

To: P. J. Kober

From: D. A. Doherty
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Subject: VCM Efficiencies

VISTA

Interoffice
Communication

Cumulative VCM Efficiency for fiscal year 1988 (through April) is 1.01259. Budgeted efficiency for fiscal '88 is 1.00756.

An investigation into the VCM efficiency was undertaken by Operations, Engineering, and other plant personnel. The investigation included a brainstorming session to develop a list of possible causes of efficiency problems. (The list is attached.)

The only major cause of reduced efficiency identified is the difference between the KCS Railroad scale (used to weigh VCM cars) and the Aberdeen railcar scale (used to weigh PVC product cars). The effect of the scale difference on the reported monthly efficiency is an unfavorable increase of about 0.006 (based on a recent scale weight comparison). April year-to-date efficiency adjusted to eliminate the effect of scale differences is 1.00678.

In order to estimate the difference between the Aberdeen railcar scale and the KCS scale, thirty-six VCM cars were weighed in Aberdeen during a two week period in January 1988. These cars were weighed both before and after unloading. The billed weight from the KCS scale averaged 946 pounds more than the Aberdeen scale weights. This difference does not include the heel weight of 750 lbs. assumed left in the car for billing purposes. The actual difference in the two scales averages 1,717 lbs. when the heel weight is included.

Table I lists the weights for the railcars received during the two week period as measured by the KCS and Aberdeen scales. Also included in this table are average differences between the KCS and Aberdeen scales. Graph I illustrates the consistently higher values from the KCS scales.

KCS guarantees their scale to $\pm 1\%$ tolerance. An average 1.0% overweight (as compared to Aberdeen scales) would result in an efficiency of 1.01 even if the actual plant efficiency was perfect. The Aberdeen railcar scales are certified quarterly to be within 0.1% of actual weight. The effect on efficiency is based on the difference between the incoming and outgoing scales regardless of the "correct" weight.

Aberdeen efficiencies are sensitive to changes in the difference between the VCM measured weight and the PVC product measured weight. Several methods were devised to try to detect changes in the KCS scale so that efficiency swings caused by a change in the

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railroad's scale could be explained. The only method proven effective is to check VCM car weights against the Aberdeen scale. Weighing VCM cars as done during this investigation cost \$140 per car. The cost for weighing all VCM cars would be approximately \$28M per month.

Volumetric methods of calculating railcar contents were investigated to see if the KCS scale could be monitored that way. VCM cars were gauged and the contents of railcars was calculated based on outages and measured temperatures. Outages and temperatures for loaded cars were provided by the LCVCN plant and similar measurements were made in Aberdeen for a few cars. Volumetric methods do not appear accurate enough to detect a small (but significant) change in a rail scale's performance.

Table II shows calculated contents and comparisons to scale weights for many of the railcars recently shipped to the Aberdeen Plant from LCVCN. Several graphs were constructed comparing the KCS scale weights against the Lake Charles and Aberdeen calculated volumetric weights. No obvious correlation exists between the calculated content and scale weight.

Based on the 36 cars weighed by KCS and checked at Aberdeen, approximately 50% of the Aberdeen Plant's reported inefficiency is accounted for by the scale difference. A cumulative efficiency adjusted by assuming a similar scale difference throughout the fiscal year, is favorable compared to budget.

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slh

cc: RWS, DCS, JEN, CJMc, AEB, DFJ, LDH, VEM, RBN
HOUSTON: RRS, THH

File: C 2.41.0

BRAINSTORMING LIST**CAUSES FOR VCM EFFICIENCY PROBLEMS**

1. Railcar weights are from KCS for Vinyl - unloading procedure
2. Low-mole resin: Product mix affects efficiency/High temperature reactors have more losses.
3. Recipe changes - chemistry--(lock up VCM?)
4. Strapping tables, etc. and inventory procedures, way we measure what is in reactor
5. Compound - Dryblend resin consumption
6. Send back more VCM in cold weather
7. Sphere gauge, etc. not accurate
8. Leaks and losses VCM, baghouses, and at Tank Farm
9. Calibration and reporting problems
10. Impurities in Vinyl
11. Reduced impurities in PVC
12. Losses to ponds, incinerators
13. No RVCM in 5305

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14. Used to count culls-don't count anymore

15. Vacuum dust in compound

16. Compound and dryblend scale variation (railcar scale variations)

17. Leaks that are washed to storm water pits and accumulation in storm water pits and API Separator

18. Fluid bed centrate to pond 3

19. Errors in bag/box scales

20. Higher slurry residuals - NO residuals are lower

21. VCM opening losses - NO opening losses are lower

22. Calculation procedure changes

23. Lowered (or increased) dryblend losses

24. Look at compound and dryblend efficiencies

25. Masterbatch bulk system for dryblend

26. VCM losses in wastewater

27. Changes in personnel