NEI Corporation

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NEI Corporation Completes Demonstration Project on Enhancing Energy Efficiency of Power Plant Condensers

Somerset, NJ – NEI Corporation announced today that it has successfully completed a project on a hydrophobic surface treatment of steam condensers used in thermal power plants. The project, supported by the Electric Power Research Institute (EPRI), investigated application characteristics and evaluated customer incentives of a hydrophobic surface treatment technology that had been shown to lead to a 20% - 30% increase in the overall heat transfer coefficient. This was achieved by promoting dropwise condensation and breaking up the insulating condensate film commonly seen on untreated metal tubes in industrial condensers.

NEI demonstrated that its NANOMYTE® SuperCN™ hydrophobic surface treatment can be applied to the shell side of an existing, in-place exchanger with a flow coating method. In a test that simulated field insertion of condenser tubes, a minimum amount of scratches were observed on the coated 316 stainless steel tube, indicating the hydrophobic coating has excellent scratch resistance as well as lubricating properties.

Further, a durability study investigated the effect of prolonged testing on the life of the SuperCN™ hydrophobic coating. The coated tubes maintained a high degree of hydrophobicity after three months of durability testing, with alternating conditions of continuous condensation and ammonia vapor conditioning. The dropwise condensation phenomenon was maintained over the duration of the long-term testing.

Finally, an analysis of customer incentives for using SuperCN™ suggested that substantial savings could be realized from application of NEI's hydrophobic coating to surface condenser tubes. Project economics indicate NROI in excess of 100% with payback in less than one year.

The project was performed under the supervision of EPRI project managers Jose Marasigan and Richard Breckenridge. "While the concept of dropwise condensation has been around for a while, it has never been put in practice in the power industry. The key issue has been the inability to obtain a reliable means of long-lived dropwise condensation under industrial use conditions," Breckenridge said. "The NEI project shows that perhaps there is now a way to use a thin hydrophobic surface treatment to enhance the energy efficiency of steam condensers. The next step is to demonstrate the technology in an industrial-scale condenser."

"The funding from EPRI and the technical support provided by the EPRI managers have been a big help to NEI in advancing the state of the art of the SuperCN™ technology. It has enabled us to develop a practical approach for using SuperCN™ in the field," said Dr. Ganesh Skandan, CEO of NEI.

SuperCN™ hydrophobic coating can also be used to impart anti-fouling and easy-to-clean properties to metallic surfaces in other industrial applications. In particular, it has been shown that variants of the coating inhibit organic vapor and monomer deposition on metal surfaces.

About NEI Corporation: NEI Corporation is an application-driven company that utilizes nanotechnology to develop and produce advanced materials. The company's core competencies are in synthesizing nanoscale materials and prototyping products that incorporate the advanced materials. NEI offers an array of Advanced Protective Coatings for metal and polymer surfaces. The coatings have tailored functionalities such as anti-corrosion, self-healing, scratch resistance, ice-phobic, and self-cleaning.

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