

PART III

SECTION J

LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS

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PART III  
SECTION J

1. STATEMENT OF WORK

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## STATEMENT OF WORK

### I. Introduction

#### A. Background

The National Academy of Sciences (NAS) has called the world's plutonium which is excess to defense requirements a "*clear and present danger*" in the Management and Disposition of Excess Weapons Plutonium, Volume I, 1994. The disposition of this surplus weapons-usable plutonium in the United States is being pursued to mitigate the plutonium proliferation danger. Actions being undertaken by the United States will be orchestrated in concert with international efforts to address surplus plutonium stocks in the Russian Federation. The rate of implementation of plutonium disposition will likely be dependent on terms and conditions in international agreements yet to be negotiated.

The Department of Energy (DOE) is tasked with the disposition of U.S.-owned plutonium that is excess to national security requirements to a condition that meets the spent fuel standard - a concept to make the plutonium as unattractive and inaccessible for retrieval and weapons use as the residual plutonium in the spent fuel from commercial reactors. Existing U.S. Commercial Light Water Reactors (CLWRs) would be used to achieve the spent fuel standard by irradiating some of the excess plutonium in the form of mixed oxide (MOX) fuel in fuel cycles comparable to conventionally used Low Enriched Uranium (LEU) fuel cycles and the balance of the material will be immobilized in a ceramic form.

#### B. Overview of Statement of Work

This Statement of Work (SOW) sets forth the MOX fuel fabrication, reactor irradiation, and related services required under the contract. The services include but are not limited to:

1. All the functions that are necessary to develop a domestic MOX Fuel Fabrication Facility that will be licensed by the Nuclear Regulatory Commission (NRC) and located at a DOE Host Site. This includes: designing, constructing, and operating a MOX Fuel Fabrication Facility; obtaining a NRC license and any necessary Federal, State, and local permits; supplying commercial grade nuclear fuel for the mission reactors; safeguarding plutonium dioxide powder feedstock and fresh MOX fuel under applicable security measures; and, ultimately, deactivating the facility.

2. All the functions that are necessary to permit the irradiation of MOX fuel assemblies in CLWRs under license from the NRC. This includes: performing all the design and engineering services to modify reactors and facilities to use MOX fuel; identifying and performing necessary fuel qualification activities; obtaining NRC license modifications; obtaining any necessary Federal, State and local permits; performing core design and fuel design services; irradiating the fuel; safeguarding fuel under applicable security measures; and storing irradiated fuel pending disposal actions.

The contract consists of the base contract and three options. The SOW is organized in sequential order. Contract options may overlap in some or all cases.

## II. Base Contract SOW

The base contract includes design of the MOX Fuel Fabrication Facility, fuel qualification activities, design of required modifications to mission reactors and associated facilities, initial license submittals, supporting project management activities, and MOX fresh fuel package activities. Base contract requirements and associated deliverables are provided by each of the four main work elements of the project, i.e., MOX Fuel Fabrication Facility, Fuel Qualification, Irradiation Services and Project Management and Administration.

### A. MOX Fuel Fabrication Facility

The Contractor shall ensure that all activities necessary to produce conceptual, preliminary and final designs of the MOX Fuel Fabrication Facility are performed including supporting DOE review of these design products. The Contractor shall ensure that the MOX Fuel Fabricator prepares and submits to the NRC an application for a license to possess and use special nuclear materials in order to operate the MOX Fuel Fabrication Facility. In addition, the Contractor shall ensure that applications for all other required licenses and permits shall be prepared and submitted. Specific activities include, but are not limited to, the following:

#### 1. Facility Design

The Contractor shall perform value engineering for the work specified in paragraphs b., c., and d., of this section in accordance with the clause of this contract entitled, FAR 52.248-2, Value Engineering--Architect Engineer (MAR 1990). The Contractor shall report on the value engineering activities as specified in paragraphs b., c., and d. of this section during the required design reviews and as part of the design deliverables.

##### a. MOX Fuel Fabrication Facility Functional Requirements

The Contractor shall ensure that the design of the MOX Fuel Fabrication Facility incorporates the following functional requirements:

- (1) Must be capable of obtaining from the NRC a license to possess and use special nuclear material in order to operate the MOX Fuel Fabrication Facility in accordance with 10 CFR Part 70, Domestic Licensing of Special Nuclear Material.

- (2) Must be able to facilitate International Atomic Energy Agency (IAEA) inspections and monitoring and minimize access to proprietary or other sensitive information. IAEA standards apply through the NRC as specified in 10 CFR Part 75, Safeguards on Nuclear Material - Implementation of US/IAEA Agreement.
- (3) Must be able to provide for final assembly of the fuel assembly components into completed MOX fuel bundles.
- (4) Must be able to provide for feed material disposition of 33 metric tonnes (MT) of plutonium with a design basis range up to 40 MT.
- (5) Must be able to provide for receiving of plutonium at a rate of 3.5 MT/year from the Pit Disassembly and Conversion Facility.
- (6) Must provide additional floor space and supporting building infrastructure sufficient for the potential addition of another finished fuel assembly production line with a nominal capacity of 30-45 Metric Tonnes of Heavy Metal (MTHM)/yr and a minimum capacity of 25 MTHM/yr.
- (7) Must be able to operate the fuel fabrication lines such that a minimum of 99.5% of the process-charged plutonium is fabricated into commercial quality fuel during SOW Option 2 (after transition to full operations) and 99.25% otherwise. The plutonium utilization factor shall be calculated on an annual basis.
- (8) [RESERVED]
- (9) Must be able to provide sufficient space for the packaging and storage of transuranic (TRU) waste for up to 180 days.
- (10) Must be able to provide 1600 square feet of non-hardened office space for DOE personnel including space suitable for storing and processing classified information..
- (11) Must be able to accommodate storage of a minimum of 7 MT of plutonium, as plutonium oxide, in stainless steel containers which are in compliance with DOE-STD 3013-96, Criteria for Preparing and Packaging Plutonium Metals and Oxides for Long-Term Storage.

- (12) Must be able to accommodate decontamination of the plutonium oxide stainless steel containers for reuse.
- (13) Must be able to provide for decontamination and decommissioning of the facility in a manner which is cost effective and efficient and minimizes the generation of radioactive waste and radiation exposure to personnel.
- (14) Must be able to incorporate the principles of ALARA (As Low As Is Reasonably Achievable) as specified in 10 CFR Part 20, Standards for Protection Against Radiation.
- (15) Must be able to accommodate plutonium oxide meeting the characteristics and impurities specified in Clause H.4, Government-Furnished Property, Tables H-4a and H-4b.
- (16) Must be able to minimize dust contamination in glove boxes through the use of proper dust abatement techniques, including dust abatement hardware, if appropriate.
- (17) Must be able to provide a fully integrated material inventory control system capable of performing near real-time inventory management and satisfy NRC inventory requirements.
- (18) Must be able to meet all applicable Federal, State, and local laws and regulations and conform with all specific agreements and requirements of the DOE Host Site and all relevant standards of the nuclear and chemical industries.
- (19) Must be able to accommodate production of fuel to support additional fuel qualification efforts beyond those required in the base contract, e.g., to improve fuel design or increase fuel burn-up.
- (20) Must be able to fabricate MOX fuel to meet mission reactor demand schedules.
- (21) Must be able to operate and produce mission fuel in a timeframe that will allow insertion of production fuel (not test or demonstration fuel) into one or more mission reactors no later than the end of 2007.
- (22) Must be able to accommodate the loading of finished fuel into certified packages and onto Safe, Secure Trailers (SSTs).

- (23) Must be able to provide capability of receiving, storing, and processing classified information and Unclassified Controlled Nuclear Information in conformance with applicable laws and regulation.
- (24) Must be able to maximize the use of existing proven technologies in process and facility designs.
- (25) Must be able to provide laboratory and analytical services sufficient to provide prompt support for the MOX fuel fabrication operations.
- (26) Must be able to comply with NRC Safeguards and DOE Security requirements.

**b. Facility Initial and Advanced Preliminary Design**

(1) Initial Preliminary Design (Non-Site Specific)

The Contractor shall ensure the development and preparation of a MOX Fuel Fabrication Facility Initial Preliminary Design. The objectives of the Initial Preliminary Design are to develop on a non-site specific basis, the initial engineering bases and design criteria for a project design that: satisfies functional requirements, operating needs, and statutory and regulatory requirements; validates project feasibility and technical performance levels; and identifies and quantifies any project risks. The Initial Preliminary Design elements required to be developed include, but are not limited to, the following:

- (a) General project criteria and design parameters including applicable codes and standards.
- (b) Quality assurance requirements necessary to satisfy program, project and regulatory objectives.
- (c) Environmental requirements including protections against potential environmental damage and methods for mitigating environmental hazards.
- (d) Types and materials of construction, basic facility drawings, and outline construction specifications.
- (e) Space allowances and general layouts for various functions.
- (f) Significant features and components.
- (g) Energy conservation initiatives and associated design/construction features.

- (h) Applicable safety and health requirements.
- (i) Applicable safeguards requirements.
- (j) Applicable security requirements.
- (k) Barrier-free design/construction features for facility accessibility by the handicapped.
- (l) Identification of and approach for elimination or mitigation of uncertainties.
- (m) Contingency requirements and analyses.
- (n) Deactivation requirements and associated waste disposal requirements.
- (o) Energy consumption and type(s) of energy supply.
- (p) Process flow diagrams.

The Contractor shall ensure the performance of Initial Preliminary Design activities until the Contracting Officer directs the Contractor to proceed to Advanced Preliminary Design. During the Initial Preliminary Design phase, the Contractor shall prepare a detailed presentation for the DOE which provides the current status of the Initial Preliminary Design and includes, but is not limited to, constructability, operability, cost, maintainability, regulatory compliance, vulnerability assessment, compliance with the functional requirements in the above design elements, and other critical information. The design status presentation shall be made at the request of the DOE Contracting Officer. At a minimum, the review shall be attended by representatives of those organizations responsible for the design, facility operations and project management functions, the DOE TM, and the DOE Contracting Officer or designee.

The Contracting Officer shall notify the Contractor that a design status presentation is requested. The Contracting Officer and the Contractor shall agree on a date for the presentation. The Contractor shall provide the DOE with an agenda together with the necessary reference materials for the review at least 10 workdays prior to the review. At the completion of the review, a report, documenting agreements and commitments resulting from the review, shall be prepared and signed by both the Contractor and the DOE TM.

(2) Advanced Preliminary Design

The Contractor shall ensure the development and preparation of a MOX Fuel Fabrication Facility Advanced

Preliminary Design. The Initial Preliminary Design shall be updated with site specific information. The objectives of the Advanced Preliminary Design are to incorporate site specific information and update the initial engineering bases and design criteria for a project design that: satisfies functional requirements, operating needs, and statutory and regulatory requirements; validates project feasibility and technical performance levels; identifies and quantifies any project risks; develops a reliable life cycle cost estimate; and develops a realistic performance schedule. The Advanced Preliminary Design elements required to be developed include, but are not limited to, the following:

- (a) General project criteria and design parameters including applicable codes and standards.
- (b) Quality assurance requirements necessary to satisfy program, project and regulatory objectives..
- (c) Environmental requirements including protections against potential environmental damage and methods for mitigating environmental hazards.
- (d) Types and materials of construction, basic facility drawings, and outline construction specifications.
- (e) Space allowances and general layouts for various functions.
- (f) Significant features and components.
- (g) Facility siting and utility services requirements.
- (h) Site development and DOE Host Site integration requirements.
- (i) Cost/benefit analyses to determine use of site infrastructure.
- (j) Energy conservation initiatives and associated design/construction features.
- (k) Applicable safety and health requirements.
- (l) Applicable safeguards requirements.
- (m) Applicable security requirements.
- (n) Barrier-free design/construction features for facility accessibility by the handicapped.
- (o) Estimated life-cycle costs, projected cash flows by Government fiscal year, performance schedules for design, procurement and construction and methods of construction performance.
- (p) Identification of and approach for elimination or mitigation of uncertainties.
- (q) Acquisition strategy for the project.
- (r) Contingency requirements and analyses.

- (s) Deactivation requirements and associated waste disposal requirements.
- (t) Energy consumption and type(s) of energy supply.
- (u) Process flow diagrams.

The Contractor shall conduct a design review at 85 percent completion of the Advanced Preliminary Design. This review shall include, but is not limited to, constructability, operability, cost, maintainability, regulatory compliance, vulnerability assessment, compliance with site specific requirements, compliance with the functional requirements in the above design elements, and other critical information. At a minimum, the design review shall be attended by representatives of those organizations responsible for the design, facility operations and project management functions, DOE and/or contractor representatives of the DOE Host Site, the DOE TM, and the DOE Contracting Officer or designee.

The Contractor shall notify DOE 30 days prior to the date for the design review. This notification shall include an agenda together with necessary reference materials for the design review. After the design review, a comprehensive report, documenting agreements and commitments resulting from the design review, shall be prepared and submitted to DOE for approval.

The Contractor shall submit the completed Advanced Preliminary Design for DOE approval. Upon DOE approval of the Advanced Preliminary Design, the Advanced Preliminary Design shall be placed under configuration management in accordance with the Contractor's DOE approved Project Management and Control System (PMCS).

**c. Facility Final Preliminary Design**

Based upon the DOE approved Advanced Preliminary Design, the Contractor shall ensure the development and preparation of a MOX Fuel Fabrication Facility Final Preliminary Design (Preliminary Design). Subject to DOE approval, the Final Preliminary Design may be segmented into Final Preliminary Design Packages in order to facilitate continuity between design phases.

The Final Preliminary Design shall include, but is not limited to: conduct of preliminary tradeoff studies, including an evaluation of alternative design approaches; finalization of the project design criteria and establishment of quality levels for systems and components in greater detail; expansion of conceptual design drawings in greater detail and development of additional drawings, or development of new drawings based on new design concepts; development of outline specifications for construction and specifications for equipment procurement; additional analyses of health, safety, and environmental protection; development of preliminary estimates of construction labor, equipment, and material quantities and identification of long-lead time procurement items and potential labor or material supply problems; development of more accurate project cost estimates, time schedules for project performance, identification of the project's critical path; methods of construction performance; further evaluation and selection of energy conservation measures and energy sources of supply/providers; and incorporation of any NRC comments received which affect the Final Preliminary Design. The completion of the Final Preliminary Design is considered to be the 40-50 percent completion point of the total design effort. The Contractor shall submit the Final Preliminary Design Packages to DOE for approval.

The Contractor shall conduct design reviews at 30 percent and 85 percent of completion of each Final Preliminary Design package. These reviews shall include, but not be limited to, constructability, operability, maintainability, regulatory compliance, vulnerability assessment, compliance with the functional requirements document, and other critical information. At a minimum, the design reviews shall be attended by representatives of those organizations responsible for the design, construction management, facility operations and project management functions, DOE and/or contractor representatives of the DOE Host Site, the DOE TM and the DOE Contracting Officer or designee.

The Contractor shall notify DOE 30 days prior to the date of each design review required above. This notification shall include an agenda together with necessary reference materials required for the design review. After each design review, a comprehensive report documenting agreements and commitments resulting from the design review, shall be prepared and submitted to DOE for approval.

The Contractor shall submit completed Final Preliminary Design Packages for DOE approval.

**d. Facility Final Design**

Based upon the DOE approval of Final Preliminary Design Packages and any NRC comments received on the license application which impact the design, the Contractor shall ensure the preparation of a MOX Fuel Fabrication Facility Final Design (Final Design). If the Final Preliminary Design was segmented into packages, Final Design may be initiated upon DOE approval of the corresponding Preliminary Design Package. The Final Design shall include, but is not limited to: restudy and redesign work resulting from changes as may be required from the Final Preliminary Design; development of final (working) drawings and specifications for procurement and construction; estimates of construction labor, equipment, and material quantities; development of detailed estimates of the cost of construction, procurement and construction schedules, methods of performance, and identification of work packages; preparation of health, safety, and environmental analyses; identification of test plans; permitting requirements; preparation of a procurement plan; and determination of utility service requirements in coordination with the DOE Host Site operating contractor or the utility supply companies.

The Contractor shall conduct design reviews at 30 and 85 percent completion of each of the Final Design Packages. The reviews shall include but not be limited to constructability, operability, maintainability, environmental compliance, regulatory compliance, vulnerability assessment, compliance with the functional requirements and other critical information. At a minimum, the design reviews shall be attended by representatives of those organizations responsible for the design, construction management, facility operations and project management functions, DOE and/or contractor representatives of the DOE Host Site, the DOE TM and the DOE Contracting Officer or designee.

The Contractor shall notify DOE 30 days prior to the date of the design reviews required above. This notification shall include an agenda together with necessary reference materials required for the design review. After the design reviews, a comprehensive report, documenting agreements and commitments resulting from the design reviews, shall be prepared and submitted to DOE.

The Contractor shall submit completed Final Design Packages for DOE approval.

**Deliverables:**

- (1) The Contractor shall submit for DOE approval a completed **Advanced Preliminary Design** no later than 3 months after the SPD EIS ROD. DOE will require 60 days to review the document and provide comments. The Contractor shall have 30 days to accept the comments and incorporate them or to hold a comment resolution meeting with DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting.
- (2) The Contractor shall submit for DOE approval all completed **Final Preliminary Design Packages** with the last design package submitted no later than 18 months after contract award. DOE will require 60 days to review each design package and provide comments. The Contractor shall have 30 days to accept the comments and incorporate them or to hold a comment resolution meeting with DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting.
- (3) The Contractor shall submit for DOE approval all completed **Final Design Packages** with the last design package submitted no later than 12 months after DOE approval of the Preliminary Design Package in (2) above. DOE will require 60 days to review each design package and provide comments. The Contractor shall have 30 days to accept the comments and incorporate them or to hold a comment resolution meeting with the DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting.

## 2. **MOX Fuel Fabrication Facility Long Lead Time Procurement Plan**

The Contractor shall ensure the development and provision of a MOX Fuel Fabrication Facility Long Lead Time Procurement Plan based on the results of the Preliminary Design. This plan should identify long lead time items and address issues such as schedule, like substitutions, and the consequences of potential shortages or delays in receiving items in a timely fashion.

### **Deliverable:**

The Contractor shall submit for DOE approval the **MOX Fuel Fabrication Facility Long Lead Time Procurement Plan** as early as possible, but no later than concurrent with the final 85 percent Preliminary Design review package. DOE will require 60 days to review the document and provide comments. The Contractor shall have 30 days to accept the comments and incorporate them or to hold a comment resolution meeting with DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting.

## 3. **Development of a Proposed Work Task Agreement (WTA) Between the Contractor and the DOE Host Site Contractor for Support of the MOX Fuel Fabrication Facility.**

The Contractor shall ensure that a proposed WTA for the base contract support required for the design of the MOX Fuel Fabrication Facility is developed with the DOE specified Host Site Contractor at the DOE Host Site named in the SPD EIS ROD. The proposed WTA will identify all support required to develop the Advanced Conceptual, Preliminary and Final Designs of the MOX Fuel Fabrication Facility including, but not limited to, the scope of design modifications necessary to satisfy infrastructure functional requirements to be provided by the DOE Host Site Contractor. The WTA will include the estimated cost and schedule for the required design effort by the DOE Host Site Contractor.

The WTA shall be updated to specify the estimated cost and schedule for the required modifications of the DOE Host Site infrastructure prior to completion of the Final Design. The role and responsibilities for performing those modifications shall also be identified.

The Contractor shall ensure that the DOE Host Site Contractor's designs meet the infrastructure functional requirements identified in the WTA as part of the MOX Fuel Fabrication Facility design.

The WTA shall define the roles and responsibilities for both the Contractor and the DOE Host Site Contractor in preparing permitting applications and obtaining required permits.

The proposed WTA shall be submitted to the Contracting Officer for approval. (The Contracting Officer and the DOE Contracting Officer for the DOE Host Site will approve the WTA for the work.) The WTA shall be updated as required to address additional support to be provided by the DOE Host Site Contractor.

**Deliverable:**

The Contractor shall submit the DOE a proposed **Work Task Agreement** within 6 months after the SPD EIS ROD. DOE will require 60 days to review the document and provide comments. The Contractor shall have 30 days to accept the comments and incorporate them or hold a comment resolution meeting with DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting. DOE approval of this agreement is required.

The Contractor shall submit to DOE a proposed updated **Work Task Agreement** prior to the completion of the Final design. DOE will require 60 days to review the document and provide comments. The Contractor shall have 30 days to accept the comments and incorporate them or hold a comment resolution meeting with DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting. DOE approval of this agreement is required.

**4. Regulatory Management**

The Contractor shall ensure that a license application is prepared and submitted to the NRC for the operation of the MOX Fuel Fabrication Facility and that applications are submitted for all other required Federal, State, and local permits.

The Contractor shall ensure that a Regulatory Management Plan is developed which describes the strategy for obtaining a NRC license and all required permits for the MOX Fuel Fabrication Facility and addresses issues such as facility safety and integrated safety management.<sup>1</sup> The Regulatory Management Plan shall address all the requirements of applicable Federal, State, and local requirements, including NRC rules. The Regulatory Management Plan shall identify proposed safety

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<sup>1</sup> Inasmuch as 10 CFR Part 70 is being revised, the Contractor may find it useful to consider the Standards that support DOE Order 420.1, Facility Safety, in addition to the relevant Nuclear Regulatory Standards in developing an appropriate set of safety standards.

standards, describe why those safety standards were chosen, describe the implementation process for the proposed safety standards, demonstrate the administrative and management processes and infrastructure that support implementation of the proposed safety standards, and the approach to management of the regulatory process. This plan should be consistent with and fully support the NRC licensing process for the MOX Fuel Fabrication Facility.

The Contractor shall ensure that a schedule of regulatory actions is prepared which identifies major milestones and all critical actions which are necessary to assure that all licenses and permits have been obtained prior to the date required to support the construction and operation of the MOX Fuel Fabrication Facility. Copies of all license and permit application documents shall be furnished to DOE for information simultaneously with submittal to regulatory agencies.

**Deliverables:**

- a. The Contractor shall submit for DOE approval a **Regulatory Management Plan** for the MOX Fuel Fabrication Facility no later than 6 months after contract award and updated annually thereafter. DOE will require 60 days to review the document and provide comments. The Contractor shall have 30 days to accept the comments and incorporate them or to hold a comment resolution meeting with DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting. Annual updates of the Plan will be provided to DOE. DOE will review the update within 14 days and provide comments for Contractor consideration.
- b. The Contractor shall submit copies of all **Regulatory Documentation**, for information only, simultaneously with submittal to regulatory agencies.

**5. Facility Quality Assurance Plan**

The Contractor shall ensure that a Facility Quality Assurance Plan (FQAP) is developed which describes the approach for implementing a Facility Quality Assurance Program for the design, construction and operation of the MOX Fuel Fabrication Facility. The plan shall meet the NRC quality assurance requirements specified in 10 CFR Part 50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Processing Plants.

**Deliverable:**

The Contractor shall submit the **Facility Quality Assurance Plan** no later than 3 months after contract award. This submittal is for DOE information only.

**6. Constructability Review**

The Contractor shall ensure that construction considerations are incorporated into the design activities. The Contractor shall incorporate the following basic constructability concepts in the development of preliminary and final designs:

- a. Designs and procurement schedules are construction-driven.
- b. Designs are configured to enable efficient construction.
- c. Design elements are standardized.
- d. Construction efficiency is considered in specification development.
- e. Module/preassembly designs are prepared to facilitate fabrication, transport, and installation.
- f. Designs promote construction accessibility of personnel, material, and equipment.

**7. Construction Market Analysis and Stimulation of Bidder Interest**

The Contractor shall continuously monitor conditions in the construction and equipment markets to identify factors which may affect the cost or time schedule for completing the project. The Contractor shall perform analyses to: determine the availability of labor, material, equipment, potential bidders, and the cost or schedule impact of any shortages or surpluses in these areas. The Contractor shall report its findings and make recommendations as may be appropriate with respect to: long lead time procurement; separation of construction into bid packages; sequencing of work; use of alternative materials, equipment or methods; other economies in design or construction; and any other matter that will promote cost savings and completion within the time specified in the contract.

The Contractor shall submit a Construction Market Analysis and Prospective Bidders Report to DOE with completion of Preliminary Design setting forth its plan for the accomplishment of the construction. The Contractor shall submit an updated report semi-annually thereafter until award of the last construction subcontract.

The Contractor shall carry out an active program of stimulating the interest of qualified construction contractors and equipment suppliers to encourage bidding on the work.

**Deliverable:**

The Contractor shall submit the **Construction Market Analysis and Prospective Bidders Report** to DOE with the Preliminary Design and semi-annually thereafter. This submittal is for DOE information only.

**8. Deactivation Plan**

The Contractor shall ensure that an initial Deactivation Plan is prepared for the MOX Fuel Fabrication Facility. The plan shall outline the deactivation process and demonstrate how the proposed methods to be used will minimize radiation exposure to workers. The plan shall also emphasize the facility design features and operational practices which will minimize waste generated and the deactivation cost. The Deactivation Plan shall also indicate how the deactivation activities will comply with the requirements of 10 CFR Part 70, Domestic Licensing of Special Nuclear Material, and 10 CFR Part 20, Standards for Protection Against Radiation.

The Deactivation Plan shall describe the actions necessary to provide for the following conditions to prevail at the completion of the Deactivation Plan of the MOX Fuel Fabrication Facility:

- (1) All loose surface contamination removed;
- (2) The facility being accessible without protective clothing;
- (3) All glove boxes and associated ventilation systems sealed in accordance with applicable standards to enable removal from the facility;
- (4) All systems depressurized and/or disabled, as applicable, except as required to enable accessibility as stated in (2) above;
- (5) All remaining unused plutonium and uranium feed materials packaged in appropriate containers and provided to DOE for disposition. All nuclear waste products packaged as required in Option 2 of the contract and provided to DOE for disposition; and

- (6) All processing chemical substances removed and disposed of in accordance with applicable regulations.

**Deliverable:**

The Contractor shall submit a **Deactivation Plan** no later than the completion of Final Design. DOE will review the plan and provide comments within 60 days. The Contractor shall have 30 days to accept the comments and incorporate them or to hold a comment resolution meeting with the DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting. DOE approval of this plan is required.

**9. MOX Fuel Safeguards Plan**

The Contractor shall ensure that a MOX Fuel Safeguards Plan is prepared which describes implementation of applicable NRC safeguards requirements for the MOX Fuel Fabrication Facility which are to be in effect for a NRC licensed operation. The plan shall describe the implementation of applicable NRC safeguards requirements, including applicable IAEA Standards.

**Deliverable:**

The Contractor shall submit the **MOX Fuel Safeguards Plan** within 13 months after contract award to DOE for information.

**10. MOX Fuel Security Plan**

The Contractor shall ensure that a MOX Fuel Security Plan is prepared incorporating the DOE requirements identified in Section J, Attachment 10.

**Deliverable:**

The Contractor shall submit for DOE approval the **MOX Fuel Security Plan** within 6 months after DOE approval of the MOX Fuel Fabrication Facility Final Design. DOE will require 60 days to review the document and provide comments. The Contractor shall have 30 days to accept the comments and incorporate them or to hold a comment resolution meeting with the DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting.

## **B. Fuel Qualification**

The Contractor shall ensure the development and implementation of a comprehensive fuel qualification plan for the initial qualification of MOX fuel for use in the mission CLWRs. The ultimate result of this activity will be approval of fuel designs to support the plutonium disposition mission. It is recognized that fuel qualification activities performed under the base contract may extend in time so that it coincides with work being performed under other options of this contract. All work performed by the DOE Host Site contractor shall be provided to the Contractor as Government Furnished Services (GFS). Fabrication of MOX test/demonstration fuels at facilities other than the MOX Fuel Fabrication Facility shall cease upon acceptance by DOE of the Contractor's Certification of Completion of the MOX Fuel Fabrication Process Qualification Plan.

### **1. Requirements**

The following requirements apply to the qualification of MOX fuel:

- a. Perform fuel qualification activities in accordance with 10 CFR Part 50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants.
- b. Complete activities to support the first core load of MOX fuel in a CLWR in or before 2007.
- c. Demonstrate adequacy of fuel design for projected burnups which shall not be less than 20,000 MWd/MTHM on an assembly basis.
- d. Provide all hardware, component parts, and, if the Contractor elects, natural or depleted uranium to fabricate the MOX test/demonstration fuel.
- e. Store, pending disposal or destructive post-irradiation examination, the irradiated test/demonstration fuel in accordance with NRC requirements.
- f. Implement fuel qualification for a maximum of two fuel types. A "fuel type" is defined as a collection of fuel designs which can be qualified via common qualification actions.
- g. Utilize DOE provided plutonium only.

## 2. **Fuel Qualification Plan**

The Contractor shall ensure that the Fuel Qualification Plan submitted in response to the Request for Proposals is updated and expanded to include, but is not limited to: the requirements listed above; identification of infrastructure functional requirements necessary to support the fabrication of MOX test/demonstration fuel; identification of plutonium feed material requirements necessary to support fuel qualification; feed materials characterization; non-irradiation testing; use of European and domestic data for fuel design; core physics calculations; required thermal-mechanical analyses; NRC licensing interactions; quality assurance requirements; and a MOX test/demonstration fuel irradiation plan. The Fuel Qualification Plan shall be submitted to DOE for approval.

### **Deliverable:**

The Contractor shall submit the updated **Fuel Qualification Plan** no later than 6 months after contract award for DOE approval. DOE will require 60 days to review the document and provide comments. The Contractor shall have 30 days to accept the comments and incorporate them or to hold a comment resolution meeting with DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting. Once approved by DOE, the Contractor shall submit the plan to NRC for review and comment. The Contractor shall elicit a formal acknowledgment of the plan's adequacy to support licensing the use of MOX fuel in mission reactors from the NRC. If changes to the Fuel Qualification Plan are required as a result of NRC comments, DOE approval of those changes is required.

## 3. **Recommendation for a DOE Host Site for Fabrication of MOX Test/Demonstration Fuel**

The Contractor may recommend the use of one or more of the DOE Host Site facilities identified in report ORNL/TM-13573 "Characterization of Candidate DOE Sites for Fabricating MOX Fuel for Lead Assemblies". If the Contractor makes such a recommendation, it shall be made on the basis of the DOE Host Site facility(s) ability to provide the Contractor optimum technical capabilities to accomplish the objectives of the Fuel Qualification Plan. The recommendation shall be accompanied by a DOE Host Site Facility(s) Recommendation Report which includes the identification of the recommended facility(s) and the Contractor's technical evaluation supporting the recommendation.

**Deliverable:**

The Contractor shall submit a **DOE Host Site Facility(s) Recommendation Report** no later than 30 days after contract award. This recommendation report along with environmental and other information will be considered by the Department in identifying the DOE Host Site Facility(s). DOE's Host Site Facility will be identified in the SPD EIS ROD.

**4. Development of a Proposed Work Task Agreement (WTA) for the Fabrication of MOX Test/Demonstration Fuel at a DOE Host Site**

The Contractor shall negotiate with the selected DOE Host Site contractor to develop a proposed WTA for the fabrication of MOX test/demonstration fuel. The proposed WTA will identify the scope of modifications necessary to satisfy the infrastructure functional requirements of the DOE approved Fuel Qualification Plan, the scope of DOE Host Site contractor operations required to support the Fuel Qualification Plan, and the cost and schedule for both the required modifications and operations. The proposed WTA shall be submitted to the Contracting Officer for approval. (The Contracting Officer and the DOE Contracting Officer for the DOE Host Site will approve the WTA for the work.)

The Contractor shall ensure that the DOE Host Site contractor's designs and modifications meet the infrastructure functional requirements identified in the Fuel Qualification Plan.

The Contractor shall be responsible for procuring and furnishing all specialized MOX fuel process equipment to the DOE Host Site contractor in accordance with the schedule identified in the WTA. The Contractor shall transfer accountability of such equipment to the DOE Host Site contractor upon delivery of the equipment to the DOE Host Site.

The Contractor shall be responsible for providing to the DOE Host Site contractor all hardware, component parts, and natural or depleted uranium necessary to fabricate the MOX test/demonstration fuel in accordance with the schedule identified in the WTA.

The Contractor shall support the DOE Host Site Contractor in preparing permitting applications and obtaining required permits.

The Contractor shall provide technical direction to the DOE Host Site contractor for the fabrication of the MOX test/demonstration fuel.

**Deliverable:**

The Contractor shall submit to DOE the proposed **Work Task Agreement** within 60 days after the SPD EIS ROD. DOE will require 60 days to review the document and provide comments. The Contractor shall have 30 days to accept the comments and incorporate them or hold a comment resolution meeting with DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting. DOE approval of this agreement is required.

**5. Implementation of Fuel Qualification Plan**

The Contractor shall ensure the implementation of the DOE approved Fuel Qualification Plan consistent with the DOE approved Work Task Agreement between the Contractor and the DOE Host Site contractor. Upon completion of the Fuel Qualification Plan, the Contractor shall provide a certification of completion to DOE.

**Deliverable:**

No later than thirty (30) days after completion of the Fuel Qualification Plan, the Contractor is required to submit to DOE the **Certification of Successful Completion of the Fuel Qualification Plan.**

**6. Fuel Qualification Long Lead Time Procurement Plan**

If test/demonstration fuels are required, the Contractor shall develop and provide a Fuel Qualification Long Lead Time Procurement Plan. This Plan shall address issues such as schedule, like substitutions, and the consequences of potential shortages or delays in receiving items in a timely fashion. Upon DOE approval, the Contractor shall initiate the Fuel Qualification Long Lead Time Procurement Plan.

**Deliverable:**

The Contractor shall submit the **Fuel Qualification Long Lead Time Procurement Plan** no later than 6 months after contract award. DOE will require a minimum of 60 days to review the document and provide comments. DOE approval of this plan is required and will not be provided until after issuance of the SPD EIS ROD.

## 7. **Fresh MOX Fuel Assembly and Pins Shipping Package**

The Contractor shall provide a certified package in accordance with paragraph J.II.D.3.b. for the shipment of fresh MOX fuel assemblies or pins from the test/demonstration fabrication facility to a reactor for irradiation services. Certified MO-1 shipping packages are available from the Government as GFP should they meet the Contractor's requirements. The Contractor shall notify DOE a minimum of 6 months in advance of the required need date for the MO-1 packages. In addition, the Contractor shall notify DOE at least 6 months in advance of the required need date for the test/demonstration fuel assemblies or pins at the reactor site.

### C. **Irradiation Services**

The Contractor shall ensure the development and implementation of an irradiation services program to utilize CLWR's to irradiate MOX fuel, which includes the following specific activities.

#### 1. **Mission Reactor and Site Facility Modification Design**

##### a. **Mission Reactor and Site Facility Modification Functional Requirements**

The Contractor shall ensure that the Mission Reactor Licensees' designs for mission reactor and site facility modifications necessary to support irradiation of MOX fuel incorporate the following functional requirements as applicable:

- (1) Must be able to facilitate IAEA inspections and monitoring and minimize access to proprietary or other sensitive information;
- (2) Must be able to secure, store and handle MOX fuel in accordance with the requirements of 10 CFR Part 73, Physical Protection of Plants and Materials;
- (3) Must have sufficient capacity for storage of one reload batch of MOX fuel elements for at least 90 days;
- (4) Must have the capability to receive MOX fuel based on twenty-four hour notice of the planned SST arrival time;
- (5) Must have the capability to receive, protect, and unload up to three SSTs during a 24-hour period;

- (6) Must have an SST parking area within the site security perimeter for parking idle, loaded SSTs awaiting unloading and having security equivalent to that of a vital nuclear site area;
- (7) Must have the capability for unloading fresh fuel transportation packages and performing receipt inspection of fuel assemblies;
- (8) Must have the capability to handle fresh fuel transportation packages to prevent contamination during unloading or fuel storage operations.
- (9) Must integrate like-type reactor design modifications to minimize costs.

**b. Mission Reactor and Site Facility Modifications**

The Contractor shall ensure that the Mission Reactor Licensees:

- (1) Perform and document engineering reviews of affected reactor systems and reactor site facilities to determine where modifications are necessary. The reviews shall include, but are not limited to: primary, auxiliary and secondary reactor systems; instrumentation and control systems (including nuclear instruments and reactivity control systems); site security systems; fresh fuel receipt and storage facilities; spent fuel storage facilities; and SST ingress and egress.
- (2) Prepare and provide to the Contractor for submittal to DOE for approval a Mission Reactors System Modification Plan (or plans if desired) which identifies proposed modifications to mission reactors systems and infrastructures to accommodate the irradiation of MOX fuel. The plan(s) shall include, but is not limited to: a summary technical description of the proposed modifications; justification of the need for the proposed modifications; and corresponding schedules and cost estimates for design and construction of the modifications.
- (3) Perform the design of required modifications to mission reactors systems and infrastructures after DOE approval of the Mission Reactors System Modification Plan(s).

**Deliverable:**

The Contractor shall submit to DOE the **Mission Reactors System Modification Plan(s)** within 24 months of contract award. Approval of this plan(s) is required prior to DOE authorization of design of the required modifications. DOE will require 60 days to review the document and provide comments. The Contractor shall have 30 days to accept the comments and incorporate them or to hold a comment resolution meeting with DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting.

**2. Mission Reactors License Amendment Applications**

The Contractor shall ensure that the Mission Reactor Licensees prepare a mission reactors licensing plan (or plans, if desired) for obtaining NRC licensing amendments. The plan(s) shall include a description of the tasks necessary to ultimately amend licenses of the mission reactors and include supporting cost estimates, schedules and milestones.

The Mission Reactor Licensees shall prepare, submit and defend NRC license amendment requests for all mission reactors.

**Deliverables:**

- (1) The Contractor shall submit the **Mission Reactors Licensing Plan(s)** to DOE within 17 months after contract award. This is submitted for DOE information only. Revisions to the plan shall be provided to DOE for information.
- (2) The Contractor shall submit **Mission Reactors License Amendment Application(s) and Revisions** to DOE concurrently with submittal to NRC. This is submitted for DOE information only.

**3. Mission Reactors Permitting Plan(s)**

The Contractor shall ensure that the Mission Reactor Licensees prepare and implement a Mission Reactors Permitting Plan(s) which outlines the overall permitting strategy and describes activities associated with obtaining Federal, State and local permits, including PUC approvals, for the mission reactors. The Plan(s) shall include a description of the tasks necessary to obtain all applicable permits for the mission reactors and the supporting cost estimates, schedules and milestones. The Mission Reactor

Licenses shall obtain permits in accordance with the approved Mission Reactors Permitting Plan(s).

**Deliverable:**

The Contractor shall submit to DOE the **Mission Reactors Permitting Plan(s)** no later than 17 months after contract award. DOE will review the plan(s) and return comments within 60 days. This submittal is for DOE information only.

**4. Mission Reactors Core Management**

**a. Core Design Requirements**

The Contractor shall ensure that the Mission Reactor Licensees' core designs to support irradiation services incorporate the following requirements:

- 1) Capability to utilize mixed oxide fuel pellet composition with no integral neutron absorbers.
- 2) Ability to achieve a minimum burnup level of 20,000 MWd/MTHM on an individual assembly basis.
- 3) Ability to utilize existing proven technology bases for core management to the maximum extent practicable.
- 4) Ability to utilize verified, validated and qualified core design codes.
- 5) Utilization of proven MOX core designs for initial core loadings.
- 6) Capability for transition from a MOX fuel core to LEU fuel core after completion of a current operating cycle and one additional cycle of operation.
- 7) Capability to accommodate an increase or decrease in the plutonium core loading rate for future refuelings. To the extent practicable, the core design approach shall enable substitution of LEU assemblies with MOX assemblies and vice versa, such that the addition or subtraction of MOX fuel assemblies can be balanced with traditional LEU fuel.
- 8) Capability to irradiate the last MOX fuel assemblies for at least one cycle before or in 2022.
- 9) Ability to extract pins from MOX fuel assemblies.

**b. Mission Reactors Core Design and Management Activities**

The Contractor shall ensure that the Mission Reactor Licensees perform the following activities associated with reactor core design and management activities:

- (1) Core design activities necessary to utilize MOX fuel in mission reactors and for core reloads encompassing:
  - (i) Development of fuel specifications, and
  - (ii) Review of European MOX fuel operating experience data;
  - (iii) Preparation of core physics calculations;
  - (iv) Design of lead and subsequent fuel assemblies and overall core design for the period of transition from full LEU fuel to a MOX fuel configuration and for routine operation with MOX fuel;
- (2) Modification of applicable core physics, neutronics, and fuel design and fuel performance computer codes, with subsequent verification, validation and qualification.
- (3) Revision of the FSAR to support the reactor license amendment.
- (4) Preparation, if necessary, of a quality assurance plan, procedures and supporting documentation as required by 10 CFR Part 50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants.
- (5) Development of contingency plans for the continued operation of the reactor using uranium fuel if the MOX fuel supply is interrupted.
- (6) Coordination, as necessary, with the DOE TM on DOE nuclear waste repository matters relating to MOX fuel design and irradiation.
- (7) Preparation of a Mission Reactors Irradiation Plan which describes an integrated approach to the operation of all mission reactors. The plan shall include, but is not limited to:

- (i) Proposed MOX fuel throughput for the selected mission reactors by year and cumulatively;
- (ii) Fuel and core designs sufficient to achieve planned throughput;
- (iii) Accommodation of potential interruptions in the MOX fuel supply; and
- (iv) Coordination of interfaces with fuel qualification activities.
- (v) Coordination of mission reactors loading patterns to accomplish the SOW.
- (vi) Capability to handle the potential disruption of MOX irradiation caused by a shut-down of a mission reactor over an extended period of time.

**Deliverables:**

The Contractor shall submit the **Mission Reactors Irradiation Plan** to DOE no later than 6 months after contract award. DOE review comments will be provided within 90 days of submittal of the plan. The Contractor shall have 30 days to accept the comments and incorporate them or to hold a comment resolution meeting with the DOE to resolve any differences. DOE will provide final its position within 5 days after the comment resolution meeting. The plan shall be updated as needed. Subsequent DOE reviews will be completed within 30 days.

**5. Mission Reactors Operations**

The Contractor shall ensure that the Mission Reactor Licensees:

- a. Review and modify mission reactor procedures and programs that may be affected by the use of MOX fuel including, but not limited to: normal, emergency and post-accident operating procedures; fresh and spent fuel handling procedures; damaged fuel handling procedures; safeguards procedures; and security procedures.
- b. Develop a MOX fuel utilization training program to train and qualify mission reactor site engineering, operations, maintenance, security and other affected personnel on the required changes to

site procedures, systems, equipment, and facilities associated with the use of MOX fuel.

## **6. Test/Demonstration Fuel Irradiation**

The Contractor shall ensure that all required permits and licenses are obtained, the MOX test/demonstration fuel is irradiated in a commercial U.S. reactor identified by the Contractor, and inspections and post-irradiation fuel examinations are performed, if required by the Fuel Qualification Plan. If post-irradiation examination is necessary, the Contractor may only use applicable DOE facilities in accordance with existing DOE agreements, court orders and other applicable laws, including quantity limits and schedules for removal of such materials. The Contractor shall obtain the necessary shipping cask(s) for transporting irradiated MOX fuel assemblies or pins to the examination facilities designated by DOE and selected by the Contractor. The Contractor shall ship irradiated MOX fuel assemblies or pins in compliance with NRC and DOT requirements. The Contractor shall ship all post irradiation examination materials in accordance with DOE direction and in compliance with applicable laws, regulations and DOE orders.

MOX fuel assemblies shall be clearly identified and remain intact at the reactor site, i.e., assemblies should not be planned for deconstitution. The only exceptions allowed are for planned testing that requires removal of pins or for fuel damaged during irradiation that requires removal of pins. Damaged fuel that needs to be withdrawn from the fuel assemblies shall be withdrawn and stored pending examination or disposal.

## **D. Project Management and Administration**

The Contractor shall perform all project management and administration activities. This includes, but is not limited to: project baseline development; performance measurement; change management; risk assessment; support for project budget requests; configuration management; integration of project technical requirements; integration of transportation requirements related to SNM; design of a fresh MOX fuel transportation package; development and maintenance of an outreach program; contract administration; procurement, except as specified elsewhere in the contract, of goods and services to support the project; and other support activities.

## 1. Project Planning, Control, and Reporting

### a. Development of a Project Management Plan

The Contractor shall develop, implement and update as required a Project Management Plan (PMP) which sets forth the plans, organization and systems to be utilized by the Contractor to manage the project. The PMP requires DOE approval. The PMP shall include, but is not limited to: a detailed description of the methodology for ensuring the successful integration of all management and technical requirements of the project across all participating organizations; a clear identification of the limits of management authority (e.g. work authorization, funds management, control of indirect costs) for all project activities; a project organizational chart; a procedure for the replacement of team members; and a summary description of the Contractor's plan for addressing labor relations issues for the project. The PMP shall also include the following:

- (1) A Project Execution Risk Assessment (PERA) which grades areas of identified risk as low, medium, or high, relative to their potential impact on the project. The PERA shall include a cost/schedule benefit analysis strategy for the identified areas of risk. The PERA shall be updated annually.
- (2) A detailed description of the Contractor's Project Management and Control System (PMCS). The PMCS shall serve as the basis for planning, development and management of technical, cost, and schedule baselines for all project activities. The PMCS shall contain a detailed description of the configuration management program including when each major element of design is to be placed under configuration control. The PMCS shall also be used for budget development, performance measurement, project reporting and analysis and funds management. DOE will perform a conformance review of the Contractor's PMCS to ensure actual operations of the system complies with the system description.
- (3) A Project Baseline Plan (PBP) which describes the technical, cost and schedule baselines for the MOX fuel project in accordance with the PMCS. The Contractor shall expand the detail of the Project Baseline Plan submitted in response to the RFP to the work package level as appropriate. Technical, cost, and schedule baseline

information for unexercised contract options shall be summarized at an appropriate level of the Contract Work Breakdown Structure (CSWBS) in the initial PBP.

**Deliverables:**

The Contractor shall submit a **Project Management Plan** for DOE approval within 75 days of contract award. DOE shall provide comments on the PMP within 30 days of its receipt. Upon receipt of DOE's comments, the Contractor shall have 21 days to resolve any issues regarding DOE's comments.

**b. Support For Budget Requests**

The Contractor shall perform budget analyses to support the project's resource requirements as requested by DOE.

**c. Project Review Meetings**

The Contractor shall participate in quarterly project reviews with the DOE project and program management staff. The reviews shall include project status, performance to date and outstanding issues. Quarterly review meetings will be scheduled by mutual agreement of the Contractor and DOE. The Contractor shall be responsible for preparing agreements and commitments prior to the end of each quarterly meeting. The DOE TM and the Contractor project manager shall approve the agreements and commitments.

**2. Outreach Programs**

In cooperation with DOE, the Contractor shall develop and implement an Outreach Program to support DOE's commitment to openness and appropriate public participation in decision-making. Key attributes of the Outreach Program are as follows:

- a. Development of a program and program materials describing the MOX Fuel Project for use with local, state, and national interest groups.
- b. Development of a protocol for coordinating outreach activities with DOE and DOE Host Site contractors for responding to the news media and information requests from the public.

**3. SNM Transportation**

**a. SNM Transportation Integration Management Plan**

The Contractor shall develop and submit for DOE approval a SNM Transportation Integration Management Plan that describes the roles and responsibilities, lead time requirements and how communications between project participants will be conducted with respect to transportation of the following SNM:

- (1) Plutonium oxide feed materials to the MOX Fuel Fabrication Facility and the test/demonstration fuel fabrication facility;
- (2) Fresh MOX fuel assemblies to the mission reactors;
- (3) Fresh test/demonstration fuel to reactor(s) for irradiation;
- (4) Irradiated test/demonstration fuel to the PIE facility if required by the Fuel Qualification Plan.

**Deliverable:**

The Contractor shall submit a **SNM Transportation Integration Management Plan** for DOE approval no later than 8 months after contract award. DOE will require 60 days to review the plan and provide comments. The Contractor shall have 30 days to accept the comments and incorporate them or to hold a comment resolution meeting with DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting.

**b. Fresh MOX Fuel Transportation Package For Test/Demonstration MOX Fuel Assemblies or Pins, If Applicable, and Mission Fuel Assemblies**

- (1) The Contractor shall ensure the preparation of an application for and shall obtain an NRC Certificate of Compliance for a fresh MOX fuel package design. The certificate shall be for a Type B(U)F package design. The Contractor or the Fuel Fabricator shall be the certificate holder and primary user. Utilities involved in the irradiation of MOX fuel, along with DOE, shall be secondary users of the NRC certified package design. The package shall comply with DOT regulations (49 CFR Parts 171-180) and shall be certified to NRC regulations (10 CFR Part 71).

- (2) Subject to any conflicting NRC requirements, the Contractor shall ensure that the design of the MOX fresh fuel package conforms to the MOX Fresh Fuel Package Technical Requirements contained in Reference ORNL/TM-13526.
- (3) The Contractor shall integrate the MOX fresh fuel package into a MOX fuel transportation system which will operate to move the fuel from the MOX Fuel Fabrication Facility to the mission reactors as cost effectively as practical, where the cost represents the total cost to the Government. To the extent practical, one fuel package design shall be compatible with all reactor sites and core designs.
- (4) The Contractor shall ensure the preparation and submittal for DOE approval of a MOX fresh fuel package certification plan.
- (5) The Contractor shall prepare an estimated total life-cycle cost which shall include, but is not limited to: the cost of package design, testing, and certification; packaging acquisition and maintenance; any acquisitions of ancillary hardware; any necessary facility interface modification (e.g., modifications at the mission reactor sites); and disposal of the packagings when the mission is complete.
- (6) The Contractor may at his discretion consider the package conceptual design developed jointly by DOE and ORNL as an initiation point for the detailed package design (Reference ORNL/TM-13526, ORNL/TM-13427, and ORNL/TM-13574).
- (7) The Contractor shall ensure that design reviews are conducted, as applicable, at approximately 30 and 85 percent of the completion of the design effort. The design reviews shall be attended by representatives of those organizations responsible for the design, the DOE TM and the DOE Contracting Officer or designee. The Contractor shall notify DOE 30 days prior to the date of the design review. This notification shall include an agenda with the necessary reference materials for the design review. After the design review, a comprehensive report which documents agreements and commitments resulting from the design reviews shall be prepared by the Contractor and approved by DOE. Following the design review by DOE,

the proposed Certificate of Compliance holder shall provide a technical briefing to the NRC Certifying Official regarding the status of the MOX Package design process, including schedule updates about when the final design and SARP will be submitted to NRC for certification.

- (8) The Contractor shall ensure that the final design of the MOX fresh fuel package(s), including the Safety Analysis Report for Packaging (SARP), are submitted to NRC and that any subsequent revisions are made as required by NRC.
- (9) The Contractor shall prepare a procurement plan to enable procurement of the desired number of MOX fresh fuel packages on a schedule so they are available prior to initiation of mission fuel irradiations. If applicable, the Contractor shall prepare a procurement plan to obtain the desired number of packages to support the shipment of test/demonstration MOX fuel assemblies or pins in accordance with the DOE approved Fuel Qualification Plan.

**Deliverables:**

- 1) The Contractor shall submit a **MOX Fresh Fuel Package Certification Plan** to DOE within 120 days of contract award. DOE will require 30 days to review and comment on the document. The Contractor will have 30 days to accept the comments and incorporate them or to hold a comment resolution meeting with DOE to resolve differences. DOE will provide its final position 5 days after the comment resolution meeting. DOE approval is required.
- 2) The Contractor shall, upon resolution of DOE design review comments, have the proposed Certificate of Compliance holder submit to NRC the **MOX Fresh Fuel Package Certificate of Compliance Application** including the final design and a completed SARP no later than 36 months after contract award. The MOX Fresh Fuel Package Certificate of Compliance Application shall be provided to DOE for information at the same time the package is submitted to NRC. The proposed Certificate of Compliance holder shall be responsible for resolving all questions with NRC, preparing revised SARP information and re-submitting safety documentation to NRC to obtain

certification of the package design in a timely manner consistent with the MOX fuel shipment schedule.

- 3) The Contractor shall submit for DOE approval the **MOX Fresh Fuel Package Procurement Plan** with estimated costs and schedule, for the acquisition of the fleet of needed MOX fresh fuel packages within 36 months from award of contract. The DOE will require 60 days to evaluate the document. The Contractor will have 30 days to accept the comments and incorporate them or to hold a comment resolution meeting with DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting.

#### **4. Advance Procurement Plan**

The Contractor shall submit an Advance Procurement Plan, on an annual basis, which identifies those subcontracts which will be submitted to DOE for approval in accordance with the clause of this contract entitled, "Subcontracts," during the succeeding twelve months.

##### **Deliverables:**

The Contractor shall submit for DOE approval the **Advance Procurement Plan** within 9 months of contract award and annually thereafter.

### **III. Option 1 SOW**

Option 1 includes construction, construction management functional check-out, and cold start-up of the MOX Fuel Fabrication Facility; defense of NRC licensing documents for the MOX Fuel Fabrication Facility and the mission reactors; construction of required modifications to mission reactors and facilities; procurement of fresh MOX fuel assemblies shipping packages; and the supporting project management activities. Option 1 requirements and associated deliverables are provided by each of the four main elements of the project, i.e., MOX Fuel Fabrication Facility, Fuel Qualification, Irradiation Services and Project Management and Administration.

#### **A. MOX Fuel Fabrication Facility Requirements and Deliverables**

The Contractor shall perform construction management services and ensure the successful completion of functional check-out, and cold start-up of the facility which includes utilizing depleted uranium oxide or natural uranium oxide as a surrogate for PuO<sub>2</sub>. The Contractor shall ensure that a plan to demonstrate that the facility is ready for plutonium-based operations is prepared and executed.

##### **1. Construction Management Services**

- (a) The Contractor shall furnish personnel, facilities, equipment, materials, and supplies necessary to perform all construction management services required for the construction of the MOX Fuel Fabrication Facility.
- (b) The Contractor shall be responsible for planning, managing, and controlling all construction activities, including award and management of construction subcontracts and shall implement an overall construction program best suited to meet project objectives.
- (c) The Contractor shall not perform any construction with its own forces. All construction activities shall be procured on a competitive fixed-price basis to the maximum extent practicable.
- (d) The Contractor shall be responsible for ensuring that the facility, as constructed, conforms to all applicable requirements, drawings and specifications.
- (e) The Contractor shall ensure that the facility is constructed in accordance with all applicable laws and regulations. The Contractor shall ensure that all necessary licenses and permits are obtained prior to the commencement of the affected construction.

- (f) The Contractor shall procure long lead procurement items and prepare construction bid packages, including preparation of bid documents, and evaluation of bids, award, inspection, acceptance, storage and protection of procured items.
- (g) The Contractor may procure specialty equipment including fuel fabrication equipment, nuclear safety equipment, alpha-containment, and ventilation equipment and other items as may be approved by the Contracting Officer.
- (h) The Contractor shall administer all subcontracts.
- (i) The Contractor shall ensure the performance of site management within the boundaries of the MOX Fuel Fabrication Facility including operation and maintenance of construction support facilities, utilities, site security, and interface with the DOE Host Site.
- (j) The Contractor shall ensure the development and implementation of management programs for procurement, property, quality assurance, environmental protection, labor relations, and site security.

## **2. Construction Documentation**

The Contractor shall prepare construction documentation and develop and maintain a system for indexing and retrieving construction documentation such as permit certifications, construction and installation reports, quality assurance records (such as receipt and testing records, instrumentation test and calibration, etc.), subcontracts, design and construction configuration management records, as-built drawings, and other similar quality construction management records. These documents shall remain the property of the Government and be a permanent part of the project record.

## **3. Functional and Operability Testing Plan**

The Contractor shall ensure the preparation of a Functional and Operability Testing Plan for the MOX Fuel Fabrication Facility's components, subsystems, systems, and integrated systems as part of the construction turn-over process to operations personnel. This plan shall describe how the Contractor will accept the completed facility from the construction subcontractor. This plan shall also define when cold start-up; hot start-up; and transition to full operations of the MOX Fuel Fabrication

Facility are complete. This Plan shall be submitted to DOE for approval. During hot start-up and transition to full operations, the net plutonium utilization factor shall not be less than 99.25%.

**Deliverable:**

The Contractor shall submit the **Functional and Operability Testing Plan** to DOE for approval no later than 6 months after the initiation of Option 1. DOE will require 90 days to review the document and provide comments. The Contractor shall have 30 days to accept the comments and incorporate them or to hold a comment resolution meeting with DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting.

**4. Construction and Cold Start-Up Completion Certification.**

The Contractor shall ensure completion of construction in accordance with approved specifications, licenses, permits, and designs. The Contractor shall ensure the successful performance of functional check-out and cold start-up testing. In addition, the Contractor shall ensure that all training and procedures are in place for hot start-up and transition to full operations. The Contractor shall provide certification to DOE that: (1) all facilities and hardware are acceptable; (2) all required procedures are issued and appropriate personnel trained; and (3) the required infrastructure is in place for the commencement of hot start-up of the MOX Fuel Fabrication Facility. The Contractor shall ensure that the MOX Fuel Fabrication Facility License Applicant submits the appropriate documentation for hot start-up to NRC.

**Deliverable:**

Thirty (30) days after completion of Cold Start-up, the Contractor is required to submit to DOE for approval the **Certification of Successful Completion of Construction and Cold Start-Up Testing in Accordance with the Functional and Operability Testing Plan.** The DOE will have up to 60 days to review the document and may request to review specific information used as the basis for the certification. This certification may be submitted to NRC, if required, during the DOE review period.

**5. MOX Fuel Fabrication Process Qualification Plan**

The Contractor shall ensure preparation of a MOX Fuel Fabrication Process Qualification Plan. The Plan shall include, but is not limited to: a description and flowchart for processes; product specifications; individual

process qualification plans; quality assurance/quality control (QA/QC) plans; fabrication and inspection procedures; and required data records for fuel pellet, fuel rod and fuel assembly production.

**Deliverable:**

The Contractor shall submit for DOE approval the **MOX Fuel Fabrication Process Qualification Plan** at least 120 days prior to Hot Start-up. DOE will require 60 days to review the document and provide comments. The Contractor shall have 30 days to accept the comments and incorporate them or to hold a comment resolution meeting with DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting.

**6. Maintenance and Operating Procedures**

The Contractor shall ensure that the MOX Fuel Fabrication Facility License Applicant develops and implements a Procedures Management System (PMS) Manual which provides instructions on the preparation, review, approval, control and implementation of procedures used to administer, operate and maintain the MOX Fuel Fabrication Facility. The PMS manual shall mandate that procedures require that: (1) protection of employees, the public and the environment is a priority whenever activities are planned and performed; (2) personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities; (3) equipment, systems, and facilities are operated and maintained in a manner which protects the Government's investment; and (4) operational requirements defined elsewhere in the SOW are implemented.

All necessary administration, operations and maintenance procedure manuals for the MOX Fuel Fabrication Facility will be prepared in accordance with the DOE approved PMS manual.

The maintenance procedure manual(s) shall, as a minimum address the following areas:

- The identification, inventory, and periodic assessment of the condition of physical assets in the maintenance program.
- The establishment of requirements, budget, and a work management system to maintain physical assets in a condition suitable for their intended use.
- The preventive, predictive and corrective maintenance to ensure physical asset availability for planned use and/or proper disposition.

- The management of backlogs associated with maintenance, repair and capital improvements

**Deliverables:**

The Contractor shall submit for DOE approval the **Procedures Management Systems (PMS) Manual** 120 days after the start of construction. DOE will require 60 days to review the document and provide comments. The Contractor shall have 30 days to accept the comments and incorporate them or to hold a comment resolution meeting with DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting.

**7. Procurement of Certified Fresh MOX Fuel Shipping Packages**

In accordance with the DOE approved MOX Fresh Fuel Package Procurement Plan, the Contractor or his designee shall procure, receive, inspect, and properly store all required certified packages for the transportation of fresh MOX fuel from the MOX Fuel Fabrication Facility to the mission reactors.

**8. Nuclear Materials Management Program**

The Contractor shall ensure that the MOX Fuel Fabrication Facility License Applicant develops a nuclear materials management program which includes, but is not limited to, compliance with safeguards and security requirements, IAEA reporting requirements, receipt inspection, safety management requirements, production information requirements and an information management system to ensure the coordination of material shipments arriving from the Pit Disassembly and Conversion facility, the uranium supplier, and shipment of completed fuel assemblies for delivery to the mission reactors.

**9. Regulatory Management**

The Contractor shall ensure that the MOX Fuel Fabrication Facility License Applicant continues defense of NRC license and applicable permit applications and amendments as necessary, and continues to maintain licenses and permits. Activities will be reflected in the annual updates to the Regulatory Management Plan.

**10. Development of a Revised Work Task Agreement (WTA) Between the Contractor and the DOE Host Site Contractor for Support of the Hot Start Up and Transition to Full Operations of the MOX Fuel Fabrication Facility.**

The Contractor shall ensure that a revised WTA is negotiated with the DOE Host Site Contractor for the Hot Start Up and Transition to Full Operations. The proposed WTA will identify all support required. The WTA will include the estimated cost and schedule for the required support to be provided by the DOE Host Site Contractor. The WTA shall define the roles and responsibilities.

The proposed WTA shall be submitted to the Contracting Officer for approval. (The Contracting Officer and the DOE Contracting Officer for the DOE Host Site will approve the WTA for the work.) The WTA shall be updated as required to address additional support to be provided by the DOE Host Site Contractor.

**Deliverable:**

The Contractor shall submit to DOE the proposed revision to the **Work Task Agreement** at least 6 months prior to the initiation of Option 2. DOE will require 60 days to review the document and provide comments. The Contractor shall have 30 days to accept the comments and incorporate them or hold a comment resolution meeting with DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting. DOE approval of this agreement is required.

**B. Fuel Qualification - None**

**C. Irradiation Services**

Mission reactors and site facilities shall be modified as approved by DOE and all applicable licenses and permits shall be obtained to allow MOX fuel to be irradiated.

**1. Mission Reactors and Site Facilities Modifications**

The Contractor shall ensure that Mission Reactor Licensees procure, construct, install, and test necessary modifications to the mission reactors and the reactor site systems in accordance with NRC requirements and the previously approved Mission Reactors System Modification Plan(s) on a fixed-price basis to the maximum extent practicable.

**2. Mission Reactors Licenses and Permits**

The Contractor shall ensure that the Mission Reactor Licensees continue, as necessary, licensing and permitting activities identified in the licensing and permitting plans included in the base contract.

**3. Mission Reactors Operations**

The Contractor shall ensure that the Mission Reactor Licensees implement the MOX fuel utilization training program developed during the base contract and that the appropriate personnel have been trained.

**4. Two-Year MOX Fuel Delivery Schedule**

The Contractor shall provide to DOE a two-year schedule identifying the amount of PuO<sub>2</sub> required from DOE and the quantities of fresh fuel (including the amounts of kg of MOX, the amounts of kg of Pu at charge, the Pu concentration, the number of assemblies, and the gross weights of each assembly) and the delivery dates for each mission reactor. The Contractor shall update the delivery schedule annually.

**Deliverable:**

The Contractor shall submit the **Two-Year MOX Fuel Delivery Schedule**. The first schedule shall be submitted to DOE 9 months prior to the required delivery date for the first shipment of fuel; and annually thereafter.

**D. Project Management and Administration**

The Contractor shall perform all applicable activities and maintain all systems and plans as specified in the base contract.

#### IV. Option 2 SOW

Option 2 includes hot start-up, transition to full operations, and operations of the MOX Fuel Fabrication Facility, irradiation of MOX fuel in the mission reactors and the supporting project management activities. Option 2 requirements and associated deliverables are provided by each of the four main elements of the project, i.e., MOX Fuel Fabrication Facility, Fuel Qualification, Irradiation Services, and Project Management and Administration.

##### A. MOX Fuel Fabrication Facility

The Contractor shall ensure that the MOX Fuel Fabrication Facility Licensee performs the activities of hot start-up and transition to full operations described in the Functional and Operability Testing Plan and the MOX Fuel Fabrication Process Qualification Plan developed during Option 1 of the contract.

The Contractor shall ensure that the MOX Fuel Fabrication Facility Licensee manages and operates the MOX Fuel Fabrication Facility consistent with the requirements of this contract.

##### 1. Hot Operations Testing through Transition to Full Operations

The Contractor shall ensure that the MOX Fuel Fabrication Facility Licensee executes the requirements of the Functional and Operability Testing Plan and ensures that the operations are in compliance with the NRC Operating License and any required permits.

###### **Deliverable:**

Thirty (30) days after completion of Hot Start-Up and Transition to Full Operations, the Contractor is required to submit to DOE for approval the **Certification of Successful Completion of Hot Start-up Testing and Transition to Full Operations in Accordance with the Functional and Operability Testing Plan**. The DOE will have up to 60 days to review the document and may request to review specific information used as the basis for the certification. This certification may be submitted to NRC, if required.

##### 2. MOX Fuel Fabrication Process Qualification Plan Implementation

The Contractor shall ensure that the MOX Fuel Fabrication Facility Licensee implements the MOX Fuel Fabrication Process Qualification Plan. The Contractor shall certify to DOE that the requirements of the Plan have been completed as specified in the plan.

###### **Deliverable:**

The Contractor shall submit the **Certification of Completion of the MOX Fuel Fabrication Process Qualification Plan** no later than 1 month after the completion of Hot Start-up and Transition to Full Operations. The DOE will require up to 60 days to review the document and may request to review specific information used as a basis for the certification. This certification may be submitted to NRC, if required.

### **3. Fuel Production**

The Contractor shall ensure that the MOX Fuel Fabrication Facility Licensee (1) manages, operates and maintains the MOX Fuel Fabrication Facility; (2) produces MOX fuel in accordance with fuel specifications for mission reactors; (3) maintains the capability to operate in a surveillance and maintenance mode; and (4) provides the Contractor with a requested PuO<sub>2</sub> delivery schedule updated on an annual basis. The plutonium oxide storage cans, which are received from the pit disassembly and conversion facility, shall not be opened until the contents are needed for process operations. The Contractor shall ensure that all fuel assembly components are obtained. The Contractor shall ensure conversion of uranium to UO<sub>2</sub>, if necessary, and the transportation and packaging of all uranium materials. Final assembly of the fuel assembly components into a completed MOX fuel bundle shall occur at the MOX Fuel Fabrication Facility. All fuel shall be shipped as completed MOX fuel bundles except as may be otherwise authorized by the Contracting Officer. The Contractor shall ensure that the MOX Fuel Fabrication Facility Licensee uses, maintains, and replaces, as necessary, the fresh MOX fuel packages and that all waste materials are packaged in accordance with DOE Host Site requirements.

### **4. Analytical Services**

The Contractor shall ensure that the MOX Fuel Fabrication Facility Licensee performs laboratory and analytical services sufficient to provide prompt support for the MOX fuel fabrication operations.

### **5. Nuclear Materials Management Program**

The Contractor shall ensure that the MOX Fuel Fabrication Facility Licensee implements the nuclear materials management program developed during Option 1.

**6. Licenses and Permits**

The Contractor shall ensure that the MOX Fuel Fabrication Facility Licensee maintains the NRC license to possess and use special nuclear materials and other required permits and has the capability to update the SAR and environmental reports, support regulatory inspections (NRC, OSHA, and other agencies), amend the operating license, and provide other actions necessary for continued operation of the MOX Fuel Fabrication Facility.

**7. International Atomic Energy Agency Support**

The Contractor shall ensure that the MOX Fuel Fabrication Facility Licensee provides all necessary support to the IAEA including the provision of laboratory space and access to appropriate documents and records.

**8. Deactivation Planning**

The Contractor shall provide to DOE an update, as appropriate, but no more frequently than annually, of the MOX Fuel Fabrication Facility Deactivation Plan. The plan may need to be updated as a result of, for example, changes to the facility, advances in technology, changes in the estimated costs for the effort, or changes in licensing requirements.

**Deliverable:**

One year after the start of construction of the MOX Fuel Fabrication Facility, the Contractor shall prepare an annual update of the **Deactivation Plan**, as appropriate, for DOE information.

**9. Revision of the Work Task Agreement (WTA) Between the Contractor and the DOE Host Site Contractor for Support of Hot Start-up and Transition to Full Operations of the MOX Fuel Fabrication Facility.**

The Contractor shall ensure that the WTA prepared in Option 1 is updated as may be required. The proposed revision to the WTA will identify all support required. The WTA will include the estimated cost and schedule for the required support to be provided by the DOE Host Site Contractor. The WTA shall define the roles and responsibilities.

The proposed revision to the WTA shall be submitted to the Contracting Officer for approval. (The Contracting Officer and the DOE Contracting Officer for the DOE Host Site will approve the WTA for the work.) The

WTA shall be revised, as required, to address additional support to be provided by the DOE Host Site Contractor.

**Deliverable:**

The Contractor shall submit to DOE the proposed revision to the **Work Task Agreement** as required. DOE will require 60 days to review the document and provide comments. The Contractor shall have 30 days to accept the comments and incorporate them or hold a comment resolution meeting with DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting. DOE approval of this agreement is required.

**B. Fuel Qualification - None**

**C. Irradiation Services**

The Contractor shall ensure that the Mission Reactor Licensees irradiate MOX fuel in the mission reactors to a minimum burnup level of 20,000 MWd/MTHM on an assembly basis. The Contractor shall update the two-year MOX fuel delivery schedule.

**1. Irradiation**

The Contractor shall ensure that the Mission Reactor Licensees (a) irradiate MOX fuel only in the mission reactors; (b) facilitate visits by the IAEA; (c) provide necessary MOX fuel safeguards and security; and (d) store and handle spent MOX fuel pending disposal in accordance with the requirements of the Nuclear Waste Policy Act and their NRC licenses. The Contractor shall confirm achievement of a minimum burnup level of 20,000 MWd/MTHM on an assembly basis.

The Contractor shall provide an annual inventory report of all MOX fuel assemblies located at mission reactors. The report shall include the total number of assemblies, the total kilograms of MOX fuel, total kilograms of Pu at charge, and their present burnup.

MOX fuel assemblies shall be clearly identified and remain intact at the reactor site, i.e., assemblies should not be planned for deconstitution. The only exceptions allowed are for planned testing that require removal of pins or for fuel damaged during irradiation that requires removal of pins. Damaged fuel that needs to be withdrawn from the fuel assemblies shall be withdrawn and stored pending examination or disposal.

**Deliverable:**

Two years after the start of irradiation of mission fuel, the Contractor shall submit the **Mission Reactors Annual Inventory Report** to DOE for information.

**2. Update of Two-Year MOX Fuel Delivery Schedule**

The Contractor shall continue to annually update and submit to DOE the Two-Year MOX Fuel Delivery Schedule which identifies the quantities of fresh fuel and the required delivery schedules for the mission reactors.

**Deliverable:**

The Contractor shall submit the **Two-Year MOX Fuel Delivery Schedule**. This schedule shall be submitted to DOE annually.

**D. Project Management and Administration**

The Contractor shall perform all applicable activities and maintain all systems and plans as specified in the Statement of Work for the base contract.

## V. Option 3 SOW

Option 3 includes deactivation of the MOX Fuel Fabrication Facility and supporting project management activities, Option 3 requirements and associated deliverables are provided by each of the four main work elements of the project, i.e., MOX Fuel Fabrication Facility, Fuel Qualification, Irradiation Services and Project Management and Administration.

### A. MOX Fuel Fabrication Facility

Upon completion of the MOX Fuel Fabrication Facility mission, the Contractor shall ensure that the MOX Fuel Fabrication Facility Licensee deactivates the MOX Fuel Fabrication Facility in accordance with the approved Deactivation Plan.

#### 1. MOX Fuel Fabrication Facility Deactivation Requirements and Deliverables

The Contractor shall ensure that the MOX Fuel Fabrication Facility Licensee performs deactivation of the MOX Fuel Fabrication Facility in accordance with the approved Deactivation Plan and the NRC license. The Contractor shall certify to the Government that the MOX Fuel Fabrication Facility has been deactivated in accordance with the plan and the NRC license requirements. Upon approval of the certification, the DOE shall accept responsibility for the facility.

The Contractor shall dispose of or otherwise effect the disposition of the fresh MOX fuel packages in accordance with the terms of the contract.

#### Deliverable:

The Contractor shall provide for DOE approval a **Certification of Deactivation Completion**. DOE will have up to 60 days to review the document and may request to review specific information used as a basis for the certification.

#### 2. Revision of the Work Task Agreement (WTA) Between the Contractor and the DOE Host Site Contractor for Support of the Deactivation of the MOX Fuel Fabrication Facility.

The Contractor shall ensure that the WTA prepared in Option 2 is updated as may be required. The proposed revised WTA will identify all support required. The WTA will include the estimated cost and schedule for the required support to be provided by the DOE Host Site Contractor. The WTA shall define the roles and responsibilities.

The proposed revision to the WTA shall be submitted to the Contracting Officer for approval. (The Contracting Officer and the DOE Contracting Officer for the DOE Host Site will approve the WTA for the work.) The WTA shall be updated as required to address additional support to be provided by the DOE Host Site Contractor.

**Deliverable:**

The Contractor shall submit to DOE the proposed revision to the **Work Task Agreement** within 30 days of the initiation of Option 3. DOE will require 15 days to review the document and provide comments. The Contractor shall have 7 days to accept the comments and incorporate them or hold a comment resolution meeting with DOE to resolve any differences. DOE will provide its final position within 5 days after the comment resolution meeting. DOE approval of this agreement is required.

- B. Fuel Qualification - None**
- C. Irradiation Services - None**
- D. Project Management and Administration**

The Contractor shall perform all applicable activities and maintain all systems and plans as specified in the Statement of Work for the base contract.

PART III

SECTION J

2. ACRONYMS, ABBREVIATIONS AND ELEMENTS

ACRONYMS, ABBREVIATIONS, ELEMENTSACRONYMS

AE	Architect-Engineer
ALARA	As Low As Reasonably Achievable
ARIES	Advanced Recovery and Integrated Extraction System
ASTM	American Society for Testing and Materials
BWR	Boiling Water Reactor
CANDU	Canadian Deuterium-Uranium Reactor
CFR	Code of Federal Regulations
CH	Chicago Operations Office (DOE)
CLWR	Commercial Light Water Reactors
CM	Construction Management
CO	Contracting Officer
CoC	Certificate of Compliance
COR	Contracting Officer's Representative
COTR	Contracting Officer's Technical Representative
CSWBS	Contract Summary Work Breakdown Structure
D&D	Decontamination & Decommissioning
DOE	Department of Energy
DOE/MD	Department of Energy Office of Fissile Materials Disposition
DOE-STD	Department of Energy Standard
DOT	Department of Transportation
EA	Environmental Assessment
EFPD	Effective Full Power Days
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ES&H	Environment, Safety and Health
FERC	Federal Energy Regulatory Commission
FMDP	Fissile Materials Disposition Program
FQAP	Facility Quality Assurance Plan
FSAR	Final Safety Analysis Report
G&A	General and Administrative
HLW	High-Level Waste (radioactive)
HM	Heavy Metal
HQ	Headquarters (DOE)
IAEA	International Atomic Energy Agency
INEEL	Idaho National Engineering and Environmental Laboratory
INPO	Institute of Nuclear Power Operations
LANL	Los Alamos National Laboratory
LEU	Low-Enriched Uranium
LLW	Low-Level Waste (radioactive)
LTA	Lead Test Assembly
LUA	Lead Use Assembly
LWR	Light Water Reactor
M&O	Management and Operating Contractor
MD	Office of Fissile Materials Disposition
MOX	Mixed Oxide (plutonium and uranium oxides)
MT	Metric Tonnes
MTHM	Metric Tonnes Heavy Metal
NAS	National Academy of Science
NEPA	National Environmental Policy Act of 1969

ACRONYMS

NOV	Notice of Violation
NRC	Nuclear Regulatory Commission
OBS	Organizational Breakdown Structure
O&M	Operations and Maintenance
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
PBP	Project Baseline Plan
PEIS	Programmatic Environmental Impact Statement
PERA	Project Execution Risk Assessment
PIDAS	Perimeter Intrusion Detection and Assessment System
PIE	Post-irradiation Examination
PMCS	Project Management Control System
PMP	Project Management Plan
PMS	Procedures Management System
PSAR	Preliminary Safety Analysis Report
PSWBS	Project Summary Work Breakdown Structure
PUC	Public Utility Commission
PWR	Pressurized Water Reactor
QA	Quality Assurance
QC	Quality Control
RF	Russian Federation
RFP	Request for Proposals
ROD	Record of Decision
S&S	Safeguards and Security
SALP	Systematic Assessment of Licensee Performance
SAR	Safety Analysis Report
SEB	Source Evaluation Board
SNM	Special Nuclear Material
SOW	Statement of Work
SPD	Surplus Plutonium Disposition
SRS	Savannah River Site
SST	Safe, Secure Trailer
TA	Test Area
TBD	To be Determined
TEC	Total Estimated Cost
TM	Technical Manager
TRU	Transuranic Waste (Radioactive)
UCNI	Unclassified Nuclear Information
US	United States
WBS	Work Breakdown Structure

ABBREVIATIONS

BTU	British Thermal Unit
Ci/g	Curies/Gram
Keff	Effective Multiplication Factor
Kg	Kilogram
m <sup>2</sup>	Square Meter
m <sup>3</sup>	Cubic Meter
mg	Milligram
mrem	Millirem
MWd	Megawatt Days
MWe	Megawatt Electric
MWh	Megawatt Hour
Yr	Year

INFORMATION FOR ENVIRONMENTAL DATA

CO	Carbon Monoxide
NO <sub>2</sub>	Nitrogen Dioxide
No <sub>x</sub>	Nitrogen Oxides
PM <sub>10</sub>	Particulate Matter Less than 10 Micron Aerodynamic Mass Mean Diameter
SO <sub>2</sub>	Sulphur Dioxide
VOC	Volatile Organic Compounds

ELEMENTS

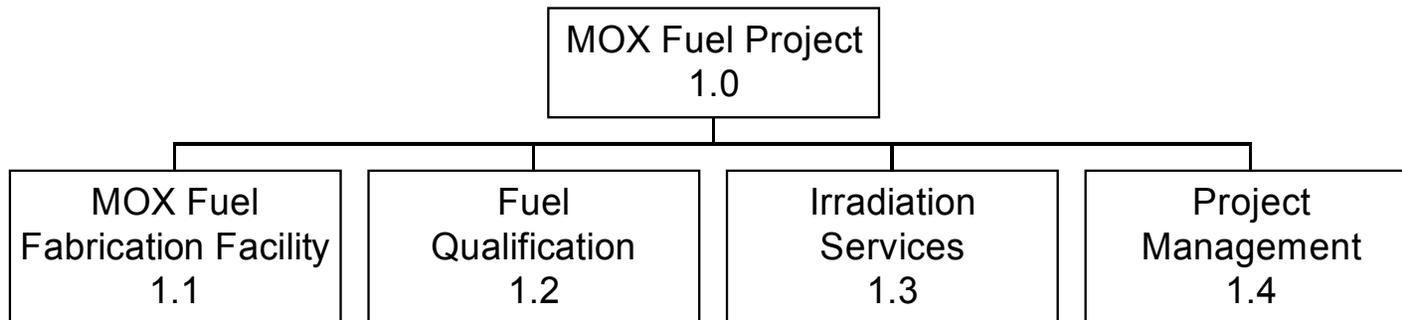
DUF <sub>6</sub>	Depleted Uranium Hexafluoride
Pu	Plutonium
PuO <sub>2</sub>	Plutonium Oxide
U	Uranium
UO <sub>2</sub>	Uranium Dioxide

PART III

SECTION J

3. PROJECT SUMMARY WORK BREAKDOWN STRUCTURE

## MOX FUEL PROJECT SUMMARY WORK BREAKDOWN STRUCTURE



PART III

SECTION J

4. DOE F 1332.1, REPORTING REQUIREMENTS CHECKLIST

**Reporting Requirements Checklist Notes**

- Note 1      Development of a Project Management Plan is an element of the Statement of Work for the contract.
- Note 2      Schedule information and milestones provided in the Contractors proposal shall be incorporated in the Milestone Schedule/Plan which shall be a component of the Project Management Plan.
- Note 3      The summary cost plan provided in the Contractors proposal shall be extended and displayed down to the work package level of the WBS.
- Note 4      Development of a Management Control System Description is an element of the Statement of Work for the contract.
- Note 5      The Contract Summary Work Breakdown Structure (CSWBS) provided in the Contractors proposal shall be extended and displayed down to the work package level of the WBS.
- Note 6      The Contractor may propose alternate formats for these reports to the Contracting Officer. Approval by the Contracting Officer is required to initiate the use of alternate formats.



PART III

SECTION J

5. LIST OF KEY PERSONNEL

The key personnel referred to in the clause entitled, “Key Personnel” set forth in Part II, Section I, are: \*

<u>Title</u>	<u>Key Personnel</u>
Project Manager	Robert H. (Bob) Ihde
Deputy Project Manager	Toney A. Mathews
MOX Fuel Irradiation Manager	Richard H. Clark
MOX Fuel Qualification and Design Manager	J. Darren Gale
MOX Fuel Fabrication Services Manager	John E. Matheson
MFFF Architect Engineering Services Manager	Edward J. Brabazon
Facilities Design Manager	Raymond E. Fortier
MFFF Licensing Manager	Peter S. Hastings
MFFF Construction Management Services Manager	Joseph M. King

PART III  
SECTION J

6. BILLING INSTRUCTIONS

## PART III

## SECTION J

LIST OF ATTACHMENTSBILLING INSTRUCTIONS

(For Cost-Reimbursement Type Contracts)

- I. Introduction. These instructions are provided for use by Contractors in the preparation and submission of vouchers requesting reimbursement on a voucher submission payment basis for work performed under cost-reimbursement type contracts. Compliance with these instructions will reduce correspondence, and other causes for delay, to a minimum and will thus promote prompt payments to the Contractor.
- II. Voucher Form. In requesting reimbursement, Contractors shall use Standard Form 1034 (Public Voucher for Purchases and Services Other Than Personal) (see Exhibit A), supported by a Statement of Cost (see Exhibit B). An acceptable substitute (which provides the same necessary information as found in Exhibits A and B of these instructions) may be used.
- III. Preparation. Standard Form 1034 shall be completed in accordance with the following instructional notations (see counterpart notations on Exhibit A):
  - (1) Leave Blank.
  - (2) Enter voucher number (number consecutively, commencing with "1"). Completion/final vouchers shall clearly be marked as such.
  - (3) Enter date voucher prepared.
  - (4) Enter contract number and date of contract award.
  - (5) Enter contractor's name, mailing address, and telephone number of office responsible for submitting voucher.
  - (6) If a task order or project agreement is involved in the billing, enter the number and date of the task order or project agreement, otherwise leave blank.
  - (7) Identify the period the billing covers (e.g., "Jan. 19\_\_" or "Jan-Mar. 19\_\_").

- (8) Enter the dollar amount of this billing. The amount claimed must agree with the amount reflected in the attached Statement of Cost (see Exhibit B).
- (9) Place an "X" in the appropriate block for the type of payment for which reimbursement is requested.
- IV. Billing Period. Vouchers shall be submitted no more frequently than once every 2 weeks (except that small business concerns may invoice more frequently).
- V. The Statement of Cost shall be completed substantially as shown in Exhibit B, making due allowance for the Contractor's cost accounting system. Costs claimed shall be only those recorded costs authorized for billing by the payment provisions of the contract. Indirect costs claimed shall reflect actual experience, but in no event shall exceed those approved for billing purposes by the Contracting Officer. Additional supporting data for claimed costs shall be provided in such form and reasonable detail as an authorized representative of the Contracting Officer may require.
- VI. Submission. An original voucher and one copy shall be submitted to:

DOE Capital Accounting Center  
CR 54/CHO  
Accounts Payable Division  
U.S. Department of Energy  
P. O. Box 500  
Germantown, MD 20874-0500

A copy of the voucher shall also be submitted to the DOE Contract Specialist and the DOE Technical Manager as set forth in Part I, Section G - Contract Administration Data, of this contract. Each voucher (original and three copies) shall be supported by a Statement of Cost. The Certification on the Statement of Cost attached to each voucher must be signed by a responsible official of the Contractor. If follow-up billings are necessary, they must be clearly marked to show that they are second or third billings. Completion/final vouchers shall clearly be marked as such.

Exhibit A

Standard Form 1034 Revised January 1980 Department of the Treasury 1 TFRM 4-2000 1034-118		<b>PUBLIC VOUCHER FOR PURCHASES AND SERVICES OTHER THAN PERSONAL</b>			VOUCHER NO.	
U.S. DEPARTMENT, BUREAU, OR ESTABLISHMENT AND LOCATION			DATE VOUCHER PREPARED		SCHEDULE NO	
			CONTRACT NUMBER AND DATE		PAID BY	
PAYEE'S NAME AND ADDRESS					DISCOUNT TERMS	
					PAYEE'S ACCOUNT NUMBER	
					GOVERNMENT B/L NUMBER	
SHIPPED FROM			TO		WEIGHT	
NUMBER AND DATE OF ORDER	DATE OF DELIVERY OR SERVICE	ARTICLES OR SERVICES <i>(Enter description, item number of contract of Federal supply schedule, and other information deemed necessary)</i>	QUAN- TITY	UNIT PRICE		AMOUNT <sup>1</sup>
				COST	PER	
(Use Continuation Sheet(s) if necessary) <b>(Payee must NOT use the space below)</b>						<b>TOTAL</b>
PAYMENT: <input type="checkbox"/> PROVISIONAL <input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL <input type="checkbox"/> PROGRESS <input type="checkbox"/> ADVANCE		APPROVED FOR =\$	EXCHANGE RATE =\$1.00	DIFFERENCES		
		BY <sup>2</sup>				
		TITLE		Amount verified; correct for <i>(Signature or Initials)</i>		
Pursuant to authority vested in me, I certify that this voucher is correct and proper for payment.						
_____ <i>(Date)</i> <i>(Authorized Certifying Officer)<sup>2</sup></i> <i>(Title)</i>						
ACCOUNTING CLASSIFICATION						
P A B I Y D	CHECK NUMBER	ON ACCOUNT OF U.S. TREASURY		CHECK NUMBER	ON <i>(Name of bank)</i>	
	CASH	DATE		PAYEE <sup>3</sup>		
<sup>1</sup> When stated in foreign currency, insert name of currency.					PER	
<sup>2</sup> If the ability to certify and authority to approve are combined in one person, one signature only is necessary; otherwise the approving officer will sign in the space provided, over his official title.					TITLE	
<sup>3</sup> When a voucher is receipted in the name of a company or corporation, the name of the person writing the company or corporate name, as well as the capacity in which he signs, must appear. For example: "John Doe Company, per John Smith, Secretary", or "Treasury", as the case may be.						

Previous edition usable

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**PRIVACY ACT STATEMENT**

The information requested on this form is required under the provisions of 31 U.S.C. 82b and 82c, for the purpose of disbursing Federal money. The information requested is to identify the particular creditor and the amounts to be paid. Failure to furnish this information will hinder discharge of the payment obligation.

**STATEMENT OF COST**

The ABC Company  
Anywhere, U. S. A., 01234

Contract No. \_\_\_\_\_  
Voucher No. \_\_\_\_\_

Contract Amount (face value):

Amount Authorized for Expenditure (obligated):

Estimated Cost \$ \_\_\_\_\_  
Fixed-Fee (if any) \$ \_\_\_\_\_  
Total \$ \_\_\_\_\_

Basic Contract \$ \_\_\_\_\_  
All Modifications \$ \_\_\_\_\_  
Contract to Date \$ \_\_\_\_\_

Period of performance covered by this billing:

Claimed Costs	Claimed for this Billing Period	Cumulative Claimed Through This Billing Period
Direct Labor		
Fringe Benefit @%		
Overhead @%		
Nonexpendable Items Including Equipment (List items separately)		
Materials & Supplies		
Travel		
Subcontract #1 (DEF Co.)		
Subcontract #2 (GHI Co.)		
Subcontract #3 (Smith)		
Subcontract #4 (Misc)		
Other Direct Costs		
Adjustments (Explain)	_____	_____
Total Costs (less G&A)		
G&A @% _____	_____	_____
Total Costs		
Fee @% _____ (if any)	_____	_____
Total costs and fee	_____	_____
Credit (Explain)	_____	_____
Contractor's share (if any)	_____	_____
Government's share	_____	_____

**CERTIFICATION:** I certify that this invoice is correct and in accordance with the terms of the contract and that the costs included herein have been incurred, represent payments made by the Contractor except as otherwise authorized in the payments provisions of the contract, and properly reflect the work performed.

**EXPLANATION:**

7. SENSITIVE FOREIGN COUNTRIES LISTING (JULY 1994)

Countries appear on this list for reasons of national security, terrorism or nuclear non-proliferation support.

Algeria  
Armenia  
Azerbaijan  
Belarus  
China, People's Republic of  
Cuba  
Georgia  
India  
Iran  
Iraq  
Israel  
Kazakhstan  
Libya  
Moldova  
North Korea  
Pakistan  
Russian Federation  
Sudan  
Syria  
Taiwan  
Tadjikistan  
Turkmenistan  
Ukraine  
Uzbekistan

NOTE: Due to the dynamic nature of world events, other countries may, at any time become sensitive. Therefore, caution should be exercised in dealing with citizens of countries not listed to assure that sensitive information, although unclassified in nature, is not inadvertently disclosed. This would include nuclear and other U.S. technology and economic information.

PART III

SECTION J

8. SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS AND HUB ZONE SMALL BUSINESS SUBCONTRACTING PLAN

PART III  
SECTION J

9. U. S. DEPARTMENT OF LABOR WAGE DETERMINATION (DAVIS-BACON)

The Department of Labor Wage Determination(s) to be attached hereto by modification to the contract, shall be complied with subject to the requirements of the Davis-Bacon Act.

PART III  
SECTION J

10. DOE SECURITY REQUIREMENTS

DOE SECURITY REQUIREMENTS

DOE Order 200.1	"Information Management Program"
DOE Order 470.1	"Safeguards and Security Program"
DOE Order 471.1	"Identification and Protection of Unclassified Controlled Nuclear Information"
DOE Order 471.2A	"Information Security Program" and accompanying manual
DOE Order 472.1B	"Personnel Security Activities"
DOE Manual 474.1-2	"Nuclear Materials Management & Safeguards Reporting and Data Submission"
DOE Order 5610.2	"Control of Weapon Data"
DOE Order 5632.1C	"Protection & Control of Safeguards & Security Interests"
DOE Order 5632.7A	"Protective Force Program"
DOE Order 5633.3B	"Control & Accountability of Nuclear Materials"
DOE Order 5650.2B	"Identification of Classified Information"

PART III  
SECTION J

11. PERFORMANCE GUARANTEE

## PERFORMANCE GUARANTEE

FOR VALUE RECEIVED, and in consideration of, and in order to induce the U.S. Department of Energy (the "Government") to enter into Contract No. DE-AC02-99CH10888 relating to Mixed Oxide (MOX) Fuel Fabrication and Reactor Irradiation Services (the "Contract") by and between the Government and Duke, COGEMA, Stone & Webster, LLC (Contractor), the undersigned, Duke Engineering Services, Inc., Cogema, Inc., and Stone & Webster Engineering Corporation (herein called "Guarantors), hereby unconditionally jointly and severally guarantee to the Government the full and prompt payment and performance of all obligations, accrued and executory, which Contractor presently or hereafter may have to the Government under the Contract, and Guarantors further agree to indemnify the Government against any expenses the Government may sustain in connection with any legal proceedings to enforce any of its rights against Guarantors hereunder, provided the Government is the prevailing party therein. Guarantors agree that Contractor shall have the full right, without any notice to or consent from the Guarantors, to make any and all modifications or amendments to the Contract without affecting, impairing or discharging, in whole or in part, the liability of Guarantors hereunder.

Guarantors hereby expressly agree that the Guarantee shall be valid and unconditionally binding upon Guarantors regardless of (i) the reorganization, merger or consolidation of Contractor into or with another entity, corporate or otherwise, or the liquidation or dissolution of Contractor, or the sale or other disposition of all or substantially all of the capital stock, business or assets of Contractor to any other person or party, or (ii) the institution of any bankruptcy, reorganization, insolvency, debt arrangement or receivership proceedings by or against Contractor, of the adjudication of Contractor as a bankrupt, or (iii) the assertion by the Government against Contractor of any of the Government's rights and remedies provided for under the Contract, including any modifications or amendments thereto, or under any other document(s) or instrument(s) executed by Contractor, or existing in the Government's favor in law, equity, or bankruptcy. The Guarantee granted to the Government herein shall be effective in the event the Contractor fails during the term of the Contract to fulfill the full and prompt payment and performance of all obligations and duties under the Contract.

Further, in the event Contractor fails to perform its aforesaid contractual obligations and duties pursuant to the terms and conditions of the Contract, Guarantors agree that their liability under the Guarantee shall be continuing, absolute, primary, and direct, and that Government shall not be required to pursue any right or remedy it may have against Contractor or other Guarantors under the Contract, or any modifications or amendments thereto, or any other document(s) or instrument(s) executed by Contractor, or otherwise (and shall not be required to first commence any action or obtain any judgment against Contractor) before enforcing this Guarantee against Guarantors, and that Guarantors will, upon demand, pay the Government any amount, the payment of which is guaranteed hereunder and the payment of which by Contractor is in default under the Contract, and that Guarantors will, upon demand, perform all other obligations of Contractor, the performance of which by Contractor is guaranteed hereunder.

Guarantors further warrant and represent to the Government that the execution and delivery of this Guarantee is not in contravention of Guarantors' Articles of Organization, Charter, by-laws, and applicable laws; that the execution and delivery of this Guarantee, and the performance thereof, has been duly authorized by Guarantors' Boards of Directors, Trustees, or other management board, as applicable; and that the execution, delivery, and performance of this Guarantee will not result in breach of, or constitute a default under, any loan agreement, indenture, or contract to which Guarantors are a party.

Guarantors have read and consent to the signing of the Contract and acknowledge the references to Guarantors herein.

Notwithstanding anything to the contrary contained herein, the liability of Guarantors hereunder shall be subject to and limited by the applicable provisions of the Contract. No express or implied provision, warranty, representation or term of this Guarantee is intended, or is to be construed, to confer upon any third person(s) any rights or remedies whatsoever.

In Witness Whereof, Guarantors have caused this Guarantee to be executed by their duly authorized officers, and their corporate seals to be affixed hereto.

DUKE ENGINEERING & SERVICES, INC.

BY: \_\_\_\_\_

TITLE: \_\_\_\_\_

DATE: \_\_\_\_\_

ATTEST:

\_\_\_\_\_

COGEMA, INC.

BY: \_\_\_\_\_

TITLE: \_\_\_\_\_

DATE: \_\_\_\_\_

ATTEST:

\_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

BY: \_\_\_\_\_

TITLE: \_\_\_\_\_

DATE: \_\_\_\_\_

ATTEST:

\_\_\_\_\_