

## STATEMENT OF CONSIDERATIONS

REQUEST BY PARKER HANNIFIN CORPORATION FOR AN ADVANCE WAIVER OF DOMESTIC AND FOREIGN  
PATENT RIGHTS UNDER DOE PROPOSAL NO. DE-EE0000412

W(A) 2009-060

The Petitioner, Parker Hannifin Corporation, has requested a waiver of domestic and foreign patent rights for all subject inventions arising from its participation under the above referenced grant entitled "Multiphase Liquid Cooling Technology Development for High Power Electronics." Any subcontractors of the Petitioner, if there will be any, are not subject to the waiver. At this time, the Petitioner does not intend to use subcontractors.

The objective of this project is the design, development, and commercialization of a two-phase refrigerant cooling solution for use with power electronics systems. The two-phase refrigerant cooling solution is configured to simultaneously remove heat from three modular sub-systems that constitute most of the modern-day power electronics systems. The cooling solution uses one or more dielectric pumps that supply liquid refrigerant to the different modular sub-systems in parallel. The liquid refrigerant absorbs heat from the modular sub-systems and leaves as a two-phase mixture. An air-cooled condenser rejects heat to the ambient and converts the two-phase mixture to liquid state. This sub-cooled liquid is then returned to the pumps to complete the cooling cycle. It is believed that this new two-phase refrigerant cooling solution provides certain improvements compared to conventional air-cooling systems and water-cooling systems.

The total anticipated cost of the project is \$907,678 with the Petitioner providing approximately 29% cost share, totaling \$262,191. This waiver is contingent upon the Petitioner maintaining the foregoing cost sharing percentage over the course of the grant.

As noted in its waiver petition, the Petitioner is a leading global supplier of air conditioning and refrigeration components and subsystems. The Petitioner is also a major HVAC subsystem manufacturer with significant worldwide capacity. The Petitioner is fully committed to providing high density electronic control systems to the market, and is doing research in multiple areas toward this purpose. For example, the Petitioner has to date invested more than \$5,000,000 to bring the technology where it is today including developing unique pumping technology to enable the work under this project. This activity has generated 12 new patent applications. The Petitioner's experience, capability, private investment and dedication indicate that the Petitioner is best suited to expedite the commercialization of the research, development, and demonstration results under this project.

Petitioner has agreed that this waiver shall 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. Further, Petitioner has agreed to the U.S. competitiveness provisions as attached to this Statement. In brief, Petitioner has agreed that products embodying intellectual property developed under this agreement shall be substantially manufactured in the United States, and that Petitioner will not license, assign, or otherwise transfer any waived invention to any entity unless that entity agrees to these same requirements.

According to the Petitioner, the bulk of the conventional cooling technologies are based in low-cost countries of the Pacific Rim. With the patent rights to the subject invention, the Petitioner is more likely to invest and obtain investment from its partners in this new cooling technology in the United States creating or sustaining more jobs in the United States and preventing the transition of even more jobs from United States to low-cost countries.

Referring to item 10 of the waiver petition, granting this waiver is not anticipated to create an anticompetitive environment due to the number of competitors and the availability of alternative proven and low-cost technologies. Specifically, today most high power electronic systems are cooled by a single phase water loop. This is proven technology readily available to the at least 42 domestic companies and at least twice as many international companies competing in this market. Moreover, these companies have access to an established supply base and have robust sales channels and deep customer relationships. Therefore, even with the granting of this waiver, the market for cooling technologies should remain competitive.

Considering the foregoing, it is believed that granting this waiver will provide Petitioner with the necessary incentive to invest its resources in commercializing the results of the agreement 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 R. Drysdale  
Patent Attorney  
Golden Field Office

Date: 11/16/09

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 best be 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 agreement, where through such modification or extension, the purpose, scope, or cost of the agreement has been substantially altered.

CONCURRENCE:



Douglas Kaempf  
Program Manager  
Industrial Technologies Program

Date:

4/5/2010

APPROVAL:



Paul A. Gottlieb  
Assistant General Counsel for Technology  
Transfer and Intellectual Property

Date:

4/7/2010

## **U.S. COMPETITIVENESS**

The Petitioner agrees that any products embodying any waived invention or produced through the use of any waived invention will be manufactured substantially in the United States, unless the Petitioner 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 Petitioner further agrees to make the above condition binding on any assignee or licensee or any entity otherwise acquiring rights to any waived invention, including subsequent assignees or licensees. Should the Petitioner 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 any waived invention is suspended until approved in writing by DOE.