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October 2, 2009

The Honorable Jeffrey D. Byron
The Honorable James D. Boyd
Ms. Suzanne Korosec

California Energy Commission
1516 Ninth Street, MS-39
Sacramento, CA 95814

Re: Public Comment submittal on IEPR Committee Workshop on the Potential Need for Emission Reduction Credits in the South Coast Air Quality Management District on 9/24/2009

Dear Commissioners,

I sat and listened with great interest during the recent Workshop in Sacramento regarding the potential need for ERCs in SCAQMD. The agenda was packed with presentations and discussions by various parties including CEC, Cal ISO, SCAQMD, utilities and several power developers. The presentations and discussions were enlightening and everyone was in concert in claiming there just are not enough credits to build the necessary power plants needed for the South coast region. As public comment time was very limited and most people had left by the time they were made, I would like the opportunity to comment on a few items.

1. **PM-10 Credit Availability and Cost:**

It is evident that PM-10 credits are in high demand and are quite scarce. It is also clear that due to the scarcity of these credits the costs have skyrocketed making it more difficult and expensive to develop a power plant in the South coast. However, the assumption by everyone in the room seems to be that there is no possible way to reduce the need for those credits or create new credits in the marketplace. This presumed assumption is incorrect. The majority of presenters in the room recommended that the answer to this problem lies in changing laws or rules or even calculation methods so that we can have enough credits. These types of solutions are difficult at best and not acceptable to the environmental community. My suggestion is solve it with technology.

2. **EMx guarantees 50 percent removal of PM from Gas Turbines:**

EMx is an emissions control catalyst system that was developed as a lean NOx trap to be used in the place of SCR. It is an ammonia free system that reduces NOx, SOx, CO, and VOCs at very high levels while simultaneously reducing PM emissions. During the 13 years of commercial history with over 420,000 operating hours, we have determined that EMx is highly effective at reducing PM emissions. EmeraChem Power guarantees 50 percent reduction of PM-10 on gas turbines and other power equipment. Immediately, any system that was built with EMx would require half the necessary PM credit offsets than would be proposed with a SCR package. In addition, by using EMx in other applications such as

retrofits and repowers, new PM-10 ERC's could be generated all while having a positive effect on the health and safety of the communities. The environmental community supports this type of solution.

3. EMx performances better than BACT across all criteria pollutants:

Below are the typical guarantees and performance levels associated with the system.

	Engine Exhaust (ppmv)	Typical Guarantee (ppmv)	Expected Performance (ppmv)
NOx	25	≤1.5 or ≥ 94% removal	<1.0 or ≥96% removal
PM-10	3-6 lbs/hr	50% removal	1.5 – 3.0 lbs/hr
SO2	0.2-0.4	95% removal	≥ 97% removal
VOC-NMNEHC	5.0	≤1.0 or ≥ 90% removal	≥ 95% removal
NH3	5-10 slip	100 % removal	100% removal
CO	25-50	≤0.2 or ≥ 99% removal	≤0.1

EMx™ technology has the ability to generate valuable ERCs in retrofit applications due to its capability to control at better than current BACT levels. In addition, it can reduce the amount of offsets required because of the high destruction levels. EMx™ is also capable of better handling startup and shutdown emissions for simple cycle applications than Selective Catalytic Reduction (SCR) systems. These transient emissions along with the low load operation can generate significantly higher emissions than steady state operation. EMx™ can better control these emissions because of the low temperature light off of the EMx™ catalyst.

4. EMx operated systems are the cleanest in the nation:

EMx™ technology was first applied to the Vernon Federal power plant on a GE LM-2500 gas turbine in 1996. It reset BACT and LAER in the first two years of operation. Since then it has been successfully employed in 10 units totaling 156 MW of power. It's robust and reliable design has lead to over 420,000 hours of successful commercial operation at greater than 99 percent availability to the operator. Listed in the chart below is the EPA reported data for the Redding Unit 5 power plant in Redding, Ca. It's average NOx outputs year over year since commercial operation have easily shown it to be the cleanest of any fossil fueled power plant in the nation every year. Unit 6 is currently under construction with the latest EMx technology to be applied. While current NOx BACT levels are 2.5 ppm for gas turbines operating on natural gas, below are the Redding Unit 5 annual NOx performances operating with EMx:

Year	Average ppm NOx dry @ 15 % O2
2002	0.93
2003	1.06
2004	1.04
2005	0.67
2006	0.54
2007	0.76
2008	0.62

5. **EMx versus SCR Emission Reductions:**

The emission reduction distinction between EMx™ technology and conventional de-NOx technologies such as Selective Catalytic Reduction (SCR) has always been significant. Both EMx and SCR are considered BACT technologies for NOx control in natural gas fired turbines. However, comparing these two BACT technologies, we can see a significant difference in the amount of overall pollutants being released into the environment. If a multi-pollutant approach were taken there would be no question which technology needs to be applied. The below table is an example of one LMS-100 operating and the differences in control between the two technologies at guaranteed levels.

	Guaranteed Removal Efficiencies		Annual Emissions Controlled		Annual Guaranteed Emission Reductions with EMx (tpy)	30 Year Guaranteed Emission Reductions with EMx (tons)
	EMx	SCR	EMx	SCR		
NOx	94%	90%	147.2	140.9	6.3	189
VOC-NMNEHC	90%	60%	9.0	5.1	3.9	117
CO	99%	90%	585.1	531.9	53.2	1596
PM-10	50%	0	6.0	0	6.0	180
SO2	90%	0	2.3	0	2.3	69
NH3	100%	0	10.0	0	10.0	300
<i>Emission Reduction with EMx</i>						
<i>Based on a LMS-100 operating 4000 hrs and 250 startups per year</i>					81.7	2451

6. **EMx technology cost effectiveness**

It is also well known that to achieve ultra-low emissions of all criteria pollutants from any combustion source, the cost is usually higher. Nevertheless, advances in catalyst formulation and process improvements in recent years have brought the cost of the EMx™ technology down, however when considering the multi-pollutant aspect and ammonia slip, EMx is easily the most cost effective emission control technology currently available.

A thorough cost effectiveness analysis between EMx and SCR has been conducted and shows that EMx™ is a cost effective solution in controlling emissions across all pollutants. Considering the value/costs of emissions offsets, applicants can save an estimated \$ 5M for every 50MWs permitted. Consequently, the “economic gap” between EMx™ and SCR has closed with regards to quantitative NOx removal rates (\$/ton). While EMx™ first time costs are higher due to the need for the precious metal catalyst; it is cost effective over the life cycle of the plant and retains much of its value when the precious metal is reclaimed later.

7. **EMx technology for Health and Safety**

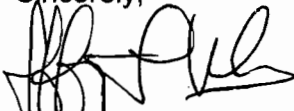
EMx™ is a multi-pollutant control technology. NOx, CO, VOC and fine and ultrafine particles are simultaneously destroyed using a single catalyst system. EMx also has the capability of controlling SOx emissions even from natural gas fired sources. These are unique features distinguishing EMx™ technology from other technologies. In fact, the U.S. EPA has twice used EMx™ technology to establish new Lowest Achievable Emission Rate (LAER) standards for gas turbines. EMx technology can be applied to gas turbines, IC engines, boiler, process heaters and other types of process flow applications. It is effective between a wide range of operating temperatures from 400°F to 1100°F.

With over thirteen (13) years of operating history in commercial power generating plants, EMx™ systems have demonstrated the ability to reduce NOx emissions from gas-fired turbines to less than 1.0 ppm, release undetectable levels of carbon monoxide (CO), and reduce VOC emissions by >90%. In the public health and regulatory arenas of increasingly stringent emission standards, the interest in fine and ultra-fine particles (UFP) is also growing, i.e., particles with a size ranging from 10 micrometers to 2.5 and below (PM10 and PM2.5, respectively). EMx™ eliminates UFP before they are formed by efficiently destroying the condensable organic compounds and reducing SO3 to SO2 – two dominant precursors for UFP. Testing on commercial turbines equipped with EMx™ indicates that ultra fine particles measured by U.S. EPA method 201A/202 are reduced by up to 70% and have a guarantee of 50% removal.

EMx™ is characterized by low environmental impact across all media. EMx™ does not require the use of hazardous reagents such as ammonia, does not produce hazardous air emission byproducts such as ammonia slip and associated fine particles, and does not become a hazardous solid waste. At the end of its service life, the catalyst is sent to a reclaim facility where the precious metals are recovered and the market value of the metals is credited to the owner. Typical reclaim values are between 70 to 85 percent.

I would be happy to provide additional details or participate in further discussions as necessary to ensure that you have all of the information available. Please feel free to contact me at 949-496-5802 or email me at jvalmus@emerachem.com should you have further questions, comments, or needs.

Sincerely,



Jeff Valmus
General Manager and Vice President
EmeraChem Power LLC