conoco

Interoffice Communication

To M. L. Ashby

From M. C. Manion

Date February 28, 1984

Subject Clarifier Repairs

Attached is a plan to allow repairs to be made to the clarifier with the secondary "on-line". This plan will require:

1) the LCCP wastewater stream from the DAF unit to be shut off three days prior to the clarifier outage in order to adjust basin levels and stabilize the ASU feed.

2) the LCVCM incinerator wastewater to continue to flow to the LCCP north lagoon and the sump pump to be in good working order.

3) the LCVCM cooling tower blowdown to continue to flow to LCCP.

4) no plant activities to be scheduled during the clarifier outage which result in additional water to the sewer (ie. washdown or washouts).

5) close monitoring of the LCVCM effluent pH during the outage.

6) favorable weather conditions.

The clarifier outage is scheduled to begin on February 29 at 0700. Repairs are expected to require a total of 40 hours. These repairs include modifications to the clarifier rake and the clarifier weir. Sufficient capacity is available to contain the plant's wastewater during the clarifier outage - see attached tables.

Mark C Manion

M. C. Manion

kf
cc: RAC-JWW-MLA(4)-JRH-HOA-SRA-PLF-RB-DLD-PE

CLARIFIER OUTAGE PLAN

Date	Time		Action
2/24	1600	1.	Shut off LCCP DAF unit wastewater.
		2.	Use 3" gas driven pump to empty the sludge basin into ASU.
		3.	Shut off the aerator in the South Basin.
		4.	Lower the set point on the South Basin level controller to zero. Allow one ASU lift pump to pull level down.
2/28	0700	5.	Turn on second ASU lift pump to empty the south basin as low as possible. Use the 6" diesel driven pump as necessary - do not overload the clarifier (use diesel after the electrics lose suction).
		6.	Allow the ASU level to stabilize.
2/29	0700	7.	Remove the polymer agitator from the clarifier inlet box. Turn off the Reaeration Basin aerator and the polymer pump and flush water.
		8.	Install wooden slide gate in the clarifier inlet box. Position sand bags as necessary at the bottom of the slide gate for seal.
2/29	0700	9.	Shut off the clarifier rake and set up the 6" diesel driven pump to take suction from the clarifier and discharge into the ASU.
		10.	Use the sludge recycle pumps and the 6" diesel driven pump to empty the clarifier.
	1100	11.	After the clarifier is emptied, wash down the clarifier and pump out.
		12.	Shut down the ASU lift pumps when the ASU level becomes high.
	1200	13.	Set up a 3" gas driven pump to take suction from the sump in the clarifier and discharge into the ASU to remove water if leakage occurs thru the slide gate.
	1200	14.	Set up the 6" diesel driven pump to take suction from the clarifier inlet box and discharge into the ASU to maintain circulation in the ASU - leave ASU aerators on.

	Date	Time		Action
	2/29	1200	15.	Secure all ladders with ropes when entering clarifier for main tenance. Set up scaffolding and lighting as necessary.
40 hrs.	3/2	0400	16.	Make repairs to clarifier rake, clarifier weir and south basin level control valve.
		0400	17.	Remove the 6" diesel driven pump from the clarifier inlet box.
		0400	18.	Remove the 3" gas driven pump from the clarifier.
		0400	19.	Turn on the polymer pump and flush water.
		0430	20.	Open the slide gate slowly and allow the clarifier to fill.
		0430	21.	Start the sludge recycle pumps and clarifier rake. Start the reaeration basin aerator.
		0500	22.	Install polymer agitator.
		0500	23.	Start up ASU lift pumps.
			24.	It is important to bring levels down slowly as not to overload the clarifier (700 gpm max).
			25.	After basin levels have returned to normal, line the LCVCM CT-50 blender back to the LCVCM secondary.

TABLE I
CURRENT AVAILABLE
CONTAINMENT TIME (2-24-84)

Flow gpm	Containment Time (Hrs.) T-701 W Basin	T-703 S Basin	Subtotal T-701; T-703	T-702 ASU	Total T-701, 2, 3	T-706 Sludge Basin
300	15.5	47.6	63.1	26.3	89.4	4.1
350	13.3	40.8	54.1	22.5	76.6	3.5
400	11.7	35.7	47.4	19.7	67.1	3.1
450	10.4	31.7	42.1	17.5	59.6	2.8
500	9.3	28.5	37.8	15.8	53.6	2.5

NOTES:

1) Based on a maximum basin level of 1.0 ft below the top of basin.

2) Based on levels measured on 2-24-84:

Basin	"C" (Inches)	Available Volume (MGAL)
T-701	90	279.7
T-703	95	856.3
T-702	61	473.3
T-706	54	74.4

3) Normal flow is approximately 400 gpm.

4) "C" is the length of the exposed basin from the top of basin to water level.

VVC 000008106

TABLE II
CONTAINMENT TIME
AVAILABLE AFTER LOWERING LEVELS

Flow gpm	Containment Time (Hrs.) T-701 W Basin	T-703 S Basin	Subtotal T-701; T-703	T-702 ASU	Total T-701, 2, 3	T-706 Sludge Basin
300	23.4	68.1	91.5	42.7	134.2	7.9
350	20.0	58.4	78.4	36.6	115.0	6.8
400	17.5	51.1	68.6	32.0	100.6	5.9
450	15.6	45.4	61.0	28.5	89.5	5.3
500	14.0	40.9	54.9	25.6	80.5	4.7

NOTES:

1) Based on a maximum basin level of 1.0 ft below the top of basin.

2) Based on lowering basin levels as follows:

Basin	Current Level (ft)	Amt Lowered (ft)	"C" (Inches)	Available Volume (MGAL)
T-701	7.84	1.84	130	420.4
T-703	7.61	1.61	130	1,226.2
T-702	9.18	1.18	87	768.3
T-706	2.99	1.00	81	142.2

3) Normal flow is approximately 400 gpm.

4) "C" is the length of the exposed basin from the top of basin to water level.

VVC 000008107

TABLE .II
CURRENT AVAILABLE
CONTAINMENT TIME (2-28-84)

Flow gpm	T-701 W Basin	T-703 S Basin	Subtotal T-701; T-703	T-702 ASU	Total T-701, 2, 3	T-706 Sludge Basin
300	18.6	60.7	79.3	30.8	110.1	-
350	15.9	52.0	67.9	26.4	94.3	-
400	13.9	45.5	59.4	23.1	82.5	-
450	12.4	40.4	52.8	20.5	73.3	-
500	11.1	36.4	47.5	18.5	66.0	-

NOTES:

1) Based on a maximum basin level of 1.0 ft below the top of basin.

2) Based on levels measured on 2-28-84:

Basin	"C" Inches	Available Volume (MGAL)
T-701	105	334.4
T-703	117	1,091.7
T-702	68	554.1
T-706	Not measured	--

3) Actual flow on meter = 300 gpm, south basin level = 14%.

VVC 000008108

[redacted]

Turnaround 83?

~~IN MONITORING OF THE SECONDARY~~

Vessel entry (OSHA)

VVC 000008109

check on OSHA Records Retention Policy

VVC 000008110

DATE 4-27-83 DAY OF WEEK Wednesday PAGE 3

INCINERATOR UNIT

Time	COOLING TOWER (CT-950) pH	PO4	Free Cl2	Cond.	Cycles	BOILER FEED WATER pH	C-902 BOTTOMS CAUSTIC SCRUBBER HOCl⁻	pH	Total Air	True Caustic	MURIATIC ACID %HCl
2300						7.7	.075	9.0	2.14	Nil	
0700	6.8	3.8	4.1	1000	2.9	6.7	.030	8.7	2.18	Nil	
1500						6.1	.05	9.0	2.1	Nil	
						6.8	.052	8.9	2.14	NIL	

VVC 000008111

GAS SAMPLES

Time	C-901 HCL	Cl2	VCM	S-901B PH	COND	C-902 HCl	Cl2	VCM
2300	Nil / .32			8.3	35			
0700	.24 / .89			8.7	250			
1500	Nil / .85			7.8	45			
	.08 / .74			8.3	116			

CHEM PLANT WATER / T/A LOG SHEET

DATE	TIME	pH	COD	NH_3	Cr (AA)
3-18	1500	6.6	112	4.11	
3-19	2300	7.3	81	4.9	
3-19	0700	8.5	137	7.50	
3-19	1200	7.3	84	4.57	
	1500	6.9	62	6.11	
	1900	7.5	94	13.6	
3-20	2300	7.0	123	3.7	
	0300	7.1	123	3.7	
	0700	8.8	482	4.67	
	1500	6.8	143	2.24	
	1900	7.2	95	18.7	
3-21	2300	6.5	100	2.9	
	0200	6.8	125	2.5	
	0700	7.3	94	3.06	
	1500	6.7	64	3.92	
	1900	7.6	216	14.3	
3-22	2300	6.7	56	4.1	
	0700	7.1	30	8.8	
3-23	0700	6.7	92	2.70	
3-28	0700	7.0	UNABLE TO READ	8.36	

VVC 000008112

LL 571-A

DATE 4-27-83 DAY OF WEEK Wednesday PAGE 1

	LE Fd	S-102	R-101	T-102				H.E. Refl.		VC to Stg.		S-309	R-102	S-307				
Time	pH	pH	Cl_2	pH	NaOH	NaOCl	SO_3	H_2O	Acid	H_2O	NaOH	Acid	Cl_2	Cl_2				
2300	9.5	6.6		8.0	.460 / 3.34			22										
0100				8.4	.916 / 3.34			15										
0300				8.1	.860 / 3.34	.60		22										
0500				7.7	.884 / 3.34			29										
0700	8.2	6.6		7.0	.79 / 3.30	.114		8										
0900		6.6		7.3	.68 / 3.22			8										
1100		6.5		6.8	.86 / 3.28			8										
1300		7.0		7.8	.80 / 3.28			15										
1500	8.3	6.9		7.3	NIL / 3.26			8										
1700				8.0	.88 / 3.34			8										
1900				7.1	3.1 / 3.3			8										
2100				9.7	2.66 / 3.58			8										
AVG	8.7	6.7	—	7.9	1.07 / 3.33	.357	—	13										

VVC 000008113

.571-A

DATE 4-27-83 DAY OF WEEK Wednesday PAGE 2

	S-109				HE Fd	Vap Fd	Vap A	Vap B	VC Btwn.	VC Reflux		S-306	S-307	T-103	VCTS Refl.	T-101	T-101	T-502	C-201
Time	H_2O	Color	Acid	Time	H_2O	H_2O	H_2O	H_2O	H_2O	H_2O	Acid	Cl_2	Cl_2	$FeCl_3$	H_2O	H_2O	$FeCl_3$	Acid	H_2O
				2300										R1					

VVC 000008114

					C.W.	C.W.			C.W.	Deion.	BFW	R-1		R-2		R-3		R-4	
				Time	pH	Cl_2	Time	Cycles	PO_4	Hrdns.	Hyd	pH	Cond.	pH	Cond.	pH	Cond.	pH	Cond.
							2400												
				0700	7.2	0.6	0800	1.9	8.0	650/350									
							1600												

	Time	H_2O	Color	Acid	pH
T-415					
T-416					
T-452					
H-202					
Tar Truck Sight G.	0100	200			
Tars Truck Btms	0100	214			199
Sight G.	0600	190			
Tars Truck Btms	0600	190			

171-B

GLASS BOMB AND MISCELLANOUS TURNAROUND SAMPLES

LOCATION AND DESCRIPTION	DATE	TIME	VCM	EDC		COMMENTS
C-102	3-9-83	0525	NIL	0.40		
C-202	~	0535	~	.40		
S-306	~	0525	NIL	61.4		
S-309	~	1055	NIL	.102		
S-306	~	1055	NIL	.20		
C-203	~	11:05	NIL	.105		
DOCK LINE	~	1215	105.1%			FOR ICEN CASH
S-306	~	1230	NIL	.91		
S-309	~	~	NIL	.117		
C-203	~	~	NIL	.10		
C-103	~	~	NIL	.05		
C-103	~	1550	NIL	.05		
TIC1	3-10-83	0200	NIL	.75		
VCRD LINE	~	0200	5733	36.1		
T-102	~	~	5.4	4.1		
C-201	~	0300	NIL	.43		
R-201-A	~	~	tr.	tr.		
R-201-B	~	~	tr.	tr.		
T-101	~	0500	NIL	NIL		
T-102	~	~	1.02	.91		
R-201-A	~	~	NIL	NIL		

VVC 000008115

GLASS BOMB AND MISCELLANOUS TURNAROUND SAMPLES

LOCATION AND DESCRIPTION	DATE	TIME	VCM	EDC		COMMENTS
VCM BTMS	3-4-83	2130	14.8%	"		EDC WASH LIQUID SAMPLE
C-202 BTMS	3-4-83	2300	0.937%			
C-202 - O/H	3-5-83	0030	72.2 %			OVER RANGED on File 3 GLASS Bomb File 18
QUENCH Col.	3-5-83	0130	11.2			Glass Bomb File 18
C-203 O/H	3-5-83	0200	719	14,650		Glass bomb File #3
C-202 O/H	3-5-83	0245	34,530	35,500		LIQUID IN SAMPLE BOMB
QUENCH Colm.	3-5-83	0330	38,070	14,720		
C-202 O/H	3-5-83	0400	7207	23080		Some liquid in sample Bomb
C-203 O/H	3-5-83	0450	609	14130		
QUENCH Col.	3-5-83	0520	3998	15,670		
C-203 O/H	3-6-83	0515	23	3293		
R-303	3-7-83	0500	Nil	Nil		
R-101	3-8-83	0520	NIL	NIL		
R-101	~	0800	NIL	.031		
R-305	~	0830	NIL	.166		
T-103-A	3-7-83	0400	TR	.80		
S-205	~	~	TR	2.0		
C-102	~	~	NIL	4		
C-202 (HCl Col.)	~	0430	NIL	.40		
T-103-A	~	0525	NIL	.10		
S-205	~	~	TR	.40		

VVC 0118000000

GLASS BOMB AND MISCELLANOUS TURNAROUND SAMPLES

PAGE _____

LOCATION AND DESCRIPTION	DATE	TIME	VCM	EDC		COMMENTS
R-201-B	3-10	0500	Nil	Nil		
C-201	″	″	Nil	tr.		
T-102	″	0700	Nil	.073		BOTTOM
T-102	″	0815	Nil	.059		TOP
S-103	3-11	0400	.29	.73		
S-103	″	0500	.27	.31		
S-103	″	0740	.26	6.61		
T 202	″	1230	0.7	19.2		
T-202	3-12	0330	tr.	2.2		
S-206	″	0500	.54	13.4		
S-103	″	″	tr.	tr.		
T-102	″	0530	.53	.78		
Dock line	3/12	1245	5.6%			by difference from N_2
S-206	3-13	0130	.08	tr.		
T-453	″	0300	3.5	77.0		
T-451	″	″	17	615		
Dock line	″	0400	58			file 18
″	″	″	15			file 19
S-206	″	0500	.18	tr.		
Dock Line	″	0645	14			file 18
″	″	0645	10.7	.90		file 19
T-451	″	0830		92		H_2O SAMPLE

VVC 000008117

GLASS BOMB AND MISCELLANOUS TURNAROUND SAMPLES

LOCATION AND DESCRIPTION	DATE	TIME	VCM	EDC		COMMENTS
Dock Line	3-14	0300	8.6			file 18
T-453	~	0400	3.4	46.9		" "
T-451	~	~	23	3983		" "
DOCK LINE	~	0830	5.2			File 17
~	~	~	3.4			File 19
S-102	~	1925	NIL	TRACE		
S-101	~	2100	NIL	TRACE		
T-451	3-15	0400	4.7	650		
DOCK LINE	3-15	0700	3.3			File 19
S 217	3-15	0915	NIL	.54		"
S 217	~	0930	.42	10.9		"
S 101	~	1315	NIL	2.3		"
S 103	~	~	NIL	TR		"
T 453	~	1500	NIL	10.8		"
Dockline	3-16	0400	1.4	NIL		"
T-451	~	~	.19	10.6		
T-453	~	~	NIL	2.0		
S 911 H	~	1000	NIL	NIL		F-19
T-453 BOTTOM	~	1115	NIL	2.2		~
T-453 TOP	~	~	NIL	9.1		~
T-453 TOP	3-17	0200	.0051	7.9		-
FLUME ROCKET	-	1235	NIL	7.7		-

VVC 000008118

GLASS BOMB AND MISCELLANOUS TURNAROUND SAMPLES PAGE _____

LOCATION AND DESCRIPTION	DATE	TIME	VCM	EDC		COMMENTS
453	3-17-83	0400	.20	6.9		File 19
451	"	"	.53	23.7		"
Rocket	"	0500	Nil	12.5		"
Dock Line	"	0730	1.87	Nil		"
T102	"	1225	Nil	.83		"
Dock Line	"	1500	2.53	Nil		"
453 Top	3-18	0400	Nil	.26		Syringe
453 Btm	"	"	.89	1.8		"
Dock Line	"	"	1.1	Nil		"
T-102	"	0500	Nil	1.3		~~Syr~~ 11 Glass Bomb
451	"	0500	.81	10.6		Syringe
Rocket	"	0500	Nil	Nil		"
T453 Btm	"	1300	Nil	2.6		Glass Bomb
T453 Top	"	1300	Nil	3.9		" "
H-201-A	3-20	1730	Nil	Trace		" "
H-201-A	3-21	0200	Nil	Trace		" "
C-500	3-21	0300	69	2,165		#1B
453 Btm	3-21	0300	Nil	Nil		Syringe
451	3-21	0300	.62	9.0		"
451	3-21	0530	Nil	3.3		"

VVC 000008119

GLASS BOMB AND MISCELLANOUS TURNAROUND SAMPLES

PAGE ____

LOCATION AND DESCRIPTION	DATE	TIME	VCM	EDC		COMMENTS
451 TOP	3-22-83	0100	NIL	3.1		SYRINGE
451 BTM	~	0400	1.4	7.5		—
451 TOP	—	0900	NIL	1.5		—
451 BTM	—	0400	.15	5.2		—
T-202	3-23	0725	NIL	NIL		GLASS BOMB
S-206	~	0800	NIL	NIL		
T 451 TOP	3-24	2300	Nil	Nil		Syringe
T 451 Bottom	3-24	2300	Nil	Nil		" "
T-451 Top	3-24	0400	Nil	Nil		Syringe
T-451 Bottom	3-24	0400	Nil	Nil		
C-103 Top	3-25	0230	Nil	Nil		
C 103 Bottom	3-25	0230	Nil	Nil		
C-103 Top	3-25	0445	Nil	Nil		
C 103 Bottom	3-25	0445	Nil	Nil		
S-202	3-[illegible]	[illegible]	[illegible]	6.6		GLASS BOMB
[illegible]	[illegible]	0530	[illegible]	[illegible]		
C-500	[illegible]	[illegible]	Nil	Nil		
[illegible]	[illegible]	0400	Nil	Nil		
C-500	3-28	0730	nil	nil		glass bomb
Line on top of Hcl colm.	3-29	1130	nil	1.5		
H-201-B	~	1400	nil	5.3		
H-201-B	~	~	~	8.4		

VVC 000008120

GLASS BOMB AND MISCELLANOUS TURNAROUND SAMPLES PAGE ____

LOCATION AND DESCRIPTION	DATE	TIME	VCM	EDC		COMMENTS
H-201-B	3-29-83	1530	NiL	27.4		GLASS BOMB
H-201-B	~	1915	NiL	20.0		—
H201-B	illegible	illegible	illegible	illegible		
HA01-L	illegible	illegible	Nil	illegible		
C-5..	illegible	illegible	illegible	illegible		
H201-B	illegible	illegible	illegible	illegible		
H2.1 B	3-3..	(illegible	Nil	.19		
H-201-B	~	0725	Nil	.13		
C-500	3-31-83	0400	.026	5.4		
C-500	~	0715	Nil	1.2		
C-500	illegible	illegible	NIL	illegible		
T-453	4-5	0400	NiL	.07		
S-202	4-5	1130	.151	2.8		
S-306	4-10	0745	Nil	2.3		
Plant Effluent	4-11	1050	.155	38		
Effluent Weir Box	4-11	0740	Nil	.89		
Dock Line @ VCM	4-17	1245	.05	—		
Dock Line @ Docks	4-17	1300	2583	—		
Pit N.E. Corner INCEN	4-18	0900	300	1.2		
Eff Weir Box NW Corner Sec	~	1030	.96	1.9		
11	~	1300	.17	.82		
illegible Box	4-17	415	NiL	3.5		

VVC 000008121

LOCATION AND DESCRIPTION	DATE	TIME	VCM	EDC		COMMENTS
Dock line	4-19	1800	1011			file 18
Dock line	~	~	682			file 3
Sewer Box	4-20	0600	NIL	2.1		File 19
Dock Line	✓	0730	16,350			File 3
Dock Vent	4-21	0350	12.3			File 19
Sewer Box	4-21	0350	Nil	Nil		
Dock Line Vent	4-22	0400	.178	Nil		File 19
Tars Trailer	4-22	0400	.014			File 19
RENOCK-LINE	4-25	1400	3468	2.1		File 18
DOCK LINE VENT	4-26	0710	TR	NIL		FILE 19

VAC 0000081221

Overexposures Plant Personnel

#	VCM	EDC	Name	Date	Job	? FALR
1	1.35	(6.96)	Moerbe, Ed	3-5-83	Blinding	yes
2.	(.74)	10.02	Trent, N.	3-5-83	"	yes
3.	(.53)	12.98	Riley, L.	3-5-83	"	yes
4.	1.17	(1.78)	Cash, K	3.4-83	S/S BL I + BL II	no
5	(.02)	12.70	Gould, E.	3-4-83	chief all over.	no
6	1.21	(3.06)	Doucet, J.	3-5-83	carpenter	no
7	1.93	17.63	Gould, E.	3-5-83	Chief	?
8	(.75)	17.82	Martin, R.	3-5-83	Op 2	no
9	(.36)	11.32	Morris, J.	3 5-83	2nd Op	?
10	(.11)	10.88	Landon, C.	3-6-83	S/S	?
11	(.37)	10.15	Fontenot, N.	3-6-83	BL I & BL II	yes
12	(.08)	45.96	Lincombe, G.	3-6-83	T-453	yes
13	(.08)	15.59	Bernard, B.	3-6-83	T-453	yes
14	(.14)	18.58	Cochran, J.	3-6-83		?
15	(.31)	17.95	Moerbe, E	3-6-83	R-202, S-202, C-203	yes
16	(.44)	15.25	O'Quinn, R	3-6-83		?
17	(.27)	13.97	Simmon, A	3-6-83		?
18	(.21)	38.92	Young, R	3-6-83		No ?
19	(.09)	44.59	VICKERS, J.	3-6-83		NO ?
20	(.10)	11.40	Fox, B.	3-6-83		no
21	(.15)	12.14	Martin, R.	3-6-83		no
22	(.18)	10.44	Wilburn, B.	3-6-83		?
23	(.61)	10.19	Gould, E.	3-6-83		?
24	(.47)	10.05	Barrow, L.	3-6-83		?
25	1.11	(.64)	TRAHAN, LARRY *	3-8-83	BL II	no

NEW EMPLOYEES For T/A

V	438 06 6822	ADDison, Ronald Doug, Jr.
V	436 13 3612	Breaux, ~~Charles~~ Phillis M.
V	434 64 6377	Broxton, Henry
V	433-66-0740	Benoit, Larry M
V	439-27-3633	Buller, Andrew Lee
V	439-08-1970	Burnett, Carroll Wesley
1. V	439-37-7039	CARTE, LANCE LAMAR
V	514-78-6899	CRADEUR, LISA LYNN
V	434-68-7492	CROWE, Gary STEPHEN
V	434-68-7490	CROWE, Richard K.
V	436 02 7895	DuBROCQ, TROY A.
V	439-54-4164	Guidry, Connie M
V	439-23-6539	Hooper, Darren, T
V	439-21-3593	JACKSON, GARY Gérard
V	433-02-6616	LATIMER, STEVE BRUCE
V	438-74-0480	LAWSON, ELMER VINCENT
V	484-54-7118	MANCHESTER, DANNY DEAN
V	436-90-9239	MARTIN, LOUIS E
V	434-34-7236	MOUHART, EARL R
V	439-15-9891	PAPILLION, GLENN G.
V	435-25-4352	PARKER, DAVID T
V	438-72-2422	Sonnier Edgar C.
V	435-45-9842	WoodHatch TONI NANETTE
V	438-08-7701	VIATOR, MICKEY

ANAL-REPORT TURNAROUND MAY 82

VVC 000008125

conoco 3L7

Interoffice Communication

To J. A. DeBernardi

From J. W. Ware

Date September 15, 1982

Subject 1982 Turnaround Critique

Summary

The 1982 turnaround was completed on-schedule, under budget and with the best safety record ever for a VCM Plant turnaround. The turnaround was budgeted for 23 days, stream-to-stream, and a total cost of $1,085.2M. The turnaround was actually completed in 26 calendar days following a cost-saving three day suspension of turnaround activities during the Memorial Day holiday weekend. Turnaround cost accounting indicates a total actual cost of $963.0M (to be confirmed by receipt of actual invoices at a later date). This represents a favorable cost variance of $122.2M. Three injuries requiring first aid treatment were reported during the 1982 turnaround. The best previous record was associated with the 1980 turnaround which recorded four first aid injuries and one medical treatment case.

The improved overall performance achieved by the Plant during this turnaround must be considered to be a significant accomplishment, especially in light of the Plant Modernization Project workload.

General elements which were factors in making the 1982 turnaround a success are as follows:

1) Favorable weather conditions during the turnaround period.

2) Relatively complete, experienced plant staff.

3) Close coordination of the work effort in daily meetings.

4) Decreased Plant Modernization activities.

5) Institution of an improved cost control program.

6) Availability of more qualified casual craftsman.

Attached you will find a more detailed analysis of the various aspects of the turnaround with plans for further improvement where appropriate.

JWWare

J. W. Ware
Plant Superintendent

br
cc: RB-MLA-JRH-JHB-SRA-PLF

VVC 000008126

Safety and Security

The 1982 turnaround was completed with three injuries requiring first aid treatment being reported. This statistic represents the best turnaround safety performance in the Plant's history. In addition fewer potentially hazardous "near miss" incidents were reported.

All injuries recorded during the turnaround involved casual personnel. The fact that the number of injuries was substantially less than previous turnarounds is attributed to increased direct supervision and employment of a casual work force which, for a variety of reasons, was more committed to established plant work practices.

Contractor safety performance improved considerably as compared to the 1981 turnaround. Factors contributing to this improvement include:

1) Fewer contract personnel in the plant.

2) Increased communication of plant safety requirements to contract personnel prior to the turnaround.

3) Depressed economic conditions in the Lake Charles area which permitted the use of more experienced contract personnel.

Plant security and employee/contractor control was adequate. Separate gates were designated for employees and contract personnel. Employees and plant contract personnel were provided identification badges and Plant Modernization contract personnel were required to wear specially designed identification tags along with their union identification buttons in full view for plant entry. This made possible improved gate control and coordination of personnel once they were in the plant.

May 1, 1982, marked the expiration of contracts between various craft unions and the Association of General Contractors in Lake Charles. Crafts with contracts which expired on May 1 included the carpenters, iron workers, cement finishers, brick layers, teamsters, operating engineers, pipefitters and boilermakers. The VCM Plant experienced no problems as a result of the expiration of these contracts.

Planning and Scheduling

The work planning effort for the turnaround was begun in early March, approximately two months prior to the start of the turnaround. The planning effort was directed toward identification of plant maintenance and Modernization Project work items and then organization of these work items into a schedule. This effort is well standardized for plant maintenance items and is based primarily upon past experience.

A special effort was made during the 1982 turnaround to apply a risk/benefit analysis to standard work items. Selected items were then eliminated in support of the cost control program. This effort yielded true cost savings during the turnaround. An Operations Shift Supervisor was assigned to work with Maintenance Department, Modernization Project and CED Planning personnel to update/improve

upon the computerized work schedule developed prior to the 1981 turnaround. The Shift Supervisor was occupied full time with this assignment for approximately three weeks. This Operations manpower commitment is critical to the success of the planning effort and the three week period was adequate. A similar commitment by Maintenance Department personnel was not possible while pre-planning the 1982 turnaround due to an understaffed condition. This deficiency manifested itself during the turnaround in deviations from the established work schedule and the resulting conflicts for available work space and manpower. An increased interaction between Maintenance and Modernization personnel is needed prior to the next turnaround. Due to the extent of the Modernization Project work and the projected duration of the 1983 turnaround, planning and scheduling work has already begun for this next turnaround.

Mechanical

In general the mechanical work went well. Unanticipated major work items which had an effect upon efficiency and scheduling included repairs to R-201A cracking furnace walls, replacement of five trays in the HCl column, C-202, and replacement of two tantalum sleeves in the spare primary oxychlorination separator, S-309 (which was installed during the turnaround).

A significant amount of extra time and money were spent cleaning the EDC Vaporizer (H-201A & B) bundles. This is believed to be due to the fact that these bundles were not cleaned when the furnaces were decoked during the previous run. As a result of this experience, the plant will return to the practice of cleaning the vaporizer bundles during routine decokings.

Catalyst removal and charging of the oxychlorination reactors continues to be a manpower intensive task. Several contractors were approached prior to the 1982 turnaround in an attempt to identify any new technology in this area which might be practical and economical for the VCM reactors. One such contractor was allowed in the plant during the T/A to test newly developed equipment. The equipment appeared to be workable. Costs for catalyst removal and charging were carefully tracked during the 1982 turnaround and will be compared with a quote from Reactor Services, Inc., in a potential move to save costs and eliminate the hiring of some 55-60 casual employees during the 1983 turnaround.

Halliburton Services were used as the chemical cleaning contractor during the 1982 turnaround. Halliburton personnel were found to be more reliable, competent and safety conscious than personnel associated with cleaning contractors used in the past.

For the first time in the history of the VCM Plant no weld repairs were required in the direct chlorinator, R-101. In addition minimal repairs were required in S-206, T-101 and T-102.

Operations

Plant shutdown and start-up procedures are well established from many years of use. Minor modifications are implemented from turnaround to turnaround to accomodate revised mechanical work plans and improve efficiency. The

shutdown and start-up activities proceeded well during the 1982 turnaround. The following comments represent areas to be considered for the 1983 turnaround.

1) The use of breathing air for blinding operations will require additional emphasis prior to the next turnaround to ensure a greater commitment to this need by both Operations and Maintenance personnel.

2) The heavy ends column and light ends column were shutdown on Friday of the shutdown weekend. This is earlier than on past turnarounds, had no adverse effects and represented a considerable cost savings.

3) Samples were not taken during the EDC purge nor during equipment preparation for entry until, by past experience, it was reasonable to expect acceptable results. This saved lab time, limited the purging of lab equipment and resulted in more accurate sampling and analysis.

4) Incinerator operator double coverage was stopped on Saturday evening shift and the standby incinerator was shut down on Sunday morning. This was effective in reducing shutdown costs.

5) The HCl storage tank, T-204, is routinely vented to control the pressure during the turnaround. Previous to the 1982 turnaround the HCl was vented to T-500 which then required caustic addition to the plant effluent for neutralization. During the 1982 turnaround T-204 was vented to the acid concentration unit and used in muriatic acid production as a cost saving measure.

6) Reduced heat load on the cooling tower allowed reduction of treatment chemical injection to near zero. This was accomplished during the 1982 turnaround without adverse effects.

7) A delay was encountered during start-up due to a malfunction of the laboratory water analyzer; this occurring during azeo drying of the unit with EDC. A minimum of two workable water analyzers should be available prior to the turnaround.

8) Prior to and during start-up operations all vinyl check tanks should be vented to the incinerator on a pre-established frequency. This is needed to avoid the development of high pressures which could lead to operational problems in the caustic decanter, S-206.

Personnel

Programs have been established at the VCM Plant related to hiring, control and termination of casual employees with the following objectives:

1) Employing capable, qualified personnel.

2) Identifying good/poor performers to ensure continued improvement of overall casual workforce.

The established program used for many years is felt to be adequate. Several modifications/additions to this program were implemented with favorable results during the 1982 turnaround:

1) All potential casual employees were required to come to the plant prior to their employment to complete the "health" and "work restriction" forms. This allowed for improved crew strength by bringing to the attention of appropriate plant personnel potential casual employees with significant health or work restrictions.

2) A deadline was established three weeks prior to the turnaround after which the plant could not offer permanent employee references consideration. This again facilitated pre-planning for increased crew strength. This deadline will be moved to four weeks prior to the start of the 1983 turnaround.

Cost Control

During the recent May turnaround, a daily accounting procedure was implemented for the first time to aid in cost control and generate additional information on T/A expenditures. As a result of knowing these daily expenditures, measures could be taken to control T/A costs; and to correct any mischarged expenditures. In addition, this documentation will be useful in future T/A budgeting.

Turnaround expenditures were classified under five categories: contractor work orders-rentals, contractor work orders-other, warehouse issues, direct purchase orders, and plant labor. Within each category, the expenditures were charged to 31 specified maintenance management system (MMS) equipment codes (see Table I). These areas were specified because they represent the major sources of T/A costs. Daily expenditures for each equipment code were recorded along with a cumulative total for the T/A. Also, daily grand total T/A expenditures, and a cumulative grand total were recorded.

Expenditure information was received daily from warehouse and maintenance personnel, and in some cases, directly from contractors (i.e., insulators and chemical cleaners/hydroblasters). This information was filed in an "in" box, by equipment code, before being logged; and after logged, filed in an "out" box in the same manner and stored for future reference. The plant labor expenditures were determined by equipment codes from a daily MMS computer printout supplied by the VCM Plant accounting dept.

Turnaround accountants during the May 1982 T/A were S. Reynolds from the VCM Plant Process Engineering Dept. and Felix Braggs from Chemicals Accounting in Ponca City. Braggs worked full time for 18 days of the T/A, and Reynolds averaged 75% of each day during the T/A (20 days), 2 days full time prior to T/A, and 10 days full time post T/A, for a combined total of 45 man-days. This personnel arrangement is most ideal because an accountant must devote full time to the books and accounting procedures, while a plant employee assists in the accounting procedures and handles plant-oriented accounting problems, while still performing normal plant T/A functions. Also, the plant employee is able to manage the full accounting procedure during off-peak times (i.e., pre and post T/A).

The overall accounting procedure was organized very well, and only minor changes were necessary:

1) The bookkeeping method was excellent, with expenditures broken down logically, and daily and cumulative information at hand quickly. (These books can be obtained through the plant superintendent, and are easily understood). Two changes to the original bookkeeping method were made: (a) a subtotal page was added to the general equipment categories (i.e., reactors, compressors, drums, exchangers, and columns) to allow a daily and cumulative total of these five equipment categories, and (b) a row must be designated in the books as pre T/A expenditures. These were kept at the top of each page during the May '82 T/A. Pre T/A expenditures should be accounted for in greater detail prior to future T/A's.

2) The flow of expenditure information was generally good. Warehouse issues and purchase orders were transferred consistently every day. Whereas, contractor work orders (rentals and others) were, at times, inconsistent and difficult to track down. A definite line of transfer must be established from all sources of contractor work. A useful line that was implemented during the May '82 T/A was: all contract expenditures were transferred to the maintenance supervisor(s) by the contractors, who in turn transferred them to the plant superintendent, who in turn transferred them to the T/A accountants.

3) The filing system proved adequate with no changes required.

4) Finally, determining the plant labor expenditures from the MMS computer printout was tedious and time consuming. This task usually took approximately two hours each day. A new program was written by H. E. Bible, of computer ORD in Ponca City, at the end of the May '82 T/A to condense most of the manual work. The program totals all plant labor costs per equipment code per day. This program was developed per the T/A accountants' suggestions and will be very useful during future turnarounds.

Specific cost control measures instituted during the turnaround which actually reduced costs included the following:

1) Only a few trays in selected, readily accessible sections of the light ends column, C-102, were manually cleaned. This is the first time in the history of the VCM plant that this risk was taken. To date, this has not presented any operating problems.

2) Some heat exchanger surfaces which were routinely cleaned during past turnarounds were removed from the cleaning work list following a visual inspection. Such exchanger surfaces included the tube side of the ethylene preheater, H-308; the tube side of the quench column condensers, H-202A & B; the shell side of the light ends condenser, H-106; the shell and tube side of the quench column interchanger, H-213; and the shell and tube side of the quench column reflux cooler, H-203.

3) Turnaround activities were suspended for the Memorial Day holiday weekend. This reduced total labor charges for the turnaround.

4) The top section of the vinyl column was not cleaned. Both the section above and the section below the feed tray are normally manually cleaned each turnaround. As with the light ends column, this has not presented any operating problems to date.

As the effect of eliminating the above work items which are normally standard for every plant turnaround is witnessed during the present run, the risk/benefit analysis will be extended to other "standard" turnaround work items, such as, BL-501 propylene compressor turbine overhaul and BL-301 air compressor overhaul.

Some other valuable lessons were learned from the institution of the above-described cost control program which warrant follow-up for future turnarounds:

1) It was found that pre-fabrication labor normally incurred in the three to four weeks prior to the turnaround were not previously budgeted in turnaround costs.

2) A significant amount of costs have been charged to previous turnarounds which should have been charged to such areas as extraordinary maintenance, capital expenditure projects or routine maintenance. Significantly improved control of charges was exercised during the 1982 turnaround. This, however, does not diminish the effect of the cost control program since these other areas where costs were charged were also controlled within budget.

TABLE I

MMS EQUIPMENT CODES

CODE	CATEGORY
05	Truck Driver
18	Warehouseman
27	Toolroom Mechanic
30	Rigging
31	Safety & Health
32	Hoses & Fittings
33	Reactors
34	Compressors
35	Turbines (BL-501)
36	Shop Tools, Portable
37	Painting
42	Insulation
45	Drums
49	Fans & Blowers
55	Exchangers
57	Control & Metering
58	Process Analyzers
62	Electrical & Telephones
64	Filters & Presses
69	Miscellaneous Structures
74	Rupture Discs
75	Wastewater Treatment Facilities
77	Piping & Valving
78	Relief Valves
79	Yards, Paving, Roads
84	Shop Equipment, Stationary
88	Towers
89/93	Tanks
59	Miscellaneous Equipment
92	Yard Machinery
Other	All others