State University System
Educational and General
2006-2007 Legislative Operating Budget Issue
Form I-b

Strategic Planning Goal/Objective: <u>Access to and Production of Degrees</u> *(Examples of issues that may be included under this goal would be new enrollment growth, financial aid, academic tracking, advising, etc.)*

Strategic Planning Goal/Objective: <u>Building World-class Academic Programs and Research Capacity</u> *(Examples of issues that may be included under this goal would be new and/or expanded research initiatives, enhancements of certain academic programs or program implementation / expansion of non-targeted programs.)*

Strategic Planning Goal/Objective: <u>Meeting Community Needs and Fulfilling Unique Institutional Responsibilities</u> *(Examples could include issues important to a regional area, such as hospitality management, or specific to an institution's mission.)*

Strategic Planning Goal/Objective: <u>Meeting Statewide Professional and Workforce Needs</u> *(Examples of issues that may be included under this goal would be new or expanded targeted and/or educated citizenry / workforce programs.)*

This issue relates on all of the strategic planning goals/objectives adopted by the Board of Governors.

University:	**Florida State University**
Issue Title:	**Targeted Critical State Needs - CAPS**
University Priority Number:	**3**
Date Approved by Board of Trustees:	**May 26, 2005**

I. **Needs Statement** *(What need will be addressed with the provision of funds for this issue?):*

Florida competes with other states and other countries for the best jobs and the skilled workforce needed to fill those jobs. Funds are requested to help provide the targeted education and innovative programs needed to secure the state's comparative competitive advantage. Funds are requested to meet the state needs in the critical targeted areas which will enhance FSU's reputation as a national leader as well as improve the economic development of the local community and State. Funding these issues will provide opportunities for increased degree production in a number of areas outlined below. Florida State University will use the funds for the following activities outlined under the description of services provided:

1) Program in Bio-NanoTechnology
2) Information Technology
3) Program in Advanced Power Systems Engineering

II. **Justification**

A. **Description of service or program to be provided** *(include whether this is a new or expanded service/program; if expanded what has been accomplished with the current service/program):*

The electrical power needs of the State are large and intricately linked to the State's ability to forge a prosperous future. There is a critical need for trained engineers and innovative solutions Industrial and Commercial Power engineering. Engineering is an area that has been identified by the State as a critical shortage area. This issue is a separate request from the FAMU/FSU Joint legislative budget issue requested under a separate issue. Included in this issue is an initiative being developed between the College of Engineering and the National High Magnetic Field Laboratory. This collaboration has lead to the establishment of world-class research and training program clustered in the Center for Advanced Power Systems (CAPS), which focuses on electric power system technologies and materials technology and integration applied to electric power production, transmission and utilization. The Center also focuses on developing a world-class engineering education programs for undergraduates, graduates and continuing education students. The Center will establish a wide spectrum of interactions with governmental, industrial and academic agencies and be a source and driver of economic development for this State. It will emphasize superconducting power system activities and power systems simulation facilities that will attract high-tech industry and jobs. Through this Center, the State will have the opportunity to lead the country in development of next generation power system technology. The Center is in the process of building unique test facilities that will make it attractive to industry, as well as open up other research and educational opportunities. The technologies advanced through this program have the promise for substantial advancements across a range of electric technologies in the near future. The technologies promise to help produce, transmit and use electricity at much higher capacity, increased efficiency, and lower cost.

Little new investment in power system apparatus or personnel over the last two to three decades has led to a major decrease in U.S. manufacturing capability and the closure of many education programs in power engineering. There is a critical need for the U.S. to regain the leadership in power system technology and to develop the capability to train a new generation of power engineers equipped to solve the complex new problems facing the power industry. Security of the power system against nature and possible man-made disasters is an area of concern that has emerged as a major issue after the horrific events of September 11, 2001. Large area blackouts are also still an issue, as was evidenced by the August, 2003 blackout that affected over a million Americans and research in maintaining and protecting the electric grid are desperately needed.

The goals for the Center for Advanced Power Systems are to address the nation's electric power infrastructure needs by building world-class research facilities and programs that will support cutting edge research, attract the best researchers in academia and industry in collaborative programs and attract the best students to power engineering degrees. In collaboration with the National High Magnetic Field Laboratory, the Center will seize an unique opportunity to leverage and build on existing capabilities to create the nation's premier center for electric power system and materials applications R&D with the scope and scale needed to reinvigorate the nation's power system engineering technology, apply new technologies to the imminent needs of the nation's electric power infrastructure, address growing security issues, and train the next generation of professionals to design, operate and maintain new state-of-the-art power systems. The Center's vision is to make Florida the place that industry will look to for the technologies and the expertise needed to address the growing challenges of the nation's electric power infrastructure.

The Center in cooperation with the National High Magnetic Field Laboratory and Florida's utility sector and power systems manufacturers proposes to:

- Establish the world's largest and most comprehensive real time digital power system simulation capability for the power industry and apply this technology to critical issues related to security and deregulation to ensure reliable and high quality electrical service throughout Florida.
- Expand in-house research programs focused on advancing the state-of-the-art in simulation and modeling techniques, and use the simulation facilities to study power system interactions, develop control strategies, and evaluate the integration of new components into power systems.
- Expand existing research in high temperature superconductors with emphasis on reliability and performance, and examine the systems issues of integrating superconducting components into a utility system.
- Redefine the undergraduate and graduate engineering educational programs to incorporate the new technologies relevant to the future in order to attract the best graduate and undergraduate students to FSU.
- Encourage research interactions with industry that will foster collaborations, encourage closer relationships, and promote access to the simulation facilities as a basis for attracting new industrial and consulting companies to relocate to Florida.
- Promote the benefits of access to the simulation facilities to the cruise ship industry, which is heavily committed to the electric ship concept and needs access to training for operators and shipboard engineering staffs.

The Center will have a number of direct and indirect impacts on the State of Florida and the economic development of the Tallahassee Region,

including: 1) placing Florida in the lead nationally as the place for research and development in the new emerging power system and component technologies; 2) helping to ensure that Florida has the state of the art power system infrastructure essential to attracting high tech businesses of all types; 3) playing a major role in the coming need for a wide range of electrified transportation, land, sea and air; 4) providing a reservoir of technical and human resources that will attract new jobs and new industries to Florida; and 5) fostering a number of new businesses and jobs in the near future. The Tech Transfer resources developed at FSU will greatly facilitate the development of new jobs.

Florida has the opportunity to leverage several well-established programs to support a unique facility which will be of vital importance to both Florida and the nation in securing our electrical infrastructure in the years to come. Florida's demand for electrical power is slated to grow by 50% over the next 10 years at a time when roughly 50% of the Utility workforce will become eligible to retire. The facility is in an area where there is little competition but where there is imminent need. Florida and Florida State University are therefore well placed to take the lead in this important technology.

Budget:	
Recurring	$1,100,000
Non-recurring	$2,200,000
Total	$3,300,000

The non-recurring budget ($2.2M) including expanding CAPS existing real time simulator facility, which will make it the largest digital power system simulator in the world, capable of addressing the needs of our researchers at CAPS, other Florida university researchers and Florida utilities researchers.

The recurring budget ($1.1M) includes simulation engineers, support staff, ongoing licensing, and operating expenses.

FSU is requesting $3,300,000 for this initiative.

B. **Description of current university initiatives, and their resources, that will strengthen the provision of this service/program**:

An investment in the Center for Advanced Power Systems (CAPS) will continue cutting edge research, train skilled graduates, enhance our reputation, attract the best researchers and enhance the local and state economy. We have added $4.4 million from contracts and grants. The Center is also supported by $253,000 in general revenue of which $123,000 is recurring.

C. **Description of outcome anticipated** *(Be specific. For example, estimate federal, private or other research dollars that may be received or other measurable forms of return on investment.)*

CAPS received a multi-year grant to support the US Navy's Office of Naval Research's all electric ship program. The grant has been averaging between $3.5M to $4M per year, which will end in 2007. In addition, there has been significant growth in other funding activities. The initiative will enable CAPS to obtain world class research and power simulation equipment to maintain and continue its research and funding in advanced power systems for the Navy. The initiative will support the development of the World's largest real time digital power system simulator that will become the focal point for the collaboration with federal institutions, utilities, and other university researchers. It is anticipated that the external funding from other federal and private sectors will be maintained and could grow substantially because of the existence of this unique facility and capability in FSU.

Over the last two years CAPS' externally funded budget has grown by over 100% and it is anticipated to continue growing substantially over the next few years.

This year CAPS was able to secure $5M from the Department of Energy to conduct power systems research. It is anticipated that future support will come from the Department of Energy where 20% cost share is required. This initiative could provide the needed cost shares to help CAPS grow.

D. **Additional information to justify request:**

III. **Budget Request for 2006-07:**

		2005-06 Budget for Issue	**State Funds Requested**	Anticipated Reallocation (A)	Total Budget for Issue (B)
a.	Recurring Funds:	$	**$1,100,000**	$	$
b.	Non-recurring Funds:	$	**$2,200,000**	$	$
c.	Total:	$	**$3,300,000**	$	$

A. Identify programs from which funds will be reallocated, if applicable (include for example, salaries from reallocated or dedicated personnel).

B. If this is a multi-year request, identify the incremental funds needed from the state for each future year, by year, for a maximum of five years.

IV. **Facilities:**

A. Does this issue require an expansion or construction of a facility?

No

B. If yes, is the project identified on the Capital Improvement List? If so, identify the project, fiscal amount, and year requested.

	Facility Project Title	Fiscal Year	Amount Requested
1.			
2.			