NOT MEASUREMENT SENSITIVE

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MISSION NEED STATEMENT GUIDE

[This Guide describes suggested nonmandatory approaches for meeting requirements. Guides are not requirements documents and are not to be construed as requirements in any audit or appraisal for compliance with the parent Policy, Order, Notice, or Manual.]

U.S. Department of Energy
Washington, D.C. 20585

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MISSION NEED STATEMENT

1. PURPOSE.

This Guide provides authors of mission need statements, as identified in DOE O 413.3A, *Program and Project Management for the Acquisition of Capital Assets,* dated 7-28-06 with suggested content, definitions, and examples for writing a clear statement to support an acquisition executive's decision to initiate exploration of options to fulfill a capability gap, which may include a capital asset acquisition.

2. SCOPE.

a. A mission need statement is the primary document supporting the acquisition executive's decision to initiate exploration of options to fulfill a capability gap including but not limited to acquisition of a new capital asset.

b. Mission need statement development occurs during the project initiation phase when a program identifies a capability gap between its current capabilities and capacities and those required to achieve the goals articulated in its strategic plan and/or in the DOE Target Enterprise Architecture for capital asset projects. A mission need statement is the translation of this gap into a high level requirement that can only be met through material means. Mission need statements summarize the analytical process used by programs to evaluate and define the need.

c. While all projects over $5M are required to have a defined and approved mission need, DOE O 413.3A requires a mission need statement when the expected cost of a project will exceed $20M.

This document provides guidance in creating a mission need statement that fulfills DOE O 413.3A and meets the expectations of the appropriate approval authorities. The guide is organized in alignment with categories of mission need statement content (see paragraph 4).

3. MISSION NEED STATEMENT.

a. The mission need statement document identifies a capability gap between the current state of the program's mission and the mission plan. It is the first step in the identification and execution of a DOE project.

b. The Critical Decision process starts with identification and approval of a mission need and continues through project baseline development, definitive design, construction and closeout.

c. The mission need statement is NOT an engineering study or a proposed solution to a capability gap in the mission. However, it is anticipated that before a mission need statement is submitted, pre-conceptual level engineering/technical analyses would be developed to:

(1) explore the scope of the gap

(2) identify potential hazards and their safety, security and risk implications

(3) identify rough order of magnitude range estimates (-50 percent to +100 percent, for example) of project cost and schedule based on the upper bound of the rough order of magnitude estimate.

d. This initial rough order of magnitude range estimate is only to provide decision-makers a frame of reference relative to potential future resources and schedules the project could entail. These initial rough order of magnitude range estimates of project cost and schedule are not the preliminary cost and schedule estimates of the project since no particular capital asset alternative has been selected. Nor are the rough order of magnitude range estimates budget quality data since they are likely to change as the program develops more detailed project requirements. Therefore, no judgment regarding project performance relative to the rough order of magnitude range estimates should be made.

e. If the initial rough order of magnitude range estimate of project cost exceeds $750M, or if an environmental cleanup project exceeds $1B (resulting in a potential major system project), a mission validation independent project review is conducted in conjunction with the development of the mission need statement as required by DOE O 413.3A.

f. Pre-conceptual analyses and independent project reviews should be referenced and readily available as supporting data to the mission need statement.

4. SUGGESTED MISSION NEED STATEMENT CONTENT. The suggested length for a mission need statement is no more than 15 pages and its content should include:

a. Title Page.

(1) mission need statement title

(2) designation as a major or non-major acquisition project

(3) submission date

(4) originator, including organization and phone number

(5) approving official’s name and signature

b. Statement of Mission Need.

Provide a clear and concise paragraph (a few sentences) that lays out the essential summary of the mission need. The section of the mission need statement

dedicated to defining the capability gap should describe the gap between the current state of the program's mission and the mission plan.

c. Alignment.

(1) Describe how the stated mission need fits into the overall strategy for accomplishing or advancing both the Department's and the program's strategic plan and mission.

(2) Describe the priority of fulfilling the mission need relative to other programs and projects within the program office and Department and relative to other project/programs at the site, installation, laboratory, etc.

(3) Cite internal or external drivers for this mission need (e.g., legal ruling, statute, regulation, international agreement, earmark, or Presidential, Congressional, or Secretarial direction/priority).

d. Capability Gap.

(1) Clearly describe the gap or shortcomings the mission need statement is addressing in terms of an operational or functional performance capability, technological opportunity, or service.

(2) **The mission need statement is a description of the mission as defined by a desired end-point, not a contract statement of work. Therefore descriptions of the capability gap in terms of a construction of a physical system, decontamination and decommissioning, environmental restoration, procurement of a piece of equipment, construction of a facility, or other specific material end item are not appropriate for a mission need statement.**

(3) The mission need statement should include the following.

(a) Explain how the effort to create the intended capability could be confirmed (e.g., output, production level, quality level, waste shipments, buildings decontamination and decommissioning), and whether this need will evolve over time.

(b) Summarize why facilities, equipment, or services currently existing or being acquired within the Department, other government agencies, public organizations, private entities, or international bodies are not sufficient to address the gap.

(c) Describe benefits that may accrue from closing the capability gap (more efficient operations, increased safety, lower operational costs, or other savings).

(d) Discuss the strategic risk to the overall mission of DOE of not filling the capability gap.

(e) Describe the impact on the program's ability to perform its mission if the capability shortfall is not resolved, including the timeframe when this impact would occur.

(f) Describe the impacts to safety, health, environment, security, capacity, operations, maintenance, cost, productivity, efficiency, or other factors as appropriate if the capability shortfall is not resolved.

(g) Identify any high-level interdependencies (within or external to the program) with other mission needs or capabilities that may be impacted or may benefit from addressing this mission need. These include: interfaces with existing and planned acquisitions; requirements for compatibility with existing or future systems; or cooperative opportunities, such as a program addressing a similar need at another Department component.

e. Approach.

(1) Briefly describe what has been considered or what will be analyzed as potential strategies to meet the new mission need. This should include a description of ongoing studies, a listing of potential technical or regulatory alternatives, or study approach (e.g. engineering studies, pilot scale projects). A detailed alternative analysis will be conducted in support of Critical Decision-1; therefore, this section should summarize the planned approach to conducting this analysis.

(2) Identify the mission-level assumptions that may be necessary to complete the project and mission.

(3) Briefly describe the functional, technical, operational, staffing, regulatory, safety, or financial constraints that could apply to the exploration and acceptance of potential solutions to satisfying the mission need.

(4) Describe, in general terms, any nuclear safety or safeguards and security issues that will need to be considered to address the mission need. This discussion should also present all safety considerations that have been taken into account in developing the mission need in accordance with

Section 3.1 of DOE Standard 1189, Integration of Safety Into the Design Process, dated March 2008. The mission need statement should communicate the expectations for the execution of safety activities during the design process.

f. Resource and Schedule Forecast.

(1) Provide a rough order of magnitude estimate of the project cost and schedule ranges to acquire various capability alternatives which address the stated mission need.

(2) To the extent possible, identify the estimated dates (fiscal year only) for meeting subsequent Critical Decisions.

(3) To support programmatic strategic planning efforts and budget requests for the five-year planning period, identify the currently projected rough order of magnitude resource planning funding profile with a breakout of project engineering and design funds, and an explanation of funding needs to proceed from Critical Decision-0 to Critical Decision-1. This projection should be based on the high end of the rough order of magnitude estimate for the project to provide an upper bound estimate for the project.

5. MISSION NEED STATEMENT APPROVAL PROCESS.

a. DOE O 413.3A requires that the Office of Program Analysis and Evaluation within the Office of the Chief Financial Officer review and provide a recommendation regarding approval for mission need statements when the expected cost of a project will exceed $100M.

b. To initiate the review, the program Secretarial Officer/Deputy Administrator or an appropriate Federal Headquarters program manager, as designated in writing by the program Secretarial Officer/Deputy Administrator to Program Analysis and Evaluation, submits the mission need statement to the Director of Program Analysis and Evaluation with a copy to the Energy Systems Acquisition Advisory Board Secretariat.

c. The submittal of the mission need statement to the Program Analysis and Evaluation Director signifies that the Federal program managers responsible for the proposed project endorse the mission need.

d. The program Secretarial Officer/Deputy Administrator may also submit draft mission need statements to Program Analysis and Evaluation prior to the official submission for informal review and developmental assistance.

e. All other mission need statements where the expected cost of a project to acquire a capital asset will not exceed $100M are submitted to the program Secretarial Officer/Deputy Administrator for approval determination.

6. ATTACHMENTS: SAMPLES.

Provided samples are for guidance only and are not to be used for reference information. Samples were extracted from existing mission need statements and altered to fit suggested content contained in this mission need statement guide.

7. REFERENCES.

a. DOE O 413.3A, *Program and Project Management for the Acquisition of Capital Assets*, dated 7-28-06.

b. Other 413 Guides.

8. POINTS OF CONTACT.

a. Office of Chief Financial Officer, Office of Program Analysis and Evaluation, 202-586-4171

b. Office of Management, Office of Engineering and Construction Management (OECM), 202-586-1784

c. Energy Facility Contractors Group (EFCOG), 858-792-6031

d. National Nuclear Security Administration (NNSA), Office of Project Management and System Support, 202-586-5555

e. Office of Environmental Management, Office of Project Management Oversight, 202-586-7709

f. Office of Science, Office of Project Assessment, (202) 586-5430

SAMPLES FOR "STATEMENT OF MISSION NEED" SECTION

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EXAMPLE 1.

An expansion of the Strategic Petroleum Reserve (SPR) to 1.0 billion barrels is essential to address the nation's needs for increasing energy security associated with growing U.S. consumption and import dependence, and to carry out its mission under the Energy Policy and Conservation Act (EPCA), to protect the nation from the adverse impacts of petroleum oil supply disruptions and comply with the nation's obligations under the International Energy Program (IEP).

EXAMPLE 2.

A need exists to disposition the excess gaseous diffusion buildings at the site, including disposition of process equipment, structures and ancillary buildings and disposition of contaminated soils under the buildings. Fulfillment of this need will accomplish the Department of Energy's (DOE's) specific responsibilities under the 1992 National Energy Policy Act (Title XI, Chapter 28, Decontamination and Decommissioning).

EXAMPLE 3.

The site does not have the capabilities to treat contact-handled (CH), large-package mixed low-level waste (MLLW) and remote-handled (RH) MLLW to meet Resource Conservation Recovery Act (RCRA) requirements, Hazardous Waste Management Act requirements, and waste acceptance criteria for disposal onsite at the existing mixed waste disposal trenches, the existing environmental restoration disposal facility, or the future integrated disposal facility. Capabilities are also required to process CH, large-package transuranic (TRU) waste and RH TRU waste to meet waste acceptance criteria for disposal at the Waste Isolation Pilot Plant (WIPP).

SAMPLES FOR "ALIGNMENT" SECTION

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EXAMPLE 1 (STRATEGIC PETROLEUM RESERVE EXPANSION).

Strategic Petroleum Reserve Mission.

The Strategic Petroleum Reserve (SPR) mission is to provide the United States with adequate strategic and economic protection against disruptions in oil supplies. The 1975 Energy Policy and Conservation Act (EPCA) authorized the creation of the SPR. In this Act, Congress declared it to be the policy of the U.S. Government to maintain a stockpile of crude oil and petroleum products, for the purpose of diminishing U.S. vulnerability to the effects of disruptions in petroleum supplies and meeting the U.S.'s obligations under the International Energy Program. The EPCA provided the authorization for a reserve of up to 1 billion barrels; however, current implementation has only been to the 700 million barrel level.

Strategic Fit of Mission Need.

Since the establishment of the SPR in 1975, both the nation's oil imports and risks to oil supply disruptions have increased significantly. U.S. petroleum imports have more than doubled since 1975 and U.S. crude import dependence has risen from 33 percent in 1975 to over 66 percent in 2005. The Energy Information Administration projects in its Annual Energy Outlook 2007, a continued growth in both the nation's petroleum consumption and foreign import dependence through 2030.

U.S. vulnerability to petroleum supply disruptions has also increased dramatically since 1975 due to increases in terrorism, world petroleum demands, and hurricanes. Since 9/11, world terrorism has increased and has targeted international energy supplies. The petroleum demands of emerging Asian nations such as China and India, have almost eliminated excess oil production capacities worldwide. Hurricanes have also increased affecting both U.S. oil production and refining in the Gulf Coast.

The need for an expansion of the SPR to 1 billion barrels aligns with the 2006 Department of Energy Strategic Plan Theme 1, Energy Security and Strategic Goal 1.1, Energy Diversity. The SPR must be large enough to satisfy the nation's energy needs as well as serve as a national defense reserve. Expanding SPR to 1 billion barrels will directly contribute to enhanced energy security. A larger reserve is necessary to address the nation's economic and security vulnerabilities associated with growing U.S. consumption and increasing import dependence. The mission need also directly contributes to SPR's mission of "provid[ing] the United States with adequate strategic and economic protection against disruptions in oil supplies."

Priority of Mission Need.

SPR expansion is a Presidential priority as announced in the 2007 State of the Union Address. The President's goal is to expand SPR to 1 billion barrels by 2019. However, funding is problematic. Out-year targets for expansion have not been provided yet, so current target level funding will enable the expansion to occur by 2050. In the 2009-2013 Corporate Program Review Integrated Priority List for the Office of Fossil Energy, 1 percent of expansion activities is funded in target. The remaining 99 percent of expansion activities are funded over target.

Internal/External Drivers.

The need for an expansion of the Strategic Petroleum Reserve to 1 billion barrels is based on the following drivers:

- The expansion of the Strategic Petroleum Reserve to 1 billion barrels is a legal requirement of the Energy Policy Act of 2005.
- An expansion of the Reserve is necessary to comply with President Bush's National Energy Plan "to ensure that SPR protection is maintained."
- An expansion of the Reserve is necessary for the continued U.S. membership and compliance with the International Energy Program.
- The need for the expansion of the Strategic Petroleum Reserve to 1 billion barrels has been reviewed and concurred by the Secretary of Energy, the White House Principals Coordinating Committee, and the President of the United States.

EXAMPLE 2 (PLUTONIUM DISPOSITION).

Program's Mission.

The mission of DOE's Office of Environmental Management (EM) is to complete the safe cleanup of the environmental legacy brought about from five decades of nuclear weapons development and government-sponsored nuclear energy research. The Savannah River Site (SRS) currently has in storage a large quantity of plutonium materials without a defined disposition path. The mission of plutonium vitrification is to provide a disposition pathway for the DOE's excess plutonium at the Savannah River Site to meet proliferation resistance standards and disposal criteria at the nation's Monitored Geologic Repository.

Strategic Fit of Mission Need.

By establishing a plutonium vitrification capability at SRS, the Department of Energy (DOE) would ensure a defined disposition path for these materials into a geologic repository. The plutonium vitrification (Pu Vit) project is critical to meet the Department of Energy's strategic goal of providing a responsible resolution to the permanent disposal

of the nation's excess high-level radioactive materials and waste; and to enable the cleanup of Environmental Management (EM) sites by 2025. This project directly supports the DOE 2006 Strategic Plan's Goal 4.1 of completing cleanup of the contaminated nuclear weapons manufacturing and testing sites across the United States.

Priority of Mission Need.

The Pu Vit program must complete operations by the end of fiscal year (FY) 2018 to coincide with the Defense Waste Processing Facility (DWPF) operating and deactivation schedule. As a result, this is a time sensitive acquisition in that just a one year delay in the Pu Vit program will extend the operating life of the K-Area Complex at a cost of approximately $50M (including site support and safeguards and security). A two-year delay in the Pu Vit program will extend the operating life of the K-Area Complex, and the High Level Waste system at cost of approximately $430M.

Internal/External Drivers.

In 1997, the DOE released a "Record of Decision (ROD) for the Storage and Disposition of Weapons-Useable Fissile Materials." The ROD called for a two-pronged disposition strategy where both reactor-burning and immobilization would be pursued for Pu disposition. This strategy allowed flexibility in the disposition of Pu since materials for disposition could be directed to the "best" disposition means (e.g. impurities in certain feeds would make disposition as a reactor fuel impractical). The amended ROD for Storage of Surplus Plutonium documented a decision to consolidate Rocky Flats plutonium storage at SRS. DOE has completed the transfer of plutonium from Rocky Flats to SRS. Public Law 107-107, Section 3155, Disposition of Surplus Defense Plutonium at Savannah River Site, Aiken, South Carolina, requires a disposition pathway out of South Carolina for all plutonium transferred to SRS.

SAMPLES FOR "CAPABILITY GAP" SECTION

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EXAMPLE 1 (STRATEGIC PETROLEUM RESERVE EXPANSION).

Capability Gap (Defined as Days of Import Protection).

In the Energy Policy and Conservation Act of 1975, Congress specified that the Strategic Petroleum Reserve should be initially sized to provide approximately 90 days of net U.S. petroleum imports (i.e. equivalent to the highest 3 consecutive months of imports over the prior 2 years). During its development, the SPR's import protection reached a high of 118 days in 1985. Since then the import protection level has fallen substantially due to the rate of increasing U.S. petroleum consumption and import dependence. In 2000, the President's National Energy Plan expressed this decline as a major problem and directed that the Secretary of Energy work closely with Congress "to ensure that the SPR protection level is maintained."

In December 2001, the President directed the Secretary of Energy to fill the Reserve to its current capacity of 700 million barrels in the interest of Energy Security. The Reserve achieved the target of 700 million barrels in August 2005, providing the nation with approximately 60 days of emergency stocks. The Energy Information Administration projects a continued growth in both the nation's petroleum consumption and foreign import dependence through 2030. Based on EIA's Annual Energy Outlook 2007, the import protection of a 700 million barrel reserve will deteriorate to 52 days by 2020 and 43 days by 2030. An expansion of the SPR to 1 billion barrels would be necessary to maintain the SPR's import protection, achieving 72 days in 2020 and 61 days in 2030.

Other Potential Capabilities.

Because DOE operates and maintains the SPR, DOE is the correct agency to create and possess the capability of SPR expansion. DOE has no other means to address the capability gap other than initiating and completing activities that result in expansion. However, other private entities may have the potential to help fill the gap. The gap can be addressed by increasing private industry stockpiles, and this can potentially be accomplished providing incentives to industry to increase inventories.

Benefits from Closing the Gap.

In 2005, a cost-benefit analysis of SPR size was initiated to determine whether increasing the size of the SPR would have expected benefits exceeding costs. This assessment was conducted using Oak Ridge National Laboratory's DIS-Risk model, a probabilistic tool for measuring the impact of severe crude oil market disruptions on the U.S. economy. The study assessed the added energy security provided by SPR sizes up to 1.5 billion

barrels and drawdown rates up to 11 million barrels per day and compared those to the incremental costs of developing a larger Reserve. The results were:

- Under Base-Case assumptions, expansion up to and beyond 1.5 billion barrels yield **POSITIVE** net economic benefits.

- The expansion of the SPR from 700 million to 1 billion barrels was estimated to provide an expected net benefits of $14 billon to the nation.

- For the sensitivity cases, the expected net economic benefit of a 1 billion barrel reserve ranges from $2.5 billion to $27 billion.

- The net expected benefits of a 1 billion barrel SPR far exceeded the expected benefits of the prior 1990 Size Analysis, as shown below.

The SPR is the cornerstone of the U.S. energy security program. The U.S. is, and will continue to be for the foreseeable future, heavily dependent on foreign petroleum. Furthermore, OPEC will continue to dominate petroleum supplies and world oil markets for the foreseeable future. The vulnerability of the U.S. with respect to its dependence on petroleum imports and OPEC's control of petroleum supplies, make the mission of the Reserve very important. The U.S. needs a strong Strategic Petroleum Reserve to:

- Significantly reduce the impacts on the U.S. economy in the event of a petroleum supply disruption.

- Provide a strong deterrent to reduce the probability of politically motivated supply disruptions.

- Assist in protecting the overall interests of the U.S. and its partners under the Agreement on an International Energy Plan.

- Support the fuel needs of the U.S. military when needed. The SPR must be sufficient in size and drawdown capability to meet the nation's energy security needs—both today and in the future.

Impact if Gap is Not Resolved.

If CD-0 is not authorized to support project inclusion in the FY 2008 budget, expansion of the SPR will be delayed and the result will be:

- Non-adherence to the legal requirements as set forth in the EPACT.

- Non-supportive of the President's National Energy Policy.

- In violation of the IEA Treaty with respect to the 90-day stockpile obligation after 2022.

- Decreased SPR drawdown capability in proportion to the U.S. import rate.
- Increased likelihood of a disruption exhausting the Reserve prior to resolution of the crisis, or leaving the Reserve at an ineffectual size during a prolonged period of refill.
- Increased likelihood of failure to use the Reserve in a timely manner out of concern that oil will be more critically needed later.

High-Level Interdependencies.

The Department of Defense currently owns approximately 6 million barrels of crude oil within the SPR to be used solely for national defense purposes.

Under the FY 1993 Department of Defense Appropriations Act (P.L. 102-396, section 9149), $125,625,000 was appropriated to purchase crude oil for storage in the Reserve. Upon the appropriate Presidential finding under section 161(d) of the Energy Policy and Conservation Act and the recommendation of the Secretary of Defense, this oil is to be drawn down and distributed to the Department of Defense for "its use, sale, or exchange." This oil can be delivered from the Reserve directly to refiners with DoD contracts to supply military fuel.

The existence of a secure, government-owned reserve affords the President much greater flexibility in considering and undertaking an unlimited range of military options than would be the case if critical military fuel requirements were dependent solely upon the world oil market's supply.

EXAMPLE 2 PLUTONIUM DISPOSITION.

Capability Gap.

DOE had planned on constructing a mixed oxide fuel fabrication facility (MFFF) and a plutonium immobilization plant (PIP) at SRS. In 2002, DOE decided to continue with MFFF but to cancel the PIP due to budgetary constraints. This left approximately 13 metric tons (MT) of Environmental Management-owned plutonium materials without a defined disposition path.

Other Potential Capabilities.

Because DOE operates and maintains the nuclear weapons stockpile, including production and ultimate disposition of the stockpile and excess material, DOE is the correct agency to develop the plutonium disposition capability for the identified excess plutonium. DOE has no other means to address the capability gap other than initiating and completing activities that result in disposition of the plutonium through a geologic repository.

Benefits from Closing the Gap.

The National Academy of Sciences (NAS) Committee on International Security and Arms Control issued a report in 1994 that concluded that the continued stockpiling of weapons-usable fissile materials by the United States and Russia represented a "clear and present danger to national and international security." In this report, the NAS identified several objectives for the United States for the storage and disposition of excess fissile material. The NAS also recommended that the plutonium (Pu) for disposition should be "roughly as inaccessible for weapons use as the much larger and growing quantity of Pu that exists in spent fuel from commercial reactor." The metric for this degree of inaccessibility became known as "the spent fuel standard."

Disposition of the 13 MT of excess plutonium via the vitrification will result in

- Disposition of the plutonium in a theft and proliferation resistant form.
- Reduced costs for the long term safe and secure storage of the immobilized material.
- Reduced potential for proliferation of excess plutonium and security threats to the material.
- Ultimate disposition of the material in accordance with government agreements and legal requirements to remove the material from the SRS.

Impact if Gap is Not Resolved.

Based on DOE decision to cancel the Plutonium Immobilization Plant in 2002, Office of Environmental Management (EM) has approximately 13 MT of plutonium in approximately 25 MT bulk materials without a defined disposition path.

A large amount of this inventory is stored at the SRS. The material would continue to be stored onsite with attendant costs for safeguards and security and related storage costs (totaling approximately $35M per year). Eventual disposition of the material will be required in accordance with legal drivers. Ongoing storage of the material could eventually conflict with SRS programs and decisions related to HLW treatment and planned facility closure.

High-Level Interdependencies.

The Pu Vit concept relies on the "spent fuel standard" in establishment of proliferation resistant packaging of the excess plutonium. This concept relies on the high-radiation nature of immobilized HLW as the barrier to prevent tampering and intrusion into the disposal container. This self protection feature can be obtained only from immobilized HLW produced from the DWPF. Therefore, the Pu Vit concept is dependent on the DWPF to provide immobilized HLW as an interdependent design feature.

SAMPLES FOR "APPROACH" SECTION

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EXAMPLE 1 (STRATEGIC PETROLEUM RESERVE EXPANSION).

Planned Approach.

The planned approach for conducting the CD-1 alternatives analysis is outlined within the mandates of the Energy Policy Act of 2005. It requires the Secretary of Energy to complete an environmental review and site selection process for the expansion of the SPR to 1 billion barrels. Section 303 of the Energy Policy Act states:

> "Not later than 1 year after enactment, the Secretary of Energy shall complete a proceeding to select, from sites that the Secretary has previously studied, sites necessary to enable acquisition by the Secretary of the full authorized volume of the SPR.
>
> "The Secretary of Energy shall first consider and give preference to the five (5) sites assessed in the Draft EIS of 1992 (DOE/EIS-0165-D). The Secretary, in his discretion, may select other sites as proposed by a State where a site has been previously studied by the Secretary to meet the full authorized volume of the SPR."

As required by EPACT Section 303, DOE will limit its review of potential new sites for expansion of the SPR to sites that DOE addressed in the 1992 draft EIS and sites proposed by a state in which DOE has previously studied a site. The following five sites met those conditions and were considered in the draft EIS:

- Richton, MS, and Stratton Ridge, TX, which were addressed in the 1992 draft EIS;
- Chacahoula and Clovelly, LA, which the Governor of Louisiana requested that the Secretary of Energy consider; and
- Bruinsburg, MS, which the Governor of Mississippi requested that the Secretary of Energy consider.

On September 1, 2005, DOE issued a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS). In the Notice of Intent, DOE proposed to expand storage capacity at three of the four existing SPR storage sites and the development of one of new storage site in the Gulf Coast region. DOE completed its public scoping process on December 19, 2005.

On May 19, 2006, DOE completed and issued the Draft EIS addressing potential expansions of 3 existing SPR sites and 5 new site candidates. The main environmental risks to the project are related to facility development in wetland areas, brine disposal from solution mining operations, air quality impacts and potential oil spills. In the evaluation and selection of sites for expansion DOE will use 4 primary criteria:

- SPR distribution capabilities
- project technical risks—geotechnical, construction and hurricane
- environmental impacts
- projected life cycle costs

In addition, DOE decision making did take into consideration the potential operational impacts associated with existing commercial operations.

Assumptions.

The SPR Expansion Project will be based on the continuation of the same major policies utilized in the implementation of the current 700 million barrel Reserve including: U.S. Government ownership (storage facilities and petroleum); Centralized Gulf Coast Reserve; underground salt dome storage technology; crude oil storage only.

The SPR will continue to develop and store petroleum in underground salt dome formations in the Gulf Coast. These facilities provide the highest security and safety, lowest environmental risks, and lowest development and operational costs for large petroleum stockpiles.

The SPR currently has 4 storage sites with a combined capacity of 727 million barrels. The SPR expansion project will increase the SPR storage capacity from 727 million barrels to 1 billion barrels and the maximum SPR drawdown rate from 4.4 million barrels per day to approximately 6 million barrels per day.

The SPR will give first consideration to expansions to existing sites which capitalize on existing site infrastructure and operations and thereby minimize development time and construction and operations costs. However, one or more new sites will need to be developed to achieve the 1 billion barrel capacity.

The total storage capacity of any existing or new sites will be limited to approximately 250 million barrels due to security issues and limitations on the commercial distribution.

Constraints.

Technical Risks. The technical risks associated with the development and operation of salt dome storage facilities are considered relatively minor.

The SPR program has developed five salt dome storage sites between 1976 and 1991. The SPR Project Management Office has considerable experience in the design, construction, cavern solution mining and operations of salt dome storage sites. From this experience, the SPR has learned a number of lessons and standardized its design in a number of areas which will be applied to the new site developments (i.e. control systems, pumping systems, cavern well design, security systems, brine storage tanks, etc).

The SPR utilizes the Sandia National Laboratory as its geotechnical program support. The Lab has done site characterizations of all existing SPR sites to assure good salt dome integrity and stability and will provide additional geotechnical studies to assure integrity and stability of the new sites.

Sandia has also done extensive studies on solution mining and developed computer programs to use in the development of new caverns to control the size and shape of the caverns.

There are no advanced technologies in the construction of its storage facilities. The SPR utilizes existing petroleum industry technology of which most is off-the-shelf technology.

Safety Risks.

The risk of injury or death to workers in the construction of new domes would be similar to that of workers in an industrial environment, e.g., offshore drilling operations. These risks will be described and analyzed in the Risk Assessment for the expansion of the Reserve in the next critical decision document.

Cost Risks.

There are always cost risks to a major project. The current project cost has been based on completed conceptual designs and includes a 25 percent contingency in accordance with DOE cost estimating guidelines.

One major cost risk lies in the future cost of drilling and construction materials and labor in the petroleum industry. Due to the increased demand for oil exploration in the oil industry, the cost of drilling has more than tripled in the last 2 years and the cost of materials and labor have doubled. SPR cost estimates have been based on these escalated prices.

Schedule Risks.

The SPR projects the expansion of the SPR to 1.0 billion will be completed by 2019. Achievement of this schedule depends largely on receiving the necessary funding by Congress.

Legal Risks.

There are no known legal or litigation issues that would affect the planning or execution of the project. Section 154(a) of EPCA provides for the creation of a SPR capable of storing up to 1 billion barrels of petroleum, and Section 159(f) authorizes the Secretary of Energy, in order to develop the Reserve, to acquire the necessary land or interests in land by purchase, condemnation, or otherwise, and to construct, purchase, lease or otherwise acquire storage and related facilities.

EXAMPLE 2 PLUTONIUM DISPOSITION.

Planned Approach.

In 2003, the Assistant Secretary for Environmental Management requested that Savannah River Operations Office perform a feasibility study for vitrification of plutonium and to identify which existing SRS facility would be proposed for the installation of a vitrification capability. The study has been completed and proposes that the vitrification capability should be installed in the K-Area Complex.

To prevent the extension of Defense Waste Processing Facility (DWPF) operations and impact the site's critical path to closure, the Savannah River Operations Office (SR) is requesting to initiate a project to install a Pu Vit capability in the K-Area Complex to vitrify excess plutonium at SRS.

The K-Area Complex was designed, built, and operated as a nuclear production reactor. On completion of the production mission, the facility was placed in a cold standby condition, for more than 10 years.

The facility currently serves a Category 1 nuclear material storage facility and has a planned storage mission in this capacity until approximately 2020. Materials currently stored in the K-Area Complex include un-irradiated highly enriched uranium (HEU), heavy water, and plutonium.

The current plans call for the removal of un-irradiated HEU in calendar year 2007. In addition, there are small groups of materials stored in adjacent storage areas to the materials described but they do not occupy significant portions of the facility. The SRS Plutonium Vitrification Project, K-Area Complex, will install the equipment listed below, and will perform modifications to facility infrastructure as indicated.

The plutonium vitrification process is broken down into the following building blocks:

- material receipt,
- oxidation,
- feed preparation,
- milling/mixing,

- vitrification,
- bagless transfer,
- magazine loading/storage, canister loading/shipping,
- DWPF modifications,
- non-nuclear material handling,
- waste handling/loading,
- balance of plant, and
- disassembly of green fuel (alternate).

DOE chartered a team to evaluate options for immobilization of surplus weapons-useable plutonium. An initial list of over 70 technologies and immobilization forms was assembled. This list was further consolidated by grouping technologies and forms into related categories until 16 distinct immobilization forms resulted.

The sixteen forms were ranked with borosilicate glass, titanate-based ceramics (e.g. Synroc), and a glass-bonded zeolite being ranked 1, 2 and 3, respectively.

Following the ranking process, it was recommended that borosilicate glass and titanate-based ceramics be further pursued. The team also determined 5 means in which both the glass and ceramic immobilization forms could be dispositioned to meet the spent fuel standard. The five disposition methods include:

- Glass can-in-canister—where small cans of Pu glass would be produced in an immobilization facility and dispositioned in a high level waste glass canister in which the small cans were surrounded by high activity waste glass.
- Ceramic can-in-canister—where small cans of Pu ceramic would be produced in an immobilization facility and dispositioned in a high level waste glass canister in which the small cans were surrounded by high activity waste glass.
- Glass produced in an adjunct DWPF melter—where glass containing Pu and radioactive Cs would be produced in a melter co-located with the current DWPF melter.
- Glass produced in Greenfield facility—where a new facility would be built to produce a glass containing Pu and radioactive Cs.
- Ceramic produced in Greenfield facility—where a new facility would be built to produce a ceramic containing Pu and radioactive Cs.

The five disposition variants were further evaluated and the glass and ceramic can-in-canister variants were determined to be the most cost effective, offer a higher degree of timeliness for implementation, and have a higher technical feasibility.

It should be also be noted that both the ceramic and glass forms were thought to be viable by the peer review panel. The panel noted that "the limited information currently available indicates that both the baseline glass and ceramic forms have the potential to provide acceptable waste forms for timely accomplishment of the objectives of the disposition mission" and that "the panel does not anticipate any show-stoppers in implementing either approach."

Assumptions.

The Pu Vit capability is assumed to be located at the SRS. While other sites have nuclear facilities capable of being modified to accept installed equipment and provide a functionally operable facility, this would require the packaging, shipment, and receipt of the plutonium that is beyond the capability of many sites, particularly closure sites where the introduction of plutonium for treatment is considered politically impractical. Further, SRS has an operating HLW vitrification capability necessary to meet the "spent fuel standard."

Constraints.

Technical Risks.

Ultimately, both the ceramic and glass forms were deemed to be viable by the peer review panel. The panel noted that with the information available, both the baseline glass and ceramic forms had the potential to provide acceptable waste forms for timely accomplishment of the objectives of the disposition mission.

The panel did not anticipate any show-stoppers in implementing either approach. Both were thought to be at about the same level of technical maturity and that technical issues were manageable.

The principal technical issue identified for the glass was the development of the high temperature induction heated platinum melter. This technical risk has now been significantly mitigated through follow-on development efforts on this melter system in the americium/curium (Am/Cm) Vitrification (Vit) program.

The primary technical uncertainty associated with the ceramic was the ability to produce a "consistently and demonstrably acceptable product across the expected range of feeds." This uncertainty becomes even more pronounced in the current Office of Environmental Management (EM) Pu disposition material study where a smaller quantity of Pu with higher impurity levels are anticipated as feeds.

Additionally, the panel concluded that repository acceptance of the glass form should be certifiable by building on existing methodologies for high level waste

(HLW) glass. However, demonstration of consistent performance and qualification of the ceramic would be more complex due to the heterogeneous nature (i.e. multiple crystalline phases) of the crystalline ceramic.

Safety Risks.

Plutonium vitrification will be a nuclear operation conducted in a nuclear facility. Risks to worker include those risks associated with nuclear facilities (radiation exposure) as well as working with complex mechanical, chemical, and thermal processes. The nature of these facilities is well understood within the DOE and at the SRS. Risks to the public include radiation exposure from an accidental release of radioactive material that would be dispersed offsite. The facility would be designed to mitigate these risks through well understood safety programs by development of approved worker and public protective criteria based on nuclear safety analysis.

Cost Risks.

There are always cost risks to a major project. The current project cost range is believed to be sufficient to cover the attendant project risks.

One major cost risk is associated with the relative immature technology associated with the vitrification of plutonium. This technology has not been deployed on a production scale before. As discussed above the risk is believed to be manageable.

Schedule Risks.

The Pu Vit is projected to complete operations by the end of 2015. Achievement of this schedule depends largely on receiving the necessary funding by Congress and the ability to address technology risks successfully. The uncertainty associated with the Pu Vit project is reflected in the cost range.

Legal Risks.

Legal risks include potential litigation by the State of South Carolina in the event that agreements to remove the plutonium from the SRS are not achieved. The project schedule is designed to achieve the disposition of the material in an expeditious manner.

SAMPLES FOR "RESOURCE AND SCHEDULE FORECAST" SECTION

NOTE: Provided samples are for guidance only and are not to be used for reference information. Samples were extracted from existing mission need statements and altered to fit suggested content contained in this mission need statement guide.

EXAMPLE 1 (PU DISPOSITION).

The project is planning to utilize the DWPF canisters as a disposition vehicle for the plutonium glass, as well as providing security during storage and transportation because the canister is self-protecting. Therefore, conceptual design must be completed in FY 2006 to ensure that the vitrification of the plutonium is completed by 2018. The project must be included in the FY 2006 budget request to ensure funds are available and Congressional approval has been obtained prior to the initiation of conceptual design which is greater than $3M.

ROM Cost Estimate Range: $300M ≤ estimate range ≤ $700M

Estimated Cost.

The estimated cost needed to proceed to CD-1 is $10 million. This estimate is $2 million more than the current funded amount of $8 million. The funding profile by fiscal year for the upcoming FY08-FY12 planning window is contained in the chart below:

Five-Year Planning Period					
Fiscal Year	**08**	**09**	**10**	**11**	**12**
ROM estimate of PED profile		$35M	$40M	$15M	
ROM estimate of 5-yr cost profile	$10 M	$60M	$110M	$120M	$130M

ROM Schedule Estimate.

Current estimated dates for major milestones are as follows:

Conceptual design start	FY2008
Preliminary design start	FY2009
Construction start	FY2010
Startup and testing	FY2012
Operations start	FY2013
Operations complete	FY2015