



International Power Technology

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JOINT PRESS RELEASE

INTERNATIONAL POWER TECHNOLOGY, INC. (IPT) TO DEMONSTRATE SUB 3 PPM NO_x AND CO STEAM INJECTION TECHNOLOGY AT MENLO PARK, CALIFORNIA CHP PLANT

SAN JOSE, California – February 26, 2004 – International Power Technology announced today that it will begin testing and demonstration of a revolutionary new sub 3 ppm NO_x and CO emissions control technology called Cheng Low NO_x (CLN[®]). Under the terms of the testing agreement, IPT and Cheng Power Systems (CPS) of Mountain View, California, will demonstrate the efficacy of the CLN[®] technology on a 6 MW Allison 501-KH gas turbine. The testing will take place over a 12 month period between April 2004 and April 2005 at SRI International's cogeneration facility located in Menlo Park, California.

The CLN[®] is a revolutionary new emissions control technology that has the potential to reduce turbine, duct burner, and boiler emissions to levels below the required California Air Resources Board (CARB) 2007 compliance levels. Atmospheric testing of the CLN[®] technology has produced emissions levels as low as 1 ppm NO_x and 2 ppm CO, with less than 1 ppm VOC and THC, on actual engine and boiler hardware. These results were achieved with steam only and without additional emissions reduction devices such as selective catalytic reduction (SCR). The CLN[®] patents were issued to CPS in 2002, and the system is in commercial operation in a limited capacity on the GE Frame 6B combustion turbine. It has also been tested on a Westinghouse 501-D5 combustion turbine in commercial cogeneration service. To date, CPS has completed testing of the combustion hardware for the GE Frame 5P/5N/5LA, Frame 6B, Frame 7B/7EA and Westinghouse 501-D5 combustion turbines, as well as the burners for different types of gas-fired power boilers. In all cases, the test results have demonstrated the potential for the CLN[®] technology to control NO_x and CO emissions of gas-fired combustion turbines, boilers and duct burners to less than 3 ppmvd, corrected, without raising THC or VOC levels, under normal CHP plant operating conditions. The experimental results to date validate the CLN[®] technology as the most cost-effective, fastest, and easiest to implement NO_x emissions control technology for a wide-range of new and retrofit applications.

The CLN[®] emissions reduction technology for the Rolls Royce/Allison 501-K line of gas turbines is in advanced application engineering and is the subject of the demonstration project. The demonstration project will attempt to validate and demonstrate that these low NO_x and CO emissions levels can be sustained in actual practice and under normal operating conditions on an Allison 501-KH Cheng Cycle gas turbine which is currently operational at SRI International's CHP cogeneration plant.

The Cheng Low NOx (CLN[®]) technology, developed by Dr. Dah Yu Cheng of CPS, premixes steam with fuel homogeneously before entering the combustion zone of a diffusion flame. Unlike the common steam or water injection system, where the steam or water reduces the O₂ concentration in the combustion air or quenches the flame to slow combustion, in the CLN[®] technology steam is used to enhance the O₂ supply by increasing the diffusion rate of O₂ through increasing the jet momentum of the fuel. The CLN[®] technology fuel nozzle is specially designed to pass the correct amount of steam and fuel mixture with the correct jet momentum so as to deliver the same amount of total fuel required to yield the designated heat release rate for the desired combustion turbine operating condition. The resulting increased rate of supply of O₂ allows the O₂ to penetrate deep into the fuel zone and reduces the flame envelop. This is in contrast to current steam or water injection which requires the flame surface to expand into a larger volume flame envelope. The reduction of the O₂ supply leads to incomplete and less efficient combustion and is the cause of high CO and unburned hydrocarbon emissions seen in the exhaust when steam or water injection rates are increased excessively using conventional technology.

SRI International is a nonprofit public benefit 501(c)3 corporation organized in 1946 for the purpose of scientific research. SRI conducts contract research and development for public and private organizations throughout the world. SRI employs approximately 1,400 people worldwide, including 1,200 people at its 63-acre campus in Menlo Park, California and had revenues for the year-end 2002 of \$200 million.

In 1985 SRI entered into a Development and Management Agreement with IPT which culminated in the development and installation of a 6 MW CHP facility (the "Project"). IPT provides management and operations services to SRI for the Project pursuant to this Development and Management Agreement. The Project, which is located at the headquarters of SRI in Menlo Park, California, is a Cheng Cycle cogeneration (CHP) system using a Rolls Royce-Allison 501-KH steam injected gas turbine capable of providing between 3.5 and 6.0 MW of electrical power and between 37 MMBtu and 45 MMBtu of thermal energy. Since its commercial operation commencement date (April 17, 1987), the Project has generated an average annual electric power in excess of 34 million kWh and an average annual thermal energy in excess of 1.0 Billion BTU and has operated at an average availability in excess of 96%.

IPT was formed in 1974 to develop gas turbine steam injection technology. In 1984 IPT co-developed the Allison 501-KH gas turbine with Allison Gas Turbines of Indianapolis, Indiana. IPT has authored over 48 U.S. and international patents relating to steam injection technology. IPT's primary business today is project development, operations, maintenance, and management of independent power projects.

Cheng Power Systems, located in Mountain View, California, is a power generation technology company that has developed proprietary systems that improve output, efficiency and emissions of power generating plants. CPS' patented technologies include: Cheng Cycle[™], CLN[™], Cheng Boost[™] and Advanced Cheng Cycle[™]. These patented technologies utilize steam injection for power augmentation and/or NOx, CO and VOC/THC emissions control. Today, CPS licenses the Cheng technology to numerous licensees worldwide.