STATEMENT OF CONSIDERATIONS

CLASS WAIVER OF PATENT RIGHTS RELATED TO QUANTUM INFORMATION SCIENCE AND ITS TECHNOLOGY APPLICATIONS
W(C) 2020-001; CH-1815

Pursuant to 10 C.F.R. 784, the United States (U.S.) Department of Energy ("DOE") has determined that it will best serve the interest of the United States and the general public to waive rights to inventions conceived or first reduce to practice by a domestic large business performing quantum information science (QIS) research under an Office of Science funding agreement. QIS is at the threshold of a revolution and DOE needs full participation of domestic large businesses to ensure that U.S. leadership in quantum information science and its applications is maintained and expanded over the next decade.

In response to these opportunities and challenges, the National Strategic Overview for QIS[1] was drafted by the National Science and Technology Council, Committee on Science, Subcommittee on Quantum Information Science (SCQIS). The SCQIS "coordinates federal research and development (R&D) in quantum information science and related technologies" and "aims to ensure that U.S. leadership in quantum information science and its applications is maintained and expanded over the next decade." Quantum Information Science (QIS) generally refers to the ability to exploit intricate quantum mechanical phenomena to create fundamentally new ways of obtaining and processing information. The National Strategic Overview divided the current QIS portfolio into seven broad categories: four in fundamental science (S1-S4) and three in technological development (T1-T3)[2]. The four fundamental sciences include (S1) quantum sensing, (S2) quantum computing, (S3) quantum networking, and (S4) scientific advances enabled by quantum devices and theory advances. The three technology development categories include (T1) supporting technology, (T2) future applications, and (T3) risk mitigation. The National Strategic Overview identifies DOE as one of the agency leaders for three of the fundamental sciences (S1, S2, and S4) and one of the technology developments (T2). QIS technologies may be used for a variety of applications including, but not limited to, the development of quantum processors which may enable limited computing applications; new sensors for biotechnology and defense; next-generation positioning, navigation, and timing systems for military and commercial applications; new approaches to understanding materials, chemistry, and even gravity through quantum information theory; novel

[1] National Science and Technology Council publication, *https://www.whitehouse.gov/wp-content/uploads/2018/09/National-Strategic-Overview-for-Quantum-Information-Science.pdf* .
[2] National Strategic Overview for QIS, Appendix.

algorithms for machine learning and optimization; and transformative cyber security systems including quantum-resistant cryptography in response to developments in QIS.

On December 21, 2018, the President signed into law the National Quantum Initiative Act (the "Act") in part "to ensure the continued leadership of the United States in [QIS] and its technology applications." The Act establishes a National Quantum Coordination Office within the White House Office of Science and Technology Policy, an outside advisory group, and an interagency working group to lead and oversee a ten-year National Quantum Initiative Program. The National Quantum Initiative Program includes, in part, various QIS research activities by DOE, the National Institute of Standards and Technology (NIST), and the National Science Foundation (NSF). The Act directs DOE to carry out a basic research program in QIS and to establish and operate at least two, but no more than five, QIS Centers ("Centers"). In addition, the Act addresses U.S. competitiveness and specifically requires "[t]o the maximum extent practicable, the Centers developed, constructed, operated, or maintained under this section shall serve the needs of the Department of Energy, industry, the academic community, and other relevant entities to create and develop processes for the purpose of advancing basic research in QIS and its technology applications through the use of the designated Centers thereby improving the competitiveness of the United States."

On December 20, 2019, the President signed into law the Further Consolidated Appropriations Act, 2020, which, provides $195 million for QIS across Office of Science programs, including $120 million for a QIS basic research program and $75 million to establish the Centers.

On January 10, 2020, the DOE Office of Science issued Funding Opportunity Announcement (FOA) No. DE-FOA-0002253, "National Quantum Information Science Research Centers." According to the FOA, DOE currently plans to fund the Centers at between $10 million and $25 million per year for a five-year award term, subject to the availability of appropriations. The Centers are intended to accelerate the transformational advances in basic science and quantum-based technology needed to develop world-leading capabilities in QIS. The Centers, coupled with a robust core research portfolio stewarded by the individual SC programs, will create the ecosystem needed to foster and facilitate advancement of QIS with public benefits in national security, economic competitiveness, and leadership in scientific discovery. DOE expects to make several QIS awards under DE-FOA-0002253. The awards may be in the form any funding agreement, including cooperative agreements, Technology Investment Agreements (TIAs), field work authorizations, and interagency agreements. The award size will depend on the number of meritorious applications and the availability of appropriated funds with a maximum of $25,000,000 and a minimum of $10,000,000 per year, not including cost share. DOE anticipates the total value of awards made between $100 million and $625 million, subject to the availability of funds.

Other SC funded awards for QIS and QIS technology applications are also anticipated. This patent class waive will empower domestic large businesses to fully participate and expediently commercialize QIS and QIS technology applications.

This class waiver of the Government's rights in inventions is subject to the usual advance patent waiver provisions, including the usual Government license, march-in rights, and preference for U.S. industry provisions comparable to those set out in 35 U.S.C. §§ 202-204. This patent waiver also includes the attached U.S. Competitiveness clause which requires that products embodying any waived invention or produced through the use of any waived invention be manufactured substantially in the United States unless the participant can show to the satisfaction of DOE that it is not commercially feasible to do so. In the event DOE agrees to foreign manufacture, there will be a requirement that the Government's support of the technology be recognized in some appropriate manner, e.g., recoupment of the Government's investment, etc. The Contractor will further agree to make this condition binding on any assignee or licensee or any entity otherwise acquiring rights to any waived invention, including subsequent assignees or licensees. Should the Contractor or other such entity receiving rights in any waived invention undergo a change in ownership amounting to a controlling interest, then the waiver, assignment, license, or other transfer of rights in the waived invention is suspended until approved in writing by DOE. Furthermore, in the event that a contractor fails to comply with the requirement to substantially manufacture a subject invention in the U.S., DOE shall obtain title (i.e. title reverts back to DOE). This right to obtain title for a breach of the U.S. Competitiveness requirement will provide DOE a quick and effective means of commercializing valuable QIS inventions in the interests of the U.S.

The grant of this class waiver is not expected to result in adverse effects on competition or market concentration. Rather the waiver should enhance competition and growth in the QIS and its technology applications.

This class patent waiver is available to any domestic large business that (1) is a recipient, or subrecipient at any tier, to a funding agreement issued under DE-FOA-0002253 or as designated in any other FOA related to QIS and its technology applications and (2) is providing at least 20% cost share from non-federal sources for the work assigned to it under their funding agreement. A domestic large business, as used herein, is any for-profit entity that does not qualify as a "small business" under Bayh-Dole[3] and is incorporated (or otherwise formed) under the laws of a particular State or territory of the United States and is not owned, controlled, or influenced by a foreign government, agency, firm, corporation or person. The waiver will remain in effect as long as such cost sharing is maintained, in

[3] 35 U.S.C. 201 et seq.

aggregate, over the term of the agreement. A large business, whether recipient or sub-recipient, that does not accept the terms of this waiver, or is otherwise ineligible may petition for an advanced or identified patent waiver.

Unless otherwise specified in the FOA or instructed by DOE patent counsel, this class patent waiver shall be incorporated into each funding agreement issued to a domestic large business that meets the above identified criteria. Unless otherwise specified in the FOA or instructed by DOE patent counsel, this class patent waiver shall also apply to any domestic large business who is a sub-recipient (at any tier), including a subcontractor to a DOE Laboratory, if the sub-recipient meets the above identified criteria and accepts the terms and conditions of the class patent waiver.

Considering the foregoing, and in view of the statutory objectives to be obtained and the factors to be considered under DOE's waiver regulation, 10 C.F.R. 784, all of which have been considered, it has been determined that this class waiver as set forth above will best serve the interest of the United States and the general public. It is recommended that the waiver be granted.

[redacted]

Michael J. Dobbs
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Intellectual Property Law Division
DOE SC

Date:_____

Based upon the foregoing Statement of Considerations and representations in the attached waiver petition, it is determined that the interests of the U.S. and the general public will best be served by a waiver of patent rights of the scope described above, and therefore the waiver is granted.

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