conoco

Interoffice Communication

To J. W. Leigh

From S. K. Biegler

Date September 24, 1982

Subject ANS CRUDE TEST RUN

I have developed a list of test samples to be taken during the Alaskan North Slope Test Run. Tables 1 and 2 present sample data required; Tables 3-7 separate sample requirements into groups; Table 8 is a list of important sample data. The five sample groups include: the FCC, the Regular Coker, the Distillate and Gas Oil HDS Units, Jet-50 Components, and No. 2 Heating Oil Components. A reformer test run is not included in the sample list. However, test run data should be collected if coker gasoline is being desulfurized and reformed. A test run on the No. 3 CTU is not planned but will be done if deemed necessary.

A cursory test run on the FCC Unit should provide yield information on the heavier ANS gas oils and will determine product sulfur distribution for the higher sulfur feeds. Sample requirements are presented in Table 3. A mini test run on the Regular Coker will provide product yield and sulfur information on coking ANS resid. Sample data is shown in Table 5.

Desulfurizing ANS gas oils provides a good opportunity to determine Gas Oil HDS Unit capabilities. If manpower is available, a complete test run should be conducted on the Gas Oil HDS Unit. The Distillate HDS Unit should be included in the test run because of the interaction of the two units. Sample requirements are presented in Table 4.

Sample data on the refinery kerosene streams (Table 6) will provide the capability to optimize the amount of off-spec ANS kerosene that can be blended to Jet-50. Cetane information on No. 2 Heating Oil blend components will enable the refinery to produce two heating oil blends, grades 76 and 77. Production of grade 77 fuel oil should be optimized as limited by cetane index specifications. Sample requirements are shown in Table 7.

If additional test runs or data are desired, let me know. Also, I would like to know priorities on the proposed test runs for scheduling purposes.

Sue

Sue Biegler
Staff Engineer
Lake Charles Refinery

dlm
Encs
cc/encs: DFM/PWL RH MSJ TJM RBW RHC WJW ARM JDT SGC PAM MEO JM ✓
File: 03.13

TABLE 1
SAMPLE TEST DATA REQUIREMENTS
ANS CRUDE TEST RUN
LAKE CHARLES REFINERY

	No. 2 CTU			No. 3 CTU							Misc. Streams		
	Kerosene	Diesel	AGO	Gasoline	Kerosene	Diesel	AGO	LVGO	HVGO	Resid	Cit-Con Gas Oil	Cit-Con Resid	Molex Raffinate
Gravity, °API	X	X	X	X	X	X	X	X	X	X	X	X	X
Total Sulfur, Wt%	X	X	X	X	X	X	X	X	X	X	X	X	X
Mercaptan Sulfur, Wt%	X			X	X								X
Total Nitrogen, Wt%										X		X	
Basic Nitrogen, PPM			X				X	X	X	X	X	X	
Distillation, °F													
IBP	X	X	X	X	X	X	X	X	X	X	X		X
10% Recovered	X	X	X	X	X	X	X	X	X	X	X		X
30% Recovered	X	X	X	X	X	X	X	X	X	X	X		X
50% Recovered	X	X	X	X	X	X	X	X	X	X	X		X
70% Recovered	X	X	X	X	X	X	X	X	X	X	X		X
90% Recovered	X	X	X	X	X	X	X	X	X	X	X		X
End Point	X	X	X	X	X	X	X	X	X	X	X		X
PONA													
Paraffins, %	X				X	X							X
Olefins, %					X								
Naphthenes, %					X								
Aromatics, %	X				X	X							X
N-Paraffins, %	X					X							X
Metals													
Vanadium, PPM			X				X	X	X	X	X	X	
Nickel, PPM			X				X	X	X	X	X	X	
Iron, PPM			X				X	X	X	X	X	X	
Sodium, PPM			X				X	X	X	X	X	X	
Copper, PPM			X				X	X	X	X	X	X	
Smoke Point	X					X							X
Cetane Index		X					X						
Carbon Residue		X	X				X	X	X	X	X	X	
Pour Point, °F		X	X				X	X	X		X		
Color		X					X						
Cloud Point, °F		X					X						
Freeze Point, °C	X					X							X
RI			X				X	X	X		X		
RI Temp			X				X	X	X		X		
Aniline Point, °F													
Bromine No.			X				X	X	X		X		
Benzene, %				X									
Octanes													
Research Clear				X									
Research + 1.1 Gm Pb				X									
Motor Clear				X									
Motor + 1.1 Gm Pb				X									
Visc @ 100°F, CS													
@ 122°F, CS			X	X		X	X	X	X	X	X	X	
@ 210°F, CS			X	X		X	X	X	X	X	X	X	
Silicone, PPM													
Ash, Wt%													

TABLE 2
SAMPLE TEST DATA - CONTINUED
ANS CRUDE TEST RUN

	Coker					FCC					Distillate HDS Gas Oil HDS			
	Charge(1)	Gasoline	Distillate	Gas Oil	Coke	Total Chg.	Gasoline	LCO	HCO	Slurry	Feed	Desulf. Dist.	Feed	Desulf. Gas Oil
Gravity, °API	X	X	X	X		X	X	X	X	X	X	X	X	X
Total Sulfur, Wt%	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mercaptan Sulfur, Wt%		X					X				X	X		
Total Nitrogen, Wt%	X				X						X	X		
Basic Nitrogen, PPM	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Distillation, °F														
IBP		X	X	X		X	X	X	X	X	X	X	X	X
10% Recovered		X	X	X		X	X	X	X	X	X	X	X	X
30% Recovered		X	X	X		X	X	X	X	X	X	X	X	X
50% Recovered		X	X	X		X	X	X	X	X	X	X	X	X
70% Recovered		X	X	X		X	X	X	X	X	X	X	X	X
90% Recovered		X	X	X		X	X	X	X	X	X	X	X	X
End Point		X	X	X		X	X	X	X	X	X	X	X	X
PONA														
Paraffins, %		X												
Olefins, %		X												
Naphthenes, %		X												
Aromatics, %		X												
N. Paraffins, %														
Metals														
Vanadium, PPM	X			X	X	X		X	X	X			X	X
Nickel, PPM	X			X	X	X		X	X	X			X	X
Iron, PPM	X			X	X	X		X	X	X			X	X
Sodium, PPM	X			X	X	X		X	X	X			X	X
Copper, PPM	X			X	X	X		X	X	X			X	X
Smoke Point														
Cetane Index			X								X	X		
Carbon Residue			X	X		X		X	X	X	X	X	X	X
Pour Point, °F	X		X	X		X		X	X	X	X	X	X	X
Color			X								X	X		
Cloud Point, °F			X								X	X		
Freeze Point, °C														
RI				X		X		X	X	X			X	X
RI Temp				X		X		X	X	X			X	X
Aniline Point, °F						X		X	X					
Bromine No.		X	X	X		X		X	X	X	X	X	X	X
Benzene, %		X												
Octanes														
Research Clear		X					X							
Research +1.1 Gm Pb		X					X							
Motor Clear		X					X							
Motor + 1.1 Gm Pb		X					X							
Visc @ 100°F, CS														
@ 122°F, CS	X	X	X	X		X	X	X	X	X	X	X	X	X
@ 210°F, CS	X	X	X	X		X	X	X	X	X	X	X	X	X
Silicone, PPM					X									
Ash, Wt%	X			X	X									

(1) If not 100% ANS Resid

TABLE 3
SAMPLE GROUP 1 - FCC TEST RUN
ANS CRUDE TEST RUN
LAKE CHARLES REFINERY

UNIT	SAMPLE	TESTS
FCC	Total Charge	(2)
	Gasoline	(2), GLC
	Light Cycle Oil	(2)
	Heavy Cycle Oil	(2)
	Slurry	(2)
	Fuel Gas to PCP	GLC
	Abs. Tail Gas	GLC
	P-P	GLC
	B-B	GLC
	Flue Gas	GLC, SO_2
No. 2 CTU	Atmospheric Gas Oil	(1)
	No. 2 CTU Overhead Gas	GLC
Tank Farm	Cit-Con Gas Oil - Gas Oil From Storage	(1)
Gas Oil HDS	Desulfurized Gas Oil	(2)
Reformers	No. 1 CRU Stab. Overhead(3)	GLC
	No. 2 CRU Stab. Overhead(3)	GLC

(1) See Table 1.
(2) See Table 2.
(3) If unit is operating and sending gas to FCC.

TABLE 4
SAMPLE GROUP 2 - DISTILLATE AND GAS OIL HDS TEST RUN
ANS CRUDE TEST RUN
LAKE CHARLES REFINERY

UNIT	SAMPLE	TESTS
Distillate HDS	Total Charge	(2)
	Desulfurized Distillate	(2)
	Distillate Stripper Ovhd	GLC, °API, Distillation
	Recycle Hydrogen	GLC
Gas Oil HDS	Total Charge	(2)
	Desulfurized Gas Oil	(2)
	Gas Oil Stripper Ovhd	GLC, °API, Distillation
Reformers	Make-up Hydrogen	(1)
No. 3 CTU	Diesel	(1)
	Atmospheric Gas Oil	(1)
	Light Vacuum Gas Oil	(1)
	Heavy Vacuum Gas Oil	(1)
Coker	Distillate	(2)
	Gas Oil	(2)
FCC	Light Cycle Oil	(2)

(1) See Table 1.
(2) See Table 2.

TABLE 5
SAMPLE GROUP 3 -REGULAR COKER TEST RUN (3)
ANS CRUDE TEST RUN
LAKE CHARLES REFINERY

UNIT	SAMPLE	TESTS
Coker	Gas	GLC (2)
	Gasoline	GLC, (2)
	Distillate	(2)
	Gas Oil	(2)
	Coke	(2)
	Total Charge	(2)
No. 3 CTU	Resid(4)	(1)
Misc.	Cit-Con Resid(4)	(1)

(1) See Table 1.
(2) See Table 2.
(3) May want to conduct test run the same day(s) as Sample Group 2, since two of the samples are required for that test run.
(4) This sample could be taken separate from the scheduled Test Run.

TABLE 6
SAMPLE GROUP 4 - JET-50 COMPONENT
ANS CRUDE TEST RUN
LAKE CHARLES REFINERY

UNIT	SAMPLE	TESTS
No. 2 CTU	Kerosene	(1)
No. 3 CTU	Kerosene	(1)
-	Molex Raffinate	(1)

(1) See Table 1.

TABLE 7
SAMPLE GROUP 5 - NO. 2 HEATING OIL COMPONENTS
ANS CRUDE TEST RUN
LAKE CHARLES REFINERY

UNIT	SAMPLE	TESTS
No. 2 CTU	Diesel	(1)
No. 3 CTU	Diesel	(1)
FCC	Light Cycle Oil	(2)
Distillate HDS	Desulfurized Distillate	(2)
Tank Farm	No. 2 Heating Oil Blend	

(1) See Table 1.
(2) See Table 2.

TABLE 8
IMPORTANT TESTS
ANS CRUDE TEST RUN
LAKE CHARLES REFINERY

UNIT	SAMPLE	TESTS
No. 3 CTU	Kerosene	Sulfur Mercaptan Sulfur Aromatic Content Smoke Point
	Diesel	Carbon Residue(on 10% Btms) Cetane Index
	Resid	Sulfur Metals
Gas Oil HDS	Feed Desulf. Gas Oil Recycle H_2	Sulfur Sulfur GLC
Distillate HDS	Feed Desulf. Distillate	Sulfur Sulfur Cetane Index Carbon Residue(on 10% Btms)
Coker	Gasoline Coke	Sulfur Sulfur Metals
FCC	Feed LCO Slurry	Sulfur Cetane Index Carbon Residue(on 10% Btms) Sulfur