AMENDMENT TO THE AMENDMENT IN THE NATURE OF A SUBSTITUTE TO H.R. 9372 OFFERED BY MR. OBERNOLTE OF CALIFORNIA

Add at the end the following:

SEC. 3. LIQUID COOLING DEPLOYMENT AND SCALABILITY.

(a) REVIEW.—Not later than 30 days after the date of the enactment of this Act, the Director of the Office of Science of the Department of Energy (in this section referred to as the ''Director'') shall initiate a review of the research and development and technological needs affecting liquid cooling utilization by data centers.

(b) ELEMENTS.—The review required under subsection (a) shall include the following:

(1) An evaluation of liquid cooling research and development needs, and the costs and benefits for high performance computing.

(2) A description of avoided costs of energy, including deferred and avoided new electric transmission and infrastructure upgrades and associated costs.

(3) A description of increased compute capacity by enabling more energy to be used for computing workloads rather than cooling.

(4) A survey and analysis of existing research on the positive and negative effects of liquid cooling on computing performance, resiliency, and cybersecurity.

(5) A comparison of direct-to-chip (DTC) liquid cooling and immersion cooling approaches across representative density bands, including relating to thermal performance, maintainability, interoperability, safety, failure modes, and lifecycle cost.

(6) An evaluation of coolant options, including water, water-glycol, and engineered fluids, materials compatibility, corrosion control, bio growth mitigation, filtration, deaeration, and fluid monitoring and management.

(7) Recommendations relating to whether liquid cooling should be considered as a primary cooling option over air cooling due to the thermal conditions of computing components in servers within data centers.

(8) Development of reference architectures and layouts for rack, row, and room-level liquid distribution by density band and cooling approach.

(9) A survey of existing opportunities for reusing waste heat produced by data centers.

(10) An evaluation of failure scenarios (such as pump failures or fluid leaks) and mitigation strategies, especially in shared co-location environments.

(c) REQUIREMENTS.—

(1) RECOMMENDATIONS.—In preparing the review required under subsection (a), the Director may include recommendations, including considerations relating to the following:

(A) The Department of Energy's utilization of and ongoing research on liquid cooling technologies.

(B) Methods to enhance the security, reliability, and resilience of computing equipment and data centers.

(2) STAKEHOLDER INPUT.—With the goal of identifying the best practices and industry standards referred to in paragraph (1)(A), the Director shall consult with approrpriate representatives of the Federal Government, State and local governments, the private sector, academia, and National Laboratories.

(d) REPORT.—Not later than 90 days after the date of enactment of this Act, the Director shall submit the appropriate congressional committees a written report containing the results, findings, and any associated rec-

ommendations of the review required under subsection (a), including the following:

(1) Relevant considerations for Congress regarding the importance of liquid cooling for the United States to maintain its global lead in AI technologies.

(2) Recommendations for research and development on liquid cooling and heat-reuse.

(e) DEFINITIONS.—In this section:

(1) AI.—The term ''AI'' has the meaning given the term ''artificial intelligence'' in section 5002 of the National Artificial Intelligence Initiative Act of 2020 (15 U.S.C. 9401).

(2) APPROPRIATE CONGRESSIONAL COMMITTEES.—The term ''appropriate congressional committees'' means—

(A) the Committee on Science, Space, and Technology of the House of Representatives; and

(B) the Committee on Commerce, Science, and Transportation of the Senate; and

(3) DIRECT-TO-CHIP (DTC) LIQUID COOLING.—The term ''direct-to-chip (DTC) liquid cooling'' means a liquid cooling method that involves circulating a coolant in direct contact with applicable

heat-generating components, such as processors and memory modules, to efficiently absorb and transfer heat away.

(4) HEAT-REUSE.—The term ''heat-reuse'' means the capture and transfer of waste heat from liquid loops for beneficial secondary use through appropriate interfaces and controls.

(5) IMMERSION COOLING.—The term ''immersion cooling'' means a cooling technique that involves submerging electronic components in a dielectric fluid to absorb and dissipate heat within a preset temperature range.

(6) LIQUID COOLING.—The term ''liquid cooling'' means utilization of liquids to remove heat efficiently from electronic components.

(7) NATIONAL LABORATORY.—The term ''National Laboratory'' has the meaning given such term in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801).