STATEMENT OF CONSIDERATIONS

CLASS ADVANCE WAIVER OF THE GOVERNMENT'S DOMESTIC AND FOREIGN PATENT RIGHTS AND COPYRIGHT UNDER DOMESTIC FIRST AND SECOND TIER SUBCONTRACTS ISSUED BY ANL/LBNL/LLNL/LANL/ORNL/PNNL/SNL FOR THE *DESIGNFORWARD* PROJECT; DOE WAIVER NO. W(C) 2012-006

The Department of Energy (DOE) has a long history of deploying leading-edge computing capability for science and national security. Going forward, DOE's compelling science, energy assurance and national security needs will require a thousand-fold increase in usable computing power, delivered as quickly and energy-efficiently as possible. Within DOE's Office of Science (SC), the mission of the Advanced Scientific Computing Research (ASCR) program is to discover, develop, and deploy computational and networking capabilities to analyze, model, simulate, and predict complex phenomena. A particular challenge of this program is fulfilling the science potential of emerging computing systems and other novel computing architectures, which will require numerous significant modifications to today's tools and techniques to deliver on the promise of exascale science. Within DOE's National Nuclear Security Administration (NNSA), the mission of the Advanced Simulation and Computing (ASC) Program supports NNSA Defense Programs to shift emphasis from test-based confidence to simulation-based confidence. Under ASC, computer simulation capabilities are developed to analyze and predict the performance, safety, and reliability of nuclear weapons and to certify their functionality. Modern simulations on powerful computing systems are key to supporting our national security mission. As the nuclear stockpile moves further from the nuclear test base through either the natural aging of today's stockpile or introduction of modifications, the realism and accuracy of ASC simulations must further increase through development of improved physics models and methods requiring ever greater computational resources.

SC and NNSA jointly formed a consortium known as the "E7", which includes representation of seven DOE Laboratories: Argonne National Laboratory (ANL), Lawrence Berkeley National Laboratory (LBNL), Lawrence Livermore National Laboratory (LLNL), Los Alamos National Laboratory (LANL), Oak Ridge National Laboratory (ORNL), Pacific Northwest National Laboratory (PNNL) and Sandia National Laboratories (SNL). In July 2011, the E7 released a request for information (RFI) with the purpose of providing DOE with information for planning the DOE Exascale Program.

The *DesignForward* Phase of the DOE Exascale Program

DOE finds that scientific simulation and data analysis requirements are exceeding petascale capabilities and rapidly approaching the need for exascale computing. However, due to projected technology constraints, current approaches to high performance computing (HPC) software and hardware design will not be sufficient to produce the required exascale

capabilities. These R&D activities will initially be pursued through a program called *DesignForward*, which will seek to fund enhancements that benefit the scalability and performance of DOE mission applications. E7 Labs will be issuing an RFP for (a) system design and integration R&D for exascale systems that will be deployed in the next decade and (b) the design of interconnection fabric and integration of the fabric with a node that will enable exascale systems in next decade.

More specifically, (a) above will span both hardware and software. *DesignForward* will fund the development of new technologies that are needed for exascale while accelerating industry roadmaps and timelines. DOE wants to work together with vendors to refine a vision for the overall system design including the design and integration of hardware, interconnect, packaging, and system software. For (b) above, the interconnection fabric will have a significant impact on the exascale goals. The fabric must support energy efficient, high bandwidth, low latency operations with minimal overhead. The effort will develop processors or memory components with network interfaces and the interconnection fabric.

DOE will solicit integrators, interconnect designers and ecosystem vendors for R&D proposals that will increase the performance of key DOE extreme-scale applications relative to energy usage while maintaining or improving reliability. It is anticipated that vendors funded will work closely with vendors funded by the DOE *FastForward* Program and other vendors selected for *DesignForward*. The goal is to begin addressing long-lead time items that will impact large-scale DOE systems later this decade. Selected proposals are expected to impact both DOE extreme-scale mission applications as well as the broader HPC community. While DOE's extreme-scale computer requirements are a driving factor, these projects must also exhibit the potential for technology adoption by broader segments of the market outside of DOE supercomputer installations. The public-private partnership between industry and the DOE ensures development of technology that reduces economic and manufacturing barriers to constructing exaflop-sustained systems, but also ensures the selected technologies have broad market impact. This ensures the DOE investment forms the center of a sustainable software/hardware ecosystem that is supported by applications across the broader IT industry. DOE expects this technology transfer to increase DOE's ability to leverage commercial developments. It is not DOE's intent to fund the engineering of near-term capabilities that are on existing product roadmaps.

The Allocation of Patent Rights

A small business or non-profit organization will retain the patent rights to its subject inventions under the Bayh-Dole Act. See 35 USC 200-212. These subcontracts will contain standard clause DEAR 952.227-11 Patent Rights—Retention by the Contractor.

For non-Bayh-Dole subcontractors, the Government retains title to subcontractor's subject inventions under DEAR 952.227-13 Patent Rights—Acquisition by the Government. However, a subcontractor that agrees to cost-share by an amount at least 40% of the total cost of the subcontract shall qualify for this Class Advance Waiver where DOE agrees to waive, in advance, patent rights to the subcontractor such that it may elect its subject inventions. See Appendix A, paragraph (b) of 10 CFR 784.12 PATENT RIGHTS--WAIVER (JUL 1996). The patent rights waiver is subject to the retained government-use license, march-in rights, reporting requirements, DOE approval of assignments, 35 U.S.C. 204, and a U.S. Competitiveness provision (paragraph (t)), which are all contained in the clause. See Appendix A.

If a non-Bayh-Dole subcontractor under the subject RFP does not agree to cost-share at least 40% of the total contract cost, that subcontractor will receive the standard DEAR patent and FAR data clauses in connection with the R&D procurement. However, such a subcontractor can still seek DOE Headquarters Program approval to have this Class Advance Waiver apply. In the alternative, the subcontractor may petition the government for either a separate Advance Waiver for its specific subcontract or an Identified Invention Waiver to obtain title to specific subject inventions as developed during the performance of the subcontract.

The Allocation of Rights in Computer Software

The Bayh-Dole Act only applies to the allocation of patent rights. However, many subcontractors prefer to have advance rights in technical data developed under their subcontracts. Therefore, this Class Advance Waiver also allows a domestic subcontractor (small business, non-profit or for-profit organization) to assert copyright in computer software without the Contracting Officer's prior approval. Under the subject *DesignForward* program, DOE agrees, in advance, to authorize the subcontractor to assert copyright, without the Contracting Officer's prior approval, in software produced under the subcontract by its employees. See Appendix B, paragraph (c)(1)(iii). The right to assert copyright in software is subject to a limited government-use license to allow the subcontractor sufficient time to commercialize the computer software. In the limited government-use license, the subcontractor grants to the Government and others acting in its behalf, a paid-up nonexclusive, irrevocable worldwide license in such copyrighted computer software to reproduce, prepare derivative works, and perform publicly and display publicly by or on behalf of the Government. However, the limited government-use license in copyrighted software will revert to a broad Government license, which allows the Government to distribute copies to the public, if either the subcontractor abandons the commercialization of the software or DOE march-in rights are exercised, for example, where the subcontractor has not taken effective steps to commercialize the software.

The deliverables expected will be detailed reports of technical activities, performance results,

and lessons learned associated with the endeavor. It is not expected that any software or hardware will be delivered to the Laboratories under the subcontracts. However, The Laboratories should consult with DOE Program to determine whether, if any, software developed under specific subcontracts should be delivered to DOE's Energy Science and Technology Software Center (ESTSC). DOE believes granting the copyright in software is warranted here in order to stimulate developed end products to purchase in the future.

The Delayed Release of Unpublished Data—Other Data

Since these subcontracts are for long-term commercialization activity, many companies will want to protect their data generated under the subcontracts from public release. However, DOE's policy (and statutory provisions) is to publicly release technical data that is funded by the U.S. Government. This policy promotes both the commercialization of the technology and the further development of knowledge in the academic/research community. However, many companies would be reluctant to enter into this subcontract if its competitors could have immediate access to the technology. DOE could limit the data delivered to E7 and DOE; however, E7 needs to receive all the pertinent data necessary to carry out the objectives of the Government's program. Therefore, DOE Program supports a delayed release of up to five years of technical data developed under the subcontracts in order to allow the subcontractor the opportunity for a competitive advantage to commercialize this technology. There are several exceptions where DOE may release the data, for example, when responding to a request under the Freedom of Information Act (FOIA). See Appendix B, Rights in Data Modifications, paragraph (d)(3) for a full list of exceptions.

Foreign Subcontracts

The provisions of this Class Advance Waiver do not automatically apply to any foreign owned or controlled subcontractors at any tier. However, the Laboratories should consult with DOE Patent Counsel and HQ Program to determine whether a foreign subcontractor could be granted the above rights or require the foreign subcontractor to submit a separate petition for an Advance Waiver to be approved by HQ.

Conclusion

This Class Advance Waiver and the terms of the intellectual property clauses included within the subject subcontracts are meant to cover the scope of the work under the *DesignForward* Program and shall not serve as precedent for any follow-on work to be negotiated separately with the selected subcontractors. Also, this Class Advance Waiver shall apply to second tier subcontracts that a first tier subcontractor issues. However, this Class Advance Waiver will not apply to foreign owned or controlled companies.

DOE Patent Counsel will qualify each subcontractor by written certification by the Laboratory

issuing the subcontract that this Class Advance Waiver is applicable. Such certification will include verification of the minimum percentage cost share by the subcontractor, a determination that the subcontractor is a U.S. company, and verification of the acceptability of the terms and conditions of the subcontract.

If any company does not qualify for this Class Advance Waiver or is not satisfied with the terms and conditions of the subcontract necessary to qualify for this Waiver, then that company may separately petition DOE for its own Advance Waiver.

For the foregoing reasons, and in view of the objectives and considerations set forth in 10 CFR 784, it is recommended that the requested waiver be granted for domestic first tier and second tier subcontracts issued under the *DesignForward* program.

Gary Drew

Date: Dec 21, 2012

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STATEMENT OF CONSIDERATIONS
W(C)2012-006

Based on the foregoing Statement of Considerations, it is determined that the interests of the United States and the general public will best be served by waiver of the United States' domestic and foreign patent rights, copyright in software copyright and delayed release of technical data as set forth herein, and therefore, the waiver is granted. This waiver shall not apply to a modification or extension of the subcontracts where, through such modification or extension, the purpose, scope or DOE cost of the subcontracts has been substantially altered. This waiver shall not affect any waiver previously granted.

CONCURRENCE:

[redacted]

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