



International Power Technology

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2nd CHENG LOW NOx (CLN[®]) SITE OPERATIONAL Customer Converts from OEM DLE to CLN

SAN JOSE, California – June 1, 2006 – International Power Technology (IPT) announced today that it has successfully commissioned the 2nd CLN[®] emissions system on a Rolls-Royce/Allison 501-KB7. The KB-7 CLN[®] system became operational on April 15, 2006 and is located in a Combined Heat and Power (CHP) plant at a paper mill in Germany.

The owner of the CHP facility converted to CLN[®] from the Rolls-Royce/Allison LE-4 Dry Low Emissions (DLE) system because of the problems and costs associated with the Dry-Low-Emissions hardware. Problems with the DLE system and future emissions reductions were the driving commercial factors for the customer. The DLE system has had many problems since the plant started in early 2001 and the customer was looking for alternatives.

The customer only needed the CLN[®] system to achieve 75 ppm NOx and so this was an easy target to achieve. Future emissions reductions were a major determining factor in the conversion from DLE to CLN[®]. Germany's future NOx requirements under the Kyoto Protocol will most likely require significant reductions in ozone gasses such as NOx and greenhouse gasses such as CO2 and N2O. CLN[®] reduces all of these gasses in a gas turbine and when they need to lower emissions, the CLN[®] system will be capable of doing so by simply increasing the steam-to-fuel (s/f) ratio through the nozzle.

IPT recently achieved single digit NOx and CO on a 501-KH cogeneration plant (CHP) unit in Menlo Park, California (See August, 2006 Press Release: SINGLE DIGIT NOx and CO ACHIEVED with CHENG LOW NOx (CLN[®])). These results were achieved at full turbine firing temperature and at 2.35 s/f ratio using only saturated steam. Sub 10 ppm NOx and CO can be

achieved on the KB7 Germany CHP unit when the customer needs to reduce NOx and greenhouse emissions. For now, 75 ppm is all that is needed.

The Cheng Low NOx (CLN[®]) technology uses saturated steam mixed with fuel to produce ultra-low emissions. The steam is mixed with the fuel to a very high level of homogeneity in hardware that is off-engine and compact. Because only 75 ppm NOx was needed at the facility, only OEM engine hardware was required including OEM LE-2 combustion liners, OEM Low Btu fuel nozzles, and OEM fuel delivery manifolds. Specially designed IPT fuel nozzles are substituted for OEM nozzles in applications where less than 20 ppm NOx and CO are needed.

Because of the available boiler pressure at the Germany CHP facility, the CLN[®] steam injection rate is limited to .6 s/f ratio at 1057 Deg C (1935 Deg F); higher steam to fuel ratios can be achieved at lower firing temperatures. Future plans include a combination of increasing the boiler pressure and increasing s/f ratio through the nozzles thereby decreasing NOx emissions, all per local German requirements.

Additional benefits of injecting CLN[®] steam into the gas turbine include: Ultra-low NOx and CO, lower operational costs, lower turbine heat rates, and extended turbine hardware and overhaul lifetimes.

Candidates for a retrofit to the CLN[®] technology include:

- 1) Existing 501 LE4-DLE customers with engines experiencing DLE problems such as high heat rates, carbon blasting, premature failure of combustion liners, and cracked outer combustion cases,
- 2) Customers seeking to get off water injection,
- 3) Customers needing to reduce NOx and CO for regulatory reasons,
- 4) Customers wanting to voluntarily reduce NOx and CO emissions to sell the offsets on the open market, and
- 5) New source review (NSR) requirements requiring ultra-low NOx and CO.

IPT was formed in 1974 to develop gas turbine steam injection technology. In 1984 IPT co-developed with Detroit Diesel Allison the Allison 501-KH "Cheng Cycle" gas turbine and has authored over 48 U.S. and international patents. Headquartered in San Jose, California, IPT's primary business today is O&M of power plants, engineering, field service, and combustion research.