

STATEMENT OF CONSIDERATIONS

REQUEST BY PRAXAIR, INC. FOR AN ADVANCE WAIVER OF DOMESTIC AND FOREIGN INVENTION RIGHTS UNDER DOE COOPERATIVE AGREEMENT NO. DE-FC26-99FT40437; W(A)-00-001, CH-1024

The Petitioner, Praxair, Inc. (Praxair), was awarded this cooperative agreement for the performance of work entitled, "Ceramic Membrane Enabling Technology for Improved Integrated Gasification Combined Cycle (IGCC) Efficiency". Under the cooperative agreement, Praxair is to conduct a technology development program to advance the state of the art in ceramic Oxygen Transport Membranes (OTM) for commercial IGCC and other applications. OTM's operate at elevated temperatures (500-1000°C) and can separate oxygen with infinite selectivity. This technology provides the basis for revolutionizing integration of oxygen production with the end-use processes to realize improved efficiencies in oxygen production. The five-year program is focused on addressing the remaining key issues in materials, processing, manufacturing, engineering, and system development to make OTM a commercial reality for oxygen production.

The total estimated cost of the cooperative agreement is about \$11,834,942 in two phases over five years. The total for phase 1 of the contract is \$6,441,588 with the DOE and the petitioner each sharing \$3,220,794, or 50%. The total for phase 2 is \$5,393,354, and DOE and the petitioner are again cost sharing 50% or \$2,696,677.

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 (OTM) technology. Praxair is a supplier of industrial gases (including oxygen) and supplies gases and systems for IGCC applications, and has approximately 14% of the global market for industrial gases. It is a leader in cryogenic technology, and has led in the commercialization of two new air separation technologies, vacuum pressure swing adsorption (VPSA) and polymeric membrane air separation. This technical competence in OTM is further evidenced by a detailed summary of its ceramic membrane experience including design and fabrication of ceramic membranes as well as commercialization. Praxair states that Additionally, Appendix A of the petition lists Praxair's Intellectual Property portfolio including Praxair owned or licensed patents related to ceramic OTM membranes in which it has exclusive rights for the field of use in this proposed program. Praxair's responses to questions 4 and 5 thus demonstrate its competency and experience in commercializing new technologies, and that this experience will enhance the potential for successful development and commercialization of ceramic membranes for IGCC.

From its response to questions 9 and 10, Praxair indicates that grant of the waiver will more efficiently promote the development and commercialization of inventions made under the cooperative agreement and will provide Praxair with the incentive to invest in the development and commercialization of the technology. Praxair states that grant of the waiver will not decrease competition, cause undesirable market concentration, or place Praxair in a dominant position. There are five major Worldwide industrial gas suppliers, including the petitioner, and each firm has development programs in air separation. Therefore, grant of the waiver will increase Praxair's incentive to rapidly commercialize the technology and create another oxygen supply alternative in the market place.

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 Praxair agrees to substantial U. S. manufacture of subject inventions (attached hereto). This clause has been modified at Praxair's request to include a preamble limiting and defining the technology to which the clause will apply. In all other respects, the attached clause is the standard DOE U.S. Competitiveness article. Additionally, Praxair agrees not to transfer subject inventions to any other entity unless that other entity agrees to these same requirements. The petitioner has 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 Petitioner 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 Signature]

Mark P. Dvorscak
 Assistant Chief Counsel
 Office of Intellectual Property Law

Date July 14, 2000

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 Signature]

George Rudins FE-20
 Deputy Assistant Secretary
 for Coal and Power Systems

Date 9/21/00

APPROVAL:

[Redacted Signature]

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

Date 9-26-00

(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 for IGCC 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.