

Xethanol LLC
1415 Engineering Drive
Madison, WI 53706

Memorandum

Date: May 21, 2007
To: Process Investigation Team
From: Thatcher Root, Director of Production Facilities

Re: Testing of new distillation column

The production group in our bioethanol startup company has purchased a used 28-tray distillation column, and needs to know if it will be suitable for purifying ethanol that will be produced by the fermentation group beginning next month. Your group is to operate the distillation column with realistic test feedstreams and characterize its performance. We wish to know if it operates satisfactorily, and get measurements of the energy consumption required to produce purified ethanol.

The column was obtained in a bankruptcy sale from the previous owner. We do not have any contact with their plant operating employees, but do have their operations manual and the necessary equipment for analysis of ethanol-containing samples. Their manual contains complete documentation on the physical equipment, along with useful startup procedures. Their data analysis procedures may be instructive, but also may not be necessary for our purposes.

You have two days for running tests on the equipment as installed at the seller's facility, before we intend to dismantle it for transfer to our plant. You are to operate it under different conditions of feed flowrate and reflux ratio to a) approve it for our purposes, b) collect data on mass and energy balances, with particular emphasis on energy consumption information for our process design team, and c) make recommendations for its operation. It will be helpful to use the full variety of modeling and analysis tools available. Comparison of operating behavior with appropriate ASPEN models or McCabe-Thiele analysis is desired. Use any other background you have to draw useful conclusions. Your memo report will be due 7 days after your lab work is completed, and your memo should have all pertinent results in 3-5 pages. You should also attach as an appendix a copy of all data and calculations that would normally remain in your files, since other workers at the home plant may need this information and may not be able to contact you on your next assignment.