

Exhibit 300: Capital Asset Plan and Business Case Summary

Part I: Summary Information and Justification (All Capital Assets)

Section A: Overview (All Capital Assets)

1. Date of Submission:
8/9/2006
2. Agency:
Department of Energy
3. Bureau:
Energy Programs
4. Name of this Capital Asset:
National Compact Stellarator Experiment (NCSX)
5. Unique Project (Investment) Identifier: (For IT investment Only, see section 53. For all other, use agency ID system.)
MIE-02
6. What kind of investment will this be in FY 2008?
Please NOTE: Investments moving to O&M ONLY in FY 2008, with Planning/Acquisition activities prior to FY2008 should not select O&M. These investments should indicate their current status.)

Planning	<input type="checkbox"/>
Full Acquisition	<input checked="" type="checkbox"/>
Operations and Maintenance	<input type="checkbox"/>
Mixed Life Cycle	<input type="checkbox"/>
E-Gov/LoB Oversight	<input type="checkbox"/>
7. What was the first budget year this investment was submitted to OMB?
FY 2003
8. Provide a brief summary and justification for this investment, including a brief description of how this closes in part or in whole an identified agency performance gap:

Project Description

The National Compact Stellarator Experiment (NCSX) is an experimental facility that is being fabricated at the Department of Energy's (DOE) Princeton Plasma Physics Laboratory (PPPL). The project is led by PPPL with the Oak Ridge National Laboratory (ORNL) providing major leadership and support as a partner. The NCSX facility will be capable of producing magnetized plasmas with a well-defined set of configuration properties, such as size, shape, magnetic field strength, and pressure, which in turn determine its physics properties. DOE has identified the NCSX Project as a Major Item of Equipment (MIE) project.

At the heart of the facility is the plasma confinement device, or stellarator core. This will be an assembly of several magnet systems that surround a highly shaped plasma. Coils provide the magnetic field for plasma shape control, inductive current drive, and field error correction. The vacuum vessel produces a high vacuum plasma environment with access for heating, pumping, diagnostics, and maintenance. The entire system is surrounded by a cryostat to permit cooling of the magnets at cryogenic temperature. The NCSX device will be assembled in the C Site test cell at PPPL. It will be equipped with magnet power supplies, pumps, fueling systems, diagnostics, control systems, and data acquisition systems. Site infrastructure such as cryogenic systems and utility services will be included. Existing control rooms, which are contiguous to the test cell, will be refurbished and utilized. Power supplies located at C-site will be used.

The NCSX is designed to provide a plasma major radius of 1.4 m and a magnetic field strength of at least 1.6 Tesla (T). The CD 4 First Plasma milestone will demonstrate a level of system performance sufficient for the start of research operations. At CD 4, the facility will support First Plasma operation with a magnetic field strength of 0.5 T, and vacuum field-line mapping operation with a magnetic field strength of 0.1 T. Refurbishment and testing of equipment for 1.5 MW of Neutral Beam Injection (NBI) heating will be performed as part of the NCSX MIE project. The NCSX will provide the initial set of equipment necessary to achieve the CD 4 First Plasma milestone and to begin the research program. It will be able to accommodate later upgrades, to meet the needs of the research program.

Justification

The National Compact Stellarator Experiment (NCSX) is an integral part of the Fusion Energy Sciences (FES) program. The mission of the NCSX is to acquire the physics knowledge needed to evaluate compact stellarators as a fusion concept, and to advance the physics understanding of three-dimensional plasmas for fusion and basic science. This mission of the NCSX supports one of the three long-term performance measures for FES, namely:

- Configuration Optimization: Demonstrate enhanced fundamental understanding of magnetic confinement and improved basis for future burning plasma experiments through research on magnetic confinement configuration optimization.

The mission also supports two of the program’s goals as documented in the Report of the Integrated Program Planning Activity (December, 2000), namely:

- Goal 2: Resolve outstanding scientific issues and establish reduced-cost paths to more attractive fusion energy systems by investigating a broad range of innovative magnetic confinement configurations.
- Goal 1: Advance understanding of plasma, the fourth state of matter, and enhance predictive capabilities through comparison of well-diagnosed experiments, theory, and simulation.

9. Did the Agency’s Executive/Investment Committee approve this request? Yes No
 a. If “yes,” what was approval date of this approval?
 11/18/2002

10. Did the [Federal] Project Manager review this Exhibit? Yes No

11. Contact information of [Federal] Project Manager?

Name: Jeffrey Makiel (NCSX Federal Project Director)
 Phone Number: (609) 243-3721
 E-mail: jmakiel@pppl.gov

12. Has the agency developed and/or promoted cost effective, energy-efficient and environmentally sustainable techniques or practices for this project? Yes No
 a. Will this investment include electronic assets (including computers)? Yes No
 b. Is this investment for new construction or major retrofit of a Federal building or facility? (answer applicable to non-IT assets only) Yes No
 i. If “yes,” is an ESPC or UESC being used to help fund this investment? Yes No
 ii. If “yes,” will this investment meet sustainable design principles? Yes No
 iii. If “yes,” is it designed to be 30% more energy efficient than relevant code? Yes No

13. Does this investment directly support one of the PMA initiatives? If “yes,” check all that apply:

- Human Capital
- Budget Performance Integration
- Financial Performance
- Expanded E-Government
- Competitive Sourcing
- Faith Based and Community

- Real Property Asset Management
- Eliminating Improper Payments
- Privatization of Military Housing
- Research & Development Investment Criteria
- Housing & Urban Development Management & Performance
- Broadening Health Insurance Coverage through State Initiatives
- “Right Sized” Overseas Presence
- Coordination of VA & DoD Programs and Systems

14. Does this investment support a program assessed using the Program Assessment Rating Tool (PART)? (For more information about the PART, visit www.whitehouse.gov/omb/part.) Yes No
- a. If “yes,” does this investment address a weakness found during a PART review? Yes No
- b. If “yes,” what is the name of the PARTed program?
Fusion Energy Sciences
- c. If “yes,” what rating did the PART receive?
Moderately Effective or 82%
15. Is this investment for information technology? Yes No

Section B: Summary of Spending (All Capital Assets)

1. Provide the total estimated life-cycle cost for this investment by completing the following table. All amounts represent budget authority in millions, and are rounded to three decimal places. Federal personnel costs should be included only in the row designated “Government FTE Cost,” and should be excluded from the amounts shown for “Planning,” “Full Acquisition,” and “Operation/Maintenance.” The “TOTAL” estimated annual cost of the investment is the sum of costs for “Planning,” “Full Acquisition,” and “Operation/Maintenance.” For Federal buildings and facilities, life-cycle costs should include long term energy, environmental, decommissioning, and/or restoration costs. The costs associated with the entire life-cycle of the investment should be included in this report.

Table 1: SUMMARY OF SPENDING FOR PROJECT PHASES									
(REPORTED IN MILLIONS)									
<i>(Estimates for BY+1 and beyond are planning purposes only and do not represent budget decisions)</i>									
	PY-1 and earlier	PY 2006	CY 2007	BY 2008	BY+1 2009	BY+2 2010	BY+3 2011	BY+4 and beyond	Total
Planning:	\$9.57								\$9.57
Acquisition:	\$41.32	\$17.02	\$15.90	\$15.90	\$2.26				\$92.40
Subtotal Planning & Acquisition:	\$50.89	\$17.02	\$15.90	\$15.90	\$2.26				\$101.97
Operations & Maintenance:									
TOTAL:	\$50.89	\$17.02	\$15.90	\$15.90	\$2.26				\$101.97
Government FTE Costs should not be included in the amounts provided above.									
Government FTE Costs	\$0.20	\$0.20	\$0.20	\$0.20	\$0.20				\$1.00
Number of FTE represented by Costs:	1	1	1	1	1				5

Note: For the cross-agency investments, this table should include all funding (both managing partner and partner agencies). Government FTE Costs should not be included as part of the TOTAL represented.

2. Will this project require the agency to hire additional FTE’s? Yes No
- a. If “yes,” how many and in what year?

3. If the summary of spending has changed from the FY 2007 President’s budget request, briefly explain those changes:

Section C: Acquisition/Contract Strategy (All Capital Assets)

1. Complete the table for all (including all non-Federal) contracts and/or task orders currently in place or planned for this investment. Total Value should include all option years for each contract. Contracts and/or task orders completed do not need to be included.

Contracts/Task Orders Table																
Contract or Task Order Number	Type of Contract/Task Order	Has the contract been awarded? (Y/N)	Is so, what is the date of the award? If not, what is the planned award date?	Start date of Contract/Task Order	End date of Contract/Task Order	Total Value of Contract/Task Order (\$M)	Is this an Interagency Acquisition? (Y/N)	Is it performance based? (Y/N)	Competitively awarded? (Y/N)	What, if any, alternative financing option is being used? (ESPC, UESC, EUL, N/A)	Is EVM in the contract? (Y/N)	Does the contract include the required security & privacy clauses? (Y/N)	Name of CO	CO Contact information (phone/email)	CO Certification Level (Level 1, 2, 3, N/A)	If N/A, has the agency determined the CO assigned has the competencies and skills necessary to support this acquisition? (Y/N)
DE-AC02-76CH03073	Management and operating contract for PPPL	Y	1/1/1951	1/1/1951		0	N	Y	N	N/A	Y	Y	Jerry Wm Faul	(609) 243-3700 jfaul@pppl.odae.gov	3	
DE-AC05-00OR22725	Management and operating contract for ORNL	Y	1/18/2000	4/1/2000	3/31/2010	5600	N	Y	Y	N/A	Y	Y	Mary Lou Crow	(865) 576-7343/ corwml@ornl.doe.gov	3	

Contracts/Task Orders Table																	
Contract or Task Order Number	Type of Contract/Task Order	Has the contract been awarded? (Y/N)	Is so, what is the date of the award? If not, what is the planned award date?	Start date of Contract/Task Order	End date of Contract/Task Order	Total Value of Contract/Task Order (\$M)	Is this an Interagency Acquisition? (Y/N)	Is it performance based? (Y/N)	Competitively awarded? (Y/N)	What, if any, alternative financing option is being used? (ESPC, UESC, EUL, N/A)	Is EVM in the contract? (Y/N)	Does the contract include the required security & privacy clauses? (Y/N)	Name of CO	CO Contact information (phone/email)	CO Certification Level (Level 1, 2, 3, N/A)	If N/A, has the agency determined the CO assigned has the competencies and skills necessary to support this acquisition? (Y/N)	

2. If earned value is not required or will not be a contract requirement for any of the contracts or task orders above, explain why:

3. Do the contracts ensure Section 508 compliance? N/A Yes No
 a. Explain why:

4. Is there an acquisition plan which has been approved in accordance with agency requirements? Yes No
 a. If "yes," what is the date?
 June 28, 2002
 b. If "no," will an acquisition plan be developed?
 i. If "no," briefly explain why: Yes No

Section D: Performance Information (All Capital Assets)

In order to successfully address this area of the exhibit 300, performance goals must be provided for the agency and be linked to the annual performance plan. The investment must discuss the agency’s mission and strategic goals, and performance measures must be provided. These goals need to map to the gap in the agency’s strategic goals and objectives this investment is designed to fill. They are the internal and external performance benefits this investment is expected to deliver to the agency (e.g., improve efficiency by 60 percent, increase citizen participation by 300 percent a year to achieve an overall citizen participation rate of 75 percent by FY 2xxx, etc.). The goals must be clearly measurable investment outcomes, and if applicable, investment outputs. They do not include the completion date of the module, milestones, or investment, or general goals, such as, significant, better, improved that do not have a quantitative or qualitative measure.

Agencies must use Table 1 below for reporting performance goals and measures for all non-IT investments and for existing IT investments that were initiated prior to FY 2005. The table should be extended to include measures for years beyond FY 2006.

Performance Information Table 1:

Fiscal Year	Strategic Goal(s) Supported	Performance Measure	Actual/Baseline (from Previous Year)	Planned Performance Metric (Target)	Performance Metric Results (Actual)
2003	3.1, Scientific Breakthroughs/ 3.2, Foundation of Science	Begin Project. Begin Title I	Same as next columns	April 2003	Accomplished
2004	3.1 Scientific Breakthroughs/ 3.2, Foundation of Science	Begin fabrication activities. Complete the final design and begin fabrication	Same as next columns	October 2004	Accomplished
2005	3.1 Scientific Breakthroughs/ 3.2, Foundation of Science	Award major contracts for modular coil winding forms, conductor and vacuum vessel subassembly	Same as next columns	October 2005	Accomplished
2006	3.1 Scientific Breakthroughs/ 3.2, Foundation of Science	Complete fabricaton of a vacuum vessel subassembly and complete winding of two modular coils	Same as next columns	October 2006	On schedule
2007	3.1 Scientific Breakthroughs/ 3.2, Foundation of Science	Complete winding of one half of the modular coils.	Same as next columns	October 2007	On schedule
2008	3.1 Scientific Breakthroughs/ 3.2, Foundation of Science	Complete winding of modular coils	Same as next columns	October 2008	On schedule
2009	3.1 Scientific Breakthroughs/ 3.2, Foundation of Science	Transition to operations. Acheive first plasma	Same as next columns	July 2009	On schedule

Section E: Security and Privacy (IT Capital Assets only)

Section F: Enterprise Architecture (EA) (IT Capital Assets only)

Part II: Planning, Acquisition and Performance Information

Part II should be completed only for investments identified as "Planning" or "Full Acquisition," or "Mixed Life-Cycle" investments in response to Question 6 in Part I, Section A above.

Section A: Alternatives Analysis (All Capital Assets)

In selecting the best capital asset, you should identify and consider at least three viable alternatives, in addition to the current baseline, i.e., the status quo. Use OMB Circular A-94 for all investments and the Clinger Cohen Act of 1996 for IT investments to determine the criteria you should use in your Benefit/Cost Analysis.

1. Did you conduct an alternatives analysis for this project? Yes No
 - a. If "yes," provide the date the analysis was completed?
8/2/2002
 - b. If "no," what is the anticipated date this analysis will be completed?
 - c. If no analysis is planned, please briefly explain why:

2. Alternatives Analysis Results: Use the results of your alternatives analysis to complete the following table:

Alternatives Analysis Results			
Alternative Analyzed	Description of Alternative	Risk Adjusted Lifecycle Costs estimate	Risk Adjusted Lifecycle Benefits estimate
Baseline	Project in post CD-3 activities (see paragraph 3 below)		

3. Which alternative was selected by the Agency’s Executive/Investment Committee and why was it chosen?

The NCSX and the stellarator proof-of-principle program were proposed to DOE in May, 1998. A peer review panel and later the Fusion Energy Sciences Advisory Committee (FESAC) recommended development of the physics basis and pre-conceptual design of NCSX, which was done over the next few years. As the pre-conceptual design evolved, several implementation approaches for the core device were considered, ranging from a modest reconfiguration of the existing Princeton Beta Experiment-Modification (PBX-M) device to all-new fabrication. Trade studies examining a range of plasma configurations and coil topologies were conducted to support the decision process. The main design features were established in a series of decisions in late 2000 and early 2001: the reference plasma configuration and its associated physics properties, modular coils for the main helical field magnets, and the size and performance parameters. The results of trade studies and alternative configurations support the conclusion that the best design approach for the mission was chosen. A second peer review, a Physics Validation Review in March 2001, confirmed the soundness of the NCSX physics design basis and the appropriateness of the implementation approach based on the pre-conceptual design.

PPPL was selected as the site for the NCSX device to maximize the use of existing fusion energy program infrastructure, facilities, and resources. NCSX will use major subsystems already on site at PPPL such as the PBX-M neutral beams, the C-site power supplies, and the CS Building test cell and associated facilities. Use of the PPPL site takes advantage of the laboratory’s decades of experience in designing and operating fusion experiments like NCSX. This long history of fusion experience has produced a knowledgeable organization, procedures, and the human resources well suited to carry out the NCSX Project.

4. What specific qualitative benefits will be realized?

The NCSX is an integral part of the Fusion Energy Sciences program and provides a unique opportunity to advance its mission. The mission of the NCSX is to acquire the physics knowledge needed to evaluate compact stellarators as a fusion concept, and to advance the physics understanding of three-dimensional plasmas for fusion and basic science. This mission of the NCSX supports two of the Fusion Energy Sciences program's goals as follows:

- Resolve outstanding scientific issues and establish reduced-cost paths to more attractive fusion energy systems by investigating a broad range of innovative magnetic confinement configurations.
- Advance understanding of plasma, the fourth state of matter, and enhance predictive capabilities through comparison of well-diagnosed experiments, theory, and simulation.

Section B: Risk Management (All Capital Assets)

You should have performed a risk assessment during the early planning and initial concept phase of this investment’s life-cycle, developed a risk-adjusted life-cycle cost estimate and a plan to eliminate, mitigate or manage risk and be actively managing risk throughout the investment’s life-cycle.

1. Does the investment have a Risk Management Plan? Yes No
- a. If "yes," what is the date of the plan?
2/4/2004
- b. Has the Risk Management Plan been significantly changed since last year's submission to OMB? Yes No
- c. If "yes," describe any significant changes:
2. If there currently is no plan, will a plan be developed? Yes No
- a. If "yes," what is the planned completion date?
- b. If "no," what is the strategy for managing the risks?

3. Briefly describe how investment risks are reflected in the life cycle cost estimate and investment schedule:

The three-dimensional character of the magnetic configuration provides design flexibility but requires extra attention to modeling and computational accuracy as well as dimensional accuracy. These special requirements were addressed in the design and analysis process by involving people with stellarator project experience in key physics and engineering roles and by making use of numerical design tools and concepts from previous stellarator projects around the world. In addition, R&D was used to help solidify the technical base. Small-scale tests have been used to establish the design criteria for the conductor and winding concept for the three-dimensional magnetic field coils. Prototypes of the three dimensional coils and vacuum vessel have been constructed to provide information on manufacturing approaches, industrial capabilities, and costs. Finally, a conservative approach for assigning contingency at the system level will be applied. This recognizes the similar designs adopted from the recently completed NSTX Project and previous experiments, while appreciating the increased complexity involved. These three risk mitigation elements adequately address risk in a proactive manner.

Section C: Cost and Schedule Performance (All Capital Assets)

EVM is required only on DME portions of investments. For mixed life cycle investments, O&M milestones should still be included in the table (Comparison of Initial Baseline and Current Approved Baseline). This table should accurately reflect the milestones in the initial baseline, as well as milestones in the current baseline.

1. Does the earned value management system meet the criteria in ANSI/EIA Standard – 748? Yes No
2. Answer the following questions about current cumulative cost and schedule performance. The numbers reported below should reflect current actual information. (Per OMB requirements Cost/Schedule Performance information should include both Government and Contractor Costs):
- a. What is the Planned Value (PV)?
\$51,874,000
- b. What is the Earned Value (EV)?
\$51,254,000
- c. What is the actual cost of work performed (AC)?
\$52,986,000
- d. What costs are included in the reported Cost/Schedule Performance information (Government Only/Contractor Only/Both)?
Contractor Only
- e. "As of" date:
6/30/2006
3. What is the calculated Schedule Performance Index (SPI = EV/PV)?
0.99
4. What is the schedule variance (SV = EV-PV)?

(\$620,000)

5. What is the calculated Cost Performance Index (CPI = EV/AC)?
0.97
6. What is the cost variance (CV = EV-AC)?
(\$1,732,000)
7. Is the CV% (= CV/EVx100) or SV% (=SV/PVx100) greater than +/- 10%? Yes No
 - a. If “yes,” what is the?
CV
SV
both
 - b. If “yes,” explain the variance:
 - c. If “yes,” what corrective actions are being taken?
 - d. What is the most current “Estimate at Completion”?
\$92,401,000.00
8. Have any significant changes been made to the baseline during the past fiscal year? Yes No
 - a. If “yes,” when was it approved by OMB?
9. Comparison of Initial Baseline and Current Approved Baseline: Complete the following table to compare actual performance against the current performance baseline and to the initial performance baseline. In the Current Baseline section, for all milestones listed, you should provide both the baseline and actual completion dates (e.g., “03/23/2003”/ “04/28/2004”) and the baseline and actual total costs (in \$ Millions). In the event that a milestone is not found in both the initial and current baseline, leave the associated cells blank. Note that the ‘Description of Milestone’ and ‘Percent Complete’ fields are required. Indicate ‘0’ for any milestone no longer active.

Comparison of Initial Baseline and Current Approved Baseline									
Description of Milestone	Initial Baseline		Current Baseline				Current Baseline Variance		
	Planned Completion Date	Total Cost (\$M) Estimate	Completion Date Planned	Completion Date Actual	Total Cost (\$M) Planned	Total Cost (\$M) Actual	Schedule (# days)	Cost (\$M)	Percent Complete
	CD-0				5/1/2001				
CD-1				11/1/2002					
CD-2				2/1/2004					
CD-3				9/1/2004					
CD-4 Project Complete	5/1/2008	86.33	7/1/2009		92.40			-0.62	63%

Part III: For “Operation and Maintenance” investment ONLY (Steady State)

Part III should be completed only for investments identified as “Operation and Maintenance” (Steady State) in response to Question 6 in Part I, Section A above.

Section A: Risk Management (All Capital Assets)

You should have performed a risk assessment during the early planning and initial concept phase of this investment’s life-cycle, developed a risk-adjusted life-cycle cost estimate and a plan to eliminate, mitigate or manage risk, and be actively managing risk throughout the investment’s life-cycle.

- 1. Does the investment have a Risk Management Plan? Yes No
 - a. If “yes,” what is the date of the plan?
 - b. Has the Risk Management Plan been significantly changed since last year’s submission to OMB? Yes No
 - c. If “yes,” describe any significant changes:

- 2. If there currently is no plan, will a plan be developed? Yes No
 - a. If “yes,” what is the planned completion date?
 - b. If “no,” what is the strategy for managing the risks

Section B: Cost and Schedule Performance (All Capital Assets)

- 1. Was operational analysis conducted? Yes No
 - a. If “yes,” provide the date the analysis was completed.
 - b. If “yes,” what were the results?
 - c. If “no,” please explain why it was not conducted and if there are any plans to conduct operational analysis in the future:

- 2. Complete the following table to compare actual cost performance against the planned cost performance baseline. Milestones reported may include specific individual scheduled preventative and predictable corrective maintenance activities, or may be the total of planned annual operation and maintenance efforts.
 - a. What costs are included in the reported Cost/Schedule Performance information (Government Only/Contractor Only/Both)?
 - b. Comparison of Plan vs. Actual Performance Table:

Comparison of Plan vs. Actual Performance Table						
Description of Milestone	Planned		Actual		Variance	
	Planned Completion Date	Total Cost (\$M) Estimate	Completion Date	Total Cost (\$M)	Schedule (# days)	Cost (\$M)

Part IV: Planning for “E-Gov and Lines of Business Oversight” ONLY

Part IV should be completed only for investments identified as an E-Gov initiative or a Line of Business (LOB), i.e., selected the “E-Gov and LOB Oversight” choice in response to Question 6 in Part I, Section A above. Investments

identified as "E-Gov and LOB Oversight" will complete only Parts I and IV of the exhibit 300.