

## STATEMENT OF CONSIDERATIONS

### REQUEST FOR ADVANCE WAIVER OF PATENT RIGHTS BY BALLARD POWER SYSTEMS (“BALLARD”) UNDER DOE AWARD NO. DE-EE0009620; W(A) 2022-004

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 “Leveraging Internal Combustion Engine (ICE) Air System Technology for Fuel Cell System Cost Reduction.” BALLARD is a sub-awardee to Caterpillar Inc.<sup>1</sup> This advance patent waiver applies only to subject inventions made by BALLARD.

The objective of project is to develop a fuel cell air system to support 350 to 1,000kW fuel cells for heavy-duty on-road, off-road, marine, rail, and electric power applications. If successful, the resulting design will fill a gap where no current solution exists. Currently, for fuel cell systems of 350kW or greater, the only existing air system option is to combine multiple smaller boosting devices in parallel to deliver the required airflow. These smaller boosters are poorly suited to heavy duty application needs as they are typically designed to be powered by lower 250V-450V power supplies, whereas heavy-duty applications have 450V-800V capability. In addition, these smaller boosters are developed for automotive and light-duty applications with typical lifetimes between 6,000-8,000 hours, well short of the 25,000-hour heavy duty requirements.

A foreign work waiver was granted by DOE for BALLARD in order to allow the project to utilize BALLARD’s systems engineering group, located in Canada, whose facilities and expertise is considered critical for the project. BALLARD’s responsibility is to develop air system requirements for the appropriate fuel cell system by making use of BALLARD’s fuel cell stack and system models to compare different operating and system concepts. BALLARD is a world leader in developing fuel cell stacks and systems for heavy-duty applications and has wide industry knowledge for applications as well as a detailed understanding of what a fuel cell air system needs to accomplish to maximize performance and longevity and minimize lifecycle cost. BALLARD will carry out the system modeling activities needed to define air system requirements. The systems engineering group will work with the stack engineers at the same location to ensure the system and stack work together to maximize performance and overall lifetime of the system.

The total cost for BALLARD’s activities under the award is \$161,000. This is 6.4% of the total project budget. BALLARD’s amount includes \$129,000 federal funds and \$32,000 cost share or approximately 20% cost share. The patent waiver is conditioned on BALLARD maintaining at least this cost share percentage. The performance period for the award is approximately 30-36 months.

As noted above, BALLARD is a world leader in the 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

---

<sup>1</sup> Caterpillar Inc. 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.

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 Caterpillar Inc. 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 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.



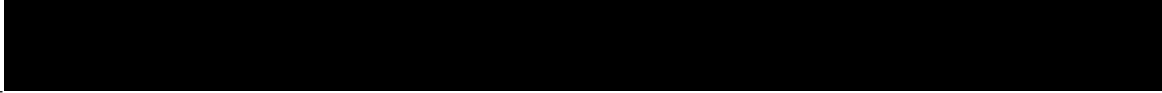
Glen Drysdale  
Patent Attorney  
Golden Field Office

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.

CONCURRENCE:

APPROVAL:



Dr. Sunita Satyapal  
Director  
Hydrogen and Fuel Cell Technologies  
Office (HFTO)

Brian Lally  
Assistant General Counsel for Technology  
Transfer and Intellectual Property

Date: \_\_\_\_\_

Date: \_\_\_\_\_