**Finned Tube**

Date: 6 September 2011

To: Engineering Development Branch

From: Engineering Division

Subject: Finned Tube Heat Exchanger Evaluation

Our company has a contract to design a heating system for the Fiber Chemical Company. This heating system will be used to deliver hot dry air to a dryer used in removing moisture from the company’s spun fibers. It has been decided to use steam-heated water as the heating agent.

The heat exchanger design specifies that the heat transfer shall be by cross-flow, forced convection outside the tubes (air velocities of ~4 m/s). Our supplier has two types of tubes available: a radial-finned tube and a bare tube. The cost of the bare pipe is half the cost of the radial-finned pipe per foot of length, and there is sufficient space in the heater design for both types.

Please conduct appropriate heat-transfer studies to formulate a recommendation concerning which type of pipe we should use. As part of your analysis, please comment on the relative magnitudes of the heat-transfer resistances in the system. For your convenience, samples of both types of tubes have been mounted on an experimental rack in the lab.