NASA AMES RESEARCH CENTER AFFILIATE MEMBERSHIP WITH CALIFORNIA COUNCIL ON SCIENCE AND TECHNOLOGY

STATEMENT OF WORK

INTRODUCTION

The California Council on Science and Technology (CCST) shall consider NASA Ames Research Center an affiliate member of its new consortium of Federal Agencies in the state of California, including the Department of Energy and NASA Centers for the year of 2012 with the option to annually renew for the next 4 years.

SCOPE OF WORK

CCST, a non-partisan, impartial, not-for-profit organization, shall provide:

Advice and formalized links with all key science and technology organizations in the state, including, the University of California, the California State University System, the California Community Colleges, California Institute of Technology, Stanford University, and the University of Southern California.

A well-respected, objective, and focused forum through which the national laboratories can inform policy on issues that are both laboratory and non-laboratory specific and that affect the health and vitality of the science and technology enterprise in California.

A ready-made forum for the national laboratories to participate more fully in time-sensitive policy discussions.

An effective and efficient mechanism through which science and technology policy issues that emerge at the state level can be shared more effectively with national-level leaders.

Access to a cadre of highly trained and highly effective science and technology policy fellows to work with state governmental and legislative leaders.

Access to a California Teachers Advisory Council comprised of expert science and mathematics educators at the K-12 level to inform leaders in higher education, industry, and government about significant issues in science and mathematics education.

A formal relationship with *Issues in Science and Technology*, the nation's premier S&T policy journal, and thereby increased opportunities for timely and informed discussions about S&T policy issues that are of concern to states.

A collaboration with the National Academies to harness the talent of California's top experts in science and technology to assist state policy makers on matters involving mathematics, technology, and science and engineering education.

MEMBERSHIP INFORMATION

BUILDING EXPERT CAPACITY TO ADVISE STATE LEADERS

The second prong of programmatic activity is to develop new mechanisms to enable expert advice to state-level decision makers. Two areas of focus will be the CCST Science and Technology Policy Fellows and the California Teachers Advisory Council.

CCST Science and Technology Policy Fellows. This new collaborative state-focused program is designed to place highly qualified science and technology professionals in state legislative and executive offices to assist policymakers and their staffs in understanding S&T issues in order to make effective and informed policy decisions. CCST Science and Technology Policy Fellows will be experts in such areas as climate change, global warming, transmission line safety, food biotechnology, Internet security, nanotechnology, risk assessment, disease control, educational technology, and science and mathematics education research and practice.

The fellows – drawn from academic researchers, scientists and engineers from private and government research laboratories, and industry – will be placed in the offices of relevant legislative committees or state government agencies. Fellows will each serve for two years.

Although highly successful fellows programs exist at the federal level, such as the National Academies' Jefferson Science Fellows and the American Association for the Advancement of Science's Science and Technology Policy Fellowships, the CCST Science and Technology Policy Fellows will be the first such program initiated at the state level. In addition to their own professional disciplinary expertise, fellows would be supported by access to a vast network of National Academies and CCST reports, experts, and works in progress.

California Teachers Advisory Council (Cal TAC). This new council is modeled after the National Academies Teacher Advisory Council, or NTAC, that was established in 2002 and is being developed in collaboration with the National Academies. Comprised of a group of ten to twelve outstanding K-14 science, mathematics and technology teachers representing a diverse range of socioeconomic and ethnic backgrounds, as well as a range of grade levels, Cal TAC is a "voice for teachers" with the goal to inform leaders in higher education, industry, and government about significant issues in science and mathematics education. By interacting directly with higher education institutions, businesses and government, Cal TAC will make the wisdom of practice from the classroom more available to these other communities, liaise with the NTAC, and become a proactive addition to CCST.

PROVIDING SPECIFIC INFORMATION AND POLICY REPORTS

This programmatic area will develop two mechanisms for providing information—specific time-sensitive information needed in short turn-around time, and longer-term deliberative studies and analyses. Both mechanisms will benefit from easy and free access to the National Academies' on-line, PDF formatted reports, which will enable CCST to use and adapt those analyses to benefit California.

Time-sensitive information. From time to time, state policy makers will need high quality, evidence-based information in a short time frame. Several recent examples highlight the range of issues to which CCST has been asked to respond.

- In response to the Governor's announcement of a hydrogen highway initiative, CCST has facilitated the assignment of two professional staff from the National Laboratories to advise the state staff team assigned to develop the details of the Governor's plan.
- With less than two weeks notice, CCST staff prepared and delivered testimony on intellectual property to a legislative committee. The result was a positive impact on the subsequent draft legislation. As a follow up, CCST has been asked to prepare a blueprint for the design of handling the state's intellectual property. Input from CCST's industry members was critical to the success of this activity.
- When the radio frequency identification tags (RFID) issue was being discussed in the state Senate and legislation was proposed, CCST was able to enlist its industry members to provide sound advice resulting in a reexamination of the privacy concerns associated with RFID tags.

CCST needs to enhance its capacity to be responsive to these kinds of time-sensitive requests. It will do so by convening hearings or workshops for legislators and their staff on key science and technology issues and involving CCST members, including members from the national laboratories, as advisors; creating special reports relevant to California, using existing National Academies' reports as a source (e.g., on counter terrorism); developing a mechanism, similar to the National Academies' "In Summary" reports and other similar products to create timely and accessible California-relevant briefs targeted to policy makers; providing access to experts from industry, academe and national laboratories in specific areas; involving CCST Science and Technology Policy Fellows as sources of evidence-based analyses; and creating a mechanism through which important state-level science and technology concerns can be communicated to the national level.

Based on current state needs, CCST is preparing proposals for several new studies that exemplify the scope and complexity of the studies that would be performed by CCST throughout the 10-year initiative. CCST anticipates requests for 2-3 of these kinds of studies and analyses per year.

- **California's Science & Math Teacher Shortage: A Critical Path Analysis.** This study will define and quantify the science and math teacher workforce and skills gap; identify critical elements in the state's teacher production system that control the science and math teacher supply; determine how the state's education and professional development systems can be enhanced to improve production and retention of science and math teachers in the face of a competitive labor market; and identify the type of community, public and private partnerships that can effectively train and support science and math teachers in California.

- **A Critical Path Analysis of the Role of California's Community College System in the Generation of Science and Technology Graduates.** This study will be conducted in consultation with the National Academy of Engineering (NAE) and the National Research Council's Board on Higher Education and Workforce, which are pursuing related avenues of research on a national scale. It will quantify and qualify the principal factors involved in the

production of STEM transfer students by community colleges, including academic preparation, socioeconomic status, articulation agreements or other inter-institutional organizational infrastructures, staff and faculty involved in counseling and teaching, and other factors to be determined.

BENEFITS OF THESE ACTIVITIES TO THE DOE AND NASA LABORATORIES

NASA Ames Research Center will benefit directly from these activities by being more closely affiliated with CCST. The CCST framework provides the laboratories an effective and efficient mechanism for making available the vast expertise of the laboratories to inform the State on key science and technology related issues. For example, professional staff from the laboratories could serve as fellows as appropriate. In addition, Cal TAC will soon be an important forum for the laboratories to consult as they develop, expand, or revise their K-12 science and mathematics education outreach programs.

Moreover, through these kinds of activities and forums, and with more active involvement by the laboratories, there will be more opportunities for CCST to reinforce their value to California. For example, decision makers and policy makers will be reminded that:

- The laboratories have programs and research facilities in several areas of current and potential future importance to the California economy – including nanotechnology, computing and electronics, lasers, communications, aerospace, robotics, biotechnology and medicine, energy, the environment and agriculture, and forestry.

- DOE and NASA laboratories in California conduct extensive joint research with professors and graduate students. One federal facility, the Jet Propulsion Laboratory, also makes significant external grants to academic researchers.

- Federal laboratories have long bought goods and services from California companies, and these procurements remain important. But under new federal policies from the 1980s, laboratories also can now interact with industry in four additional ways: technology licenses, cooperative research and development (R&D) projects, work for others (including technical assistance projects for companies), and in a few cases, direct grants under the Small Business Innovation Research Program.

- In the 1990s and into the early 2000s, federal laboratories in California have used these new policies to provide significant new benefits to companies. For example, these laboratories have issued hundreds of technology licenses, both to established companies and startups. Major laboratories have entered into dozens of cooperative R&D projects through which laboratory technology is shared with industry. And the laboratories have provided companies access to unique research facilities.

In addition, through CCST, a number of steps could be taken to examine and expand the benefits that the state receives from the federal facilities. In return, discussions and convening activities also could strengthen the current ties between the laboratories and California companies and universities, and also address problems of particular importance to the state, such as homeland

defense, education, environmental remediation and protection, transportation, seismic studies, hazard reduction, and so on.

Other issues identified in earlier work [1] are still significant today, and CCST could serve as the convener of discussions about issues such as:

Federal Issues
- Current and potential future laboratory programs valuable to the California economy or other problems important to the state
- Building support for the national laboratories within Congress
- Policy issues related to CRADAs, intellectual property, technology transfer
- Support for other federal programs that aid industrial competitiveness or develop technologies critical to solving important California problems

State Issues
- Ways to improve links between the laboratories and California industry
- Steps to be taken to help the laboratories meet state government needs

Industry Issues
- Further assistance by the laboratories to startup companies
- Improvements to the CRADA process
- Continuing to offer access to user facilities
- Discussions about procurement opportunities, or joint research and technical assistance

University Issues
- Providing more opportunities for graduate students
- Helping California universities remain competitive for grants and contracts
- Informing faculty and graduate students of research opportunities

In addition, as part of its strategic plan, CCST is developing a mechanism to identify annually ten key science and technology policy issues that are important to California. Those issues would then be brought to the attention of policy makers through a coordinated communications strategy throughout the state, and would also include publishing articles about them for a broader national policy audience in *Issues in Science and Technology*.

Through these and other mechanisms yet to be developed, the national laboratories would have a timely, professional, in-state forum to voice issues of concern and influence state policy.

WHAT THE DOE and NASA LABORATORIES CAN DO FOR CCST

CCST has been successful in securing involvement of members of its current sustaining organizations in all of its activities. The national laboratories could help CCST respond to its mission by providing advice and counsel on policy issues through service on the Board and Council, as CCST Fellows, and by recommending professional staff who could be called upon to help with specific policy issues.

The laboratories also provide a critical resource of knowledge about the training of future S&T researchers, and opportunities for challenging research careers. Through the labs' work,

[1] Ibid.

exploration and innovation are advanced, especially in the areas of national interest including national security, with potential spin-offs into the commercial economy. That kind of expertise is needed to fully complement the other kinds of academic and industrial expertise within CCST.

LEVEL OF SUPPORT REQUESTED

The major national laboratories located in California are invited to become affiliate members of CCST for an initial period of five years. This group includes the NASA Jet Propulsion Laboratory, NASA Ames Research Center, Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, Sandia/California National Laboratory, and the Stanford Linear Accelerator Center.

Each annual dues will cover the period January 1 through December 31 of the year.