

STATEMENT OF CONSIDERATIONS

CLASS WAIVER OF THE GOVERNMENT'S DOMESTIC AND FOREIGN PATENT RIGHTS AND COPYRIGHTS UNDER DOMESTIC FIRST AND SECOND-TIER SUBCONTRACTS, ISSUED BY OAK RIDGE NATIONAL LABORATORY (ORNL) UNDER DOE PRIME CONTRACT NO. DE-AC05-00OR22725 FOR NEW FRONTIERS INDUSTRY RESEARCH PROGRAM (NEW FRONTIERS)

WAIVER NO. W(C) 2024-003

Summary

Oak Ridge National Laboratory (ORNL), via the Oak Ridge Leadership Computing Facility (OLCF), will be issuing a Request for Proposal and awarding subcontracts for the New Frontiers industry research program to enable the next generation of exascale supercomputers in the 2027 and beyond time frame. This research is required to enable the fulfillment of the mission needs of the Advanced Scientific Computing Research (ASCR) Program within the Department of Energy (DOE) Office of Science (SC).

Background

DOE SC is the lead Federal agency supporting fundamental scientific research for energy and the nation's largest supporter of basic research in the physical sciences. The SC portfolio has two principal thrusts: direct support of scientific research and direct support of the development, construction, and operation of unique, open-access scientific user facilities. These activities have a wide-reaching impact. SC supports research in all 50 States and the District of Columbia, at DOE laboratories, and at more than 300 universities and institutions of higher learning nationwide. The SC user facilities provide the nation's researchers with state-of-the-art capabilities that are unmatched anywhere in the world.

Within SC, the mission of the Advanced Scientific Computing Research (ASCR) program is to discover, to develop, and to deploy computational and networking capabilities to analyze, to model, to simulate, and to predict complex phenomena important to the DOE. 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 science in the exascale era.

High-performance computing (HPC) and data-driven modeling and simulation are used extensively in advancing DOE missions in science. To maintain leadership and to address the future challenges in science, energy, health, and growing security threats, the United States must continue to push strategic advancements in HPC—bringing about a grand convergence of modeling and simulation, data analysis, workflows, deep learning, artificial intelligence (AI), quantum computing, and other emerging capabilities—across integrated infrastructures in computational ecosystems. New approaches to predictive analysis for scientific discovery and solutions to complex data-driven engineering problems will arise from this convergence.

The DOE exascale systems recently deployed (i.e., Frontier, Aurora, and El Capitan), as well as those to be developed, are designed to address this emerging convergence. These systems can run simulations that require the entire platform and take days to weeks to complete. The AI-driven approaches on these systems are used to perform uncertainty quantification and to discover complex, non-linear relationships in the output of large multi-physics simulations and large science experiments. The new capabilities of these systems will revolutionize scientific areas, such as energy production, materials design, chemistry, precision healthcare, advanced manufacturing, stockpile stewardship, and national security.

For the past decade, the six science programs in the DOE Office of Science have formulated strategic plans for the disciplines that they steward. These plans rely on HPC in ever-increasing proportion, and, in recent years, the explicit call for HPC at exascale performance levels has been a common and defining theme. Examples include discovery and characterization of next-generation materials; systematic understanding and improvement of chemical processes; analysis of the extremely large datasets resulting from the next generation of particle-physics experiments; and extraction of knowledge from systems-biology studies of the microbiome. Advances in applied energy technologies also are dependent on next-generation simulations, notably whole-device modeling in plasma-based fusion systems. The current Exascale Computing Project (ECP) has developed a portfolio of applications and technologies at exascale that will use the current DOE exascale systems, while benefiting next-generation systems.

In August of 2022, ORNL, in collaboration with the other ASCR laboratories, released a request for information (RFI) with the purpose of providing DOE SC with information for planning future DOE HPC Programs. The RFI responses highlighted numerous innovative ideas to address future HPC challenges. Informed by responses to the RFI, the DOE facilities drafted several, broad themes for strategic research and development (R&D) investment that will provide benefit to future extreme-scale applications:

- Hardware Technologies
 - Processor and Memory Advancements
 - Disaggregated and Heterogeneous Computing
 - Next Generation Storage Architectures
 - HPC Network Advancements
- Software Technologies
 - Compilers, Software Stack, and Programming Environments
- Cross Cutting
 - Co-Design of Algorithms, Software, and Hardware
 - Energy Efficiency
 - Reliability and Resiliency
 - Thermal Management
 - Quantum Computing
 - Integrated Research Infrastructure

These R&D activities will initially be pursued by ORNL through a program called New Frontiers. The objective of the New Frontiers program is to initiate partnerships with multiple companies to accelerate the R&D of critical technologies needed for the next generation of exascale computing. It is recognized that the broader computing market will drive innovation in directions that may not meet DOE's mission needs.

Many DOE applications place extreme requirements on computations, data movement, and reliability. New Frontiers seeks to fund innovative new and/or accelerated R&D of technologies targeted for productization in the 5–10-year timeframe. The period of performance for the subcontracts awarded by ORNL will be two years with a total funding of \$25M allocated for all awarded subcontracts.

ORNL will be soliciting innovative R&D proposals in the areas of hardware technologies, software technologies, and cross-cutting technologies. Due to the focus on extreme-scale application workflows, overall time to solution is also an important consideration. Software technologies will focus on open-source and sustainable software technologies for the extreme scale HPC system and the development of techniques necessary to support emerging workloads of integrated facilities across the DOE landscape. The goal is to begin to address long-lead time items that will impact extreme-scale DOE systems later this decade. Technology roadmaps, as they exist today, threaten to have a hugely disruptive and costly impact on development of DOE applications and ultimately a negative impact on the productivity of DOE scientists.

The Allocation of Patent Rights

Any small business or non-profit organization will retain the patent rights to its subject inventions under the Bayh-Dole Act, codified at 35 U.S.C. §§ 200-212. Such subcontracts will contain the 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 as set forth in the clause DEAR 952.227-13, *Patent Rights-Acquisition by the Government*. However, a subcontractor that agrees to cost share by an amount of **at least 40% of the total cost of the subcontract shall qualify for this Class Waiver** where DOE agrees to waive in advance, patent rights to the subcontractor such that it may elect its subject inventions. This patent rights waiver is subject to a retained government-use license, march-in rights, reporting requirements, DOE approval of assignments, 35 U.S.C. § 204, a U.S. Competitiveness provision (paragraph (t)), and other terms set forth in the *Patent Rights-- Waiver* clause in Appendix A, which will replace the 952.227-13 clause in all qualified subcontracts.

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 data developed under their subcontracts, specifically rights in computer software. Therefore, this Class 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 award, 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. The right to assert copyright in New Frontiers software is subject to a limited government-use license to allow the subcontractor sufficient opportunity to commercialize the software.

The Government reserves, via the limited government-use license, for itself and others acting on its behalf, a paid-up nonexclusive, irrevocable worldwide license in the computer software to reproduce, prepare derivative works, and perform publicly and display publicly (but not to distribute to the public) by or on behalf of the Government. Furthermore, the limited government-use license in copyrighted

software will expand to a broad Government license (which allows the Government to distribute copies to the public) if either the subcontractor abandons efforts to commercialize the software or DOE exercises its march-in rights when, for example, the subcontractor has not taken effective steps to commercialize the software. Separately, the broad Government license will also apply to whatever New Frontiers software the subcontractors release under an Open Source Software (OSS) license.

Notwithstanding the above approval to assert copyright in computer software, a subcontractor delivering software under a New Frontiers subcontract shall comply with the requirements of the subcontract governing copyright and rights in data, including the standard policies and practices regarding submission to DOE's Office of Science and Technical Information (OSTI) via its DOE CODE platform. ORNL's treatment of delivered software shall be governed by the applicable terms of its prime contract. Therefore, ORNL should consult with ASCR (and with DOE Patent Counsel's concurrence) to determine which software developed under specific subcontracts should be (a) delivered to ORNL and/or (b) required by the subcontract to be distributed under an OSS license.

DOE believes that the above approach for allocating rights in New Frontiers computer software is warranted in order to stimulate the development of end products for future purchase. The proposed subcontract language for these data rights is also attached in Appendix A.

Foreign Subcontracts

The provisions of this Class Waiver do not automatically apply to any foreign-owned or foreign-controlled subcontractors at any tier. However, ORNL should consult with ASCR to determine whether DOE should grant a foreign subcontractor this waiver's disposition of rights or require the foreign subcontractor to submit a separate waiver petition to be approved by DOE's Assistant General Counsel for Technology Transfer and Intellectual Property.

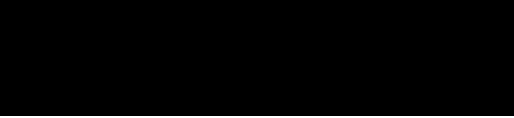
Conclusion

This Class Waiver and the terms of the intellectual property clauses included within the subject subcontracts are meant to cover only the scope of the work under the New Frontiers procurements for ORNL and shall not serve as precedent for any follow-on work to be negotiated separately with the selected subcontractors. This Class Waiver shall apply to domestic second-tier subcontracts that a first-tier subcontractor issues but shall not apply to foreign-owned or foreign-controlled subcontractors except as provided above.

DOE Patent Counsel will qualify each subcontractor upon written certification by ORNL that this Class 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, a review of the subcontractor's foreign ownership and control, and verification of the acceptance of the terms and conditions of the subcontract.

If any company does not qualify for this Class 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 Waiver.

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



Emily G. Schneider
Deputy Chief Counsel for Intellectual Property
DOE Oak Ridge Office of Chief Counsel
GC-South

Based upon the foregoing Statement of Considerations, it is determined that the interests of the United States and the general public will best be served by a waiver of the United States and foreign patent rights, and, therefore, the waiver is granted. This waiver shall not affect any waiver previously granted.

CONCURRENCE:

by signed by

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APPROVAL:

Brian Lally

Associate Director
Office of Advanced Scientific Computing Research
Office of Science, DOE Date: _____

