

STATEMENT OF CONSIDERATIONS

REQUEST BY PRAXAIR, INC. FOR AN ADVANCE WAIVER OF DOMESTIC AND FOREIGN INVENTION RIGHTS UNDER DOE COOPERATIVE AGREEMENT NO. DE-FC26-00NT40756; W(A)-00-018, CH-1033

The Petitioner, Praxair, Inc. (Praxair), was awarded this cooperative agreement for the performance of work entitled, "Oxygen Enhanced Combustion for N0x Control". Under the cooperative agreement, Praxair is executing a program to develop a commercial technology to take advantage of oxygen enrichment for N0x reduction, by developing both oxygen based low N0x technology and the economically enhancing Oxygen Transport Membrane (OTM) technology. The program is structured to achieve two related goals. The first is to demonstrate the technical and economic viability of oxygen based N0x reduction in utility boilers using current oxygen production technology. The second is to position the new low cost OTM oxygen production technology for commercialization soon after conclusion of this program to significantly reduce the cost of N0x control. The three main tasks in the program include: oxygen enhanced combustion; oxygen transport membranes; and, economic evaluation. These tasks are described in response to question two of the attached waiver petition. To accomplish these tasks, Praxair will lead a team consisting of the University of Arizona and Reaction Engineering, Inc (REI) in pursuit of the project goals.

The total estimated cost of the cooperative agreement is about \$5,438,531 over three years. The DOE share is \$1,984,494 with the petitioner cost sharing \$3,454,037, or 63.5%.

In its response to questions 4 and 5 of the attached waiver petition, Praxair indicates that it is technically competent in the field of ceramic membrane technology and combustion commercialization. Praxair is the largest domestic oxygen producer and a technical leader of applied combustion technology. It has successfully developed and commercialized a variety of oxygen enriched combustion systems for a broad range of industrial furnaces including a low N0x, high momentum, oxy-fuel burner which provides significant fuel savings and uniform temperature distributions. A list of Praxair owned or licensed patents related to OTM membranes is attached to the waiver petition as Appendix A. It is noted that the U.S. Government has rights in item 4, patent number 5,723,074 by virtue of a government license. In addition to these patents, Praxair has detailed its Ceramic membrane experience and described its established commercial position in this market. This technical competence in OTM is further evidenced by a brochure illustrating Oxy-Fuel application attached as Exhibit "B". 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 technologies for oxygen-enhanced combustion for N0x control.

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 a new burner and mitigation technologies for Nox emission reduction applications.


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.



MARK P. DVORSEK
Assistant Chief Counsel
Office of Intellectual Property Law

Date Aug 16, 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.

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

Date 10-17-00

APPROVAL:

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

Date 10-31-00

(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 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.