

**APPENDIX F - TASK 1.5.4 - APPROVAL FOR BUDGET PERIOD THREE**



Department of Energy  
Washington, DC 20585

OCT 03 1996

MEMORANDUM

To: Sun Chon  
Director, Pittsburgh Energy Technology Center

From: Patricia Fry Godley *Patricia Fry Godley*  
Assistant Secretary for Fossil Energy

Subject: Approval of Request for Transition to the Final Budget Period Three for the  
Liquid Phase Methanol Process Demonstration Project Cooperative Agreement  
No. DE-FC22-92PC90543

You are authorized to transition from Budget Period Two (Design and Construction) to the final Budget Period Three (Commissioning, Startup, and Operation) on the demonstration project, "Commercial Demonstration of the Liquid Phase Methanol Process," Cooperative Agreement No. DE-FC22-92PC90543 in accordance with the Continuation Application Request of August 2, 1996, and supporting documentation. You are authorized to provide \$67,138,458 of funding as the Department of Energy's (DOE) share of the cost of the final Budget Period. The total estimated cost of the project remains at \$213,700,000 with a DOE cost share of \$92,708,370.

cc:  
C. L. Miller ✓  
G. Kight  
G. Lynch  
D. Archer  
J. Strakey, PETC  
R. Kornosky, PETC

**APPENDIX G - TASK 2.5 - PARTNERSHIP ANNUAL PLAN  
(For FY - 97)**

# Memorandum



To: Distribution Dept./Loc.:

From: W. R. Brown Dept./Ext.: PSED/A31E9, X17584

Date: 11 November 1996

Subject: Partnership Annual Operating Plan for FY-97

Distribution: cc: R. M. Kornosky/DOE/PETC

D. P. Drown/APCI L. B. Paulonis/EMN  
E. C. Heydorn/APCI V. E. Stein/APCI  
W. C. Jones/EMN P. J. A. Tijm/APCI  
R. B. Moore/APCI

## Background

The Partnership Agreement requires that an Annual Operating Plan be prepared each Fiscal Year for the approval of the Partners. Article 5.2 of the Partnership Agreement sets forth the requirements. This memo constitutes the Partnership's Annual Operating Plan for FY-'97.

## Goals and Objectives for FY- '97

The goals and objectives for FY-'97 are to initiate Phase 3 operation of the LPMEOH™ demonstration plant in accordance with the Statement of Work. The Milestone Schedule (Attachment A), the Demonstration Test Plan (Attachment B), the FY-97 Cost Plan (Attachment C) and the Project Success Factors (Attachment D) are attached for reference. These attachments summarize the Phase 3, Operation activities, and the schedule for their performance. The Partnership's major FY-'97 objectives are:

- the LPMEOH™ demonstration plant will have successfully completed Test Runs #1 through #5 (by May-'97), and will have achieved 30 plus weeks of Task 2.1.1 operation (by Sept-'97).

- the decision to continue DME design verification testing, at the LaPorte AFDU in conjunction with the DOE Alternative Fuels R & D program, will have been made (by Dec.'96); and plans will have been made (by Apr '97) for completion of the operational proof of concept testing at LaPorte by December of 1997.

- the updated plan for Off-site Product-use Testing will have been completed (by May '97).

- the project Success Factors will continue to have been achieved during FY-97.



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W. R. Brown

Approved:



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Air Products/W.R. Brown



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Eastman/W.C. Jones



Test Run #	Test Run Description	Temp (Deg C)	Wt% Cat	H2/CO Ratio at Inlet	Space Velocity (SI/hr-kg)	MeOH (tpd)	Fresh Feed			Recycle Gas (KSCFH)	Inlet Sup. Velocity (ft/sec)	Time Period (weeks)	Elapsed Time (incl. outages) (weeks)	Start of Test
							Balanced (KSCFH)	CO Gas (KSCFH)	H2 Gas (KSCFH)					
<b>Task 2.1.1 - Process Shakedown and Catalyst Aging:</b>														
1.	Initial Shakedown; and Design Production Tests	250	28	2.42	8,000	260	900	50	40	1,800	6	6	Feb-97	
							(varies, to maintain syngas utilization.)							
2.	Gassed Slurry Level	Part of other tests												
3.	Reactor Feed: Texaco-Type Syngas	250	28	0.67	9,240	202	650	95 (*)	0	2,612 (*)	2	9	Mar-97	
4.	Early Testing @ High Superficial Velocity	250	28	2.54	10,300	TBD	1,200 (**)	50	40	2,520 (*)	2	12	Apr-97	
5.	Check @ Test 1 Conditions	250	28	2.42	8,000	< 260	900	50	40	1,800	2	15	May-97	
6.	Catalyst Addition and Aging	250	28 - 40	2.51	Dec. from 8,000	237	765	40	45	Max	18	41	May-97 to Nov-97	
	<i>(Note: Kingsport Complex Outage during this test)</i>													
7.	Free Drain Entrained/ Condensed Oil to Reactor	250	28 - 40	2.51	Dec. from 8,000	237	765	40	45	Max	During Test 6			
8.	Operation @ Design Feed Gas Rates	250	40	2.42	4,000	260	900	50	40	1,800	2	43	Nov-97	
9.	Check for Limitation on Catalyst Slurry Concentration	250	> 40	2.51	Varies	TBD	765	40	45	Max (2,700)	6	50	Dec-97	
10.	Catalyst Addition to Reach Max Productivity	250	Target 45	2.49	3,320	256	765	40	45	2,605	12	68	Jan-98	
				2.29	3,500	293	900	50	40	2,520	2			
				TBD	TBD	TBD	1,110 (***)	50	40	2,520	2			

U.S. DEPARTMENT OF ENERGY  
COST PLAN

OMB Control No.  
1910-1400

DOE F 1312.7  
(12-85)

1. TITLE		2. IDENTIFICATION NUMBER		3. START DATE		4. COST PLAN DATE		11. CURRENT FISCAL YEAR (FY97)												12. FUTURE FISCAL YEARS			13. Subsequent Fiscal Years		14. Total	
2. PARTICIPANT NAME AND ADDRESS		5. START DATE		6. COMPLETION DATE		11. CURRENT FISCAL YEAR (FY97)												12. FUTURE FISCAL YEARS			13. Subsequent Fiscal Years		14. Total			
7. Element Code	8. Reporting Element	9. Plan Prior Fiscal Years	10. Act. Prior Fiscal Years	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	Total	98	99	00	13. Subsequent Fiscal Years	14. Total					
	Liquid Phase Methanol Demonstration	16,289	16,304	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16,304				
1.1.1	Project Definition	1,021	1,051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,051				
1.1.2	Permitting	246	238	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	238				
1.1.3	Design Engr.	9,677	10,034	200	200	200	200	160	160	160	21	0	0	0	0	1,301	0	0	0	0	0	11,335				
1.1.4	Off-Site Testing	74	12	0	5	5	10	10	15	15	15	20	20	30	30	175	89	0	0	0	0	276				
1.1.5	Plan, Admin, DME Verif Test	1,892	2,707	40	40	40	30	13	0	0	0	0	0	0	0	163	0	0	0	0	0	2,870				
1.2.1	Procurement	8,655	9,220	150	100	100	100	33	0	0	0	0	0	0	0	483	0	0	0	0	0	9,703				
1.2.2	Construction	9,598	7,444	1,200	1,000	800	600	400	30	30	46	0	0	0	0	4,106	0	0	0	0	0	11,550				
1.2.3	Training & Commissioning	1,163	117	200	250	250	200	98	0	0	0	0	0	0	0	998	0	0	0	0	0	1,115				
1.2.4	Off-Site Test Proc. & Constr	0	0	0	0	0	0	0	0	0	0	0	20	50	50	120	136	0	0	0	0	256				
1.2.5	Planning & Admin	613	721	45	45	45	45	10	10	10	15	15	15	15	15	285	9	0	0	0	0	1,015				
1.3.1	Startup	0	0	0	0	0	0	0	0	0	0	0	0	0	0	680	0	0	0	0	0	680				
1.3.2	Operations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1.3.2.1	Methanol Operation	0	0	0	0	0	0	2,524	2,524	2,545	2,546	2,546	2,545	2,545	2,546	20,321	34,240	38,689	40,061	13,174	146,485					
1.3.2.2	DME Design, Mod., Oper.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,790				
1.3.2.3	LPMEOH Dismantlement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	515				
1.3.3	On-Site Testing	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	2	2	0	0	0	4				
1.3.4	Off-Site Testing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,233	1,972	246	0	3,451					
1.3.5	Data Analysis & Reports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	390	520	500	553	707	2,670				
1.3.6	Plan, Adm., & DME La Pt.	0	0	0	0	0	0	20	20	50	50	80	100	100	100	520	800	280	282	510	2,392					
15. TOTAL		49,228	57,848	1,835	1,640	1,440	1,865	3,283	2,772	2,871	2,784	2,721	2,761	2,801	2,801	29,544	37,029	42,008	42,365	14,906	213,700					

16. DOLLARS EXPRESSED IN: Thousands

17. SIGNATURE OF PARTICIPANT'S PROJECT MANAGER AND DATE

*[Signature]* 10/22/96

18. SIGNATURE OF PARTICIPANT'S AUTHORIZED FINANCIAL REPRESENTATIVE AND DATE

*[Signature]* 10/22/96





**DOE/Air Products/Eastman  
SUCCESS FACTORS  
LPMEOH™ DEMONSTRATION PROJECT**



The three participants will judge the project success on the following factors:

- SAFE AND ENVIRONMENTALLY SOUND OPERATION
- DEMONSTRATE THE NEW TECHNOLOGY:
  - RESOLVE ALL TECHNICAL ISSUES
  - ACQUIRE SUFFICIENT ENGINEERING DATA FOR COMMERCIAL DESIGNS
  - OBTAIN INDUSTRY ACCEPTANCE
- FOR EASTMAN OPERATION AT KINGSPORT:
  - NO ADVERSE IMPACT DURING DEMONSTRATION
  - VALUABLE PLANT ASSET AT END
- MEET BUDGET AND SCHEDULE EXPECTATIONS
- POSITIVE WORKING RELATIONSHIPS BETWEEN THE PARTICIPANTS

Bob Kordecky

Bill Brown

Bill Jones

**APPENDIX H - TASK 3.2.1 - SAMPLES OF DETAILED MATERIAL BALANCE  
REPORTS**

RUN NO:

K5-7/2

TITLE: Recheck Test 1 Conditions

Balance Period:

Start Date  
End Date

02jul97 07:00:00  
03jul97 07:00:00

Time From Start of Run (days)

Start  
End

86.7  
87.7

Reaction Conditions

Temperature (°F)  
Pressure (psig)  
Space Velocity (sl/kg-hr)  
Vg (inlet)

481  
707  
8827  
0.70

Slurry Data

Catalyst Weight (lb oxide)  
Slurry Concentration (wt %)  
Slurry Level (ft)  
Gas Holdup (vol %)  
Gassed Slurry Volume (ft3)

19,500  
26.5  
58.4  
45.4  
2459

Performance Results

Raw MeOH Production (ton/day)  
Raw MeOH Production (ton/day)  
Syngas Utilization (SCF/lb MeOH)  
Catalyst Life (eta)

195.9 (gas measurements)  
195.9 (liquid measurements)  
41.9  
0.54

Energy Balance

Steam Production (lb/hr)  
Steam Drum Pressure (psig)  
Steam Import/Export (lb/hr)  
Reactor O-T-M Conversion (% LHV)  
Wetted Tube Length (ft)  
Heat Transfer Area (ft2)  
Reactor Overall U (BTU/hr-ft2-F)

12027  
373  
1446  
19.6  
54.7  
2120  
166

Syngas Conversion (% LHV)

77.4

Atom/Mass Balance Closure (% of reactor inlet)

Syngas Usage (BTU/gallon MeOH)  
Recycle Ratio  
MeOH Productivity (gmol/kg-hr)  
Rxt Volumetric Productivity (ton/day-ft3)  
Sparger "K"-value

69,808  
3.22  
25.39  
0.080  
9.21

C  
H  
O  
N  
Total Mass

99.14  
98.92  
100.75  
99.65  
100.60

Liquid Product Analysis (wt%)

	7/2 19:00	7/3 7:00
Methanol	99.92	99.98
Ethanol	0.01	0.01
Water	0.08	0.02
Oil	0.00	0.00
Total	100.01	100.01

REFINED PRODUCT

CRUDE PRODUCT

	7/2 19:00	7/3 7:00
	85.62	86.58
	0.25	0.25
	14.02	13.08
	0.15	0.15
Total	100.04	100.06

RUN NO: K5-7/2 TITLE: Recheck Test 1 Conditions

	FRESH FEED	CO MAKEUP	H2 MAKEUP	K-01 OUTLET	REACTOR FEED	C-05 OUTLET	MAIN PURGE	DISTILL. PURGE	CRUDE PRODUCT	REFINED PRODUCT
T	95	82	84	117	334	249	100	74	222	84
P	754	864	486	742	733	699	686	9	185	139
Comp (mol %)										
H2	67.14	1.93	77.66	69.27	68.72	63.64	69.27	8.00	0.00	0.00
CO	29.89	97.05	9.12	18.27	19.85	15.82	18.27	7.00	0.00	0.00
N2	0.46	0.97	6.50	4.09	3.18	3.66	4.09	2.00	0.00	0.00
CH4	0.03	0.05	0.92	0.34	0.26	0.30	0.34	0.00	0.00	0.00
CO2	2.48	0.00	3.76	5.07	4.31	4.51	5.07	62.00	0.00	0.00
DME	0.00	0.00	0.01	0.00	0.00	0.01	0.00	4.00	0.00	0.00
MeOH	0.00	0.00	0.06	0.55	0.65	8.15	0.55	10.00	78.00	99.90
EtOH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.01
H2O	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	21.83	0.09
others	0.00	0.00	1.97	2.40	3.03	3.44	2.40	7.00	0.01	0.00
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Mole Wt	10.953	27.501	7.770	10.849	10.897	12.096	10.849	39.217	29.048	32.028
LHV	191.6	0.0	0.0	562.6	754.6	735.9	18.4	1.6	33.3	114.9
Enthalpy	-32.98	0.00	0.00	-104.51	-123.21	-149.35	-3.44	-2.98	-15.25	-40.68
Flow										
SCFH	684,799	0	0	2,202,625	2,913,449	2,535,117	71,993	8,736	55,532	150,156
lbmol/hr	1,805.2	0.0	0.0	5,806.4	7,680.2	6,682.9	189.6	23.0	146.4	395.8
lb/hr	19,772	0	0	62,993	83,688	80,838	2,057	903	4,252	12,678

RUN NO:

K3-8/06

TITLE: Texaco-type Syngas

Balance Period:

Start Date

End Date

06aug97 07:00:00

07aug97 07:00:00

Time From Start of Run (days)

Start

End

121.7

122.7

Reaction Conditions

Temperature (°F)

Pressure (psig)

Space Velocity (sL/kg-hr)

Vg (inlet)

481

701

6507

0.70

Slurry Data

Catalyst Weight (lb oxide)

Slurry Concentration (wt %)

Slurry Level (ft)

Gas Holdup (vol %)

Gassed Slurry Volume (ft3)

26,400

33.8

56.5

45.4

2377

Performance Results

Raw MeOH Production (ton/day)

Raw MeOH Production (ton/day)

Syngas Utilization (SCF/lb MeOH)

Catalyst Life (eta)

(gas measurements)

(liquid measurements)

Energy Balance

Steam Production (lb/hr)

Steam Drum Pressure (psig)

Steam Import/Export (lb/hr)

Reactor O-T-M Conversion (% LHV)

Wetted Tube Length (ft)

Heat Transfer Area (ft2)

Reactor Overall U (BTU/hr-ft2-F)

13520

332

1341

18.5

52.7

2045

139

Syngas Conversion (% LHV)

Syngas Usage (BTU/gallon MeOH)

Recycle Ratio

MeOH Productivity (gmol/kg-hr)

Rxr Volumetric Productivity (ton/day-ft3)

Sparger "K"-value

70.9

68,968

2.98

18.56

0.081

8.95

Atom/Mass Balance Closure (% of reactor inlet)

C

H

O

N

Total Mass

98.60

101.83

98.16

99.56

98.77

Liquid Product Analysis (wt%)

Methanol

Ethanol

Water

Oil

Total

8/6

19:00

99.98

0.01

0.02

0.00

100.01

REFINED PRODUCT

8/7

7:00

99.99

0.01

0.01

0.00

100.01

CRUDE PRODUCT

8/6

19:00

95.11

1.32

2.42

1.15

100.00

8/7

7:00

95.61

0.97

2.56

0.65

99.79

RUN NO: K3-8/06 TITLE: Texaco-type Syngas

T	F	FRESH FEED	CO MAKEUP	H2 MAKEUP	K-01 OUTLET	REACTOR FEED	C-05 OUTLET	MAIN PURGE	DISTILL. PURGE	CRUDE PRODUCT	REFINED PRODUCT
P	90	755	77	74	122	336	243	89	66	217	76
	psig		861	455	753	738	688	669	9	185	140
Comp (mol %)	H2	67.35	1.93	77.66	31.81	38.27	28.96	31.67	3.00	0.00	0.00
	CO	28.98	97.05	9.12	54.09	50.02	49.91	53.97	15.00	0.00	0.00
	N2	0.45	0.97	6.50	2.57	2.05	2.35	2.56	2.00	0.00	0.00
	CH4	0.06	0.05	0.92	0.45	0.36	0.41	0.45	0.00	0.00	0.00
	CO2	3.16	0.00	3.76	10.27	8.36	9.49	10.25	59.00	0.00	0.00
	DME	0.00	0.00	0.01	0.01	0.01	0.01	0.01	3.00	0.00	0.00
	MeOH	0.00	0.00	0.06	0.51	0.60	8.00	0.82	11.00	94.71	99.97
	EtOH	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.79	0.01
	H2O	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	4.40	0.02
	others	0.00	0.00	1.97	0.30	0.33	0.75	0.26	7.00	0.10	0.00
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Mole Wt	lb/lbmol	LHV	MMBTU/hr	Enthalpy	MMBTU/hr
	11.004	176.7	27.501	-31.93	19.391
			30.0		792.9
			-11.62		-282.41
					22.197
					773.9
					-309.71
					21.405
					38.7
					-16.63
					39.897
					1.0
					-1.90
					31.853
					51.1
					-18.41
					69.317
					182.7
					5.609
					143.266
					377.7
					8.084
					2,542,142
					6,701.4
					148,750
					2,182,407
					5,753.1
					122,886
					7,664.4
					148,619
					2,907,469
					95,064
					250.6
					6,892
					18,457
					1,677.4
					5,609
					14.8
					590
					69,317
					182.7
					5,820
					124,830
					329.1
					10,543

RUN NO: K6-8/17

TITLE: Catalyst Addition and Aging

**Balance Period:**

Start Date 17aug97 07:00:00  
 End Date 18aug97 07:00:00

**Time From Start of Run (days)**

Start 132.7  
 End 133.7

**Reaction Conditions**

Temperature (°F) 481  
 Pressure (psig) 700  
 Space Velocity (sL/kg-hr) 6537  
 Vg (inlet) 0.71

**Slurry Data**

Catalyst Weight (lb oxide) 26,400  
 Slurry Concentration (wt %) 34.2  
 Slurry Level (ft) 51.0  
 Gas Holdup (vol %) 40.4  
 Gassed Slurry Volume (ft3) 2142

**Performance Results**

Raw MeOH Production (ton/day) 195.5 (gas measurements)  
 Raw MeOH Production (ton/day) 195.5 (liquid measurements)  
 Syngas Utilization (SCF/lb MeOH) 42.6  
 Catalyst Life (eta) 0.37

**Energy Balance**

Steam Production (lb/hr) 12524  
 Steam Drum Pressure (psig) 339  
 Steam Import/Export (lb/hr) 1508  
 Reactor O-T-M Conversion (% LHV) 18.9  
 Wetted Tube Length (ft) 47.2  
 Heat Transfer Area (ft2) 1832  
 Reactor Overall U (BTU/hr-ft2-F) 150

Syngas Conversion (% LHV) 76.3  
 Syngas Usage (BTU/gallon MeOH) 67,506  
 Recycle Ratio 3.21  
 MeOH Productivity (gmol/kg-hr) 18.78  
 Rxt Volumetric Productivity (ton/day-ft3) 0.091  
 Sparger "K"-value 11.20

**Atom/Mass Balance Closure (% of reactor inlet)**

C 99.29  
 H 102.38  
 O 99.80  
 N 97.12  
 Total Mass 100.26

**Liquid Product Analysis (wt%)**

	REFINED PRODUCT		CRUDE PRODUCT	
Methanol	8/17	8/18	8/17	8/18
Ethanol	19:00	7:00	19:00	7:00
Water	99.98	99.98	89.65	90.01
Oil	0.01	0.01	0.25	0.25
	0.02	0.02	10.08	9.77
	0.00	0.00	0.15	0.15
Total	100.01	100.01	100.13	100.18

RUN NO: K6-8/17 TITLE: Catalyst Addition and Aging

	FRESH FEED	CO MAKEUP	H2 MAKEUP	K-01 OUTLET	REACTOR FEED	C-05 OUTLET	MAIN PURGE	DISTILL. PURGE	CRUDE PRODUCT	REFINED PRODUCT
T	108	83	84	118	330	248	100	76	220	84
P	737	862	35	736	728	691	679	7	185	139
Comp (mol %)										
H2	67.07	1.93	77.66	70.82	69.76	64.63	70.58	8.00	0.00	0.00
CO	29.87	97.05	9.12	19.35	21.70	17.90	19.27	7.00	0.00	0.00
N2	0.43	0.97	6.50	2.75	2.21	2.53	2.74	2.00	0.00	0.00
CH4	0.04	0.05	0.92	0.38	0.30	0.34	0.38	0.00	0.00	0.00
CO2	2.59	0.00	3.76	5.14	4.53	4.74	5.13	62.00	0.00	0.00
DME	0.00	0.00	0.01	0.01	0.00	0.01	0.00	4.00	0.00	0.00
MeOH	0.00	0.00	0.06	0.58	0.65	8.12	0.94	10.00	83.43	99.96
EtOH	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.16	0.01
H2O	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	16.39	0.04
others	0.00	0.00	1.97	0.96	0.84	1.26	0.95	7.00	0.01	0.00
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Mole Wt	10.989	27.501	7.770	10.425	10.612	12.086	10.500	39.217	29.812	32.035
LHV	193.8	0.0	0.0	587.7	783.3	764.7	27.6	0.6	47.6	100.3
Enthalpy	-33.56	0.00	0.00	-108.08	-130.60	-156.08	-5.15	-1.20	-20.17	-35.48
Flow										
SCFH	693,132	0	0	2,227,422	2,920,865	2,551,183	103,764	3,521	74,227	130,998
lbmol/hr	1,827.2	0.0	0.0	5,871.7	7,699.7	6,725.2	273.5	9.3	195.7	345.3
lb/hr	20,079	0	0	61,212	81,708	81,280	2,872	364	5,833	11,063



RUN NO: K6-9/19

TITLE: Catalyst Addition and Aging

**Balance Period:**

Start Date 19sep97 07:00:00  
 End Date 20sep97 07:00:00

**Time From Start of Run (days)**

Start 165.7  
 End 166.7

**Reaction Conditions**

Temperature (°F) 481  
 Pressure (psig) 675  
 Space Velocity (sL/kg-hr) 5047  
 Vg (inlet) 0.67

**Slurry Data**

Catalyst Weight (lb oxide) 31,000  
 Slurry Concentration (wt %) 37.3  
 Slurry Level (ft) 51.0  
 Gas Holdup (vol %) 38.6  
 Gassed Slurry Volume (ft3) 2142

**Performance Results**

Raw MeOH Production (ton/day) 165.9 (gas measurements)  
 Raw MeOH Production (ton/day) 165.9 (liquid measurements)  
 Syngas Utilization (SCF/lb MeOH) 41.7  
 Catalyst Life (eta) 0.30

**Energy Balance**

Steam Production (lb/hr) 8542  
 Steam Drum Pressure (psig) 381  
 Steam Import/Export (lb/hr) 1448  
 Reactor O-T-M Conversion (% LHV) 18.0  
 Weited Tube Length (ft) 47.2  
 Heat Transfer Area (ft2) 1832  
 Reactor Overall U (BTU/hr-ft2-F) 155

**Syngas Conversion (% LHV)**

Syngas Usage (BTU/gallon MeOH) 78.7  
 68,233  
 Recycle Ratio 3.67  
 MeOH Productivity (gmol/kg-hr) 13.78  
 Rxt Volumetric Productivity (ton/day-ft3) 0.077  
 Sparger "K"-value 18.56

**Atom/Mass Balance Closure (% of reactor inlet)**

C 99.83  
 H 100.37  
 O 100.53  
 N 103.43  
 Total Mass 100.44

**Liquid Product Analysis (wt%)**

Methanol 99.99  
 Ethanol 0.01  
 Water 0.00  
 Oil 0.00  
 Total 100.00

**REFINED PRODUCT**

9/19 9/20  
 19:00 7:00

**CRUDE PRODUCT**

9/19 9/20  
 19:00 7:00  
 72.46 73.18  
 0.23 0.25  
 23.26 26.40  
 0.15 0.15  
 96.10 99.98



**APPENDIX I - TASK 3.2.1 - RESULTS OF DEMONSTRATION PLANT  
OPERATION**

**Table 1 - Summary of LPMEOH™ Demonstration Unit Outages -  
July/September 1997**

**Table 2 - Summary of Catalyst Samples**

**Table 3 - Analysis of Crude Methanol from Test K3 - Operation with  
Texaco-Type Syngas**

**Figure 1 - Catalyst Life ( $\eta$ ) vs. Days Onstream**

**Figure 2 - Sparger Resistance Coefficient vs. Days Onstream  
(Post May/June 1997 Outage)**

**Table 1 - Summary of LPMEOH™ Demonstration Unit Outages - July/September 1997**

Operation Start	Operation End	Operating Hours	Shutdown Hours	Reason for Shutdown
7/1/97 00:01	7/8/97 17:10	185.2	8.7	Syngas Unavailable to LPMEOH™ Demonstration Unit
7/9/97 01:50	7/29/97 00:25	478.6	68.3	Fix C-06 Flange Leak
7/31/97 20:40	8/12/97 21:05	288.4	51.2	Fix C-06 Flange Leak
8/15/97 00:15	8/31/97 13:30	397.3	10.0	Syngas Unavailable to LPMEOH™ Demonstration Unit
8/31/97 23:30	9/5/97 14:40	111.2	20.0	Syngas Unavailable to LPMEOH™ Demonstration Unit
9/6/97 10:40	9/6/97 10:40	0.0	149.3	* Low Catalyst Activity
9/12/97 16:00	9/29/97 18:30	410.5	29.5	G-03 Electrical Tie-in and Eastman Guard Bed Change
9/30/97 23:59	9/30/97 23:59	0.0		End of Reporting Period
Total Operating Hours			1871.1	
Syngas Available Hours			2169.3	
Plant Availability, %			86.3	

\* Syngas became available, but Demonstration Unit would not restart because of low catalyst activity. Plant was restarted after addition of one fresh batch of catalyst.

Table 2

## Summary of Catalyst Samples

Sample	Identity	XRD		BET m <sup>2</sup> /g	Analytical (ppm)				
		Cu	ZnO		Fe	Ni	S	As	Cl
14987-54 Trailer Run	Lab run using 383-4119 (450 hours) AFFTU run in Kingsport (672 hours)	175 179	74 101		172	58	<=660	184	5570
Reduction #3	Reduction Batch sample from Kingsport	73	55	57	49	32	<=110	<25	
Reduction #4	Reduction Batch sample from Kingsport			73	83	28	<100	<25	
Reduction #6	Reduction Batch sample from Kingsport			90	29	18	<=150	<25	
Reduction #8	Reduction Batch sample from Kingsport			81	26	23	<=110	<25	
K0597-2	Reactor Sample 6/15/97 (30 days)	274	89	40	281	61	<=190	446	<200
K0897-1	Reactor Sample 8/19/97	283		43	169	<20	235	601	
K0997-1	Reactor Sample 9/5/97	281	118	42	261	37	575	779	
K1097-1	Reactor Sample 9/29/97	289							

TABLE 3

Analysis of Crude Methanol from Test K3 - Operation with Texaco-Type Syngas

Component	Kingsport Samples	
	#1 wt%	#2 wt%
Methanol	98.0163	98.1399
Ethanol	0.2999	0.3116
2-Propanol	0.0328	0.0285
1-Propanol	0.0962	0.1030
2-Butanol	0.0251	0.0258
iso-Butanol	0.0107	0.0115
Methyl Propionate	0.0058	0.0059
n-Butanol	0.0496	0.0570
3-Methyl-2-Butanol	0.0104	0.0112
2-Methyl-2-Butanol	0.0094	0.0098
Methyl Butyrate	0.0066	0.0067
2-Methyl-1-Butanol	0.0122	0.0131
1-Pentanol	0.0255	0.0299
3-Pentanol	0.0067	0.0071
2-Pentanol	0.0073	0.0079
Methyl Valerate	0.0043	0.0043
Methyl Formate	0.0000	0.0000
Methyl Acetate	0.0000	0.0000
Dimethyl Ether	0.0000	0.0000
Water	1.3000	1.1400
Mineral Oil	0.0812	0.0868

**Figure 1**  
**Catalyst Age (eta)**

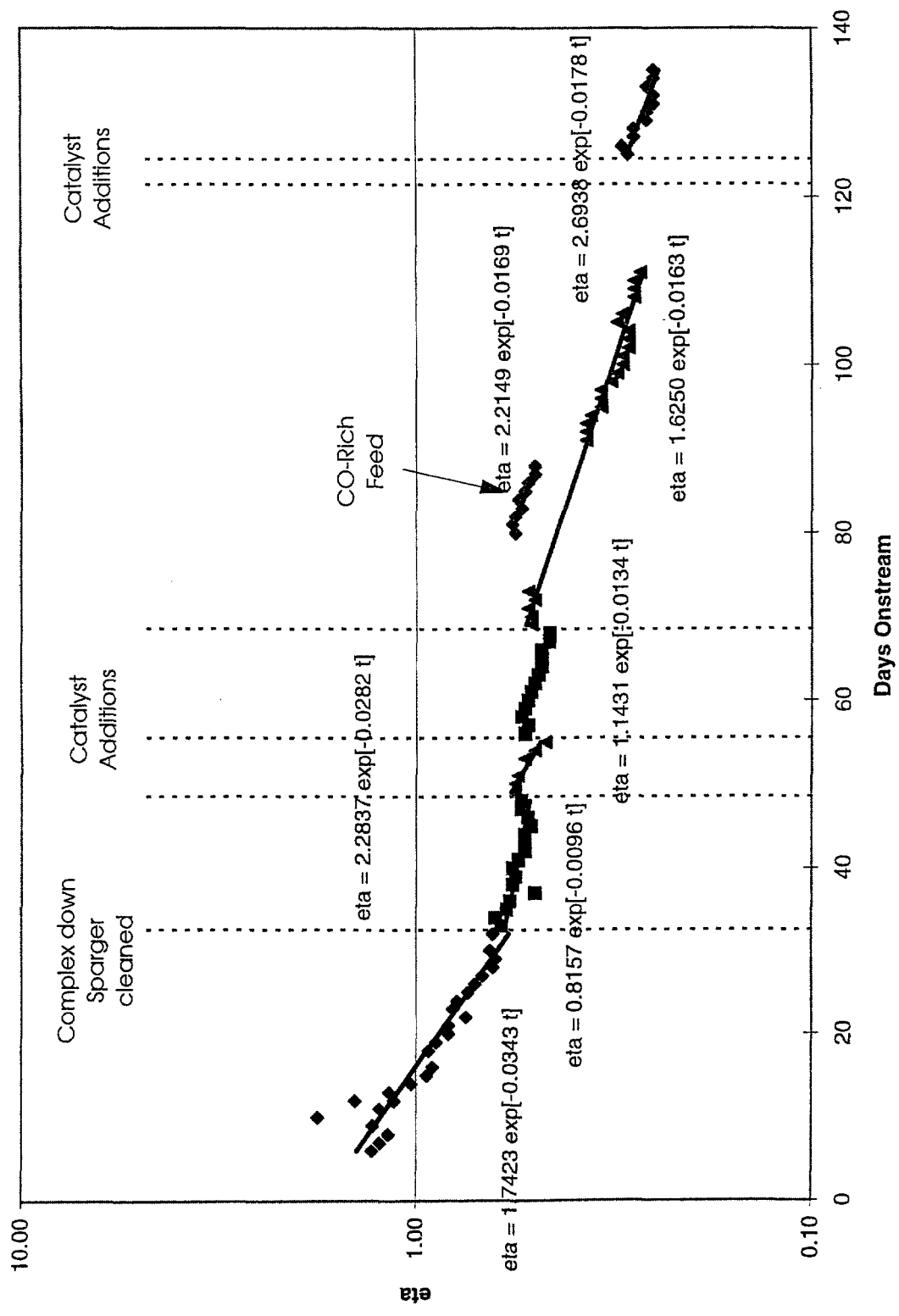
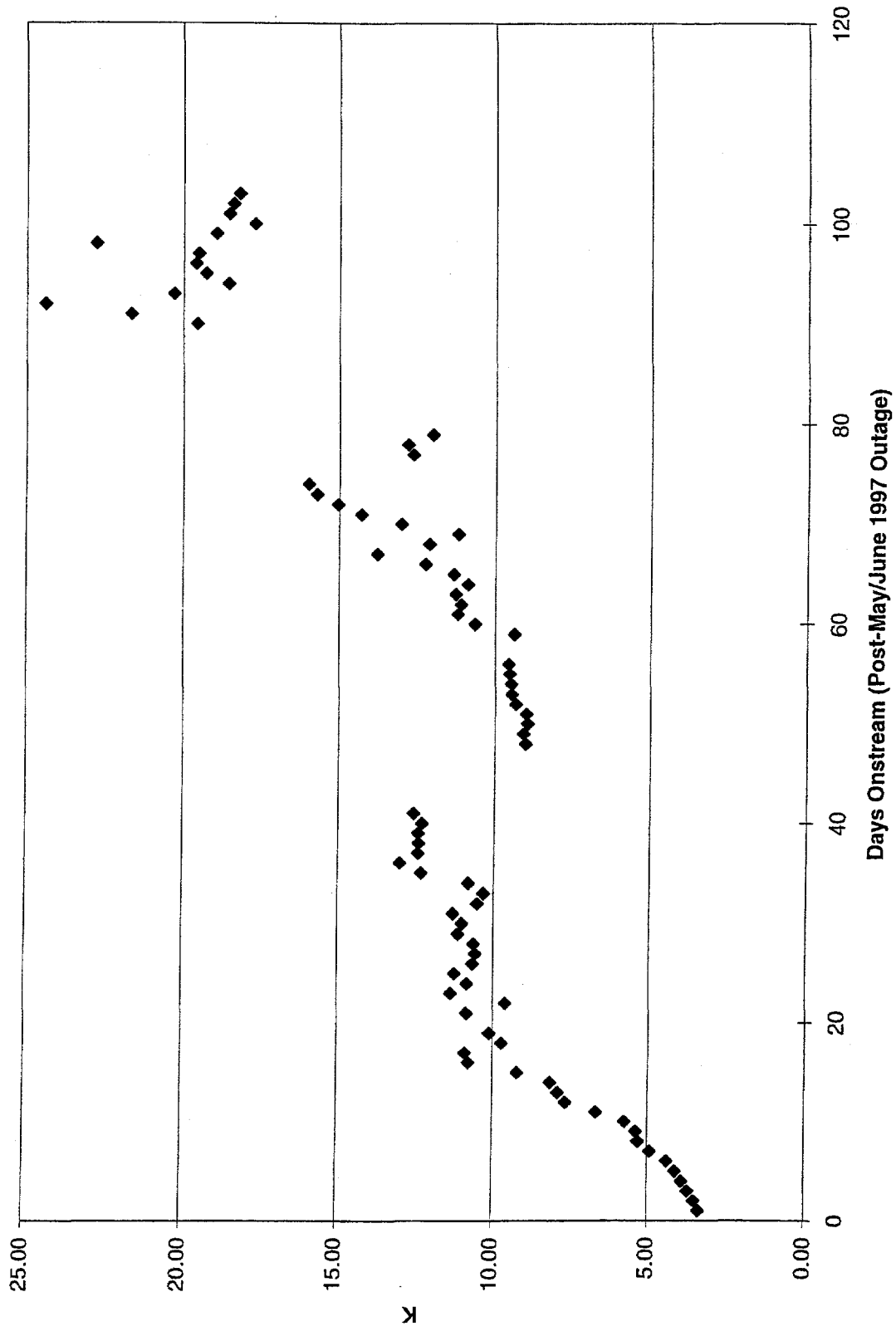


Figure 2

Sparger Resistance Coefficient (Post-May/June 1997 Outage)





**APPENDIX J - TEST AUTHORIZATION K3 - METHANOL SYNTHESIS WITH  
TEXACO-TYPE SYNGAS**

**TEST AUTHORIZATION # K3**

Kingsport LPMEOH™ Plant

Sheet: 1 of 2  
Date : 07/21/97  
By: VES

RUN NUMBER: K3  
APPROX. START DATE: 21 July, 1997

TITLE: METHANOL SYNTHESIS WITH TEXACO-TYPE SYNGAS

**OBJECTIVE:**

To evaluate the performance of the LPMEOH™ facility when fed with Texaco-type (CO-rich) syngas per a typical IGCC application.

**SUMMARY:**

At a time when approximately 100 KSCFH of CO is available for use in Plant 29 over a multi-week period, the reactor feed composition will be adjusted to match the typical syngas composition exiting a Texaco gasifier. The performance data from this test will be more directly comparable to the extensive database from the LaPorte pilot plant and more indicative of LPMEOH™'s expected market in IGCC facilities. The test will best be accomplished by maintaining essentially constant feed gas composition (SP-5), and the operators may adjust the Balanced Gas, CO Gas, and Recycle flow rates to achieve that. Liquid samples from the 29C-10 underflow will be collected periodically to test the stabilized product's suitability for fuel-grade applications.

TEST DETAILS: See page 2.

ANALYTICAL COMMENTS: See page 2.

**SAFETY IMPLICATIONS:**

Air Products personnel will be required to wear Nomex in the plant when syngas is present. Otherwise, Eastman safety rules (including M.O.C.) are in effect. All visitors to the facility must follow the Visitor Safety Guidelines issued by the Joint Venture.


**ENVIRONMENTAL IMPLICATIONS:**

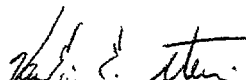
Minimal. The plant syngas purge will go to the Eastman boilers as designed.

**SPECIAL REMARKS:**

Because of ongoing problems with increasing pressure drop through the gas sparger, the current off-design operating mode will be continued. Free-draining oil return to the reactor will remain closed (except for periodic flushes) and condensed oil will be batch transferred from 29C-05 to 29C-30 and then flushed through the gas sparger with the 29G-30 pump.

**AUTHORIZATIONS:**

  
\_\_\_\_\_  
E. C. Heydorn - Program Manager

  
\_\_\_\_\_  
V. E. Stein - Lead Process Engineer

## TEST AUTHORIZATION # K3

Kingsport LPMEOH™ Plant

Sheet: 2 of 2  
Date : 07/21/97  
By: VES

### TEST DETAILS:

1. Call the PIA's and have them set up SP-2 (CO Makeup) and add it to the analysis sequence.
2. Follow the Reactor Area Start-Up Procedure S.O.P. Section II A 3 Step T - start CO makeup feed.
3. Line up CO flow through FE-010B (open valve 2025) and shut off flow through FE-010A (close valve 2026). Make sure the Honeywell DCS is set up to recognize FE-010B.
4. Slowly increase the flow on FC-010 to approximately 90 KSCFH while decreasing the flow on FC-009 to approximately 650 KSCFH. As the MW of the recycle stream begins to rise, the compressor flow will increase. Adjust it to maintain approximately 3000 KSCFH on FI-100.
5. The target feed gas composition (SP-5) in mol% (Honeywell schematic AnaID or AnaIB) is: 35% H<sub>2</sub>, 50% CO, 12% CO<sub>2</sub>, 3% N<sub>2</sub>. In wt% (Honeywell schematic Anal\_D or Anal\_B), this corresponds to 3.3% H<sub>2</sub>, 66% CO, 25% CO<sub>2</sub>, 3.6% N<sub>2</sub>. Be patient when adjusting flows to match the target composition; Air Products personnel will advise.

TEST AUTHORIZATION #K3 is complete.

### ANALYTICAL REQUIREMENTS:

1. Process GC sampling requirements:
  - SP-1: syngas feed;
  - SP-2: CO makeup
  - SP-4: K-01 outlet;
  - SP-5: reactor feed (highest frequency);
  - SP-6: C-05 outlet (highest frequency);
  - SP-7: main purge;
  - SP-8: distillation purge;
  
  - SP-3 can remain valved out.
2. Carbonyl GC sampling requirements:
  - SP-12: 29C-40 guard bed inlet;
  - SP-13: 29C-40 guard bed intermediate #1;
  - SP-14: 29C-40 guard bed intermediate #2;
  - SP-15: 29C-40 guard bed outlet.
3. Liquid sampling requirements:
  - all identified liquid sampling points per standard Eastman routine;
  - 29C-10 underflow samples may be shipped to Allentown for by-product analysis.

**APPENDIX K - TASK 3.6 - PROJECT REVIEW MEETING (24-25 JULY 1997)**

## NOTES FROM MEETING

DISTRIBUTION (NAME/ORGANIZATION) *Unable to attend. **Chairman Frank Frenduto - APCI Bill Jones - EMN Bob Kornosky - DOE-FETC Bob Moore - APCI Bill O'Dowd - DOE-FETC (*) - Part-Time	Ed Schmetz - DOE-HQ Van Eric Stein - APCI Barry Street - EMN(*) Peter Tijm - APCI		COPIED FOR INFORMATION ONLY
			Dave Drown - APCI Sue Kasinecz - APCI John Shen - DOE-HQ Lee Stockhausen - APCI

FROM Edward C. Heydorn	ORGANIZATION APCI - Program Manager	EXTENSION 17099	TODAY'S DATE 31 July, 1997
DATE OF MEETING 24 & 25 July 1997	WEEKDAY Thurs. & Fri.	TIME STARTED ENDED 12:15 PM 11:00 AM	
			LOCATION APLPCC (JV) Trailer, Kingsport, TN

**SUBJECT AND/OR PURPOSE**

• **Project Review Meeting - DOE, Eastman, and Air Products**

ITEM NO.	RESPONSIBLE PERSON (INITIALS)	TARGET DATE	DISCUSSION
1.	ECH	9/24/97	<p><u>Review Project Team Roster</u></p> <p>Frank Frenduto has decided to accept another position within Air Products. He will continue to follow up on issues related to the 29G-03 make-up oil pumps and Ingersoll-Dresser. Our best wishes to Frank in his new endeavors, and our thanks for his contributions to the Kingsport project. <i>In Frank's absence, a new Environmental Coordinator for the Air Products team will be required.</i></p> <p><u>Costs - Review</u></p> <p>The attached summary of spending by task (Attachment A) was used as a basis for discussion. No specific comments or action items were generated.</p>
2.			<p><u>On-Site Testing (Product-Use Demonstrations) - Task 3.3</u></p> <p>Barry Street reviewed the fitness-for-use criteria used by Eastman in the acceptance of Refined Methanol from the LPMEOH™ Process. Since start-up, there have been 2-3 instances when the Refined Methanol has been outside the specifications for fitness-for-use; in each of these cases, a procedure has been followed whereby a production supervisor has approved the blending of the contents of the 29D-20 or -21 lot tanks (about 30,000 gallons per lot) into Eastman's 1,000,000 storage tank.</p> <p>A discussion focused on the fitness-for-use for crude methanol from the LPMEOH™ Process. Compounds such as water and ethanol are at levels in the crude methanol which would not satisfy the criteria for use in the downstream processing.</p>

**NOTES FROM MEETING  
CONTINUATION**

ITEM NO.	RESPONSIBLE PERSON (INITIALS)	TARGET DATE	DISCUSSION
3.	BTS	9/24/97	<p>Eastman will provide a list of the criteria and tests for fitness-for-use. This listing will be published as part of any reports covering on-site fitness-for-use.</p> <p><u>Environmental Monitoring Report (EMR) No. 1</u></p>
4.	BTS	8/8/97	<p>The group reviewed the objectives and status of environmental monitoring. Quarterly reports will focus on the status of sampling and analysis, while a compilation of results will be included as part of specific production Topical Reports. Eastman will provide input to the April-June EMR, including reports on spills, leak detection and repair (LDAR), dust, and noise.</p> <p><u>Process Economics Topical Report</u></p>
5.	RBM/ECH	9/30/97	<p>Air Products has received comments from DOE on the 31 March 1997 version of the Topical Report. An updated version is expected to be released in late September.</p> <p><u>Operations/Plant Performance</u></p> <p>VanEric Stein led an extensive discussion on the performance results from the Demonstration Facility. His slides are included in Attachment B.</p> <p>Attachment B-1 is a summary table with the daily performance results from the facility. This type of summary will be included as part of the quarterly Technical Progress Reports.</p> <p>Two specific topics were reviewed:</p> <p><u>Gas Sparger Resistance</u></p> <p>Air Products has reviewed the pressure drop data for the gas sparger since the start-up of the unit. Effects of vapor flowrate and vapor molecular weight can be removed, so that the net pressure resistance can be calculated (resistance = pressure drop / (vapor density * (vapor flowrate)^2). This resistance term is plotted in Attachment B-2. During the initial start-up in April, the resistance increased over time; extended shutdowns (12-24 hours without gas flow) are noted,</p>

**NOTES FROM MEETING  
CONTINUATION**

ITEM NO.	RESPONSIBLE PERSON (INITIALS)	TARGET DATE	DISCUSSION
			<p>and do not appear to affect the rate of increase after each of the outages. Since the restart in June, resistance has slowly increased with time, starting at a lower value than during the April operating period. A liquid flush connection was installed on the reactor feed gas inlet piping during the May outage; this has been used to introduce oil into the gas inlet line during operation (Attachment B-3). The first two flushes used process make-up oil, and were pumped to the process using the 29G-30 slurry transfer pump. A small decline in the resistance term (as averaged over a 24 hour mass balance period) was observed, with a greater decline on an instantaneous basis; however, resistance continued to increase during the 4-5 days between the required make-up oil addition steps. Starting on day 15, the frequency of flushing was increased by stopping the free-draining of entrained liquid and catalyst back to the reactor and batch-transferring this material from the 29C-05 secondary oil knock out vessel through the 29C-30 catalyst reduction vessel and to the sparger flush connection via the 29G-30 slurry transfer pump. These flushes are about 30 minutes in duration at 30 gallons per minute, and take place about every 10 hours. This amount of flushing has stabilized the resistance, but has not resulted in a long-term reduction. Also, during a 9-hour syngas outage around day 20, the gas inlet piping was filled with clean oil within 10 minutes of closing the reactor inlet block valve. At restart, the pressure in the reactor gas inlet piping was increased by 80 PSI over the reactor pressure in an attempt to pressure-pulse the sparger and bottom of the reactor. There was a temporary drop in resistance upon restart, but the pattern of resistance increase continued. Sparger flushing has continued on a 10-hour interval during all times except when catalyst is activated in the 29C-30 slurry transfer pump. During this 2-day interval, sparger resistance increases, but can be reduced to the same range of resistance (10-12 units) observed during operation with the 10-hour flush interval.</p> <p>Attachment B-4 shows pressure measurements during a 2-day operating period where vapor flowrate and molecular weight are constant. The reactor pressure (not shown) is also constant. The vapor inlet pressure at the reactor feed orifice meter (PI-100) shows the same rate of increase as the differential pressure (DP) measurement around the gas sparger (PDI-120); this verified the reading from the DP measurement in the three phase mixture.</p>

**NOTES FROM MEETING  
CONTINUATION**

ITEM NO.	RESPONSIBLE PERSON (INITIALS)	TARGET DATE	DISCUSSION
6.			<p>3. A gas survey at the Kingsport plant will be scheduled using the carbonyl sampling stations installed for this purpose. <i>Samples around and at a mid-point of the 29C-40 carbonyl guard bed, at the reactor inlet, and the plant purge will also be taken. Iron, nickel, and arsenic will be analyzed. Also, the possibility of determining the water content in the gas streams is being investigated. Depending upon these results, the carbon in the guard bed may be sampled and analyzed.</i></p> <p><u>29G-03 Oil Make-up Pump</u></p> <p>A replacement oil make-up pump has been ordered by Eastman. This pump (manufactured by Hydrocell) appears to be a simpler design than the screw pump originally installed in this service. A single pump will be installed and operated to determine the suitability of this pump in the high-flow, high-differential pressure service. Delivery on the pump is expected in early August, and initial operation is expected later in the month. This will then provide the opportunity to operate the 29G-01A/B condensed oil circulation pumps (the 29G-01's require seal flush provided by the 29G-03 oil make-up pump).</p> <p><u>DME Design Verification Testing</u></p> <p>Within Air Products' Alt. Fuels Program, activities have focused on two areas which relate to the DME DVT Recommendation (latest version issued 30 June 1997):</p> <p><u>Dehydration Catalyst Scale-up</u></p> <p>Initial discussions have been held with 2 prospective manufacturers of the dehydration catalyst (AB-05). Once a vendor is selected, the plans call for a 1 lb. trial batch followed by a commercial (2-3 tons) production campaign. About 300 lbs. of dehydration catalyst are required for a single charge at the LaPorte AFDU. An Air Products internal review meeting on the status of these activities is scheduled for 01 August.</p>



**NOTES FROM MEETING  
CONTINUATION**



ITEM NO.	RESPONSIBLE PERSON (INITIALS)	TARGET DATE	DISCUSSION
			<p>Attachment B-5 shows a longer-term view of sparger resistance in terms of pressure drop, molecular weight, and flow. The DP measurement (PDI-120) has stabilized in the 10-12 PSI range since the start of the batch flushing with entrained liquid and catalyst.</p> <p>Air Products has held an initial meeting with our process and technology team involved in the design of the gas sparger. An update of the status of sparger operation and any conclusions resulting from these discussions will be provided at the next Project Review Meeting.</p> <p><u>Catalyst Life</u></p> <p>Attachment B-6 summarizes the normalized catalyst rate constant (<math>\eta</math>) as a function of days on stream. Initial activity of the catalyst was quite high (<math>\eta &gt; 1</math>), but has declined more rapidly than experienced at the LaPorte AFDU or the autoclave. A catalyst sample from the May outage has been examined in Air Products' laboratories; these tests show the presence of iron and arsenic at levels greater than expected. Also, the copper crystallite size and surface area of the catalyst correlate with the value of <math>\eta</math> at the extended shutdown. There is a possibility that the presence of water (a byproduct of reaction) at concentrations greater than previously encountered could be a factor in the catalyst aging.</p> <p>Three courses of action are planned:</p> <ol style="list-style-type: none"> <li>1. Air Products will start an autoclave test using a gas composition similar to that observed during the April-May operating period; this will provide a basis for determining catalyst life at a high <math>H_2/CO</math> ratio.</li> <li>2. Catalyst samples from the Kingsport reactor will be taken on a regular (every 1-2 weeks) basis to determine if concentrations of arsenic and iron are continuing to increase.</li> </ol>

NOTES FROM MEETING  
CONTINUATION



ITEM NO.	RESPONSIBLE PERSON (INITIALS)	TARGET DATE	DISCUSSION
7.	PJAT		<p><u>Commercial Contacts</u></p> <p>Bernie Toseland and X. D. Peng (Air Products) presented a paper at the 2<sup>nd</sup> Joint China/U.S. Chemical Engineering Conference in June. The paper was well received, and contacts were made with several groups interested in the production of DME from syngas. Some concerns have been raised over the burning characteristics of DME in the home cooking application (a large potential market in China); Peter Tijm has contacted researchers at Penn State to study the exhaust characteristics of DME combustion.</p> <p>Peter Tijm is attending the Pittsburgh Coal Conference in China in late September; it was suggested that he should contact independent Chinese design institutions regarding coproduction scenarios.</p> <p>A discussion of the DME DVT Recommendation focused on the funding issues from the Alt. Fuels Program. Other discussion points:</p>
	ECH	9/24/97	1. A preliminary test plan for a campaign at the LaPorte AFDU will be presented at the next Project Review Meeting.
	ECH	Done	<p>2. On Sheet 5 of the Recommendation, change the term "Remaining Activity" to "Initial Productivity" when an update of the document is planned.</p> <p>3. DOE accepted to the Recommendation; the campaign at the LaPorte AFDU can occur subject to the availability of funding for the Alt. Fuels Program</p>
	ECH/FSF	8/8/97	<p><u>Reports</u></p> <p><u>Public Design Report</u> - Air Products is completing its final internal review; three copies will be sent to DOE for formal review/comment.</p>
	RMK/ECH	9/24/97	<p><u>DME Laboratory/Market Studies and Catalyst Poisons Topical Reports</u> - These reports include activities from both the CCT and Alt. Fuels Programs. Air Products and DOE will decide whether these reports will be published in their entirety under both contracts or whether a condensed version will be published under the CCT Program.</p>

**NOTES FROM MEETING  
CONTINUATION**

ITEM NO.	RESPONSIBLE PERSON (INITIALS)	TARGET DATE	DISCUSSION
8.	RMK/ECH	9/5/97	<p>Air Products and DOE will review the requirements for electronic filing of Technical Progress Reports and Topical Reports to determine whether the entire report must be filed, or only highlighted sections of the contract modification</p> <p>An updated Reporting Status log (Attachment C) is provided for reference.</p> <p><u>Conferences/Papers</u></p> <p><u>Gasification Technologies Council (GTC)/EPRI Conference (06 - 08 October 1997)</u> - Air Products has been asked to present a paper on the start-up and initial operating experiences from Kingsport. This will be the first public review of plant performance. The final paper is due 22 August; ECH will work to provide a draft copy in time for review by DOE and Eastman.</p> <p><u>World Methanol Conference (08 - 10 December 1997)</u> - Eastman has been asked to participate at this conference. Air Products has offered to co-present the paper with Eastman. The GTC/EPRI Conference paper will be used as the basis for this presentation.</p> <p><u>Statoil Research Summit (07 - 10 September 1997)</u> - Dennis Brown from Air Products has been invited to participate in this forum. No formal paper is required. He will only present overview results from the CCT Program, since most of his remarks will focus on DME.</p>
9.			<p><u>Off-Site Testing (Product-Use Demonstrations) - Task 3.4</u></p> <p>Air Products has published a cost breakdown for the 8 projects under consideration (letter dated 11 July 1997). The cost tables are being reorganized to more clearly reflect the spending levels of Air Products, the participant, and the DOE.</p>

**NOTES FROM MEETING  
CONTINUATION**



ITEM NO.	RESPONSIBLE PERSON (INITIALS)	TARGET DATE	DISCUSSION
10.	ECH	8/1/97	<p>Action Items from these discussions:</p> <ol style="list-style-type: none"> <li>1) Air Products will extract the Statements of Work from each of the 8 proposals and send to DOE for review.</li> <li>2) DOE will work to meet the following schedule (assuming no unexpected problems with the proposals): <ul style="list-style-type: none"> <li>■ Two of the proposals which have starting dates in 3Q CY'97 will have a target approval date of <b>15 August 1997</b>.</li> <li>■ The remaining six projects will have a target approval date of <b>29 August 1997</b>.</li> </ul> </li> </ol> <p>Air Products will communicate this schedule to Acurex for planning purposes.</p> <p>Another topic of discussion was the possibility of off-site product-use testing in the manufacture of chemicals. In particular, the use of stabilized methanol (light and acid gases removed, no separation of oil or higher alcohols from crude methanol) in the production of MTBE would be of interest. Air Products, as part of the Alt. Fuels Program, has already participated in bench studies of the use of crude methanol in this application. It was noted that interest by MTBE technology suppliers in the use of crude methanol from a LPMEOH™ plant would be generated only if a prospective MTBE customer would request a laboratory/pilot plant study - our program interest alone will probably not be adequate.</p> <p><b><u>Report Card - Project Success Factors</u></b></p> <p>All participants are pleased with the efforts to continue to meet the success factors. In particular, the safe and injury-free start-up of the Demonstration Facility is a tribute to the design work and the excellent operations team at Eastman.</p>
11.	ECH	9/5/97	<p><b><u>Next Meeting</u></b></p> <p>The next Project Review Meeting is scheduled for 24 - 25 September 1997 at Kingsport. A Meeting Notice will be published.</p>

**NOTES FROM MEETING  
CONTINUATION**

ITEM NO.	RESPONSIBLE PERSON (INITIALS)	TARGET DATE	DISCUSSION
12.	BTS	Update 9/24/97	<p><u>Miscellaneous</u></p> <p>An updated Organization Chart for the Federal Energy Technology Center was provided (Attachment D).</p> <p>During discussions on plant operation, a recommendation was made that contact be made with the spent catalyst reclaimer to verify his continuing interest in material from Kingsport.</p>

# MEETING NOTICE



Check if this meeting was scheduled through Schedule+

PLEASE NOTE: Security badges required for visitors in all buildings and employees in R&D buildings.

DISTRIBUTION (NAME/ORGANIZATION) <i>(If unable to attend, contact originator)</i>		COPIED FOR INFORMATION ONLY
Frank Frenduto - APCI	Ed Schmetz - DOE-HQ	Brenda Overton - APCI
Bill Jones - EMN	John Shen - DOE-HQ	Dave Drown - APCI
Bob Kornosky - DOE-FETC	Van Eric Stein - APCI	Barry Halper - APCI
Bob Moore - APCI	Barry Street - EMN	
Bill O'Dowd - DOE-FETC	Peter Tijm - APCI	

FROM Edward C. Heydorn	ORGANIZATION APCI - Program Manager	EXTENSION 17099	TODAY'S DATE 2 July 1997
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DATE OF MEETING July 24 & 25, 1997	WEEKDAY Thurs. & Fri.	TIME FROM 12:15 PM TO 11:00 AM	LOCATION APLPC (JV) Trailer at LPMEOH Site, Kingsport
---------------------------------------	--------------------------	--------------------------------------	---

SUBJECT AND/OR PURPOSE  
 • Project Review Meeting, DOE, Eastman, and Air Products

DESIRED RESULTS/OUTCOMES  
 • Review Operations Status, Review DME and Fuel-use Status

REFERENCE MATERIAL/OTHER

AGENDA  

## LPMEOH™ Project Review Meeting - Agenda

**A. Meet and Lunch, Thursday, July 24th - About 12:15.** (DOE flight arrives at 11:40 am)

**B. Project Review - Part One 1:30 PM**

- |  |              |
|--|--------------|
| 1. Review Logistics for Dedication                               | 1. All       |
| 2. Construction, Commissioning - (Summary - Final Costs)         | 2. FSF/(ECH) |
| 3. Phase 3, Task 1 - Startup - (Summary - Costs)                 | 3. ECH/BTS   |
| 4. Phase 3, Task 2 - Operations - 4a). Status                    | 4. VES/BTS   |
| 4b). Demo Test Plan - what to expect remainder of quarter        |              |
| 5. Data Collection - 5a). Status/Review                          | 5. VES/(ECH) |
| 5b). Test Plan Overview: Major Goals/Objectives with Milestones. |              |
| 6. Eastman Fitness for Use Testing                               | 6. BTS       |
| 7. Process Economics Topical                                     | 7. RBM/WJO   |
| 8. <del>CHP</del>  |              |

**C. Plant Operation - Visit - 4:00 PM**

**D. End of (work) Day One - 5:30 PM**  
 Dinner and early to bed.

**E. Project Review - Part Two 8:30 AM Fri. - July 25th**

- |  |             |
|--|-------------|
| 8. DME Design Verification Testing - Status/Recommendation | 8. ECH      |
| 8a). Approval of decision to support LaPorte AFDU Test-run | All         |
| 9. Public Design Report                                    | 9. FSF/WJO  |
| 10. Reporting Requirements/Other - Status                  | 10. ECH/RMK |
| 10a) Calculations/Data Analysis Techniques - Overview      | VES/WJO     |

LPMEOH™ Project Review Meeting - Agenda (cont'd)

- |   |         |
|---|---------|
| 11. Conference Paper/Plans                                | 11. ECH |
| 12. Updated Fuel-use demo plan - Status/Schedule          | 12. ECH |
| 13. Report Card - Project Success Factors                 | 13. All |
| 14. Make Plans for: Next Project Meeting; Visitors: Other | 14. All |

F. Depart - 11:00 AM - Fri., July 25th (Dedication Ceremony begins at 11:30 AM)

- AGENDA -

**LPMEOH DEMONSTRATION PROJECT  
DE-FC22-92PC90543  
CURRENT SPENDING THROUGH 6/30/97**

\$000's

	<u>Cost Plan 10/22/96</u>	<u>Current Forecast</u>	<u>Spending To-date</u>	<u>% Spent</u>
<b>PHASE 1</b>				
1.1.1 Project Definition	1,051	1,039	1,039	100.0%
1.1.2 Permitting	238	253	253	100.0%
1.1.3 Design Engineering	11,335	10,979	10,896	99.2%
1.1.4 Off-Site Testing	276	276	36	13.0%
1.1.5 Planning, Admin. & DME DVT	<u>2,870</u>	<u>2,984</u>	<u>2,984</u>	100.0%
Subtotal	15,770	15,531	15,208	97.9%
<b>PHASE 2</b>				
1.2.1 Procurement	9,703	10,326	10,173	98.5%
1.2.2 Construction	11,550	11,629	11,629	100.0%
1.2.3 Training & Commissioning	1,115	588	588	100.0%
1.2.4 Off-Site Testing	256	256	0	0.0%
1.2.5 Planning & Admin.	<u>1,015</u>	<u>1,071</u>	<u>966</u>	90.2%
Subtotal	23,639	23,870	23,356	97.8%
<b>PHASE 3</b>				
1.3.1 Startup	680	1,445	1,445	100.0%
1.3.2.1 Methanol Operation	146,485	145,728	6,503	4.5%
<del>DME</del> 1.3.2.2 Methanol Design Mod. Oper.	1,790	1,790	0	0.0%
1.3.2.3 LPMEOH Dismantlement	515	515	0	0.0%
1.3.3 On-Site Product Use Demo	4	4	0	0.0%
1.3.4 Off Site Product Use Demo	3,451	3,451	0	0.0%
1.3.5 Data Analysis & Reports	2,670	2,670	18	0.7%
1.3.6 Planning, Admin. & DME LaPort	<u>2,392</u>	<u>2,392</u>	<u>346</u>	14.5%
Subtotal	157,987	157,995	8,312	5.3%
XXXXXX Costs Prior to Mod 2	16,304	16,304	16,304	100.0%
<b>GRAND TOTAL</b>	<b>\$213,700</b>	<b>\$213,700</b>	<b>\$63,180</b>	<b>29.6%</b>
<b>Total Phase 1&amp;2</b>	<b>\$39,409</b>	<b>\$39,401</b>	<b>\$38,564</b>	<b>97.9%</b>

NOTES: All dollar values in thousands; Forecast and Actual Spending data updated from June 1997 Cost Management Report. Spending to date is ACTUAL, not COMMITTED.



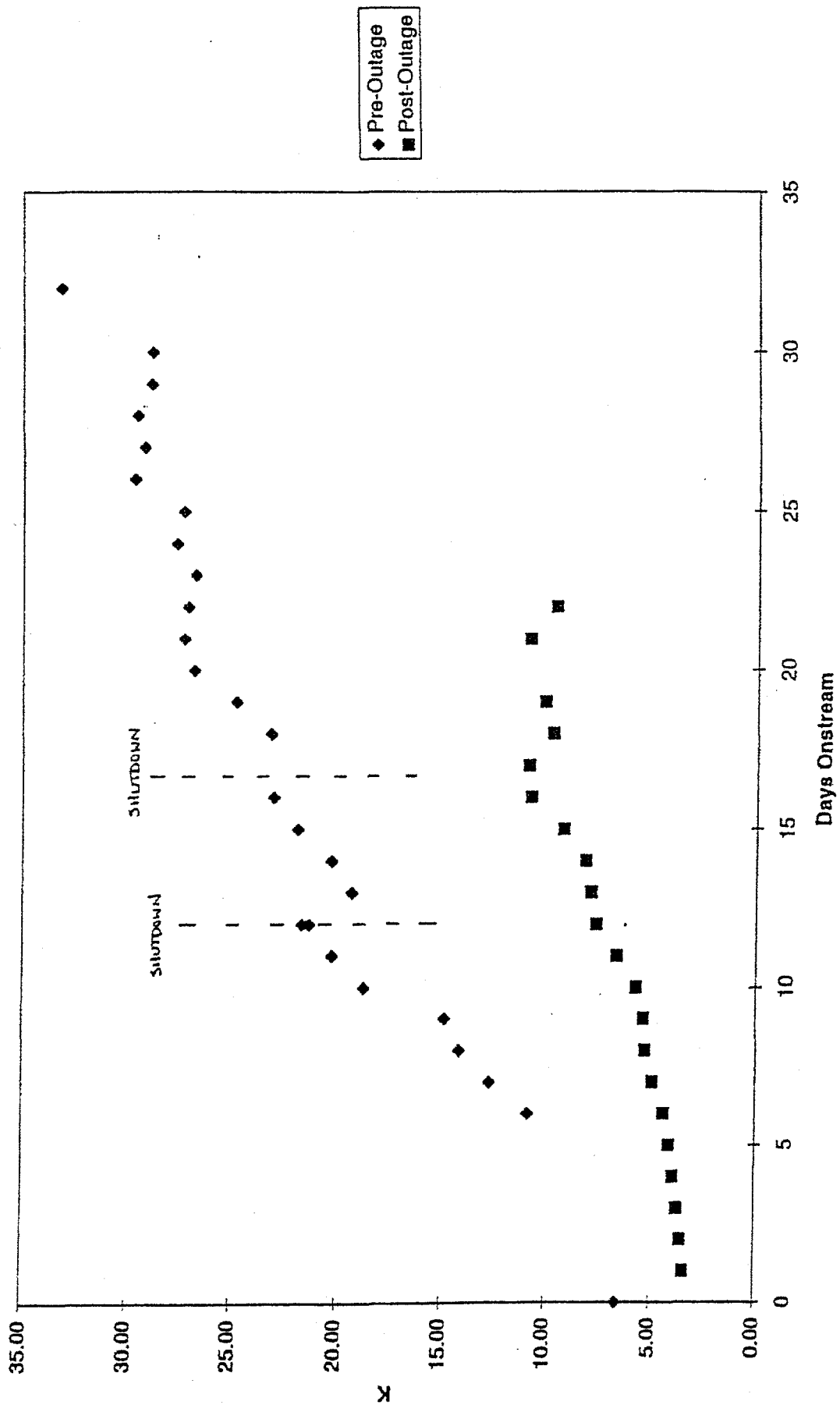
DATA SUMMARY FOR LPMEOH DEMONSTRATION UNIT

Case	Date	Gas type	Temp (Deg C)	Pres (psig)	Balanced Gas (KSCFH)	CO Gas (KSCFH)	Recycle Gas (KSCFH)	Recycle Inlet Sup. Velocity (ft/sec)	Space Velocity (hr <sup>-1</sup> )	Space Conc. (wt% ox)	Gas Holdup (vol%)	Gas Inventory (ft <sup>3</sup> )	Catalyst Age (eta)	CO Conv. (%)	Reactor O-T-M Conv. (%)	Synogas Uni (SCFH/b)	Raw MeOH (FPD)	Catalyst (gmo/hr-kg)	Reactor Vol Prod (IPD/Cu ft)	Overall (ft <sup>3</sup> /hr n2 F)	Sparger aP (psf)	Sparger Resistance (K)
1	6-Apr-97	Balanced	248	719	758	0	1,375	0.80	6.203	30.5	50.2	54.9	1.30	54.8	33.1	37.6	242.3	30.74	0.105	181	3.37	6.64
1	12-Apr-97	Balanced	249	716	792	0	1,536	0.85	4.783	30.8	50.6	54.9	1.24	54.8	31.7	37.5	253.4	32.19	0.110	184	6.23	10.87
1	13-Apr-97	Balanced	249	705	789	0	1,619	0.86	7.014	30.9	52.0	56.1	1.18	50.5	30.5	37.5	252.8	32.00	0.107	172	8.69	12.72
1	14-Apr-97	Balanced	249	705	818	0	1,601	0.88	7.019	30.8	50.9	55.1	1.29	51.7	31.2	37.9	258.9	32.84	0.112	170	10.50	14.17
1	15-Apr-97	Balanced	248	705	904	0	1,527	0.89	7.094	30.9	50.7	54.5	1.78	55.8	33.6	38.5	281.9	35.82	0.123	168	11.05	14.88
1	17-Apr-97	Balanced	249	704	887	0	1,746	0.83	7.629	32.1	53.0	54.3	1.24	49.8	30.0	39.4	270.5	34.35	0.119	171	14.17	18.78
1	18-Apr-97	Balanced	249	705	841	0	1,843	0.84	7.762	32.0	51.9	53.4	1.14	48.2	29.1	37.8	267.0	33.86	0.119	173	17.61	20.28
1	18-Apr-97	Balanced	249	703	934	0	1,779	0.86	7.970	32.0	52.2	53.8	1.43	51.1	30.7	40.0	288.8	36.80	0.128	153	19.17	21.35
1	19-Apr-97	Balanced	249	709	958	0	1,994	0.70	8.582	32.2	51.5	52.4	1.17	48.3	29.2	39.4	292.2	36.60	0.133	158	20.47	21.69
1	20-Apr-97	Balanced	249	708	913	0	2,114	0.72	8.771	30.3	50.5	55.8	1.03	47.1	26.4	39.8	275.5	34.77	0.117	172	21.64	20.31
1	21-Apr-97	Balanced	249	709	859	0	2,122	0.71	8.635	29.4	50.4	58.0	0.97	47.5	25.6	39.5	261.1	32.84	0.107	174	22.29	21.00
1	22-Apr-97	Balanced	249	709	793	0	2,106	0.69	8.376	29.3	49.0	56.7	0.94	49.0	24.6	39.2	242.7	30.66	0.102	177	21.59	23.04
1	24-Apr-97	Balanced	249	702	865	0	2,024	0.70	8.419	29.9	50.7	57.0	0.95	44.6	26.2	39.8	261.0	33.17	0.109	159	24.25	23.16
1	25-Apr-97	Balanced	248	700	835	0	1,921	0.67	8.019	31.8	45.6	47.5	0.90	44.6	26.2	40.4	248.2	31.58	0.125	161	23.48	24.80
1	26-Apr-97	Balanced	246	694	864	0	1,877	0.67	7.980	32.8	45.0	45.8	0.83	41.6	26.0	41.9	247.8	31.38	0.129	144	25.38	26.81
1	27-Apr-97	Balanced	247	690	902	0	1,793	0.65	7.842	32.8	44.9	45.0	0.83	39.7	26.9	42.9	252.2	31.88	0.134	145	26.18	27.29
1	28-Apr-97	Balanced	247	698	783	0	1,895	0.65	7.817	31.0	47.1	50.6	0.74	42.7	24.4	41.9	224.4	28.35	0.106	136	24.49	27.11
1	29-Apr-97	Balanced	249	700	810	0	1,923	0.66	7.951	29.3	46.9	54.5	0.81	42.1	25.6	40.9	238.0	30.05	0.104	148	26.26	26.76
1	30-Apr-97	Balanced	249	699	794	0	1,936	0.66	7.945	29.9	44.6	51.0	0.74	41.1	24.5	42.0	228.0	28.85	0.106	154	26.26	27.32
1	1-May-97	Balanced	249	699	798	0	1,898	0.64	7.767	30.4	43.7	49.0	0.68	40.5	23.9	42.8	219.5	27.66	0.107	153	26.05	29.24
1	2-May-97	Balanced	249	700	789	0	1,901	0.65	7.831	30.5	44.6	49.0	0.65	38.9	23.4	43.4	218.1	27.43	0.105	157	26.24	29.58
1	3-May-97	Balanced	249	699	782	0	1,885	0.65	7.678	30.2	44.2	50.0	0.64	37.5	23.4	43.7	218.9	27.76	0.104	158	26.26	28.88
1	4-May-97	Balanced	249	700	789	0	1,901	0.65	7.856	30.4	43.2	48.5	0.64	38.1	23.3	42.8	217.3	27.84	0.107	160	26.26	28.83
1	5-May-97	Balanced	249	699	798	0	1,908	0.65	7.835	30.4	43.2	48.5	0.65	38.1	23.3	42.8	217.3	27.84	0.107	160	26.26	28.83
1	6-May-97	Balanced	249	700	776	0	1,908	0.65	7.835	30.4	43.2	48.5	0.65	38.1	23.3	42.8	217.3	27.84	0.107	160	26.26	28.83
1	8-May-97	CO-rich	248	700	215	40	1,042	0.82	3.813	30.8	36.9	43.0	0.65	8.6	15.1	44.4	69.0	8.82	0.038	161	14.81	33.22
5	18-Jun-97	Balanced	248	724	718	0	1,938	0.62	8.062	25.6	45.9	61.4	0.99	39.3	22.5	42.0	205.3	26.95	0.079	127	2.99	3.37
5	19-Jun-97	Balanced	249	711	638	0	1,938	0.62	7.905	26.6	45.3	57.6	0.99	42.6	21.4	40.7	188.3	24.77	0.077	152	3.05	3.52
5	20-Jun-97	Balanced	249	707	651	0	2,079	0.60	8.294	27.1	44.9	56.0	0.60	39.2	20.2	41.3	189.4	24.99	0.080	179	3.45	3.71
5	21-Jun-97	Balanced	249	707	687	0	2,109	0.67	8.465	27.6	45.2	55.0	0.58	35.5	20.8	41.4	198.9	26.14	0.086	177	4.00	3.90
5	22-Jun-97	Balanced	249	707	625	0	2,097	0.65	8.203	28.2	44.2	52.7	0.51	33.4	19.5	41.3	181.5	23.85	0.082	177	3.96	4.11
5	23-Jun-97	Balanced	249	707	762	0	2,021	0.67	8.455	28.4	43.6	51.6	0.56	33.6	21.5	43.8	208.8	27.35	0.096	155	4.51	4.38
5	24-Jun-97	Balanced	249	708	781	0	1,991	0.67	8.412	29.0	44.5	50.9	0.55	33.2	21.2	45.6	205.4	26.90	0.096	140	5.04	4.93
5	25-Jun-97	Balanced	248	707	739	0	2,003	0.66	8.338	29.2	43.3	49.4	0.57	33.7	21.0	44.0	201.5	26.62	0.097	169	5.33	5.31
5	26-Jun-97	Balanced	249	705	736	0	2,080	0.68	8.559	28.9	48.3	54.8	0.56	33.0	20.7	43.4	203.5	26.65	0.088	176	5.64	5.38
5	27-Jun-97	Balanced	249	706	736	0	2,326	0.74	9.252	26.7	46.6	59.0	0.53	29.7	19.5	42.8	206.5	26.68	0.083	160	7.34	6.74
5	28-Jun-97	Balanced	249	707	691	0	2,307	0.72	9.079	27.5	45.8	56.0	0.52	31.0	19.3	41.5	199.7	25.84	0.085	155	8.12	6.67
5	29-Jun-97	Balanced	249	706	719	0	2,267	0.72	9.042	27.7	43.9	53.5	0.53	30.0	19.1	43.0	198.4	25.77	0.090	173	9.33	7.65
5	30-Jun-97	Balanced	249	706	711	0	2,263	0.71	9.019	28.1	43.9	52.5	0.51	29.9	19.1	43.0	198.4	25.77	0.090	180	9.29	7.90
5	1-Jul-97	Balanced	249	707	676	0	2,251	0.71	8.944	26.1	45.3	56.4	0.51	31.5	19.0	42.0	193.2	24.68	0.077	157	10.66	9.21
5	2-Jul-97	Balanced	249	707	685	0	2,203	0.70	8.827	26.5	45.4	56.4	0.51	32.5	19.6	41.9	195.9	25.39	0.080	177	10.66	9.21
5	3-Jul-97	Balanced	249	707	664	0	2,218	0.70	8.794	27.5	43.9	54.0	0.55	32.8	19.4	41.1	193.9	25.48	0.085	174	12.10	10.78
6	4-Jul-97	Balanced	249	707	705	0	2,231	0.70	7.939	30.0	44.1	64.0	0.57	37.3	21.0	40.6	208.4	23.96	0.092	173	12.21	10.89
6	5-Jul-97	Balanced	249	706	761	0	2,203	0.72	8.060	30.7	43.1	61.8	0.57	35.8	21.1	42.3	216.0	25.11	0.100	175	11.09	9.73
6	6-Jul-97	Balanced	249	705	755	0	2,198	0.71	8.031	30.2	42.5	52.0	0.57	36.2	20.9	42.6	212.8	24.85	0.097	184	11.49	10.12
6	8-Jul-97	Balanced	249	705	761	0	2,161	0.70	7.926	31.1	41.9	49.5	0.54	35.4	20.5	44.2	206.5	24.25	0.099	185	11.94	10.65
6	9-Jul-97	Balanced	248	695	610	0	2,277	0.70	7.788	31.3	42.0	49.0	0.50	34.3	19.0	40.2	182.1	21.26	0.089	161	11.02	9.60

5

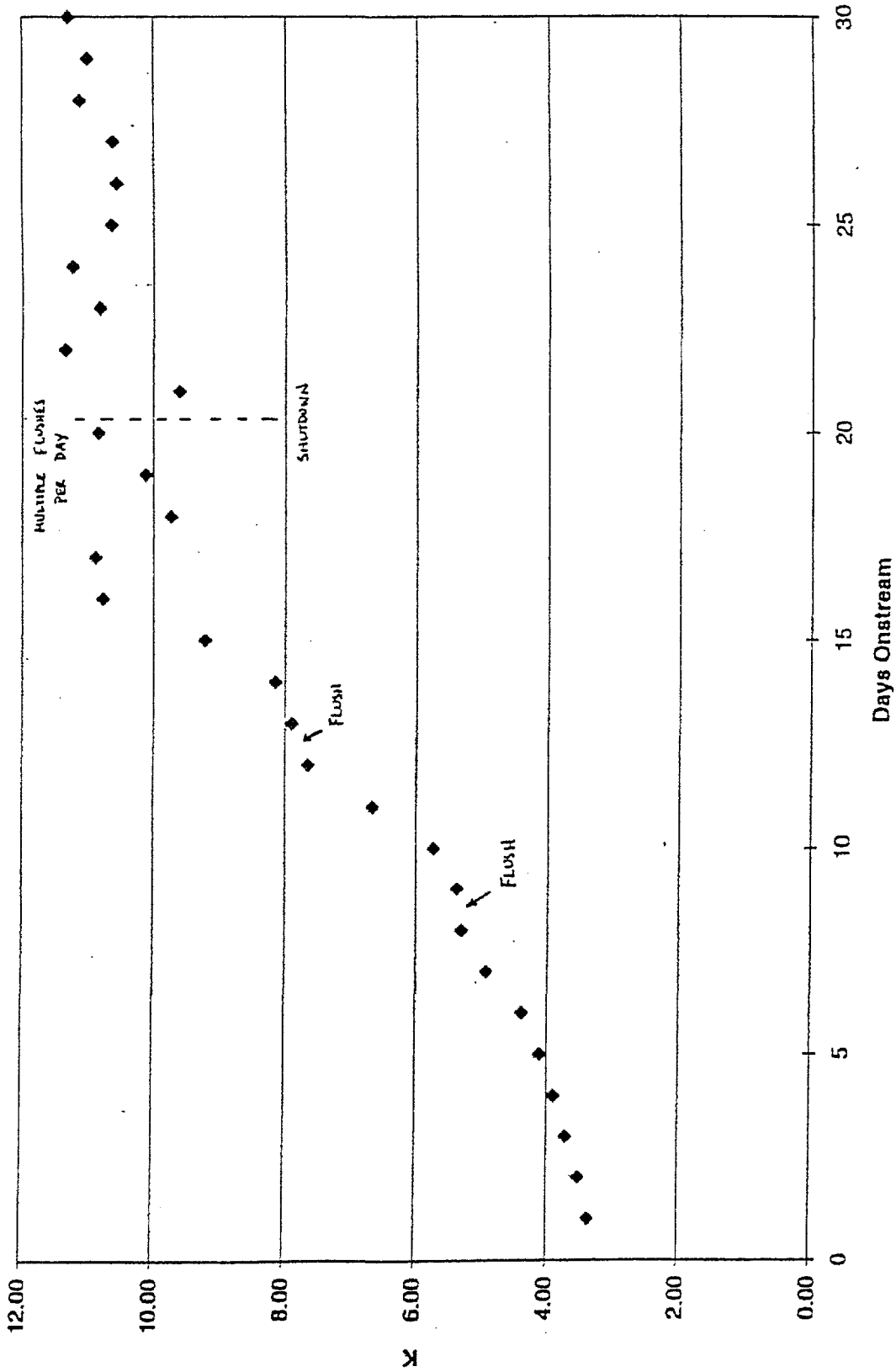
# Kingsport LPMEOH

## Sparger Resistance



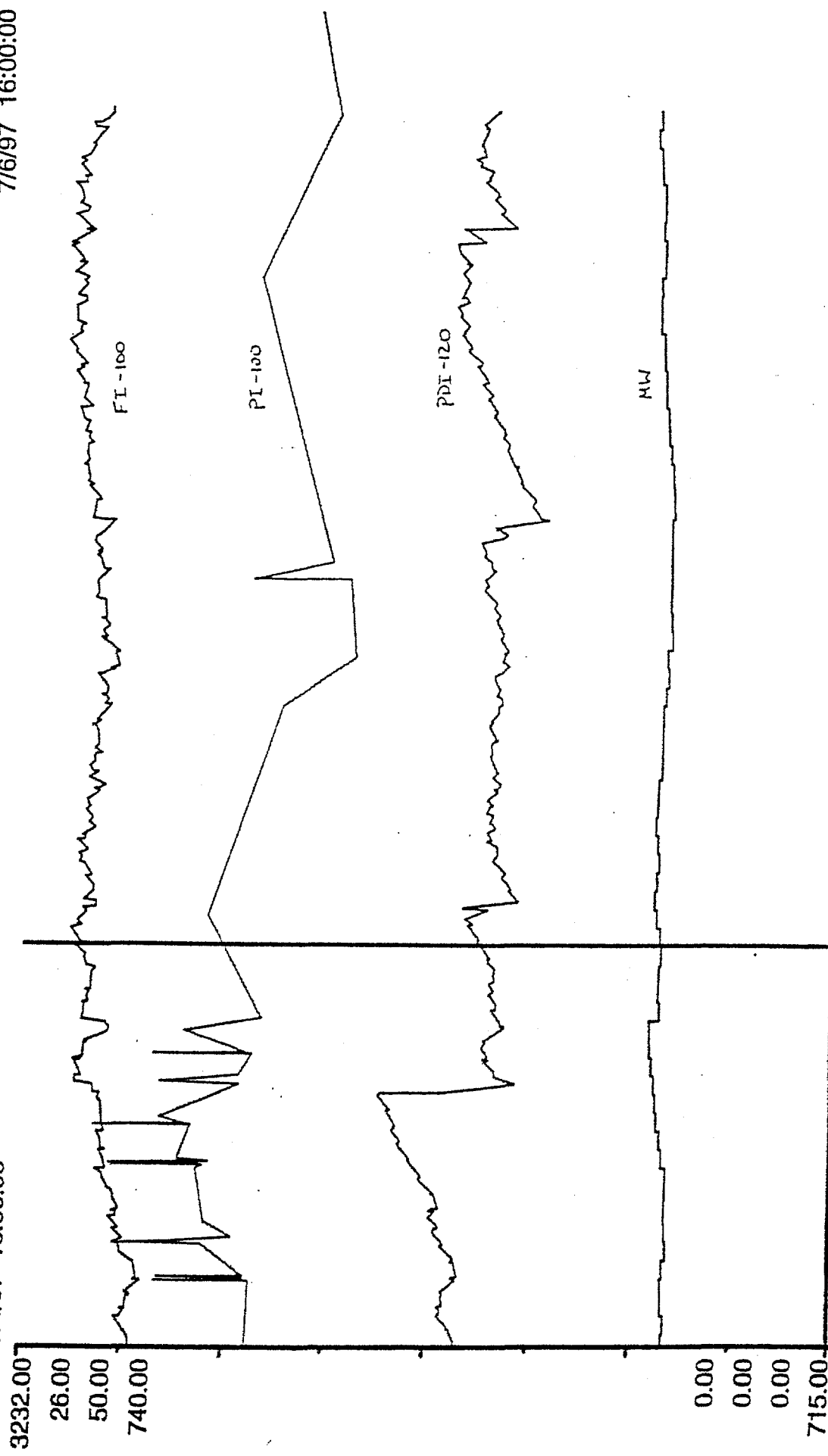
# Kingsport LPMEOH

## Sparger Resistance (Post-Outage)



Sparger

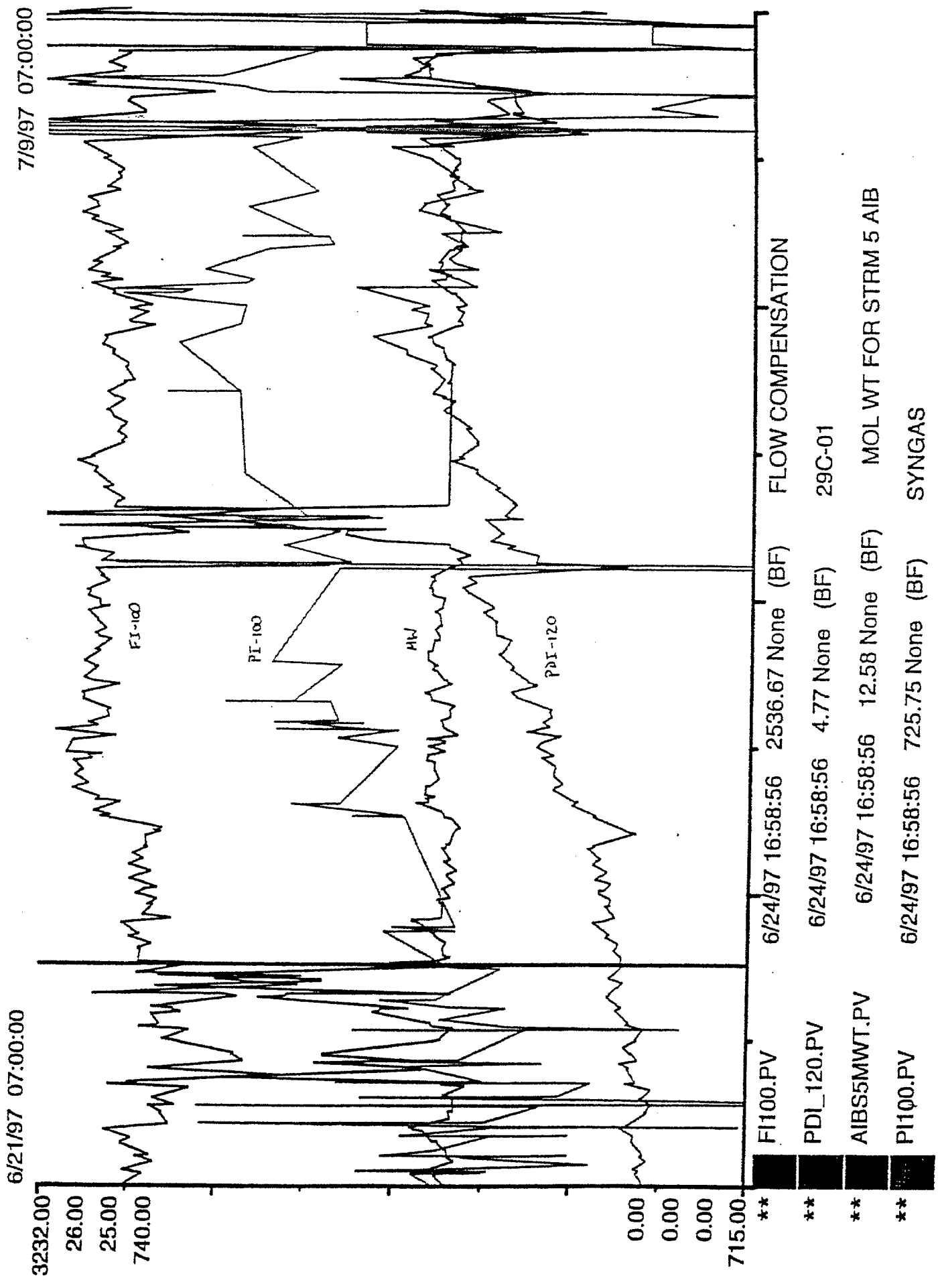
7/4/97 16:00:00 7/6/97 16:00:00



Variable	Time	Value	Unit
FI100.PV	7/5/97 06:31:18	2995.18	None (BF)
PDI_120.PV	7/5/97 06:31:18	11.42	None (BF)
AIBS5MWT.PV	7/5/97 06:31:18	10.82	None (BF)
PI100.PV	7/5/97 06:31:18	733.87	None (BF)

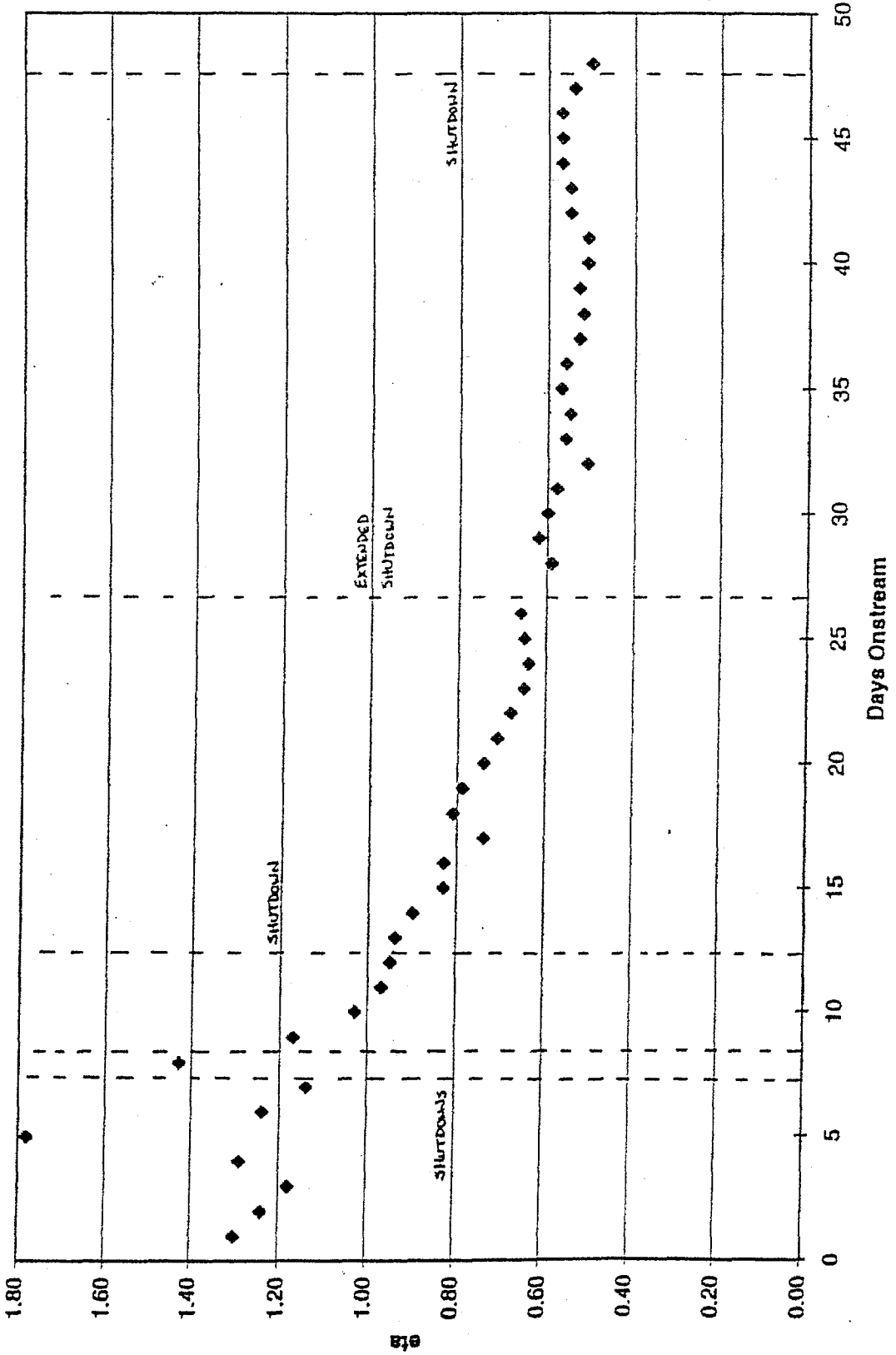
Attachment B (4)

Sparger



Kingsport LPMEOH

Catalyst Age (eta)



LPMEOH™ Reporting Status  
July 24, 1997

Quarterly Technical Progress Reports

No. 1 (October 1, 1993 to June 30, 1994)	Approved
No. 2 (July 1, 1994 to September 30, 1994)	Approved
No. 3 (October 1, 1994 to March 31, 1995)	Approved
No. 4 (April 1, 1995 to June 30, 1995)	Approved
No. 5 (July 1, 1995 to September 30, 1995)	Approved
No. 6 (October 1, 1995 to December 31, 1995)	Approved
No. 7 (January 1, 1996 to March 31, 1996)	Approved
No. 8 (April 1, 1996 to June 30, 1996)	Approved
No. 9 (July 5, 1996 to September 30, 1996)	Approved
No. 10 (October 1, 1996 to December 31, 1996)	Approved
No. 11 (January 1, 1997 to March 31, 1997)	Approved
No. 12 (April 1, 1997 to June 30, 1997)	First Draft Due August 15, 1997

Topical Reprts

No. 1 (Peroxide Formation)	Need Revised Draft
No. (DME Laboratoy and Market Studies)	Need First Draft
No. (Catalyst Poisons)	Submitted For DOE Review
No. (Economic Analysis)	Need Revised Draft
No. (Liquid Phase Reactor Design)	Need First Draft

Environmental

Environmental Information Volume	Approved
Environmental Monitoring Plan	Approved
Environmental Monitoring Report No. 1 (April 1, 1997 to June 30, 1997)	First Draft Due August 15, 1997

Technical

5 <sup>TH</sup> Clean Coal Technology Conference Paper	Approved
AIChE Spring 1997 Conference Paper	Approved
American Chemical Society Spring 1997 Paper	Approved
Power-Gen Europe '97 Conference Paper	Published
EPRI Conference Paper	Need First Draft
Demonstration Test Plan	Approved
Final Report - Volume 1 - Public Design	Need Revised Draft
Demonstration Technology Start-Up Report	Due June 1, 1997
Test Series Report	As Required

Other

Project Management Plan	Approved
DME Decision Memo	Submitted For Approval

# Federal Energy Technology Center

Attachment D

**Office of the Director**  
 Director - Rita A. Bajura  
 Deputy - Ralph A. Carabatta  
 Chief Counsel - Curtis W. McBride  
 Executive Officers  
 MGN - John J. Kovach  
 PGH - Sharon K. Marchant  
 Supervisory Office Managers  
 MGN - Georganne St. Clair  
 PGH - Margie A. Guenther  
 Chief Engineers  
 - John E. Nolestein  
 - Gilbert V. McGurt

**Office of Product Management for Fuels & Specialty Markets**  
 Assoc. Dir.  
 Leonard E. Graham

Senior Management & Technical Advisors  
 (1) Gregory J. Kawaikin  
 (2) Hugh D. Guthrie

**Product Managers**

- Natural Gas Supply & Storage  
Charles A. Komar
- Natural Gas Processing  
Venkat K. Venkataranian
- Coal Liquefaction Technology  
John C. Winslow
- Solid Fuels  
Arthur L. Baldwin
- Fuels Systems Adv. Research  
Richard P. Nozari
- New Business Development (I)  
Curtis V. Nakaishi
- New Business Development (II)  
(Vacant)
- International Program  
Scott M. Smouse

**Office of Power Systems Product Management**  
 Assoc. Dir.  
 Joseph P. Strakey

Senior Management & Technical Advisor  
 Dale K. Schmidt

**Product Managers**

- Pulverized Coal Combustion  
Lawrence A. Ruth
- Environmental  
Charles E. Schmidt
- Pow. Sys. Adv. Research/AR & TD  
Robert R. Romanosky
- IGCC  
Gary J. Silegal
- Fluidized Bed Combustion  
Donald L. Bonk
- Advanced Turbine Systems  
Abbie W. Layne
- Fuel Cells  
Mark C. Williams

**Office of Product Management for Environmental Management**  
 Assoc. Dir.  
 Carl O. Bauer

Senior Management & Technical Advisor  
 James A. Marsh

**Product Managers**

- Industry Programs  
Robert C. Bedtick
- D & D  
Paul W. Hart
- Technology Applications  
Joseph B. Paladino
- Nuclear & Strategic Processes  
Joseph P. Parise
- Center for Acquisition and Business Excellence  
(Vacant)

**Office of Project Management**  
 Assoc. Dir.  
 Kenneth E. Markel, Jr.

Deputy Assoc. Director  
 Larry K. Carpenter  
 Senior Management & Technical Advisor  
 Melvin C. Keller

**Power & Environmental Systems Division**

- Director  
Harvey M. Ness
- Fuels Resources Division  
Director  
William F. Lawson, Jr.
- Gas Power Systems Division  
Director  
Charles M. Zeh
- Advanced Crosscutting Technologies Division  
Director  
Bruce R. Utz
- Environmental Waste Management Division  
Director  
Floyd W. Crouse
- Major Projects & Agreements Division  
Director  
Thomas A. Sattus

**Office of Science and Technology**  
 Assoc. Dir.  
 Larry C. Headley

Deputy Assoc. Director  
 Michael L. Eastman  
 Senior Management & Technical Advisors  
 (1) James I. Joubert  
 (2) David J. Wildman

**Solids Processing & Separations Division**

- Director  
Richard R. Schehl
- Combustion & Cleanup Division  
Director  
Larry D. Strickland
- Gaseous Fuels & Gas Cleanup Division  
Director  
John S. Halow
- Environmental Science & Technology Division  
Director  
Robert L. Kleinmann
- Fuels & Chemicals Division  
Director  
Richard G. Left
- Engineering & Operations Division  
Director  
William J. Ayers, Jr.

**Office of Program Support and Site Operations**  
 Assoc. Dir.  
 Thomas M. Torkos

Deputy Assoc. Director  
 James J. Grabulis  
 Management & Technical Advisor  
 Jake K. Appetta

**Acquisition & Assistance Division**

- Director  
Carol A. Lambton  
Sup. Contract Spec.  
Randolph L. Kesting
- Information Resources Management Division  
Director  
Jerry G. Craig
- Budget & Financial Management Division  
Director  
Glenn E. Trenham
- Environmental, Safety, & Health Division  
Director  
Jan K. Wachter
- Human Resources Division  
Director  
Norman L. Howlton
- Site Operations Division  
Director  
(Vacant)

**Office of Systems and Environmental Analysis**  
 Assoc. Dir.  
 Fred R. Brown

Deputy Assoc. Director  
 James M. Ekman  
 Senior Engineering & Management Advisor  
 John A. Ruether  
 Health & Safety Officer  
 Dan L. McCollum  
 Environmental Manager & NEPA Compliance Officer  
 Lloyd Lorenzi, Jr.  
 EEO/Diversity  
 Nancy R. Vargas

**Process Engineering Division**

- Director  
Robert B. Reuther
- Evaluation & Planning Division  
Director  
Charles J. Drummond
- Management & Communications Division  
Director  
Rodney J. Anderson



**APPENDIX L - TASK 3.6 - PROJECT REVIEW MEETING (24-25 SEPTEMBER  
1997)**

# NOTES FROM MEETING

DISTRIBUTION (NAME/ORGANIZATION) *Unable to attend. **Chairman		COPIED FOR INFORMATION ONLY	
Bill Jones - EMN	John Shen - DOE-HQ	Sue Kasinecz - APCI	Ed Schmetz - DOE-HQ
Bob Kornosky - DOE-FETC	Van Eric Stein - APCI	Bob Senn - APCI	Peter Tijm - APCI
Bob Moore - APCI	Barry Street - EMN	Bernie Toseland - APCI	
Bill O'Dowd - DOE-FETC			

FROM Edward C. Heydorn <i>EH</i>	ORGANIZATION APCI - Program Manager	EXTENSION 17099	TODAY'S DATE 10/22/97
-------------------------------------	--	--------------------	--------------------------

DATE OF MEETING 24 & 25 Sept. 1997	WEEKDAY Wed. & Thurs.	TIME STARTED 12:15 PM	TIME ENDED 11:00 AM	LOCATION APLPCC (JV) Trailer, Kingsport, TN
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SUBJECT AND/OR PURPOSE  
**• Project Review Meeting - DOE, Eastman, and Air Products**

ITEM NO.	RESPONSIBLE PERSON (INITIALS)	TARGET DATE	DISCUSSION
1.			<p><b><u>Operations/Plant Performance (Task 3.2)</u></b></p> <p>Two specific topics were reviewed:</p> <p><u>Gas Sparger Resistance</u></p> <p>Attachment A-1 shows the daily plot of the sparger resistance coefficient. During the July 1997 review meeting, it was reported that the resistance had been stabilized using an intermittent (every 10 hours, 30 minutes duration) flush of entrained slurry (recovered in the 29C-06 cyclone and 29C-05 secondary oil separator). This slurry is returned to the reactor at a 30 gpm rate using the 29G-30 slurry addition pump. The resistance coefficient continues to remain fairly steady through August and September; the decrease at Day 40 is during the CO-rich gas test in August; the magnitude of the decrease is not considered to be significant, but may be due to the method of calculation of the resistance coefficient.</p> <p>During a 1-week plant outage in September (described later), slurry was kept in the reactor without gas flow. Upon restarting the unit, the resistance coefficient increased from 12 to 20.</p> <p>In the near term, we expect to study the effects of a small continuous flow of entrained slurry to the gas sparger, via the 29G-01 pumps and/or by other means.</p>

NOTES FROM MEETING  
CONTINUATION

ITEM NO.	RESPONSIBLE PERSON (INITIALS)	TARGET DATE	DISCUSSION
			<p><u>Catalyst Life</u></p> <p>Attachment A-2 summarizes the normalized catalyst rate constant (<math>\eta</math>) as a function of days on stream. The catalyst rate constant is declining by about 1.5% per day (vs. 0.4%/day from the LaPorte AFDU). After a syngas outage in early September, the reactor could not be restarted to maintain a stable operating condition. A fresh batch of catalyst was activated and added to the reactor; following this, the system started without incident.</p> <p>Attachment A-3 shows the results of the various tests on catalyst samples from the reactor. We have discounted the validity of Sample K0797-2, due to the physical nature of the sample (high oil content) and the inconsistency with the results of the analysis of other samples taken before and after it. The conclusion of the analysis of solids samples to date indicates an increase in arsenic and sulfur levels, with an intermittent presence of iron which cannot be supported by gas carbonyl analyses (refer to Attachment A-5). A recent slurry sample is being analyzed; preliminary results show that arsenic levels on the catalyst are continuing to increase, and that sulfur levels may be increasing at a greater rate. Tests for other halogens (fluoride, bromide) are pending. Attachment A-4 is a tabulation of the arsenic and sulfur levels on the catalyst, with calculations indicating the likely concentrations in the Balanced Gas stream. A comparison with the June 1995 trailer test at Kingsport is provided for reference.</p> <p>Work has been performed in the autoclave to determine some of the possible causes of catalyst deactivation. An initial test using a <math>H_2</math>-rich gas similar to the reactor feed concentration during start-up in April showed no deactivation and confirmed the water concentrations calculated from the Kingsport data. A test of a 50-50 mixture of freshly reduced catalyst and aged Kingsport catalyst showed some degree of accelerated deactivation compared to fresh catalyst alone; however, no conclusions can be drawn regarding the possibility of migration of poisons between catalyst particles. An autoclave test is planned for early October to add a controlled concentration of arsine to a batch of freshly activated catalyst to measure the rate of deactivation and to determine the copper crystal size after exposure to arsine.</p>

**NOTES FROM MEETING  
CONTINUATION**

ITEM NO.	RESPONSIBLE PERSON (INITIALS)	TARGET DATE	DISCUSSION
2.	ECH/RBM  RMK/WCO	Done  Done	<p>Eastman has scheduled the changeout of their guard bed (arsine and sulfur removal) for 01 October. Plans are to take an outage of the LPMEOH™ plant at the same time in order to make the electrical tie-ins for the new 29G-03 oil make-up pump. A fresh batch of catalyst will be activated and added to the reactor prior to restarting the plant. Gas sampling for arsine around the LPMEOH™ plant is scheduled for the week of 06 October. We anticipate that results from the gas sampling, continued slurry sampling, the arsine test in the autoclave, and the actual plant performance following the guard bed changeout will be available on 24 October. During this period, an assessment of the performance on the oil make-up pump and possibly the 29G-01 condensed oil return pumps will be made. A recommendation will be made at that time regarding the possibility of draining the slurry from the reactor and restarting with all fresh catalyst (Eastman has been in contact with the catalyst reclaimer about the possibility of spent catalyst slurry being available in November).</p> <p><u>Public Design Report</u></p> <p>DOE has the present version of the report. In addition to rework of certain sections of text (including possibly Section 6 regarding operating costs), DOE was dissatisfied with Section 5, in particular the breakdown of equipment costs. Air Products will attempt to modify the tables to provide equipment costs by area. A proposed breakdown will be provided to DOE independent of their review of the remainder of the document. DOE will furnish other comments to Air Products.</p>
3.			<p><u>DME Design Verification Testing</u></p> <p>A manufacturer for the dehydration catalyst has been selected by the Alt. Fuels Program. The initial schedule showed a catalyst delivery date to LaPorte of 01 March 1998. This date could be met assuming that the dehydration catalyst would be produced in a series of campaigns in a pilot plant. The Alt. Fuels Program has determined that it is important to complete the scale-up of the dehydration catalyst as part of the proposed LaPorte run. This will increase the time requirement, as a production test in the pilot plant is still required before operating the commercial catalyst production unit. The new estimated delivery date of dehydration catalyst to LaPorte is 01 June 1998. Air Products will keep the LPMEOH™ Project informed of any changes in schedule.</p>



NOTES FROM MEETING  
CONTINUATION

ITEM NO.	RESPONSIBLE PERSON (INITIALS)	TARGET DATE	DISCUSSION
4a.	VES	11/30/97	<p><u>Demonstration Technology Start-up Report</u></p> <p>DOE and Air Products agreed that the resolution of issues regarding catalyst activity will not impact the publication date for this report. Once the 29G-01 condensed oil return pumps have been operated successfully, the report can be published. Assuming that work on the pumps proceeds smoothly, Air Products anticipates that the start-up report will be published in late November.</p>
5.			<p><u>Quarterly Reports</u></p> <p>Technical Progress Report (TPR) No. 12 has been returned to Air Products by DOE with minor comments. Environmental Monitoring Report No. 1 is presently being audited by Rich Hargis (DOE/FETC) for comparison with the Environmental Monitoring Plan. Several of the approved TPR's have not yet been published; this is a result of first-time problems related to creating an electronic version of the report.</p> <p>A section in TPR #12 covered the method of calculation for key performance parameters within the LPMEOH™ Demonstration Facility; this section was reviewed by DOE and approved without comment.</p> <p>Attachment C-1 contains the reporting status as provided by DOE.</p>
6.	ECH	12/97	<p><u>Conferences/Papers</u></p> <p><u>Gasification Technologies Council (GTC)/EPRI Conference (06 - 08 October 1997)</u> - Air Products has prepared the slides for this upcoming presentation. Eastman provided photographs of the site for use in this and future presentations. Air Products will provide copies of the site photographs.</p> <p><u>World Methanol Conference (08 - 10 December 1997)</u> - Barry Street is preparing a draft of this paper. Barry and Ed Heydorn will co-present. The final paper is due to the conference organizers at the end of October.</p> <p><u>North America Methanol Producers Conference (March 1998)</u> - Air Products will advise Eastman of any interest to present at this forum.</p> <p><u>Clean Coal Technology Conference (April/May 1998)</u> - No updates at this time.</p>

**NOTES FROM MEETING  
CONTINUATION**

ITEM NO.	RESPONSIBLE PERSON (INITIALS)	TARGET DATE	DISCUSSION
7.	RJS	Done - No change	<p><u>Off-Site Testing (Product-Use Demonstrations) - Task 3.4</u></p> <p>Air Products has received a revised request for a smaller quantity of methanol from the two programs at West Virginia University. Air Products will confirm that there is no change in the project costs associated with this reduction in methanol use.</p>
	RJS	Spring 1998	<p>DOE and Air Products will schedule a separate review meeting with Acurex, probably in the spring of 1998. One of the issues raised by DOE is that each of the test sites may be using different analytical methods to determine the emissions results; a summary of the test methods for review at that meeting would be helpful.</p> <p>Discussions with users of methanol in chemical applications have been initiated.</p>
	ECH	Done	<p>Air Products is preparing a recommendation letter to DOE regarding the use of methanol from a campaign at the LaPorte AFDU in certain of the off-site tests. A comparison of the composition of the AFDU methanol with two samples taken during the August 1997 CO-rich test at Kingsport will be included in this letter.</p>
8.	BTS	12/97	<p><u>Product-Use Fitness-for-Use Testing - Status</u></p> <p>DOE indicated that the results of Eastman's Fitness-for-Use testing for methanol in their downstream chemical processes can be included in an upcoming TPR. A Topical Report will be required only if the off-site test program identifies other chemical uses for methanol.</p> <p>Eastman will sample the stabilized methanol and analyze for their fitness-for-use criteria. A summary of these results will be provided in the October/December 1997 TPR.</p>

NOTES FROM MEETING  
CONTINUATION

ITEM NO.	RESPONSIBLE PERSON (INITIALS)	TARGET DATE	DISCUSSION
9.			<p><b><u>Report Card - Project Success Factors</u></b></p> <p>All participants are pleased with the efforts to continue to meet the success factors. The resolution of technical issues may have some impact on the schedule for meeting the commercialization objectives for the LPMEOH™ Process. However, the upcoming cost plan will continue to forecast no change in the overall budget. Air Products asked for guidance from DOE should a no-cost extension of the operating program be deemed necessary to complete the Demonstration Test Plan. DOE advised that it was premature to discuss an extension at this time; this should be addressed later in the test program, when a clear definition of the operating end date can be made.</p>
10.	ECH	11/14/97	<p><b><u>Next Meeting</u></b></p> <p>The next Project Review Meeting will be scheduled for December 16 and 17 at Kingsport. A Meeting Notice will be published.</p>
11.			<p><b><u>Miscellaneous</u></b></p> <p>An updated Project Team (Attachment D-1) is attached.</p>



# MEETING NOTICE



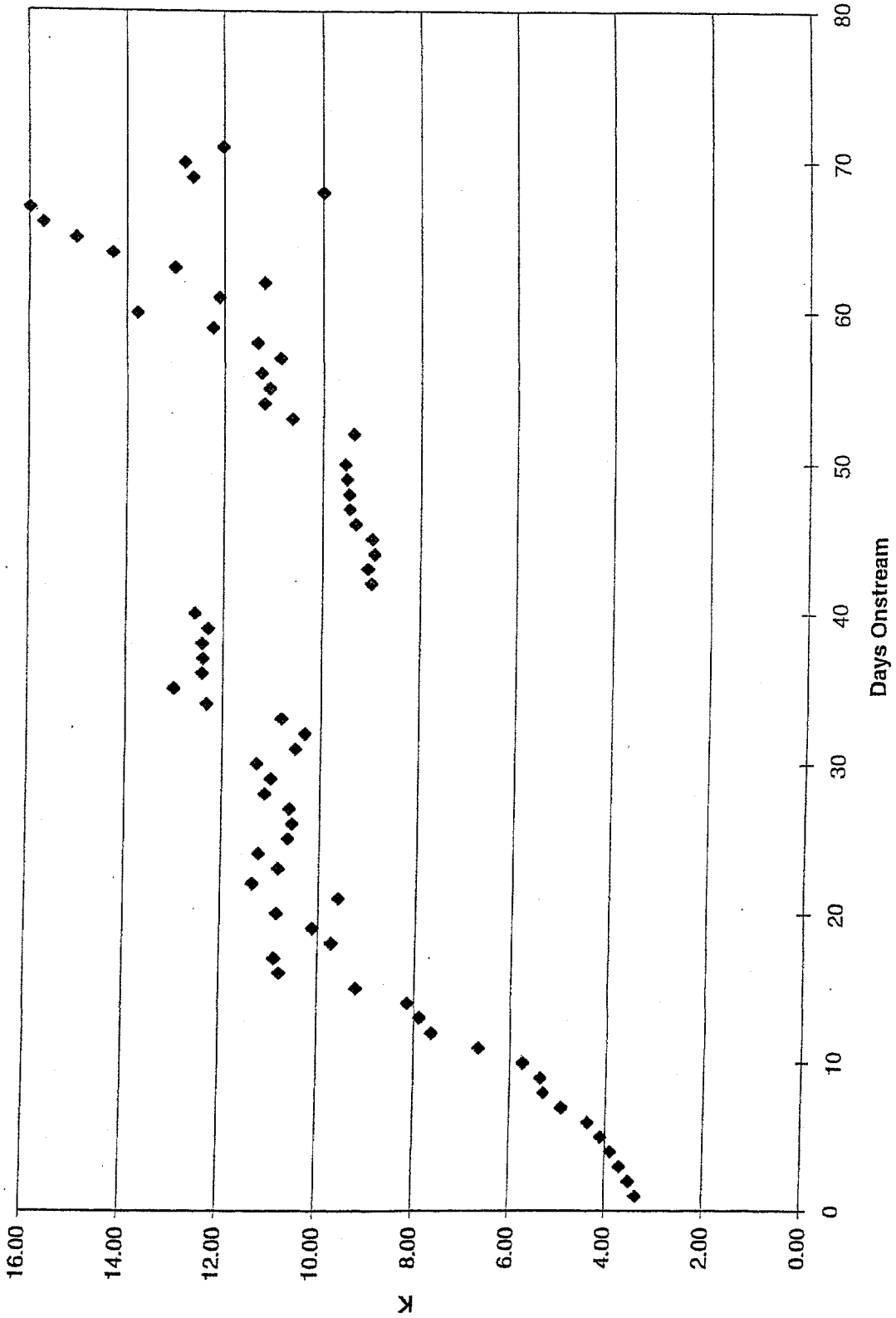
Check if this meeting was scheduled through Schedule+

PLEASE NOTE: Security badges required for visitors in all buildings and employees in R&D buildings.

DISTRIBUTION (NAME/ORGANIZATION) <i>(if unable to attend, contact originator)</i>				COPIED FOR INFORMATION ONLY	
Bill Jones - EMN		Ed Schmetz - DOE-HQ		Barry Halper - APCI	
Bob Kornosky - DOE-FETC		John Shen - DOE-HQ		Peter Tijm - APCI	
Bob Moore - APCI		Van Eric Stein - APCI			
Bill O'Dowd - DOE-FETC		Barry Street - EMN			
FROM Edward C. Heydorn		ORGANIZATION APCI - Program Manager		EXTENSION 17099	TODAY'S DATE 09/17/97
DATE OF MEETING	WEEKDAY	TIME		LOCATION	
		FROM	TO		
24 & 25 Sept. 1997	Wed. & Thurs.	12:15 PM	11:00 AM	APLPC (JV) Trailer at LPMEOH Site, Kingsport	
SUBJECT AND/OR PURPOSE					
• Project Review Meeting - DOE, Eastman, and Air Products					
DESIRED RESULTS/OUTCOMES					
• Review Operations Status, Review DME and Fuel-use Status					
REFERENCE MATERIAL/OTHER					
AGENDA					
<b><u>LPMEOH™ Project Review Meeting - Agenda</u></b>					
<b><u>A. Meet and Lunch, Wednesday, 24 Sept. - About 12:15</u></b> (DOE flight arrives at 11:10 AM)					
<b><u>B. Project Review - Part One</u></b> <span style="float: right;"><b>1:30 PM</b></span>					
1. Phase 3, Task 2 - Operations - 1a). Status				1. VES/BTS	
1b). Issues - Catalyst life, 29G-03 Pump replacement					
1c). Objectives for Next Quarter					
<b><u>C. Plant Operation - Visit -</u></b> <span style="float: right;"><b>4:00 PM</b></span>					
<b><u>D. End of (work) Day One -</u></b> <span style="float: right;"><b>5:30 PM</b></span> Dinner and early to bed.					
<b><u>E. Project Review - Part Two</u></b> <span style="float: right;"><b>8:00 AM Thursday, 25 Sept.</b></span>					
2. DME Design Verification Testing - 2a). Status of Catalyst Production				2. ECH	
2b). AFDU Preliminary Run Plan				VES	
3. Public Design Report				3. ECH/WJO	
4. Topical Reports - Status - 4a). Process Economics				4. RBM/WJO	
4b). Peroxide, Catalyst Poisons, Reactor Design				ECH	
5. Reporting Requirements/Other - Status - 5a). TPR#12, EMR#1				5. RMK/ECH	
5b). Calculations/Data Analysis Techniques - Review				VES/WJO	
6. Conference Papers - Plans				6. ECH	
7. Product-Use Demo Plan - Status/Schedule				7. ECH	
8. On-Site Testing (Task 8.8) - Update, Reporting Requirement				8. BTS/RMK	
9. Report Card - Project Success Factors				9. All	
10. Make Plans for: Next Project Meeting; Visitors: Other				10. All	
<b><u>F. Depart - 11:30 AM - Thursday 25 Sept.</u></b> (DOE flight departs at 1:25 PM)					

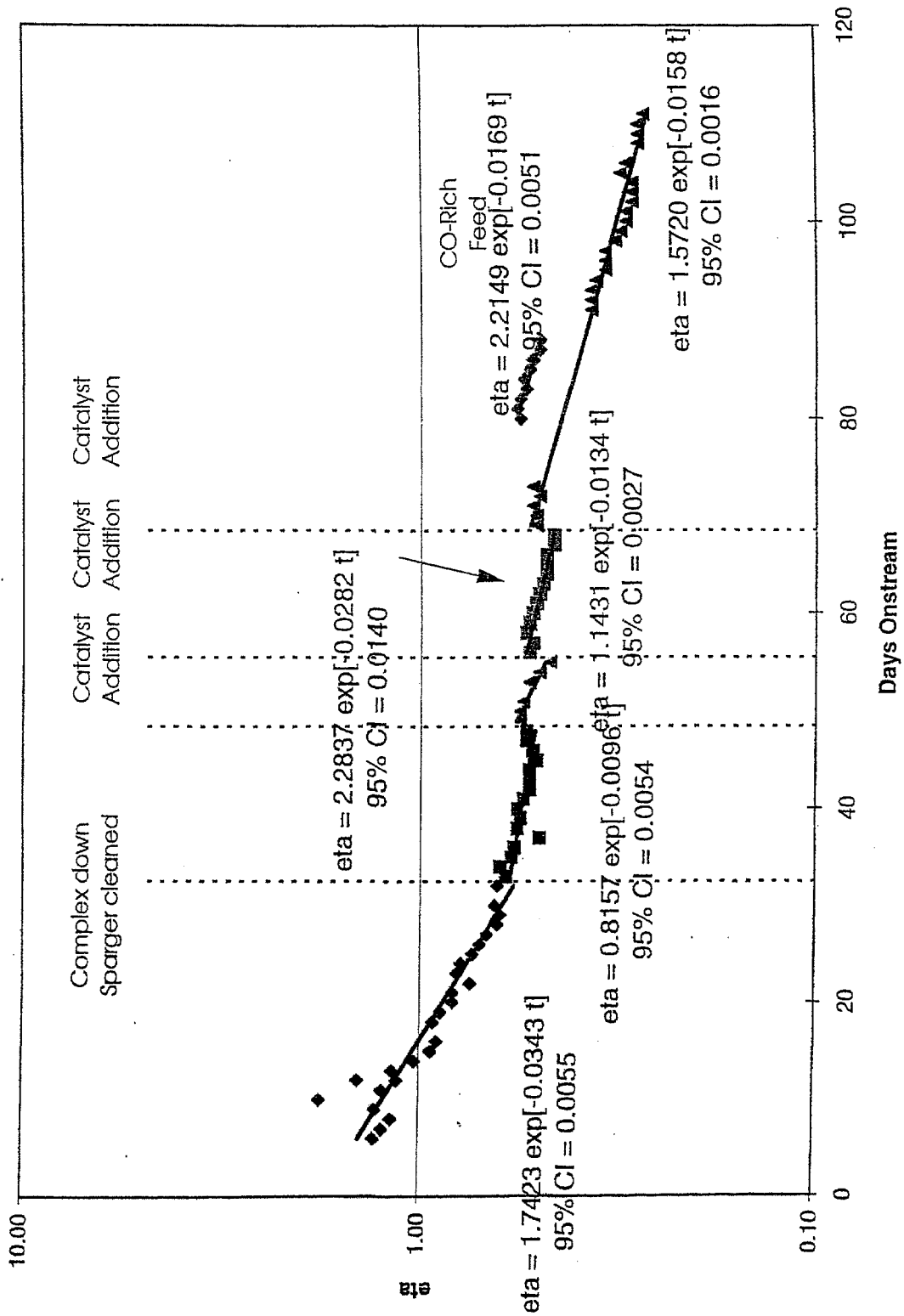
Kingsport LPMEOH

Sparger Resistance (Post-Outage)



# Kingsport LPMEOH

## Catalyst Age (eta)



Summary

Sample	Identity	XRD		BET m <sup>2</sup> /g	Cu S.A.	Analytical				
		Cu	ZnO			Fe	Ni	S	As	Cl
Unreduced S3-86 Fresh S83-4119 BASF (Fresh) 14987-54 Trailer Run	Kingsport S8-86 Batch from BASF Data supplied by BASF for typical catalyst Lab run using S83-4119 (450 hours) AFFTU run in Kingsport (672 hours)	175.4 179.4	74.3 101.1	74.8	30.9*	73	<50	<100		<500
Reduction #1	Reduction Batch sample from Kingsport									
Reduction #2	Reduction Batch sample from Kingsport									
Reduction #3	Reduction Batch sample from Kingsport			57	27.7	49.2	31.6	<=110		<25
Reduction #4	Reduction Batch sample from Kingsport			73.3		83.2	27.9	<100		<25
Reduction #5	Reduction Batch sample from Kingsport									
Reduction #6	Reduction Batch sample from Kingsport			55.4,90		29.3	17.7	<=150		<25
Reduction #7	Reduction Batch sample from Kingsport									
Reduction #8	Reduction Batch sample from Kingsport			80.9		26	23.2	<=110		<25
K0597-1	"grab sample" from Kingsport (26 days)			33.8		487	38.5	<=160		162
K0597-2	sample from Kingsport (26 days)	275.8	89.2	40,10,15	11.4	281	61.3	<=190		446
K0597-3	Sparger sample from Shutdown					175	11.5	<100		139
K0797-1	Reduction Batch sample 7/22/97					175	14.5	<100		<=28
K0797-2	Reactor Sample 7/28/97	86.1	28.4	86.2		652	23.3	<=130		75.9
K0897-1	Reactor Sample 8/19/97	115.2	55.3	63		169	<20	235		601
K0997-1	Reactor Sample 9/5/97	283		42.6		261	36.8	575		779
				41.7						

	Poison Calculations			
	Demo Plant K0597-2	Demo Plant K0897-1	Interval Period 1 to 2	AFFTU
<b>Basis:</b>				
<b>Sample ID</b>				
Average Fresh Feed Gas Flow	842	742	706	3150 sccm
Catalyst Amount in Reactor	20300	26400		30.02 grams
Time on-stream	26	81	55	17 hours
Fe on Spent Catalyst	281	169		172
Fe on Fresh Catalyst	70	70		70
As on Spent Catalyst	446	601		184
S on Fresh Catalyst	50	50		
S on Spent Catalyst	140	235		
<b>Estimate:</b>				
Fe(CO) <sub>5</sub> in Fresh Feed Gas	55	12	-12	16
AsH <sub>3</sub> in Fresh Feed Gas	87	56	37	21
H <sub>2</sub> S/COS in Fresh Feed Gas	41	40	39	

Carbonyl Burnout at Kingsport LPMEOH Plant

Time Start	3/4/97 18:00	Sample Pt # 1	Sample Pt # 2	Sample Pt # 4	Sample Pt # 5	Sample Pt # 6	Sample Pt # 7
Fe(CO) <sub>5</sub> ppbv		Syngas Feed	CO Feed	Compressor K-01 Out	Reactor C-01 Feed	Separator C-05 Effluent	Plant Purge
Sample Time	On-stream Time, Hrs						
3/5/97 13:34	19.58			104		94.2	
3/5/97 17:22	23.38	0			88.8		
3/6/97 12:45	42.75	0					207
3/7/97 9:46	63.78	0			180		
3/7/97 13:44	67.73			114		152	
3/7/97 16:46	70.77		17.7				84.7
3/8/97 8:51	86.87			55.8		90.7	
3/8/97 12:12	90.20						41.3
3/8/97 15:15	93.26	0			33.3		
3/9/97 8:46	110.78			59.3			26.9
3/9/97 12:21	114.36	0			22.5		
3/9/97 16:12	118.22					18.0	
3/10/97 9:30	135.51			19.1	16.8		
3/10/97 12:50	138.83	14.9				58.3	12.9
3/11/97 9:15	159.27			19.2			
3/11/97 12:42	162.70	0			12.3		
3/11/97 16:12	166.21			14.7		16.4	
8/11/97 19:11		<10					
8/12/97 10:40			13.5		13.0		
8/12/97 14:00							<=11
8/12/97 16:50							11.5
8/12/97 19:50							

# 12. GUARD BED IN  
 # 15. GUARD BED OUT

< 10  
 < 10  
 < 10

Attachment A-5

Analysis of 4-month LPMeOH Life Run at LaPorte

Days On-stream	Deact. Rate (a) of k <sub>0</sub> , %/day	2*Std Error of (a)	2*% Std Error of (a)
113	-0.38	0.01	3
60	-0.36	0.04	11
45	-0.29	0.06	21
30	-0.44	0.10	24
22	-0.52	0.18	34
15	-0.25	0.26	106
7	0.44	0.59	132

Days On-stream	Deact. Rate (b) of Productivity, %/day	# of Days needed to see a 2% drop
113	-0.17	12

- \* Need minimum data for 15 days on-stream to check stability if catalyst is as stable as LPMeOH
- \* Need data for more than 3 weeks on-stream to quantify deactivation rate.
- \* Data for 60 days on-stream are enough to get fairly accurate deactivation rate.
- \* Kingsport LPMeOH Life Data will be available before the LaPorte DME run

PRELIMINARY RUN PLAN FOR A DME DEMONSTRATION RUN AT LAPORTE

OBJECTIVE	CATALYST	FEED GAS	DURATION, DAYS
METHANOL WATER INJECTION STUDY	MEOH	TEXACO	7
DME LIFE STUDY	MEOH + X% DEHY.	SHELL	15
DME PROCESS VARIABLE STUDY: - HIGHER PRESSURE - HIGHER SUPERFICIAL VELOCITY - WATER INJECTION	MEOH + X% DEHY.	SHELL	7
DIFFERENT FEED GAS COMPOSITIONS	MEOH + X% DEHY.	TEXACO KINGSPORT	4
TRACER STUDY	MEOH + X% DEHY.	SHELL	3
HIGHER PROPORTION OF DEHY. CATALYST	MEOH + Y% DEHY.	SHELL	4
<b>TOTAL</b>			<b>40</b>



NOTES FROM MEETING **\*\*ADDITIONS\*\***



DISTRIBUTION (NAME/ORGANIZATION) *Unable to attend. **Chairman				COPIED FOR INFORMATION ONLY	
Bill Jones - EMN		John Shen - DOE-HQ		Sue Kasinecz - APCI	
Bob Kornosky - DOE-FETC		Van Eric Stein - APCI		Ed Schmetz - DOE-HQ	
Bob Moore - APCI		Barry Street - EMN		Bob Senn - APCI	
Bill O'Dowd - DOE-FETC				Peter Tijm - APCI	
				Bernie Toseland - APCI	
FROM Edward C. Heydorn		ORGANIZATION APCI - Program Manager		EXTENSION 17099	TODAY'S DATE 10/23/97
DATE OF MEETING		WEEKDAY	TIME		LOCATION
24 & 25 Sept. 1997		Wed. & Thurs.	STARTED 12:15 PM	ENDED 11:00 AM	APLPCC (JV) Trailer, Kingsport, TN
SUBJECT AND/OR PURPOSE					
• Project Review Meeting - DOE, Eastman, and Air Products					
ITEM NO.	RESPONSIBLE PERSON (INITIALS)	TARGET DATE	DISCUSSION		
			<p><u>Please make the following changes to these meeting notes:</u></p> <ul style="list-style-type: none"> <li>■ Attachments B-1 and B-2 should be labeled as A-4 and A-5</li> <li>■ Please add new Attachments B-1 and B-2</li> </ul>		

LPMEOH™ Reporting Status  
September 23, 1997

Quarterly Technical Progress Reports

No. 1 (October 1, 1993 to June 30, 1994)	Approved
No. 2 (July 1, 1994 to September 30, 1994)	Approved
No. 3 (October 1, 1994 to March 31, 1995)	Approved
No. 4 (April 1, 1995 to June 30, 1995)	Approved
No. 5 (July 1, 1995 to September 30, 1995)	Approved
No. 6 (October 1, 1995 to December 31, 1995)	Approved
No. 7 (January 1, 1996 to March 31, 1996)	Approved
No. 8 (April 1, 1996 to June 30, 1996)	Approved
No. 9 (July 5, 1996 to September 30, 1996)	Approved
No. 10 (October 1, 1996 to December 31, 1996)	Approved
No. 11 (January 1, 1997 to March 31, 1997)	Approved
No. 12 (April 1, 1997 to June 30, 1997)	Need Revised Draft
No. 13 (July 1, 1997 to September 30, 1997)	First Draft Due November 15, 1997

Topical Reports

No. 1 (Peroxide Formation)	Need Revised Draft
No. (DME Laboratory and Market Studies)	Need First Draft
No. (Catalyst Poisons)	Submitted For DOE Review
No. (Economic Analysis)	Need Revised Draft
No. (Liquid Phase Reactor Design)	Need First Draft

Environmental

Environmental Information Volume	Approved
Environmental Monitoring Plan	Approved
Environmental Monitoring Report	
No. 1 (April 1, 1997 to June 30, 1997)	Submitted For DOE Review
No. 2 (July 1, 1997 to September 30, 1997)	First Draft Due November 15, 1997

Technical

5 <sup>TH</sup> Clean Coal Technology Conference Paper	Approved
AIChE Spring 1997 Conference Paper	Approved
American Chemical Society Spring 1997 Paper	Approved
Power-Gen Europe '97 Conference Paper	Published
1997 Gasification Technologies Conference Paper	Approved
World Methanol Conference Paper	Need First Draft
Demonstration Test Plan	Approved
Final Report - Volume 1 - Public Design	Submitted for DOE Review
Demonstration Technology Start-Up Report	Due June 1, 1997
Test Series Report	As Required

Other

Project Management Plan	Approved
DME Decision Memo	Recommendation Accepted

## CLEAN COAL TECHNOLOGY PROGRAM (CCT-3)

## PROJECT TEAM (09-97)

**SPONSOR:** Air Products Liquid Phase Conversion Company, L.P. (ID: 3K)  
Air Products and Chemicals, Inc. (APCI) and Eastman Chemical Company (EMN)

**ADDRESSES:** Air Products and Chemicals, Inc. U.S. Department of Energy  
7201 Hamilton Boulevard Federal Energy Technology Center  
Allentown, PA 18195-1501 P.O. Box 10940  
Building 922, Room 323  
Eastman Chemical Company 626 Cochran Mill Road  
P.O. Box 511 Pittsburgh, PA 15236-0940  
201 South Wilcox Drive  
Kingsport, TN 37662-5231

**PROJECT:** "Commercial-Scale Demonstration of the Liquid Phase Methanol (LPMEOH™) Process"

**SITE:** Kingsport, Sullivan County, Tennessee

		Phone Number	Fax
PETC Project Manager:	Robert M. Kornosky	412/892-4521	412/892-4775
APCI Program Manager:	Edward C. Heydorn	610/481-7099	610/706-7299 (A)
EMN Program Manager:	William C. Jones	423/229-2901	423/224-0364
APCI Operational Program Manager:	Edward C. Heydorn	423/229-2816	423/224-7674 (K)
EMN Operational Program Manager:	Barry T. Street	423/229-6062	423/224-7268
High-Level Participant Contact:	Peter J.A. Tjijm	610/481-0513	610/706-7299
PETC Contract Specialist:	William R. Mundorf	412/892-4483	412/892-6216
APCI Contract Specialist:	Barry J. Halper	610/481-7685	610/481-2576
EMN Contract Specialist:	Gary R. Whitaker	423/229-8529	423/229-4137
PETC Legal Counsel:	Thomas J. Russial	412/892-4630	412/892-5949
APCI Legal Counsel:	Willard Jones, II	610/481-4587	610/481-8223
EMN Legal Counsel:	Gary R. Whitaker	423/229-8529	423/229-4137
PETC Environmental Coordinator:	Richard A. Hargis	412/892-6065	412/892-6204
APCI Environmental Coordinator:	Van Eric Stein	610/481-3549	610/481-2177 (A)
		423/229-2841	423/224-7674 (K)
EMN Environmental Coordinator:	Barry T. Street	423/229-6062	423/224-7268
PETC Cost/Price Analyst:	John J. Wehner	412/892-4738	412/892-6216
APCI Cost/Price Analyst:	Susan J. Kasinecz	610/481-2658	610/481-8949
EMN Cost/Price Analyst:	Ron Jelle'y	423/229-2564	423/224-7386
PETC Patents Support (CH):	Robert J. Fisher	630/252-2176	630/252-2779
APCI Patents Support:	Willard Jones, II	610/481-4587	610/481-8223
EMN Patents Support:	Fred Thomsen	423/229-2282	423/229-1239
PETC Public Relations:	Patrice A. Leister	412/892-6126	412/892-5914
APCI Public Relations:	Greta C. Campbell	610/481-4986	610/481-6642
EMN Public Relations:	Thomas A. Dickens	423/229-3149	423/229-1008
PETC Business/Financial Advisor:	John C. McDowell	412/892-6237	412/892-4775
APCI Business/Financial Advisor:	Robert B. Moore	610/481-7513	610/481-5833
EMN Business/Financial Advisor:	William M. Fortenberry	423/229-2512	423/224-0648
PETC Technical Analyst:	William J. O'Dowd	412/892-4778	412/892-6204
APCI Technical Analyst:	Van Eric Stein	610/481-3549	610/481-2177 (A)
		423/229-2841	423/224-7674 (K)
EMN Technical Analyst:	Barry T. Street	423/229-6062	423/224-7268
FE HQ Program Manager:	John Shen	301/903-4344	301/903-2238
FE HQ Portfolio Manager:	Edward Schmetz	301/903-3931	301/903-2238

**APPENDIX M - TASK 3.6 - MILESTONE SCHEDULE STATUS AND COST  
MANAGEMENT REPORTS**





U.S. DEPARTMENT OF ENERGY  
COST MANAGEMENT REPORT

DOE F 1332.9  
(11-84)

8. ELEMENT	9. REPORTING ELEMENT				10. ACCRUED COSTS				11. ESTIMATED ACCRUED COSTS				12. Total Plan Value		13. Variance
	1. TITLE		2. PARTICIPANT NAME AND ADDRESS		3. REPORTING PERIOD		4. COST PLAN DATE		5. IDENTIFICATION NUMBER		6. START DATE		7. COMPLETION DATE		
	a. Actual	b. Plan	c. Actual	d. Plan	a. Subsequent Reporting Period	b. Balance of Fiscal Year	c. FY 1999 (1)	c. FY 2000 (2)	c. FY 2001 (3)	d. Subsequent FY's (4)	Total	Total			
	0	0	16,304	16,289		0	0				16,304	16,304	0		
1.1.1	(17)	0	1,011	1,021		0	0	0	0	0	1,011	1,051	(40)		
1.1.2	(2)	0	248	246		0	0	0	0	0	248	238	10		
1.1.3	64	0	10,895	10,865		0	0	0	0	0	10,895	11,335	(440)		
1.1.4	2	30	61	249		54	749	0	0	0	864	276	588		
1.1.5	44	0	3,000	2,055		2	28	0	0	0	3,030	2,870	160		
1.2.1	(72)	0	10,226	9,000		0	0	0	0	0	10,226	9,703	523		
1.2.2	(9)	0	11,728	13,519		0	0	0	0	0	11,728	11,550	178		
1.2.3	(1)	0	585	2,162		47	232	0	0	0	864	1,115	(251)		
1.2.4	0	50	0	120		66	729	0	0	0	795	256	539		
1.2.5	(10)	15	954	898		2	22	0	0	0	978	1,015	(37)		
1.3.1	19	0	1,497	680		0	0	0	0	0	1,497	680	817		
1.3.2	2,227	2,546	13,354	20,321		2,373	26,893	34,635	36,137	33,470	146,862	146,485	377		
1.3.2.1	0	0	0	0		0	0	560	1,207	0	1,767	1,790	(23)		
1.3.2.2	0	0	0	0		0	0	0	0	0	472	515	(43)		
1.3.2.3	0	0	0	0		0	0	0	0	0	5	4	1		
1.3.3	0	0	0	2		2	22	24	1,595	45	1,688	3,451	(1,763)		
1.3.4	15	60	63	390		4	40	47	49	93	296	2,670	(2,374)		
1.3.5	55	100	461	520		81	891	1,149	652	936	4,170	2,392	1,778		
1.3.6															
14. TOTAL	2,315	2,801	70,387	78,337	2,631	29,606	36,415	39,645	35,016	0	213,700	213,700	(0)		

15. DOLLARS EXPRESSED IN: Thousands

16. SIGNATURE OF PARTICIPANT'S PROJECT MANAGER  
 AND DATE  
 [Signature] 1/14/97  
 E. C. [Name]

17. SIGNATURE OF PARTICIPANT'S AUTHORIZED FINANCIAL REPRESENTATIVE AND DATE  
 [Signature] 1/14/97  
 G. J. Kasiecz