REV. 1-1-68

INTEROFFICE COMMUNICATION

Westlake, Louisiana
October 14, 1969

TO: Mr. R. H. Gerlach

SUBJECT: Heavy Ends Reboiler Fouling

As a result of an engineering study on the heavy ends reboiler fouling problem, the following conclusions and recommendations can be made.

Due to pressure drop considerations, use of one reboiler is not giving the high flow rates required to keep deposits from collecting on the tubes. This is true whether the coking is forming due to a large film between tube and liquid or if the residue is formed strictly as an evaporative process. There are several alternatives which can be chosen which may remedy this problem.

Ths most inexpensive method is to operate with two reboilers in service. This has been tried once before but the unit was not given a fair chance, as one reboiler had operated for seven days before the other reboiler was placed in service. A test could be run with two reboilers with a clean bundle standing by. This spare unit could be placed in service within 12 hours after one bundle is taken out of service. While operating with two reboilers, the coefficient will approach 1/2 the value of one reboiler and this should be pointed out to the operators in advance so they are not unduly alarmed.

The 14" liquid line feeding each reboiler is too small, particularly when one unit is in service. This was noticeable in July when the 14" gate was 3/4 open and the coefficient was low. By opening the valve completely, the flow increased and the level in the heavy ends column dropped rapidly and hence raised the coefficient. By increasing the line size to 18" the pressure drop will decrease.

The baffling in the reboilers is very intricate. There are eleven baffles per reboiler (sketch attached). By changing and eliminating many of the baffles, the net flow would increase and have a higher liquid to gas ratio.

The net head available for flow through the reboilers is 19.4 feet which corresponds to 9 PSID. The design ratio for the reboilers is 20% vaporization at a design flow rate of 4553 GPM. The design line loss for one reboiler in service is 22.5 feet at this design flow rate. Since the differential pressure is greater than design, the percent vaporization is increased. As this design data are based on clean service and assumes high column level, high flow rates are highly optimistic. The flow rate is less than design.

The use of a filtration system in the feed line to the heavy ends column was ruled out since the heavy tars were not filtrated by 40 micron equivalent paper.

Another alternate system would be a recirculation pump system to give forced convection to each reboiler. The pump system, while offering the greatest chance of success, is the most expensive.

Also enclosed is a graph which could be used by Operations and/or Maintenance to anticipate reboiler cleaning. Additional uses may be found in furnace decoking, EDC vaporizers, etc.

In addition to bringing a reboiler on "cold" as was done by Operations during the last startup, it is also recommended that the deposits of a "dirty" reboiler be sent to the offsites tanks rather than to the EDC tar stills where there is a possibility that the dirty material could be transferred to the clean reboiler.

After review of this letter, a meeting should be held with all interested parties to discuss any future action.

P. M. Winegar

PMW-MC
Attachment
cc: LNV
JDM
DKP
RDG
RLH

from

J. D. MINOTT

May 28, 1970

To

$\frac{118}{996}$ =

6263

4000 ft² area.

Monel = 2.5 × steel cost

1" × 1¼ Δ = 1.08 × ¾" × $\frac{15}{16}$ Δ

Length factor of 10' = 1.2 × 16'

Bundle type = 0.80 × floating head

3.30 (0.80)(1.2)(1.08)(2.5) = $8.55/ft². (1958)

8.55 × 6263 = $53,549 in 1958

Escalation factor = $63,442

Assume $65,000 + 10,000 = $75,000 = $85,000

Cont. 15% = $10,000

Valves	$1000	Insulation	$1,000
Piping	4,000	steam fit + Valve	$1,000
Found.	$2000	Controller	$1,000

} $10,000