STATEMENT OF CONSIDERATIONS

REQUEST FOR ADVANCE WAIVER OF PATENT RIGHTS BY SHELL GLOBAL SOLUTION INTERNATIONAL B.V. ("SHELL GLOBAL")
UNDER DOE AWARD NO. DE-EE0009387; W(A) 2021-002

SHELL GLOBAL has requested a waiver of worldwide patent rights of the United States of America for all subject inventions arising from its participation, including the participation of any SHELL GLOBAL affiliate, under the above referenced award entitled "First Demonstration of a Commercial Scale Liquid Hydrogen Storage Tank Design for Maritime and International Trade Applications."

The award is to Shell International Exploration and Production, Inc. (Shell IEP), a domestic affiliate of SHELL GLOBAL. The work to be performed by employees of Shell IEP and its subrecipients, which are domestic entities, will be covered by the EERE Class Patent Waiver for Domestic Large Businesses W(C) 2016-004. To support the award, Shell IEP requested and was granted approval by DOE through the foreign work waiver process to use at least one employee employed by SHELL GLOBAL or its affiliates . The granting of this patent waiver will allow Shell IEP to treat subject inventions made by employees of Shell GLOBAL and its affiliates in the same manner.

The project is to develop an affordable large-scale liquid hydrogen storage tank suitable for import and export terminals. These types of tanks are necessary to allow for a cost effective and global hydrogen supply chain. The objective is to develop a tank that can be used to store 1,400-7,100 metric tons of hydrogen

Shell IEP and SHELL GLOBAL are part of Royal Dutch Shell plc, one of the largest retailers of transportation fuels in the world. Historically, Royal Dutch Shell plc has been associated with oil and gas. Over the last two decades, it has also been a leader in hydrogen production, supply chain and application technology, especially through its dedicated business unit, Shell Hydrogen. Shell Hydrogen has participated in joint ventures and alliances to build hydrogen refueling stations for passenger cars in the U.S., Canada, Germany and the United Kingdom. It has opened eight hydrogen refueling stations in California, with a ninth soon to be opened. It was awarded $40.8 million by the California Energy Commission to install hydrogen refueling equipment at 48 other Shell retail stations, update two Shell hydrogen stations and add light-duty fueling dispensers at an existing hydrogen heavy-duty truck station. Royal Dutch Shell plc is also working to develop a global hydrogen supply chain, including transporting clean hydrogen fuel from energy rich countries to energy short countries. It has participated in the Hydrogen Energy Supply Chain Technology Research Association program to transport liquified hydrogen from Australia to Japan.

Shell IEP has partnered with CB&I Storage Solutions LLC (CB&I), a sub-recipient of the award. CB&I is a world leader in the design, fabrication, construction, and commissioning of cryogenic storage tanks. CB&I has built over 1125 low-temp and cryogenic storage tanks, over

230 LNG storage tanks and over 100 vacuum insulated double wall spherical pressure vessels. CB&I has approximately 950 U.S. patents related to the design and construction of storage tanks and pressure vessels.

The total anticipated cost of the award is $12,000,000, including $6,000,000 in cost share. The anticipated cost for Shell IEP's activities under the award is $2,535,000. At the time of the waiver, there has been only one employee of a Shell IEP affiliate approved to work on the project under the award. The anticipated cost for that work is $465,000. Any work done by a Shell IEP affiliate will be in the form of cost share. No federal funds are being used by a Shell IEP affiliate. In total, Shell IEP and its affiliates are providing approximately $3,000,000 in cost share. In addition, CB&I will provide approximately $3,000,000 in cost share. The period of performance of the award is 36 months.

SHELL GLOBAL 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, SHELL GLOBAL has agreed to the U.S. Manufacturing Plan that has been approved for Shell IEP.

The U.S. Manufacturing Plan includes the standard U.S. Competitiveness provision, in which products embodying a waived invention or produced through the use of a waived invention will be manufactured substantially in the United States. However it does allow for local activities, including manufacturing, to support the installation of the hydrogen storage vessels globally. A copy of the U.S. Manufacturing Plan is attached.

The objective of the award is to develop hydrogen storage vessels that are likely to be installed globally. The primary products resulting from the award are novel insulation systems, installation techniques and the conceptual design of the storage vessels. The insulation system developed for this project will be a unique combination of insulation materials already commercially available. Any proprietary installation equipment needed to apply the insulation systems will be manufactured in the U.S. But the installation of the insulation systems will occur at the point of final installation which would be outside the U.S. for non-U.S. projects by a U.S. based crew. Similarly, due to the sizes of the vessels, the storage vessels must rely on fabrication centers and field construction near or at the location of the final installation which requires some manufacturing outside the U.S. for non-U.S. projects. All design and detail engineering activities related to the storage vessels will be in the U.S. and the personnel required for commissioning and startup of the storage vessels will be U.S. based labor.

Referring to item 10 of the waiver petition, SHELL GLOBAL does not believe the waiver would place it in a dominant position due to competing technologies being developed by different companies.

Considering the foregoing, it is believed that awarding this waiver will provide SHELL GLOBAL 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.

[redacted]

Glen Drysdale
Patent Attorney
Golden Field Office

Date: 06/23/21

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:

[redacted]

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

Date: _____

APPROVAL:

Brian Lally
Assistant General Counsel for Technology Transfer and Intellectual Property

Date: 7.26.21

(t) U.S. COMPETITIVENESS

The Contractor 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 Contractor can show to the satisfaction of the DOE that it is not commercially feasible to do so. For storage vessels installed outside the U.S., the Contractor may rely on international fabrication centers and field construction near or at the final installation location to construct and assembly the storage vessels provided any proprietary equipment needed to apply the insulation system for the storage vessels are manufactured in the U.S. and the applying of the insulation will be done by a U.S. based crew. All design and detail engineering activities related to the storage vessels embodying or made through the use of a waived invention will be in the U.S. and the personnel required for commissioning and startup of the storage vessels will be U.S. based labor. In the event the DOE agrees to foreign manufacture beyond the activities already provided for above, 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 agrees that it will not license, assign or otherwise transfer any waived invention to any entity unless that entity agrees to these same requirements. Should the Contractor or other such entity receiving rights in the 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 the DOE.