# STATEMENT OF CONSIDERATIONS

REQUEST BY PRAXAIR, INC. AND BP AMOCO, FOR AN ADVANCE WAIVER OF DOMESTIC AND FOREIGN INVENTION RIGHTS UNDER DOE COOPERATIVE AGREEMENT NO. DE-FC26-01NT41096; W(A)-01-022, CH-1069

The Petitioner, Praxair, Inc. (Praxair), was awarded this cooperative agreement for the performance of work entitled, "Development of OTM Syngas Process and Testing of Syngas-Derived Ultra-Clean Fuels in Diesel Engines and Fuel Cells." The petitioner BP Amoco Production Company (BP) is a subcontractor to Praxair for this cooperative agreement. Praxair and BP are each petitioning for an advance patent waiver to their own inventions made in the performance of their respective work under the cooperative agreement. Upon grant of the waiver, Praxair will take title to Praxair inventions, and BP will take title to BP inventions. This thirty-nine month project has three objectives: 1) develop an advanced syngas technology, based on Oxygen Transport Membranes, that will provide a step change reduction in the cost of converting natural gas to a spectrum of liquid transportation fuels and thereby improve the prospects for meeting vehicle emissions targets with cost competitive ultra clean transportation fuels (UCTFs); (2) evaluate the performance of, and emissions from, selected syngas-derived UCTFs in advanced vehicle propulsion systems, including advanced diesel engines with post treatment and fuels cells; and 3) develop an optimized UCTF/diesel engine/exhaust after treatment system capable of meeting 2007 emission regulations.

The total estimated cost of the cooperative agreement is about $39,612,147 in four budget periods over thirty nine months. A table showing the cost sharing over this period is attached as Attachment 1; the overall cost sharing for the project is Praxair and BP cost sharing 62.1%, or $24,612,147 and DOE 37.9% or $15,000,000. An e-mail from Praxair Patent Counsel indicates BP cost sharing in excess of 20% (Attachment 2). This e-mail also indicates that Praxair does not have rights in BP inventions.

In its response to questions 4 and 5 of the attached waiver petition, Praxair indicates that it is technically competent in the field of oxygen transport membrane technology for syngas production. Development began in 1994 with the objective of developing ceramic transport membrane processes for separating and purifying industrial products at lower costs. This has resulted in thirty-one issued patents for Praxair. The patents most relevant to the subject cooperative agreement are listed in Appendix A. In addition, Praxair has partnered with BP Amoco, Statoil, and Sasol, and together with these companies has co-developed oxygen transport membranes for syngas production and advanced the technology to the pilot stage. Several other technical competencies are detailed in response to question 4. In addition, Praxair has described its relevant commercial expertise in response to question 5. It is a supplier of industrial gases such as syngas (a mixture of hydrogen and carbon monoxide), oxygen, hydrogen, carbon monoxide, carbon dioxide, helium, nitrogen, argon, etc. Praxair also has expertise in the ceramics manufacturing necessary for commercializing the OTM technology that is the subject of this agreement, as well as in the air separation technologies important to bringing ceramic membranes to commercial reality.

BP's response to questions 4 and 5 also indicates its technical competence in the field of OTM reactors for syngas production. It began in the mid 1980's and has collaborated with the

Department of Energy and Argonne National Laboratory through the 1990s. Its work in this field has resulted in over twenty patents, twenty-five publications, and hundreds of presentations around the world. A list of relevant patent is attached as Appendix A to BP's waiver petition. In response to question 5, BP states that is the second largest marketer of gasoline in the nation.

Praxair's and BP's responses to questions 4 and 5 thus demonstrate their competencies and experiences in commercializing new technologies, and that these experiences will enhance the potential for successful development and commercialization of technologies for OTM ceramic membranes.

From its response to questions 8 and 9, Praxair indicates that grant of the waiver will increase its incentive to rapidly commercialize the technology to benefit the U.S. economy and create another syngas alternative in the market place. Since Praxair is one of five major worldwide industrial gas suppliers, grant of the waiver is unlikely to decrease competition or cause undesirable market concentration. Similarly, BP states that grant of the waiver is unlikely to have a negative effect on competition. BP is in an already established position, and has substantial Intellectual Property covering the OTM technology. Grant of the waiver will have a marginal effect on BP's intellectual property rights. Therefore, grant of the waiver will increase Praxair's and BP's incentive to rapidly develop and commercialize OTM technology to the benefit of the U.S. economy.

The subject cooperative agreement will be modified to add the Patent Rights--Waiver clause in conformance with 10 CFR 784.12. This waiver clause will also include a paragraph entitled U.S. Competitiveness, in which both Praxair and BP have agreed to substantial U. S. manufacture of subject inventions (attached hereto). This clause has been modified at Praxair's and BP's request to include a preamble limiting and defining the technology to which the clause will apply, a preamble which has been previously approved for other Praxair ceramic OTM waivers. In all other respects, the attached clause is the standard DOE U.S. Competitiveness article. Additionally, Praxair and BP agree not to transfer subject inventions to any other entity unless that other entity agrees to these same requirements. The petitioners have further agreed to modification of the data clause of the subject cooperative agreement (48 C.F.R. 952.227-14) by adding paragraph (k), Alternative VI, concerning contractor licensing of data.

Considering the foregoing, it is believed that granting the waiver will provide the Petitioners with the necessary incentive to invest resources in the commercialization of the results of the agreement in a fashion which will make the agreement's benefits available to the public in the shortest practicable time. In addition, it would appear that grant of the requested waiver will not result in an adverse effect on competition nor result in excessive market concentration. Therefore, 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, as set forth above, be granted.

[redacted]

Mark P. Dvorscak
Assistant Chief Counsel
Office of Intellectual Property Law
Date March 18, 2002

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

CONCURRENCE:

[redacted]

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APPROVAL:

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GC-62

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(t) U. S. COMPETITIVENESS

*The parties acknowledge that the purpose of this cooperative agreement is a technology development program to advance the state-of-the-art in ceramic Oxygen Transport Membranes and Burners for low NOx combustion and other applications. Accordingly, this clause does not apply to the making of products arising from the use of the ceramic membranes, or use of products arising from the use of the ceramic membranes.*

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. In the event the 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 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.