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Submitted electronically to GC-62@hq.doe.gov

Office of the Assistant General Counsel for Technology Transfer  
U.S. Department of Energy  
1000 Independence Ave., SW  
Washington, DC 20585

Dear Mr. Gottlieb,

Subject: Notice of Inquiry: Technology Transfer Practices at Department of Energy Laboratories (75 FR 72036)

We are pleased to respond to the questions published in the Federal Register. The Lawrence Livermore National Laboratory (LLNL) is committed to DOE's mission to improve the Nation's global competitive posture and believes that the Lab's ability to partner and collaborate with industry, universities and others around the globe is key to achieving that goal. As Secretary Chu expressed in his statement to the Committee on Energy and Natural Resources in March of this year, "we need broader, more effective collaboration." He went on to characterize what he meant by saying, "My goal is nothing less than to build research networks within the Department, across the government, throughout the nation and around the globe. We'll better integrate national lab, university and industry research. And we will seek partnerships with other nations."

As a National Nuclear Security Agency laboratory whose management contractor was recently transitioned from the University of California to Lawrence Livermore National Security, a limited liability company, we are pleased to offer you our perspectives on the issues raised in the Notice of Inquiry. As a private company with members that include a major university system, engineering and construction companies and even, as a teaming subcontractor, a non-profit charitable trust, LLNS, LLC understands what it takes to collaborate. Clearly, if we are going to achieve the goal set for us by the Secretary, we must assess the effectiveness of the mechanisms available to the National Laboratories to work with other federal agencies, private industry, universities and even other nations and we thank you for inviting the discussion. In what follows, we will provide comments on each of the questions raised in the order in which they appeared in the Notice.



### Existing and Other Agreements:

There is significant value in working with industry. Not only does this work supplement and leverage the growth of our capabilities, it frequently provides us with new insights and solutions to problems confronting DOE. A case in point is provided by the CRADA relationship we have with the Compact Particle Accelerator Corporation (CPAC). This is a relatively small firm dedicated to bringing the benefits of proton therapy to a large underserved market of cancer patients for whom X-ray is the only available effective therapy. The efficacy of proton therapy is well documented. The problem is that it requires access to an accelerator. There are only 5 accelerators in the country providing proton therapy at U. S. medical centers, and they cost on the order of \$150 million and require a very large footprint. LLNL has been developing the dielectric wall accelerator which, it is hoped, will provide as much energy (200 MVe) in as little as a couple of meters. Our commercial partner is working with us to develop this technology to be able to bring proton therapy into individual hospitals. For cancer patients, this means greater access to this form of treatment. In the process of doing this work, the challenge of high voltage laser switches is leading to a breakthrough. This advance not only brings us closer to delivering a device capable of treating cancer with protons but will advance the development of the dielectric wall accelerator for use in its national security application.

However, our CRADA relationship with this company and others frequently requires us to define the “value proposition” from their perspective. The concerns that we hear most often relate to our costs, the time it takes to get work started, our requirement for indemnification, and our requirement for advance payment for work that is not guaranteed. While we may not be able to satisfy all of these objections, we suggest that there is a need to consider new contract mechanisms that, from the client’s perspective, better balance their assessments of the risks and rewards of engaging the national laboratories.

We would also urge that consideration be given by permitting Laboratory contractors to partner with non-federal sponsors in competing for work that the Laboratory is uniquely qualified to perform. Such a mechanism could increase the transfer of Laboratory technology and knowledge to the public while adding new perspectives to the research conducted by our staff.

Finally, we join in the recommendation from the University of California that DOE consider a “sponsored research” agreement that would allow us to pursue grant funding from potential sponsors, the primary intent of which would be to grow the capabilities of the Laboratory. Under these circumstances, DOE would permit its laboratories to accept work on a less than full-cost recovery basis in accordance with the rules of the granting entity.

### Best Practices:

It has been our observation that universities and laboratories have, over the course of the last several years, sought greater influence over the factors required for successful licensing of new technologies. Among these factors, arrayed from greatest control to

least control, are: a) the rights to technologies from which new products or processes are derived and which are largely in the control of these institutions; b) the detailed understanding of the possible applications of these technologies in commerce, the characteristics of the markets for them and the strategies needed to penetrate those markets; c) the prototyping of the form factor of the technology in the chosen application and the assessment of costs and price points in the market place; d) the firm or team of entrepreneurs and managers with the skills to successfully take them to market; and, e) the capital needed to support the further development, production and commercialization of the technology-based products. With respect to factor b), some universities and laboratories are building relationships with university entrepreneurship centers. Generally constituted of graduate students in science, engineering or business, these students self-select to pursue an understanding of how to succeed in the commercial world. Most centers require students to prepare a business plan and enter one of the more than 200 business plan competitions. The prizes for first-place can be hundreds of thousands of dollars so there is real incentive to do well. One of the best ways to do well is to have a very unique technology as your product that represents a real breakthrough. National laboratories have breakthrough technologies. At LLNL, we work with six entrepreneurship centers in the Bay Area and last year they prepared nine business plans on nine of our breakthrough technologies. The students got a chance to work with our scientists and imagine the commercial products that might be capable of disrupting markets, and the Laboratory got nine very creative analyses of products, markets and strategies for licensing our technologies.

Factor c) is often extremely important in being able to demonstrate to potential licensees that the nascent concept we've developed is really a practical solution to a significant need. Battelle-affiliated laboratories are entitled to compete with each other for maturation funds to make these prototypes. Other laboratories that have licensing and royalty revenues in excess of their costs are increasingly investing in maturing the inventions that have strong market potential. A DOE program of significant value is the Technology Commercial Fund offered by EERE. Multiple labs have qualified for the TCF program and are using those funds for technology maturation. At Livermore, we apply maturation funding from Battelle, EERE and our own licensing revenues to those technologies that have demonstrated business plans that reveal the best applications for the technologies and the pathways to markets.

Factors d) and e) are more elusive. While some laboratories permit their staff members to leave or separate (with rights of return) to pursue commercial and/or entrepreneurial activities, the people needed to lead new businesses or new divisions of existing businesses are often those with much greater depth of experience in managing commercial enterprises. The Entrepreneur-in-Residence program offered by DOE-EERE provides a mechanism for giving laboratories a chance to work with a member of a venture firm who has, as his/her objective, the selection and commercialization of a technology. Not only can this result in a new license for the Laboratory, but staff learn what is important in the selection of technologies and what is needed to demonstrate real commercial potential. At LLNL we have identified a person with experience in taking

multiple DOE technologies to market by serving as the interim CEO, finding the financing and constructing the company. Our intention is to try to do two or more deals per year using his experience and the business plans and prototypes around our technologies.

Other examples of best practices include those being pursued by our sister laboratories including the use of privately-funded technology transfer (PFTT) to permit the joint development and shared costs of technology commercialization. We are also supportive of the use of the Federal Demonstration Partnership (FDP) model to facilitate research collaborations by reducing the time required to negotiate with partners not accustomed to the use of, or unable to accept, the terms of Work for Other agreements.

U.S. Competitiveness:

Given the objectives set for the Agency by the Secretary of Energy, the proposal spelled out in this section of the Federal Register notice, while much less restrictive than the existing rules regarding WFO agreements, may not be sufficient to permit National Laboratories to engage in international collaborations. We suggest adopting the WFO language of the Environmental Protection Agency (EPA) in which there is no reference to U.S. competitiveness.

The Intellectual Property Rights Disposition in Work for Others (WFO) Agreements:

The proposal in the Notice to modify the WFO agreement so that labs may retain title to lab employee inventions but grant the non-federal WFO sponsor a nonexclusive, royalty-free, non-transferable, non-sublicensable worldwide license in a field of use with no requirements concerning U. S. manufacture, no Government use license where the Government is not a likely user, no march-in rights and the option to negotiate an exclusive license in the field of use appears to be a reasonable alternative to the existing terms and conditions in the DOE WFO agreement. We recommend that in addition to deleting the requirement for U.S. manufacture, DOE adopt the language of other agencies (e.g., EPA) to remove consideration of U.S. competitiveness generally, including U.S. manufacture. We feel strongly, based on our experience, that retention of title by the Laboratory (contractor) is necessary to assure that the invention reach its full commercial potential and provide an incentive to the inventors for their work. We also believe that as we move to do business globally, particularly in developing new energy technologies and reducing CO<sub>2</sub> emissions, we will be called upon to work with others who will be unable to satisfy the U.S. competitiveness requirement.

Negotiable or Non-Negotiable User Agreements:

LLNL does not yet have a user facility but anticipates having one in the near future. We are pleased to support the new DOE user agreement.

Other:

LLNL would like to recommend that DOE permit its contractor more authority and flexibility in the execution of technology transfer agreements to significantly reduce the time required to implement transactions. DOE could provide oversight by assuring that the systems in place to undertake these agreements are fully validated and followed.

LLNL appreciates the opportunity to add our comments on these important issues. If you have any questions or concerns regarding our recommendations or suggestions, please contact me at (925) 423-9353 or stenehjem1@llnl.gov.



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Erik Stenehjem, Director  
Industrial Partnerships Office

Copy to:  
George H. Miller