QUARTERLY REPORT FORM

Report Date: **March, 2004**	U. S. DOE Project Manager's Progress Report	Office of Science
Project Number: **MIE-02**	Title: **National Compact Stellarator Experiment**	Program: **FE**
Report Period: 2nd Quarter FY2004	Location: **Princeton Plasma Physics Laboratory**	Project Office: **CH**

SUMMARY ASSESSMENT

	Current Quarter	Previous Quarter
Cost:	Satisfactory	Satisfactory
Schedule:	Satisfactory	Satisfactory
Technical:	Satisfactory	Satisfactory
Overall:	Satisfactory	Satisfactory

PROJECT MANAGEMENT

DOE Program Manager:	Gene Nardella
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DOE Project Director:	Greg Pitonak
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COST/FUNDING ($K)

	Baseline	Current Estimate	Funding Received
DOE TEC:	86,300	86,300	23,800
DOE TPC:	**N/A**	**N/A**	**N/A**
NON DOE:	0	0	0

CRITICAL DECISIONS

Number	Baseline	Actual/Forecast
1	Aug, 2002	Nov, 2002 (A)
2	Jan, 2004	Feb, 2004 (A)
3	Oct, 2004	
4	May, 2008	

FUNDING PROFILE (KS)

Per Latest Approved Budget in $M (as-spent)

	FY03	FY04	FY05	FY06	FY07	FY08	Total
TEC:	7.9	15.9	15.9	22.1	19.4	5.1	86.3
OPC:	N/A						
TPC:	N/A						

N/A

Cumulative Costing through end of March, 2004

	TEC ($K)	TPC ($K)
Costs Accrued:	$12,078	N/A
Uncosted Commitments:	$1,498	N/A
Remaining Uncommitted	$72,724	

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SCHEDULE SUMMARY

	Start Date		Completion Date		Percent Complete	
	Baseline	**Forecast/Actual**	**Baseline**	**Forecast/Actual**	**Baseline**	**Actual**
Title I & II Design:	10/02	04/03 (A)	04/06		42.0	40.5
Procurement:	05/04		09/06		10.4	8.4
Fab & Assembly	09/04		12/07		0.5	0.5
Start-up & Operation	04/07		05/08			

Key Milestones (LEVEL)	**Completed Since Last Report**	**Baseline Date *(PEP)***	**Actual Date**
DOE I	Complete CD-2 Milestone	January 2004	February 2004(A)
DOE II	Initiate 3D MC Winding Process	March 2004	Jan 2004 (A)

Key Milestones (LEVEL)	**Upcoming (Next Three Months)**	**Baseline Date*(PEP)***	**Forecast Date**
Joule #3	Prototype MCWF Casting ready for Machining	June, 2004	May, 2004
DOE II	Conduct Final Design Review	July, 2004	May, 2004
DOE	Conduct Independent Project Review	June, 2004	June, 2004

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NARRATIVE HIGHLIGHTS (Jan. 1 – Mar. 31, 2004)

Technical: Manufacturing Development

- Prototype vacuum vessel sector: one supplier has completed fabrication and final leak check of the prototype. The other supplier has completed forming the panels.
- Prototype modular coil winding form: one supplier team has fabricated the casting and completed heat treating. A series of inspections and evaluations showed it to be a suitable casting for the prototype. The other team completed an extensive flow solidification analysis effort and began fabricating the casting mold.
- Modular coil winding trials: winding trials on the twisted tee winding form began, satisfying the 2Q Joule milestone. Accomplishments: development of conductor handling techniques, development of in-process measurement techniques, development of winding clamp design, training of staff.
- Twisted racetrack winding form: the casting was fabricated and machining of the precision surfaces began.
- Conductor material properties testing: An R&D effort was launched to measure the engineering properties of the copper-epoxy composite that makes up the modular coil winding. Compression and flexure data were obtained.
- Modular coil winding facility: the autoclave (vacuum oven for epoxy impregnation) was fabricated and moved into the TFTR test cell, site of the winding facility. The winding form turning fixtures were fabricated.
- Coil test facility: A facility for power testing of modular coils at cryogenic temperatures was installed in the TFTR basement. It will use one of the FCPC power supply modules.

Technical: Design

- Improved port access: a series of peer reviews led to a revised machine configuration design with significantly improved port access compared to the CD-2 baseline. The number of ports increased by 30 and were optimized in shape, size, and orientation to meet diagnostic and heating requirements.
- Vacuum vessel heating/cooling tubes: a series of internal design and analysis reviews established a feasible design for baking the vacuum vessel at 350 C and removing plasma heat losses between pulses.
- Modular coil winding pack configuration: an internal review confirmed that the final winding pack configuration design satisfied performance and manufacturing requirements.
- Field-period assembly: a trajectory for assembling the coils over the vacuum vessel was developed using a computer model, resolving interference issues. An assembly simulation based on computer models of the assembly tooling was developed.
- Modular coil leads: a novel lead block design was developed.
- Test cell preparations: successful preliminary design review of the shield wall modifications.
- Power systems: successful preliminary design review of the D-to-C-site DC transmission system consisting of large cables in elevated trays support by a row of towers.

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NARRATIVE HIGHLIGHTS (Jan. 1 – Mar. 31, 2004), cont'd.

Management & Administrative

- CD-2 was approved on Feb. 3, 2004. The CD-2 baseline was validated by OECM in January.
- ECP-04-004 was approved, establishing the CD-2 baseline.
- ECP-04-005 was approved, establishing revised budgets for certain modular coil and vacuum vessel design and R&D tasks.
- PDR and PBR recommendations status was updated. 18 of 22 PDR items and 14 or 21 PBR items are now closed.
- The project scheduled the Final Design Review for May 19-20, 2004. Carl Strawbridge (ORNL/SNS) agreed to serve as chair.
- The project is reviewing/updating the following documentation as part of CD-3 readiness
  - Project Execution Plan
  - Acquisition Strategy
  - Integrated Project Team
  - Resource Loaded Schedule
  - Detailed Project Cost and Schedule Estimates
  - NEPA Documentation
  - Risk Analysis & Risk Management Plan
  - System Functions and Requirements
  - Hazards Analysis/Safety Management Planning
  - Value Management/Engineering
  - Integrated Safeguards & Security Management
  - Quality Assurance Plan
  - Project Controls/Earned Value Management System reports
  - Action plans for EIR and SC Baseline reviews

- Performance metrics as of 3/31/2004

  SPI = 0.94

  CPI= 0.96

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WBS Cost Summary Plan (BO $k)

Scope Item	FY03 Actual	FY04 Plan	FY04 *Actual*	FY05 Plan	FY06 Plan	FY07 Plan	FY08 Plan	Total Plan
WBS-1 Core Systems	$4,005	$11,084	*$4,508*	$12,192	$13,064	$1,965	$290	$42,600
WBS-2 Heating, Fueling	$ 207	$101	*$ 31*	$108	$520	$758	-	$1,694
WBS-3 Diagnostics	$ 155	$79	*$ 38*	$273	$622	$527	$38	$1,693
WBS-4 Power Systems	$ 115	$568	*$90*	$1,133	$2,524	$988	$3	$5,331
WBS-5 Central I&C	$ 10	$13	*$16*	$13	$427	$2,128	-	$2,590
WBS-6 Facilities	$ 9	$32	*$15*	$14	$331	$1,684	-	$2,071
WBS-7 Assembly	$ 164	$435	*$110*	$299	$1,025	$1,661	$654	$4,237
WBS-8 Project Mgmt	$1,277	$2,370	*$1328*	$1,869	$1,854	$2,523	$903	$10,796
Total Plan (BO)	**$5,942**	**$14,682**	***$6,136***	**$15,900**	**$20,365**	**$12,232**	**$1,889**	**$71,012**
Contingency	-	$1,033		$1,465	$2,725	$6,885	$3,210	$15,309
Total Plan (BO)	**$5,942**	**$15,715**		**$17,365**	**$23,090**	**$19,117**	**$5,099**	**$86,329**
Total Plan (BA)	**$5,942**	**$17,907**		**$15,909**	**$22,098**	**$19,384**	**$5,089**	**$86,329**

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