Application of HTE System for Improved Efficiency of Power Plant Condensers

The Problem
Industrial cooling systems such as power plant condensers suffer efficiency loss from organic and inorganic fouling, causing an increase in the plant heat rate. A 1% increase in heat rate can cost a 500 MW coal plant $600,000 a year and increase CO₂ output by 40,000 tons (EPRI).

Interphase Materials Overview
Interphase Materials has created a product, the HTE system, that:
- Improves heat transfer efficiency
- Reduces biofouling
- Reduces scale buildup
- Reduces the need for toxic water treatment chemicals
- Is environmentally friendly

Awards & Recognition
- Located in Maidsville, WV
- Most efficient coal plant in U.S.
- 6.809 Btu/kwh heat rate
- 3 million gallon condenser loop
- Test site of Interphase Materials HTE system application

Longview Power
- Located in Maidsville, WV
- Most efficient coal plant in U.S.
- 8,809 Btu/kwh heat rate
- 3 million gallon condenser loop
- Test site of Interphase Materials HTE system application

Application to Lab Scale Rig
Heat transfer improvements will be quantified on lab-scale test rig using Longview Power Plant water.

Application to Field Test Rig
Two rigs will be deployed allowing evaluation of treated water, utilized in the Longview condenser, as well as water prior to chemical treatment. Heat Transfer and fouling will be evaluated on both heat exchanger and cooling tower.

Anticipated Benefits
Interphase Materials and Longview seek to gain quantitative field data on heat transfer efficiency improvements of condenser cooling systems in Coal-Fired Power Plants (CFPs) following application of the HTE system. It is anticipated that an application of the Interphase HTE system on condensers could help CFPs reduce plant heat rate, which could significantly reduce CO₂ output and improve CFP performance. Additionally, the anti-fouling properties of the HTE system could potentially reduce the amount of chlorine and other water treatment chemicals CFPs apply to their cooling systems, which would not only assist power plants in meeting the requirements of the EPA Clean Water Act, but also decrease cleaning frequency, lower maintenance costs, increase hardware lifecycles, and help plants maintain long-term high efficiency operation.