STATEMENT OF CONSIDERATIONS

REQUESTS BY PRAXAIR, INC., AND ITS SUBCONTRACTOR POWER SYSTEMS MANUFACTURING, FOR AN ADVANCE WAIVER OF DOMESTIC AND FOREIGN INVENTION RIGHTS UNDER DOE COOPERATIVE AGREEMENT NO. DE-FC26-03NT41892; W(A)-04-004, CH-1176 AND W(A)-04-005, CH-1175

The Petitioners, Praxair, Inc. (Praxair), and its subcontractor Power Systems Manufacturing (PSM), were awarded this cooperative agreement for the performance of work entitled, "Low NOx Emissions in a Fuel Flexible Gas Turbine." The purpose of the cooperative agreement is to develop and commercialize a gas turbine combustor capable of operating on fuels typical of coal gasification plants or natural gas/hydrogen blends. This combustor is expected to provide a system with NOx emissions typical of Selective Catalytic Reduction (SDR) exhaust aftertreatment systems while offering fuel flexibility, enhanced turndown and stability at a competitive price. The concept of actively controlling the fuel and air flow rates and compositions is the basis for this program. The program has three phases. Phase one includes conceptual development of the combustor, the fuel processor and means of controlling the airflow throughout the combustor. Phase two will focus on the development of technologies identified during the first phase, and phase three will include scale up and demonstration of the design solution. Praxair and Power Systems Manufacturing have each petitioned for an advance patent waiver to their respective inventions made during the course of the agreement.

The total estimated cost of the cooperative agreement is $6,764,342, with the DOE share being $3,795,615, or 56%, while the remaining cost share of 44%, or $2,968,727 will be provided by Praxair and PSM. The period of performance is thirty-six (36) months, from October 1, 2003 through September 30, 2006.

In its response to question 5 of the attached waiver petition, Praxair has described its technical competence in the field of hydrogen addition to gas turbines. Praxair has detailed its hydrogen experience, as well its experience in integrated gasification combined cycle (IGCC) electric power generation. Further, Praxair has substantial experience in reactor development and oxy-fuel combustion. A list of relevant patents representing these research areas is attached to the waiver petition. Praxair's response fully demonstrates its technical competency in the field of hydrogen addition to gas turbines.

PSM has also described its technical competence in the field of hydrogen addition to gas turbines in response to question 5 of its attached waiver petition. It has design and engineering expertise relevant to delivering hot gas in any combustion engine, and PSM has custom engineered replacement parts specifically engineered to enhance the performance of combustion engines. PSM has listed its relevant patents in this area as well. PSM's response fully demonstrates its technical competency in the field of combustion turbines.

In its response to question 9 of the attached waiver petition, Praxair states it is one of five major worldwide industrial gas suppliers, currently including Air Products and Chemicals, British Oxygen Group, Air Liquide and Linde AG. Each firm has development programs in hydrogen production as well as various development efforts in combustion technologies. . While Praxair expects the development of a fuel flexible, low NOx gas turbine combustor to reduce the cost of emissions compliance, granting Praxair a waiver will increase its incentive to rapidly commercialize the technology to benefit the U.S. economy and create another emissions control alternative in the market place. It is believed that this will increase competition, lowering the cost of emissions compliance by all methods, thereby bringing additional benefits to the U.S. economy. With respect to PSM, it states in response to question 9 that it controls less than 1% of the market for industrial

gas turbines. Although the technology will assist PSM in competition, it is unlikely to significantly impact major original equipment manufacturers such as GE or Siemens-Westinghouse. The technology should allow PSM to effectively compete with the large manufacturers, which should lower the cost of reduced emissions systems. Therefore grant of the waiver will have a positive effect on competition and market concentration.

The subject cooperative agreement will be modified to add the Patent Rights--Waiver clause in conformance with 10 CFR 784.12, wherein Praxair and PSM have agreed to the provisions of 35 U.S.C §§ 202, 203, and 204. This waiver clause will also include a paragraph entitled U.S. Competitiveness, in which Praxair and PSM agreed to substantial U. S. manufacture of subject inventions (attached hereto). Additionally, Praxair and PSM agree 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 above requested waiver would 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, with each Petitioner getting title to its respective inventions.

[redacted]

Mark P. Dvorscak
Assistant Chief Counsel
Intellectual Property Law Division

Date: Nov. 16, 2004

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 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]

George Rudins
Deputy Assistant Secretary
Office of Fossil Energy
Coal and Power Systems

APPROVAL:

[redacted]

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

(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. 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.