April 21, 2017

To Whom It May Interest:

Neumann Systems Group, Inc. (NSG) will no longer be actively conducting its professional service and contracting business after June of this year. This follows the completion of performance testing on the NeuStream® SOx (sulfur dioxide) scrubbing system installed on Martin Drake Units 6 and 7. All major contractually specified scrubber performance goals were met or exceeded. The ongoing SOx removal levels of the two installed scrubbers are **significantly above** the minimums required by the Colorado State Air Quality requirements and the contract performance goals. Scrubber power consumption and water usage which are two factors affecting operating cost are significantly lower than contractual performance goals. Chemical consumption is at the performance goal. In short the scrubbers' performance is significantly greater than required by regulation and operating cost is significantly less than expected. NSG notes that the project cost growth experienced by CSU is in no way associated with design or engineering shortcomings for the system. The NSG team is extremely proud to have demonstrated that a small, highly talented group can start with an idea, prove the concept through component and prototype testing and then engineer, design, install, test and commission a full scale commercial system that meets or exceeds customer needs. In addition to the NSG team, NSG wants to recognize the many local small businesses who contributed in a positive way to our successful project. We also want to recognize the talented CSU engineers and technicians who aided in control system development and installation and commissioning of the NeuStream® system.

NSG was incorporated in Colorado in 1997 as Neumann Information Systems, Inc. After a brief period working on advanced software for business, the company turned to defense and laser weapons research. In conjunction with this shift in emphasis, the company adopted the dba (doing business as) of Directed Energy Solutions (DES). During the period 1998-2004, the company, under the direction of Dr. David Neumann and Dr. Jay Brasseur, was awarded 21 contracts for laser related projects from 27 submitted proposals for a win rate of 78%. The typical success rate in these competitions was less than 20%. All of these contracts were completed on time and at or under cost. These contracts included awards from Air Force, Army, Navy and other Defense research organizations. DES was particularly proud of awards received from the Defense Advanced Research Projects Agency (DARPA), the National Science Foundation (NSF), and the National Reconnaissance Office (NRO). The NRO award rate was 7% with competition from major Aerospace companies and was validation of the exceptional talent and innovation inherent in the people of DES. In these early years, DES was aided by a Cooperative Research and Development Agreement with the USAF Academy which provided use of Physics Department laboratory facilities. Without this initial assistance, it is doubtful we could have succeeded.

From 2003 through 2008, NSG continued to build on its earlier success in an environment of declining DOD dollars for laser research. The funding environment was significantly affected by the Airborne Laser (ABL) program growing from a 3-yr, $2B program to a 10-year, $10B program (note that these numbers are approximate based on my recollection). The ABL program was later cancelled after an initial demonstration of very limited capability. DES had been awarded a contract for a technology demonstration of what would have been the next generation, highly compact and much more efficient

power source for the chemical oxygen iodine laser (COIL) weapon on the ABL. The Chief Scientist for the ABL program stated that "this (DES technology) is the biggest advance in this laser weapons technology in 20 years." This period of time was also marked by the DES invention and demonstration of a 50% efficient, all cryogenic solid state laser with near perfect beam quality and operating at several kilowatts of continuous output power. This laser smashed all previous records for high power laser efficiency.

In 2007 it became clear that the market for future defense laser development had become extremely limited. As a consequence, DES began looking more actively for commercial opportunities to apply its technology. Coincidentally its name was changed to Neumann Systems Group, Inc. The technology developed in support of powering the ABL laser was a highly advanced and compact gas-liquid contactor. It was recognized that another application of this technology was in contacting the pollutant bearing flue gas from a coal burning power plant with the dense, high surface area liquid jets of the mechanical part of the contactor. Chemicals added to the arrays of water jets which were at the heart of the contacting device determined which pollutants could be removed. Initial testing demonstrated efficacy in removing SOx, NOx and CO_2. With support from Colorado Springs Utilities and based on their need for coal gas scrubbing for the Martin Drake and Nixon units, a conservative, multi-step scale-up, prototyping and testing program was embarked upon. Units were rapidly designed and tested on the flue gas generated from .13 MW, 2 MW and 20 MW of power generation. The 20 MW NeuStream® system was a prototype of the scrubbers to be installed on the Martin Drake 6 and 7 units. While the vast majority of the funding for the scale-up projects was provided by Colorado Springs Utilities, four other utilities and the Electric Power Research Institute provided funding for independent validation and testing of the 20 MW prototype NeuStream® desulfurization system. Based on the successful prototype system testing and EPRI validation testing, CSU awarded a contract to NSG for a SOx scrubbing system that would meet future mandated SOx emission levels from the Martin Drake plant. From 2012-2015 the design, development, construction and commissioning of the Colorado Springs Utilities' NeuStream® desulfurization system proceeded slowly as a result of an environment of political and customer uncertainty.

The decade of the 20-teens will go down in history as being the most tumultuous ever experienced by the US energy industry. The primary drivers were economic and environmental in nature. The battle between coal and natural gas as a fuel was clearly won by natural gas. At the start of the decade there was a 250-year supply of coal and only a 25 to 30-year supply of natural gas. As a consequence future long term dependence on natural gas was in question and the limited supply resulted in prices of 3 to 7 times that of coal. The advent of widespread fracking and advanced horizontal well drilling not only increased access to more oil in the US but significantly affected the economical access to vast new supplies of natural gas. Several other factors affected the rise of natural gas as the primary power generation source for the US. When natural gas is burned, it has little or no sulfur emissions and only produces half the CO_2 of coal. In addition, the cost of a new natural gas plant is typically less than half that of a new coal plant. These factors and to a lesser degree the rise of renewables have led to a decline in coal from 43% of our power generation capability to 25% today.

The unprecedented shift in power generation from coal to natural gas and renewables had a significant effect on NSG's ability to generate additional business for a technology that was being scaled to

commercial size for sulfur removal. Active business development efforts in the 2012-2014 timeframe included surveying the nearly 800 coal burning units in the US that did not have desulfurization capability. We directly contacted the companies controlling more than half of these units. What was clear from the beginning of this work was that these units were the smaller, older units with limited life. Most of the newer, larger units of 1990s vintage had been forced to install desulfurization units under the Air Quality regulations stemming from the 1990 Air Quality Act and earlier air quality laws. In most cases we were told that the coal burning units without scrubbers were old; upgrading and equipping with new emissions controls was not cost effective; and they were being scheduled for shut-down. Utilities were planning for new natural gas replacement power generation units. When we found potential opportunities for NeuStream®, we were able to present a compelling case from a cost/size perspective. However, we were unable to produce the two years of cost and availability information for a full-scale operating system which these companies deemed necessary from a risk perspective. Furthermore, cost was not the driver for their decisions in that all their increased costs from installing scrubbers were passed on to their rate payers and recovered with additional net profit.

We did have significant help from EPRI in presenting our technology to the industry. For two years running they made presentations to their working groups on emissions controls presenting a very positive picture for the potential of our technology. This followed their efforts to create a working group of four utilities with desulfurization needs. These companies contributed funding to EPRI for purposes of independent validation testing and assessment of scaling-up risks of the NeuStream® 20 MW prototype system.

In the end, we were unsuccessful in finding US customers for our technology. The factors affecting our success in finding new customers were: the major shift in the energy industry to natural gas and renewables; the uncertainty generated by pending new environmental regulations including CO_2; no operating history for a full scale NeuStream® system; and the local factors contributing to significant delays in building the first full-scale NeuStream® system. An additional factor was the necessity to defend ourselves to potential customers (including the Department of Energy) against the negative local press reports. For us the local business environment was not conducive to growth.

As we came to the realization that we were unlikely to find additional customers in the US, and as the first NeuStream® desulfurization system construction began, we started to explore Chinese and Indian opportunities. We were assisted with introductions to Chinese companies by the US Department of Commerce and also the State of Colorado economic development organization. After market analysis and surveys of the 20 largest emission control companies in China we entered into negotiations with four companies. We employed an international law firm, to create the contractual documentation to protect our interests when operating in the significantly different business environment in China. Two of these four companies proceeded to the point of final contract negotiations including discussions, site visits, due diligence efforts and prolonged negotiations. In the end the companies wanted us to proceed through a Chinese demonstration program that would have fully exposed our technology with only very limited protection and at great cost to NSG. We therefore declined to proceed. The individuals we worked with in recent years with respect to the opportunities in India did not follow through with

contacts. After repeated unsuccessful attempts with several individuals with substantial Indian connections and including a senior Indian government official we ended our quest in that direction.

Beginning with the initial tests of the NeuStream® technology at the Martin Drake plant, we gained an understanding of the potential to significantly impact what appeared to be a substantial future carbon capture market. We succeeded in garnering approximately $9 million of DOE funding for building and testing a significant size carbon capture system at a coal burning power plant. It was understood that this was a stepping stone to a much larger DOE demonstration project in the future. Our system was built and installed at the Martin drake plant with initial operational checkout on the system underway when the facility fire occurred. We were told that the plant was shut down indefinitely. In concert with DOE, we moved the system to our own facility and provided a natural gas source of CO_2 for testing. The unit performed as expected, meeting the stated goals for carbon capture. Results were obtained in time to compete for the follow-on DOE program; however, we were not selected for award. As part of the proposal debriefing, we were told that a major consideration for not winning was that we had not tested our CO_2 technology at a coal plant. Attempts to protest the DOE decision failed. During this same time period we had a significant business development effort in carbon capture for oil companies. A demonstrated commercial process called Enhanced Oil Recovery (EOR) using CO_2 allows oil companies to extract oil left behind by conventional extraction processes. We were at the point of final contract negotiations with two medium size oil companies, when the oil prices started a precipitous decline. The result was substantial cutbacks in capital investment funds to the point the companies declined to proceed. The continued low oil prices, increasing efficiency of the fracking process and the discovery of additional large US oil reserves have caused these companies to decline to proceed with our projects as of our last contact with them.

Beginning in early 2016, it appeared that we had exhausted our opportunities for significant additional business. The NeuStream® project at CSU was nearing completion. We began laying off people and closing out our facilities. Equipment for making spares for the NeuStream® scrubbers was transferred to CSU. Our Elkton facilities were restored to their original warehouse configuration and were vacated at the end of 2016. All of our financial and contractual commitments have been met.

While Neumann Systems Group, Inc. is not going to continue, we are proud of our technological achievements and business accomplishments over our 20-year history. Our company always met our commitments and did so in an ethical and professional fashion. We operated profitably every year. Our employees worked in a very demanding environment and were the key to our success. While at NSG they received salaries and benefits that were among the very best in this region. We hope that they will look back at their time at NSG as a significant growth opportunity and highly beneficial to their careers. We wish them all the best.

David K. Neumann, CEO
Neumann Systems Group, Inc.