

More than a dozen UCSD proposals submitted for defense conversion funds under new federal program

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MORE THAN A DOZEN UCSD PROPOSALS SUBMITTED FOR DEFENSE CONVERSION FUNDS UNDER NEW FEDERAL PROGRAM

A plan to build a landmark highway bridge in San Diego from lightweight composite materials heads a list of more than a dozen University of California, San Diego proposals seeking defense conversion funds under the federally sponsored Technology Reinvestment Project (TRP).

Deadline for submission of proposals was July 23, with an estimated 10,000-20,000 research groups nationwide expected to apply for funding.

Approximately \$472 million has been appropriated by Congress this year for the defense conversion project whose mission is "to stimulate the transition to a growing, integrated, national industrial capability which provides the most advanced, affordable, military systems and the most competitive commercial products."

The program seeks to stimulate the commercialization of dual-use (defense and non-defense) technologies nationwide by funding partnerships among private sector firms and other entities, including universities.

At UCSD, the proposed fan-shaped bridge over Interstate 5-- connecting the east and west campuses of UCSD--already has won support from the Federal Highway Administration with a \$1.6 million grant for its initial phase.

As outlined in their proposal, UCSD engineers and a consortium of defense industry participants are requesting \$33.7 million over 4 years to continue their work, with the consortium providing an additional \$10 million in matching funds. The State of California has endorsed the idea, with a pledge of \$250,000 in matching funds from the California Trade and Commerce Agency pending approval under the TRP request.

Funding not only would go toward research, development and construction of the 450-foot-long bridge, which would be the first of its kind in the world, but also toward a large-scale bridge rehabilitation demonstration project. The total estimated cost of the project is \$55 million.

If successful, research from the bridge program could create a new multibillion dollar industry based on designer materials whose properties and performance would be tailored to specific applications. Such materials--including glass, carbon and polymer fibers--have previously been used for military aircraft and are generally lighter, stronger and more durable than conventional materials such as steel or concrete.

"The program advanced involves a potentially enormous commercial market for composites," said Gilbert Hegemier, director of UCSD's Charles Lee Powell Structural Systems Laboratory and the project's co-principal investigator with Frieder Seible, associate director of the Powell lab.

"This market will serve to preserve a critical national industrial resource," Hegemier added.

Members of the bridge program consortium, aside from UCSD, include the University of Delaware, Amoco Performance Products, Inc., B.P. Chemicals (Hitco), Inc., E.I. DuPont de Nemours & Co., Hercules, Inc., Lockheed Missiles and Space Company, Inc., J. Muller International, Inc., Morrison Knudsen Corporation, Fluor-Daniel; Shell Chemical Co., Trans-Science Corp., and XXsys Technologies, Inc.

Several other UCSD defense conversion proposals are focusing on educating and training manufacturing engineers, including those in the defense industry who are now unemployed as a result of budget cutbacks.

One proposal calls for the creation of a new two-year master's degree program in World Class Manufacturing Engineering that would recruit displaced engineers from the defense industry for retraining. Estimated costs for the master's degree program is \$6 million over three years, with about \$4 million in matching funds coming from a consortium that includes ALCOA Electronic Packaging, Inc., Hewlett Packard Co., Hughes Aircraft Co., TITAN Linkabit, and UCSD's Center for Magnetic Recording Research.

UCSD's School of Engineering is requesting \$600,000 for three years to fund a postdoctoral research and education program in manufacturing engineering. Among other things, the program would provide training of displaced defense engineers for specific products identified by five participating companies. These firms are Orincon Corporation, Hewlett-Packard Co., Science Applications International Corp. (SAIC), Cubic Corp., and Brooktree Corp.

To provide on-site technical and business advice to small- and medium-size manufacturers in California, UCSD Extension has requested about \$9.1 million for three years in federal defense conversion funding for the newly created University of California Manufacturing Extension Program (UCMEP). The program, modeled after the UC agricultural extension system, is designed to bring university research and academic expertise to bear on business problems in such areas as regulatory compliance, employee training and retraining, technology and management techniques.

A program that would develop and implement a statewide network of technology-based business assistance and computer-based information resources for small and medium companies and high-technology startups in California also is seeking funding under TRP. The California Information Infrastructure or Goldstrike consists of regional teams in the San Francisco Bay area, Los Angeles and San Diego seeking to develop operational business and economic development databases. CONNECT, the UCSD Program in Technology and Entrepreneurship, is working with the San Diego Supercomputer Center and SAIC on the local component of Goldstrike.

Three proposals from UCSD's Scripps Institution of Oceanography focus on new technology for exploring the sea or exploiting its resources.

To help explore the depths of the ocean, a collaborative project between researchers from SIO and Applied Remote Technology, Inc., a division of Raytheon Company, seeks funds to build a light-weight Unmanned Undersea Vehicle system powered for multi-day missions. The \$23 million robotics project already has attracted significant private investment from several industrial partners, with the group requesting \$7 million from the TRP program.

In a separate effort, Michael J. Buckingham, professor of ocean acoustics at SIO--along with EDO Corporation and SubSea International--are seeking defense conversion funds to help create pictorial images of objects in the ocean, using the ambient noise created by bubbles for illumination. In this sense, the ambient noise of the ocean can be likened to daylight in the atmosphere. An object in the ocean scatters some of this "acoustic daylight," providing a signal which, with an acoustic lens and subsequent electronic processing, can be converted to a pictorial image on a television screen.

A \$3 million request in federal funds revolves around efforts to discover, develop and market products based on the chemical cornucopia of marine microorganisms. Here, researchers are seeking to build a large library of microorganisms that could be screened for pharmacological and other industrial uses. The work also would advance the development a state-of-the-art fermentation and filtration system for the large-scale culturing of salt-requiring microorganisms. About \$7 million in matching funds are coming from the project's industrial participants-- CalBio Marine, Bristol-Myers Squibb, and Kelco.

In another health-related proposal, researchers from the UCSD School of Medicine are requesting about \$837,000 in federal funds over two years to further develop and test a temporary living skin replacement for burn victims. The recipe for this new form of artificial skin consists of a combination of human skin cells grown in nylon or fiber mesh, that secretes growth factors and human proteins. The skin replacement could be cryopreserved and shipped and stored around the world, where they can be available for civilian and military use. Industrial participants for the project are Advanced Tissue Sciences, Inc., and GIBCO Life Technologies.

Other UCSD proposals include:

*a plan to develop private communications networks from researchers at UCSD's Institute for Nonlinear Science, acting as consultants to Marcelyn Designs Corp. of Santa Clara, Calif.

*a request for funds to help develop affordable, secure, wireless communications systems by Walter Ku, a professor in the Department of Electrical and Computer Engineering, to be conducted under the sponsorship of Titan/Linkabit of San Diego.

*a clinical evaluation of semiconductor radioisotope imaging device, that would be portable and lightweight, allowing battlefield detection of internal bleeding and other trauma. Under the direction of William Ashburn, professor of radiology, UCSD would serve as the evaluation site for this next generation of imaging devices. Industrial collaborators are Aurora Technologies, Hughes, Hybritech, USC and an instrument manufacturer to be named later.

Announcements of awards are scheduled for October 1.

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