STATEMENT OF CONSIDERATIONS

REQUEST FOR ADVANCE WAIVER OF PATENT RIGHTS BY BALLARD POWER SYSTEMS ("BALLARD") UNDER DOE AWARD NO. DE-EE0009618; W(A) 2022-005

BALLARD has requested a waiver of patent rights of the United States of America for all subject inventions arising from its participation under the above referenced award entitled "High Efficiency and Transient Air Systems for Affordable Load-Following Heavy-Duty Truck Fuel Cells." BALLARD is a sub-awardee to Eaton Corporation.¹ This advance patent waiver applies only to subject inventions made by BALLARD.

Eaton Corporation's project proposes a fundamentally new architecture for fuel cells air systems that will drive a step-change of their efficiency, power density and life to match the needs of heavy-duty freight, and thus enable significant decarbonization of the U.S. transportation sector. The project's objectives are to design, simulate, and optimize an air management system composed of Roots machines. The scope of this system would include a compressor, expander, electric motor, inverter, geartrain, recuperator, and a water dosing system to replace the humidifier. The final project deliverable will be a sub-scale prototype heavy-duty vehicle air management system.

BALLARD's responsibility is to develop air system requirements for the appropriate fuel cell system. Development of the requirements will make use of BALLARD fuel cell stack and system models to compare different operating and system concepts. A foreign work waiver was granted by DOE to allow the project to benefit from the BALLARD engineers located in Canada who have the capability to run the necessary system models.

The total cost for BALLARD's activities under the award is \$200,000. This is 10% of the total budget project. BALLARD's amount includes \$160,000 federal funds and \$40,000 cost share or 20% cost share. The patent waiver is conditioned on BALLARD maintaining at least this cost share percentage. The performance of period for the award is approximately 27 months.

BALLARD is a world leader in the hydrogen fuel cell industry. It was established over 40 years ago and has over 1400 patents and patent applications. In 2021, BALLARD had \$104.5 million from sales of fuel cell products and services. It has invested more than \$1 billion in its proprietary proton-exchange membrane (PEM) technology, including millions in labor to develop stack and system models that will benefit this project.

While the work under the award will be performed in Canada, BALLARD has a strong industrial U.S. presence in terms of manufacturing, service, commercial sales, demonstration, partners and operations. BALLARD has agreed to the same U.S. competitiveness provision that applies to Eaton Corporation under the class patent waiver, i.e., any products embodying any waived invention or produced through the use of any waived invention will be manufactured substantially in the United States unless BALLARD can show to the satisfaction of DOE that it is not commercially feasible to do so. In addition to U.S. competitiveness provision, this

¹ Eaton Corporation is subject to the EERE Class Patent Waiver for Domestic Large Businesses W(C) 2016-004. BALLARD does not qualify for the Class Patent Waiver because it is a Canadian company.

advance patent waiver will include the same terms and conditions as the class patent waiver. For example, it will be subject to the march-in and preference for U.S. industry provisions, as well as the U.S. Government license, comparable to those set out in 35 U.S.C. 202-204.

Referring to item 10 of the waiver petition, BALLARD does not believe this patent waiver would place it in a dominant position because the inventions are likely to be incremental and not fundamentally impact competitiveness compared to other technologies in the marketplace.

Considering the foregoing, it is believed that awarding this waiver will provide BALLARD with the necessary incentive to invest its resources in commercializing the results of the award in a manner that will make the above technology available to the public in the shortest time. Therefore, upon evaluation of the waiver petition and in view of the objectives and considerations set forth in 10 CFR 784, all of which have been considered, it is recommended that the requested waiver be granted.



Glen Drysdale Patent Attorney Golden Field Office

APPROVAL:

Date:

Based upon the foregoing Statement of Considerations and representations in the attached waiver petition, it is determined that the interests of the United States and the general public will be best served by a waiver of patent rights of the scope determined above, and therefore the waiver is granted. This waiver shall not apply to any modification or extension of the award, where through such modification or extension, the purpose, scope, or cost of the award has been substantially altered.

Dr. Sunita Satyapal	Brian Lally
Director	Assistant General Counsel for Technology
Hydrogen and Fuel Cell Technologies	Transfer and Intellectual Property
Office (HF1O)	
Date:	Date:

CONCURRENCE: