, and measurement and verification oversight.

#### **4.8 User Facilities.**

The Contractor shall manage all Laboratory User Facilities. The Contractor shall make available and encourage use of Laboratory research facilities designated by NNSA as Technology Deployment Centers or User Facilities by the U.S. industry, universities, academia, other laboratories, state and local governments, and the

scientific community in general. Contracting Officer approval is required prior to entering into any user agreement. Such centers and facilities consist of physical facilities, equipment, instrumentation, scientific expertise and necessary operational personnel.

#### **4.9 Waste Storage Facilities.**

The Contractor shall conduct storage activities and operate the waste storage facilities consistent with the current Authorization Agreement and any revisions.

#### **4.10 On-site Nuclear Material Transportation Activities.**

The Contractor shall conduct on-site nuclear material transportation activities safely, securely, and efficiently, consistent with the current Authorization Agreement and any revisions.

### **5.0 Business Operations.**

The Contractor shall manage and administer a system of internal controls for all business and administrative operations. Management of the Laboratory business and administrative operations shall include integrating common systems of internal controls across the Laboratory and implementing business processes that are risk-based, cross-functional, cost effective, optimize and streamline operations, increase efficiency and enhance productivity.

#### **5.1 Strategic Human Capital Management.**

The Contractor shall maintain a strategic human capital management system to attract and retain a world class workforce and promote workforce diversity. This system shall promote workforce excellence by attracting and retaining a world class science and technology workforce and by ensuring maintenance of critical skills for the nuclear weapons program and limiting the number and duration of vacancies in positions requiring critical skills while optimizing direct to indirect employee ratios. The Contractor shall conduct comprehensive pre-employment screening as part of its strategic human capital management system.

#### **5.2 Financial Management.**

The Contractor shall maintain a financial management system that is integrated with NNSA's financial management system and provides sound financial stewardship and public accountability. The overall system shall be suitable to: collect, record, and report all financial activities; include a budgeting system for the formulation and execution of all resource requirements; include a disbursements system for employee payroll and supplier payments; and contain an effective internal control system for all expenditures.

### **5.3 Purchasing Management.**

The Contractor shall maintain a NNSA-approved purchasing system to provide purchasing support and subcontract administration, including subcontract pre-award and post-award reviews. The Contractor shall actively participate in strategic sourcing activities and centralized purchasing for the Nuclear Weapons Complex. The Contractor shall, when directed by NNSA and may, but only when authorized by NNSA, enter into subcontracts for the performance of any part of the work under this Contract.

### **5.4 Personal Property Management.**

The Contractor shall maintain an NNSA-approved personal property management system for overall integrated planning, acquisition, maintenance, operation, control, accountability, utilization, and disposal of Government owned personal property.

### **5.5 Real Property Management.**

The Contractor shall manage Government-owned and Contractor-leased real property. The Contractor shall perform overall integrated planning, acquisition, maintenance, operation, management and disposition of Government-owned real property and Contractor-leased facilities and infrastructure used by the Laboratory. Real property management shall include providing office space within the Laboratory site, including laboratory services and parking, for the NNSA Livermore Site Office as identified by the Contracting Officer, and any other additional space, parking and related laboratory services as requested by the Contracting Officer. Real property may also be made available to private and public sector entities, including universities, industry, and local, state, and other government agencies, subject to the Contracting Officer's approval.

### **5.6 Information Resources Management.**

The Contractor shall maintain the inter-site and intra-site classified and unclassified information system for technical programs, organizational, business and operations functions and for activities including general purpose programming, data collection, data processing, report generation, software, electronic and telephone communications. The Contractor shall provide computer resource capacity and capability sufficient to support (1) Laboratory-wide information management requirements and (2) Laboratory wide classified computing infrastructure. The Contractor shall also maintain a records management program. The Contractor shall, with Contracting Officer approval, standardize non-scientific software and hardware programs/platforms within the Laboratory for generating and storing electronic information.

### **5.7 Legal Affairs.**

The Contractor shall maintain a legal program to support contract activities including those related to patents, licenses, and other intellectual property rights; subcontracts; technology transfer; environmental compliance and protection; labor relations; and litigation and claims.

### **6.0 Laboratory Management.**

The Contractor shall provide the management and expertise to lead the Laboratory in accomplishing the Science and Technology, Laboratory Operations and Business Operations activities.

#### **6.1 Audits and Assessments.**

The Contractor shall conduct an audit program which provides capabilities for internal and subcontractor audits and supports external audits, reviews, and appraisals.

#### **6.2 Community Support.**

The Contractor shall, with Contracting Officer approval, provide community support to facilitate Laboratory operations, including coordination with the Counties of Alameda, Contra Costa, and San Joaquin. The Contractor shall perform periodic needs assessments to determine what support to the community is necessary to facilitate Laboratory operations.

#### **6.3 Science and Math Education.**

The Contractor shall conduct a science and mathematics education program . The program may include, with the Contracting Officer's approval, technical assistance; loans of scientific equipment; programs of "hands on" research experience for students, teachers and faculty members; a program of encouraging volunteerism and community service; and cooperative programs.

#### **6.4 Communications and Public Affairs.**

The Contractor shall conduct communications and public affairs programs including public participation, internal and external communications; community involvement and outreach; interactions with the media, businesses, and the scientific and technical community; and liaison and consultation with local, state, federal agencies and Congressional offices.

## **6.5 Other Administrative Services.**

The Contractor shall provide other administrative services to include operating communications systems; operating transportation and traffic management services, operating a records management system; and operating a systems of records for individuals including those related to personnel radiation exposure information, medical, safety and health; logistics support to the NNSA Livermore Site Office, when approved by the Contracting Officer; and, support other NNSA Nuclear Weapons Complex initiatives, when approved by the Contracting Officer.

## **6.6 Training.**

The Contractor shall implement a training and qualification program including general training, orientation, and indoctrination; employee development; educational and professional advancement, and facilities-specific training and qualification. All Laboratory training and qualification programs shall emphasize the environment, safety and health (ES&H), and safeguards and security aspects of job and position responsibilities. The Contractor's training and qualification program shall be an element of the laboratory integrated safety management process. The Contractor shall provide other training programs and opportunities as approved by the Contracting Officer. The Contractor shall ensure the continuing involvement by senior laboratory line management in directing and evaluating the training and qualification program.

## **7.0 Reports and Other Deliverables.**

The Contractor shall prepare, submit, disseminate, or otherwise publish financial, schedule, scientific, and technical performance plans and reports; and other information and deliverables as required elsewhere in this Contract or as required by the Contracting Officer or his/her authorized representative in accordance with the provisions of this Contract.

The Contractor shall provide a Deliverable Tracking System that will track and report all required reports and other deliverables, such as those specified in the contract terms, appendices, directives, and work authorizations. At a minimum, the Deliverable Tracking System and report shall track the name of the report or other deliverables, requirement document name, document tracking number, document tracking number, due dates, deliverable requestor, and date transmitted; and shall be submitted to the Contracting Officer upon commencement of the contract term and on a monthly basis thereafter.