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THE NATIONAL ACADEMIES

Advisers to the Nation on Science, Engineering, and Medicine

GOVERNMENT-UNIVERSITY-INDUSTRY RESEARCH ROUNDTABLE

December 30, 2003

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Dear Dr. Salmon:

This letter report and attachments represent the final reporting requirements for DOE grant DE-FG02-00ER30309 awarded for the period 8/15/00 to 8/17/03 in the amount of \$405,000 (\$220,000 received).

GUIRR STRUCTURE AND PROGRAMS

During this reporting period GUIRR underwent a number of structural and programmatic changes due to new leadership in the co-chair and director positions. In July 2001 Marye Anne Fox, Chancellor of North Carolina State University joined William Joyce, then CEO of Hercules Corporation, to serve as GUIRR co-chair. At the same time, Tom Moss retired from his position as GUIRR director and was replaced by Merrilea Mayo.

In the latter half of 2001, an executive committee was re-established, with federal agency interests on that committee being represented by National Science Foundation director Rita Colwell. The executive committee redefined the GUIRR agenda with a programmatic shift that expanded the Roundtable's position as a neutral convener among research leaders from government, universities and industry by encouraging members to propose and champion relevant issues, develop task forces around said issues, and plan for outcomes aimed at improving the science and technology research infrastructure. 2002 marked the transition to this new project and champion-driven format for GUIRR initiatives which has allowed GUIRR to move beyond "discussion only" meetings to activities that have well-defined outcomes.

GUIRR COUNCIL MEETINGS

[Note: DOE representatives to this activity are Bill Valdez, Jim Decker]

GUIRR convenes all of its members three times a year to inform them of new developments and secure input for new initiatives. The meetings generally center around a theme or topic and provide opportunity for GUIRR members to present new project ideas. Below is a brief summary of GUIRR meetings during the reporting period.

2000-2001

In 2000-2001 the Council Meetings focused on the science and technology policy issues that would be facing the new administration, particularly those issues surrounding the research and development enterprise. The October 2000 Council meeting was devoted to the topic *Ensuring National Research Vitality* and in March 2001 the membership discussed research commercialization initiatives at the

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Council Meeting entitled *Commercializing University Research: Aligning Incentives and Protecting the Research Enterprise*.

The June 2001 Council Meeting approached the issue from the IT perspective and was entitled *Transforming the Missions and Outputs of Research Universities for the 21st Century: Will Information Technology Be the Critical Driver?* The meeting focused on the impact of IT on the research university and members discussed what the new roles might be that research universities would be expected to play in the 21st century.

2001-2002

During the 2001-2002 award period, much of the focus for GUIRR Council meetings was on the status and trends of the U.S. Science and Engineering (S&E) workforce, including workforce initiatives and approaches for improving the S&E talent pool. In May 2001, the *S&E Workforce and Education* group, co-chaired by Council member Shirley Ann Jackson, President of RPI and then Council Associate, General Spence Armstrong of NASA HQ, assembled a team to investigate projections for the production of domestic science and engineering workforce. Their efforts focused the October 2001 Council Meeting on *Envisioning the 21st Century Science and Engineering Workforce: Tasks for Universities, Industry, and Government*. One of the outcomes for that meeting included the GUIRR publication by the same name authored by Shirley Jackson.

The March 2002 Roundtable Council Meeting was devoted to a discussion of project proposals submitted by Council members, Associate Council Members, and University-Industry Partners under the new project-championed approach. Several initiatives were approved, including a study group to determine the benefits and possible drawbacks of applying the GUIRR concept to the state and/or regional level, and a workshop on Research Collaboration between DOE National Laboratories and Universities (see GUIRR Projects).

The topic for the June 2002 Council Meeting was *Winning the War on Terrorism: Tasks for the Science and Engineering Enterprise*. Dr. Lewis Branscomb, Professor Emeritus at Harvard University, discussed the findings in the recently published National Research Council Report entitled, "Making the Nation Safer: The Role of Science and Technology in Countering Terrorism." Continuing the focus on the science and engineering workforce issue, Stanley Williams from Hewlett Packard gave a large industry perspective on the topic.

2002-2003

In 2002-2003 GUIRR continued with the S&E Workforce theme and also took an interest in the broader implications of globalization on the workforce. The November 2002 Council Meeting was substituted for the Pan-Organizational Summit on the U.S. Science and Engineering Workforce (see GUIRR Projects), which turned to the community for ideas on how to improve the S&E workforce. In March of 2003 GUIRR did a review of current and proposed roundtable projects for 2004, at which point it became clear that globalization was indeed a topic that many of our members were interested in. The membership identified a potential effort for identifying R&D policy changes to sustain U.S. technological leadership in the face of globalization trends from overseas migration of U.S. industry and the emerging technological prowess of Asian countries. A series of conference calls during the summer resulted in a draft white paper on the topic to be reviewed at the November 2003 meeting by a panel of external evaluators. The June 2003 meeting followed up on this interest and the topic of the meeting was *The Impact of Globalization on U.S. R&D Policy*. The meeting focused on designing a global U.S. science policy and motivating factors for changing R&D policies.

GUIRR PROJECTS (SELECTED SUBSET)

Core funding enables GUIRR to quickly take on projects of its members' choosing rather than waiting for a specific contract or grant to cover an activity. In the context of its roundtable structure, GUIRR can introduce and spin off new non-profit organizations, develop press strategies for emerging issues, coordinate activities across multiple federal agencies, generate physical products such as templates for legal agreements, beta test concepts for research partnerships, and team with external organizations to accomplish specific national goals. Projects and activities undertaken by GUIRR during the reporting period reflect national priorities for S&E workforce issues; effective alliances and partnerships; globalization and corporate outsourcing trends; and homeland security and counterterrorism initiatives.

Corporate R&D Investment: A Question of Here or There?

Building a more quantitative understanding of the outward migration of industrial R&D requires a variety of resources, including access to privately held corporate data, the ability to link geographic migration to economic impacts, and the interpretation of all of the above with respect to existing policies and trends. GUIRR assembled a coalition of organizations with the expertise to address this issue. They include IRI (Industrial Research Institute), RAND, NIST, and several units within the Commerce Department. An op-ed on the subject by Harold Schmitz (Mars, Inc.), GUIRR member, was also written and disseminated by the National Academies.

The group agreed to approach the problem in the following manner:

- Conduct a forum to identify salient factors in R&D migration overseas
- Develop a survey tool to assess the relative weights of those factors, using the IRI membership as the survey takers
- Perform a series of post-survey interviews to elucidate qualitative reasons behind the quantitative answers
- Re-issue the survey to determine variances between "unconsidered" and "considered" responses
- Apply statistical, economic, and policy analysis to the results of the survey
- Integrate data into one or more report formats.

It was further agreed that the work would be performed by a National Academies Committee and result in a National Academies consensus report, with inputs from experts within the advisory organizations participating as required/requested. This project is currently in a fundraising phase.

National Laboratory-University Collaborations

[DOE representative to this activity is Bill Valdez]

Planning for this workshop was the focus of much of 2002. Year-long input from an ad-hoc committee representing 11 national laboratory and university representatives resulted in the development of a program agenda, agreement on desired outcomes, and a dissemination plan for the workshop's written product. Substantial time was also spent obtaining approval for this activity from the National Academies' Governing Board Executive Committee and establishing an NRC oversight committee for the workshop.

On July 10-11, 2003, The National Academies held a workshop in Berkeley, California to address best practices and remaining challenges. The scope of the workshop covered a wide range of collaborative practices, from individual investigator-level collaborations, to joint centers, to lab-run, university-populated user facilities, to extramural outreach programs. The workshop focused on issues that transcend all extramural collaboration types, but manifest themselves differently at each level-- issues such as using collaborations to augment institutional human resources, resolving classification and access issues in sensitive projects, identifying financial resources for joint work, and addressing cultural issues. The report from the 2003 workshop will be released in early 2004.

Re-Engineering Intellectual Property Agreements

In the mid-1980's, GUIRR and IRI (Industrial Research Institute) published model templates for university-industry intellectual property agreements. Since that time, there has been a considerable evolution in the perception of the value of intellectual property rights to research universities. As a result, GUIRR has entered into a collaboration with NCURA (National Council of University Research Administrators) and IRI to develop a set of high level principles that can be used as guidelines for the most common types of collaborative arrangements between universities and industry. GUIRR's role is to facilitate the "buy-in" of these principles by the leadership of university and industry. As a first step, GUIRR assisted IRI and NCURA in developing a Congress on "Re-Engineering Intellectual Property Rights," held August 19-20, 2003, in San Francisco, CA. GUIRR was particularly active in helping to secure many of the 30 delegates representing a number of key constituencies involved in the national debate. Honorary delegates to this event included Jared Cohon, President of Carnegie-Mellon University; R. Stanley Williams, Director of Quantum Science Research at Hewlett-Packard; and Benjamin Wu, Deputy Undersecretary for Technology in the Commerce Dept. The delegates to the IP Congress have since divided into working groups to tackle the articulation of the high level principles as well as the development of practical "experiments" by which to roll out national implementation of the principles.

Leadership Dinner Series

[Note: DOE representative to this activity is Ray Orbach]

A series of quarterly, "leadership dinners", attended by approximately 15 invited guests, launched in 2002 allowed the highest levels of federal representation within GUIRR to informally engage in conversation on important issues. The primary theme for these dinners in 2002-2003 was Homeland Security. One outcome was recognition of the need for further work in interoperability and standardized communication protocols in the area of public alerts. Topics under consideration for future dinners include Peer Review Standards and Regulatory Science, the Role of Federal Agency Science Advisors, and Strategies/Models for Encouraging Multidisciplinary and Collaborative Research.

Science and Engineering Workforce

[Note: DOE representatives to this activity are Bill Valdez and Peter Faletra]

GUIRR has sponsored a number of activities related to the U.S. Science and Engineering workforce, as listed below. Of particular concern to GUIRR members was the low production of U.S. students in the physical science and engineering disciplines.

- Coalition of the Concerned (for the Vitality of the U.S. Science and Engineering Workforce), a cross-agency task force whose members met on a monthly basis and eventually segued into the NSTC Subcommittee on Education and Workforce
- Preliminary survey of outreach and internship programs across federal agencies
- Dissemination of best practices in measuring outcomes of the above programs
- Collaboration with OPM to develop internship web site for all federal agencies dubbed "E-Scholar" (launched on March 28, 2003), www.studentjobs.gov/e-scholar.htm
- Pan-Organizational Summit on the U.S. Science and Engineering Workforce (Nov. 11-12, 2002)

The Pan-Organizational Summit was the highlight of the S&E workforce activities in 2002.

Representatives from over 30 scientific societies, professional associations, and related non-profit organizations presented position papers on the workforce. The goal was to consolidate and showcase the official policy statements of community and professional organizations on the topic of the U.S. Science and Engineering Workforce, and then make these policy statements available to interested federal leaders. The event received significant press coverage from Nature, LA Times, Chemical and Engineering News,

Science's Next Wave, AIP FYI, The Edge, EE Times, ASME News, IEEE USA. The summit summary was published in November 2003.

Federal Demonstration Partnership (FDP)

[Note: DOE representatives to this activity are Trudy Wood, Christine Chalk and Martin Rubenstein]

FDP is a cooperative initiative among federal agencies and institutional recipients of federal funds. It was established to increase research productivity by streamlining the administrative process and minimizing the administrative burden on principal investigators while maintaining effective stewardship of federal funds. GUIRR continues to provide staff support to this volunteer organization. In April 2002, GUIRR conducted the proposal and review process for FDP's move from Phase III to Phase IV, which saw a 50% expansion of its membership to more than 90 institutions and 11 federal agencies. In May 2003, Jerry Stuck, formerly of the NSF, was appointed Executive Director of FDP. An Executive Assistant position for FDP was created soon thereafter. These two positions mark a structural transition for FDP, which now has dedicated staff within GUIRR.

A few of FDP's accomplishments during the reporting period include:

- **Presidential Review Directive 4: Renewing the Government-University Partnership,** (<http://www.ostp.gov/html/011001.html>): Provided both tactical assistance and informed comment to the National Science and Technology Council in its conduct of the Review. The final report on the PRD incorporated several measures recommended by the FDP. As part of this process, the FDP terms and conditions came under consideration by the OMB Circular A-110 committee for use throughout the government. NSF revamped its agency wide cost sharing policy in keeping with the PRD report.
- **NSF E-Signature Pilot:** Demonstrated that institutional responsibility could be obtained electronically so that signed, paper proposal cover pages could be eliminated.
- **Clarification on Subaward Agreements:** The "FDP Statement on Subawards" clearly differentiated between subawards and subcontracts, the latter subject to procurement regulations contained in A-110 and the former considered financial assistance for sub-recipients and not subject to the procurement section of A-110. This statement was approved by the Office of Management and Budget with a minor clarification concerning the statement's relationship to definitions under OMB Circular A-133.
- **Standard Subaward Agreement:** Developed a standard two-page subaward agreement for use by FDP member institutions and organizations. The intent was to create a standard subaward, as distinct from a contract, to help eliminate legal reviews and other negotiations involved in arranging for collaborative research among FDP institutions. It is estimated that the new subaward model would allow subaward agreements to be processed in an hour or less.
- **Electronic Research Administration (ERA) Core Principles:** Worked with OMB and other agencies to draft a set of 11 "core principles" for designing and implementing ERA systems in response to Public Law 106-107. Developed a web site for ERA within FDP, with links to relevant executive orders and public laws, the National Performance Review, the NIH Commons, FastLane and other information. The Foundation Commission, a joint FDP-NCURA effort, created a repository of ERA-related systems used by private organizations and is identifying mechanisms to promote information-sharing.

- **Electronic Data Interchange (EDI) Pilot:** FDP has identified submission of the 194 transaction set (specific required data elements) via EDI as the focus of a pilot demonstration. Initial discussions were held on the need to address inclusion of additional data elements, attachments and the FastLane (the National Science Foundation's electronic proposal submission system) interface. Discussion on planning for inclusion of EDI 4020 versions of the transaction set were also initiated. As an incentive, institutions participating in the demonstration would be held harmless.
- **Electronic Notification of Awards:** This demonstration tested the feasibility of sending an EDI (electronic data interchange) award document datastream in the body of an email. Through the combined efforts of about twenty institutions and several federal agencies, we successfully managed the sending and receiving for award messages structured so that the data could be entered automatically in a local institutional database.
- **Federal Funding Opportunities:** FDP continues to assess opportunities for standardization in federal funding opportunity announcements. Recently, FDP finalized a federal funding opportunity analysis document that identified, by data element, the contents of funding opportunities from all participating FDP agencies, including a section that summarizes the business rules of the opportunity. Efforts are underway to assess optimum methods of electronically transmitting this information.
- **PL 106-107 (Federal Financial Assistance Management Improvement Act of 1999):** Public Law 106-107 offers an opportunity to simplify, standardize and integrate the grants process. FDP hosted a special session at its September 2000 meeting that served as one of the first consultations with affected communities under the law. Comments were sought on the grant-making process, plan objectives, and agencies' program reforms. FDP then provided extensive comments on the interim draft plan of action and the draft Initial Plan to Congress, in the form of a 60-page response to P.L. 106-107, that appeared in the *Federal Register* on January 17, 2001. FDP also partnered with the Interstate Advisory Group (IAG), which formed as a result of the passage of P.L. 106-107, to work on areas of common interest as they relate to improvement in federal assistance programs. FDP established mirror groups to work in conjunction with the four subgroups established under 106-107 (pre-award, post-award, audit and electronic), and, through the subgroups, tested various agency systems and provided end user feedback to both the agency and the 106-107 group.

GUIRR PUBLICATIONS & OP-EDS

- *Pan-Organizational Summit on the U.S. Science and Engineering Workforce Meeting Summary.* Washington, DC: National Academies Press, 2003
- *Envisioning a 21st Century Science and Engineering Workforce for the United States.* Washington, DC: National Academies Press, 2003
- Sean O'Keefe, *Seeking Scientists*, Government Executive Magazine (March 2003)
- Dr. Jerry Grossman, "America Must Invest More Human Capital in Scientific Technical Fields" (October 2002)
- Harold Schmitz, "Tech Transfer Is A Crucial Part of National Security Debates" (November 2002)
- Dr. Shirley Jackson, "Intellectual Capital: The Key to U.S. Superiority", Research USA (April 2003)

The ongoing support of federal mission agencies, such as DOE, provides the core funding that allows GUIRR to fulfill its mission; to provide a platform for leaders of the federal mission agencies, universities, and industry to converge and explore critical issues affecting the science and technology agenda. As always, we are appreciative of DOE support for GUIRR projects and initiatives.

Sincerely,

Merrilea J. Mayo
Director, GUIRR

cc:

James Decker
Ray Orbach
Norman Kreisman
Marvin Singer
Bill Valdez

Enclosures:

GUIRR Membership List

GUIRR Annual Reports 2000, 2001, 2002

Pan-Organizational Summit on the U.S. Science and Engineering Workforce Meeting Summary

Envisioning a 21st Century Science and Engineering Workforce for the United States