

R. E. JONES - #1

MONTHLY REPORT

August, 1974

CHEMICALS GROUP

ESCAMBIA PLANT

AP00041188



Air Products and Chemicals
INC.

ESCAMBIA PLANT

INTEROFFICE MEMORANDUM

To: Mr. A. K. McMillan Date: 11 September 1974

From: R. E. Jones Copies:

Re: Monthly Report - August, 1974

The ammonia plant performance continued below standard and was a major contributor to unfavorable plant variances. A major plant outage of 10 days was required to replace broken packing in the carbonate system regenerator. Plant production losses are shown in the following:

Carbonate System Outage	2,900 tons
Low Temperature Shift Converter Catalyst Activity	310 tons
Refrigeration Outage	<u>90 tons</u>
Total	3,300 tons

Production for the month was 4,954 tons as compared to a standard of 7,553 tons.

The ammonia plant was forced down on July 31, following an emergency outage caused by an electrical failure on July 28. The outage caused a pressure surge in the reform system which "lifted" the packed sections of the carbonate super regenerator. This lifting caused considerable breakage of the porcelain packing resulting in gas flow restrictions in the column. Replacement packing was found and was installed and the plant restarted on August 11. The replacement packing is not the recommended material and will have to be replaced during the next scheduled turnaround.

In addition to the above plant problems the low temperature shift catalyst is showing rapid activity decline. Sulfur levels in the natural gas have increased significantly during the summer and breakthroughs are occurring through the OSR vessels. Replacement of the existing OSR vessels will be required at the higher sulfur loads in the feed gas.

Outages are continuing to occur in the west refrigeration machine because of water leaks in the freon condenser. A replacement condenser is on order.

Ammonia plant outages continue to contribute to unfavorable production variances in the downstream facilities.

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Nitric Acid production continues to exceed standard values with an August production of 16,020 tons as compared with a standard of 15,146 tons. An outage for a routine gauze change was taken in the No. 1 plant during the month. The No. 2 plant gauze will be changed in September.

The No. 1 nitric acid plant will be shut down in mid-September for a scheduled fitting of the spare Elliott rotor and for absorber inspection. A five-day outage will be required.

The ammonium nitrate area at sales limiting production rates. 83% AN inventories were increased to maximum levels during the month at the expense of prilling. Production figures for the month are shown in the following:

	<u>Month</u>		<u>Year to Date</u>	
	<u>Tons</u>	<u>% of Budget</u>	<u>Tons</u>	<u>% of Budget</u>
83% AN	17,673	214	201,071	130
AN Prills	3,758	75	151,803	122
Bay-Sol	1,785	357	16,837	183
Urea	1,195	132	18,201	99
U-32 Solutions	2,908	124	45,833	96

Prilling rates will be increased during September to maintain 83% AN inventories.

Urea outages totalling 472 tons resulted from the ammonia plant outage taken at the beginning of the period. U-32 solution was also below standard due to the urea outage.

Methanol production was 2,391 M gallons or 113% of standard in spite of the loss of CO₂ during the ammonia plant shutdown. Production loss of 264 M gallons was incurred due to this outage. Gas efficiencies were also adversely affected because of this.

The methanol expansion continues well on schedule. At month end all the new compressor foundations have been poured and overhaul work on the two main gas engines is proceeding ahead of schedule. Project completion is still scheduled for March 1, 1975 with equipment coming on stream in various stages. Compressor work will be completed by February 1.

PVC production for August was 6,075 M pounds or 94.6% of budget primarily because of continued recipe problems with 2,200 resin causing gross reactor fouling and with "glassy" particle problems with 1230P. Recipe changes were made and some improvement has been noted.

AP00041190

The new stainless steel reactor was installed in the No. 8 position during the month. The No. 8 reactor was replaced instead of the scheduled No. 9 reactor because of a jacket failure.

The energy group has been working closely in the PVC plant to resolve obvious energy discrepancies. A general plant overhaul of steam traps and leak repairs have reduced steam usage by approximately 24% from a July value of 2.98 lb./lb.

The following summarizes the Escambia Plant program in reducing VCI exposure.

Personnel Monitoring

a. Century readings have averaged 5-10 ppm throughout the month. These readings continue to be taken by a maintenance mechanic on routine leak patrols. This program has been successful in reducing the number as well as severity of VCI leakage from equipment.

b. Personnel monitoring showed further decreases in personnel exposure. August exposures to 50 ppm and greater decreased to 1.4% from 4.5% in July. 95.9% of all readings were below 10 ppm as compared to 81.1% in July. All August sampling has been long term (7-7-1/2 hrs.).

c. The Bendix multi-point chromatographs show the same downward trend with only 1.1% above 50 ppm as compared with a July value of 2.4%.

d. The Bacharach explosion monitoring system continues to require excessive maintenance to be really operable. Spare parts delivery is very slow and results in some portion of the system to be out of service virtually all the time.

e. Ambient air samples were taken on three occasions in the PVC operating area. VCI levels of <1 ppm were recorded each time. Particulate measurements in the area around the product collector discharge were also made and show very small quantities of particulate concentrations.

Personnel Protection

a. Ventilation by removing one course of the building siding has been very effective in reducing VCI excursions. Removal of additional siding will be evaluated.

b. Relocation of the VCI charge pumps was completed during August. Leakage from these pumps and VCI filter will be outside the building.

c. Revisions of the safety and emergency procedures have been completed and will be issued in September.

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Product Collectors

Delivery of the new Ducon product collectors is scheduled for November 4 shipment. Steel and duct work will be completed by November 13 and the installation completed at that time.

VCl Residual in Resin.

Measured VCl residuals in all resin grades have been within the VCM specification with the exception of 1230P resin. Only 54% of the samples analyzed were below the 500 ppm level for this resin.

PVC Expansion

Expansion cases were reviewed with all involved with a considerable amount of information updating accomplished. Cases for the economic alternates have been fully developed for the project presentation.

Solvent Cleaning

Solvent recovery laboratory work continued in August with excellent results. An easily filterable precipitate can be made with steam precipitation of PVC from the solvent at 90°C. This process coupled with water extraction of the filter cake indicate a DMF recovery of 98 to 99.5% is indicated. Details are presented in Mr. Tolar's report.

Amines product rates continue below budget primarily caused by extended outages for repairs to corroded equipment (IBN) and because of ammonia column deficiencies caused by tray corrosion in the No. 1 plant.

Methylamines production was limited to only 82% of budget because of the unstable ammonia column operation. Loss of trays is indicated below the feed tray. Replacement will be required at next plant outage. The No. 1 plant was started up on MIPA on July 27 and has operated satisfactorily since even with the apparent deficiencies in the ammonia column. Loadings in MIPA are not as critical as with methylamines.

DNPA production was continued in the No. 2 plant until July 18 and was well above budget with good alkyl efficiencies. Outage associated with product turnaround and corrosion during the IBN startup resulted in 102 hours of plant outage. In general, the IBN production run is much improved over the past run with above budget rates being achieved. Plant mechanical difficulties however have prevented any extended operating periods.

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Raw material yield losses in both plants have been determined to be directly attributable to low pressure vent scrubber losses. Venting is required from product columns because of the inability of the ammonia columns for stripping all ammonia from the mixed amines stream. Revisions to the ammonia stripping system are being designed with implementation of the revised process scheduled by January 1.

The No. 1 plant expansion continues on schedule in spite of some slippage of critical instrumentation this month. Early October startup is still forecasted.

The Escambia Plant effluent treatment system experienced an extreme change in biological makeup. All of the biological ponds went from aerobic to anaerobic over a period of one week as a result. The entire month of August was spent in returning the system to its former condition.

Excursions from the NPDES permit in BOD₅ and suspended solids were experienced. At month's end the system seems stabilized and previous good results are anticipated.

Considerable project work was accomplished with the NO_x and prill tower abatement systems. Preliminary plant layouts of both the Masar units for NO_x abatement and the venturi-shroud system have been made. Actual construction was begun prior to September 1 to achieve the third increment of progress for the nitric acid plant final compliance schedule.

The energy group continues to determine energy losses throughout the entire plant with a particular emphasis in PVC. Results in reducing steam consumption in that facility have been encouraging. Anticipated reductions in other production units will exceed our in-plant goal of 20% savings.

The ammonium nitrate solution tank insulation project was approved and work begun on the large 10,000 ton tank at month end. Steam usage was measured for the 5000 ton tanks and was found to be approximately 5000 lbs./hr. The project will reduce 91% of the total steam requirement in these tanks.

The total plant variance continued unfavorable with (\$171.1M) for August. Major variance contributors were as follows:

Ammonia	(\$58.4M)	Unfavorable variances occurred from the unscheduled outage of 10 days for carbonate system packing replacement.
Methanol	\$26.9M	Methanol generated positive variances due to increased volume effects of the Phase I expansion. This was

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Methanol (cont'd)		accomplished in spite of rate and efficiency losses incurred during the ammonia outage.
Amines	(\$94.9M)	Large amines variance occurred primarily due to low methylamines production and raw material efficiencies in the No. 1 plant caused by ammonia column tray losses due to corrosion. Additional corrosion problems in the No. 2 plant caused extended startup problems.
PVC	(\$51.3M)	Unfavorable PVC variance was caused principally by recipe problems with 2200 and 1230 P resins (\$19.5M) and unfavorable maintenance costs for product collector replacement accrual and VCI exposure reduction items (\$44.5 M).
Agricultural Chemicals	\$35.2M	Favorable nitric acid and 83% AN volumes - \$78.8M - offset by unfavorable prills due to sales demand (\$56.4M).
Overhead & Utilities	(\$28.6M)	


R. E. Jones

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Attachments (3)

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EXHIBIT I
PRODUCTION SUMMARY

	<u>August</u>		<u>Year to Date</u>		<u>September</u>		<u>Plant</u>
	<u>Actual</u>	<u>Budget</u>	<u>Actual</u>	<u>Budget</u>	<u>Estim.</u>	<u>Budget</u>	<u>Inven.</u>
<u>Agricultural</u> <u>Chemicals (tons)</u>							
Ammonia	4,954	5,600	80,369	83,000	7,500	7,638	3,956
Nitric Acid	16,020	10,800	190,059	166,225	13,900	15,525	241
83% AN	17,673	8,272	201,071	154,082	16,414	14,021	18,784
Bay-Sol	1,785	500	16,837	9,200	1,412	800	140
Prills	3,758	5,000	151,803	124,242	8,175	6,000	413
Urea	1,195	900	18,201	18,440	1,720	1,560	0
U-32	2,908	2,345	45,833	47,514	3,870	4,181	1,199
<u>Industrial</u> <u>Chemicals</u>							
Amines (M lbs.)	4,374	5,621	52,967	56,906	4,816	5,181	6,013
Methanol (M gals.)	2,397	2,150	18,909	19,000	2,600	2,080	1,317
<u>Plastics</u>							
PVC (M lbs.)	6,075	6,381	68,057	68,364	6,421	6,421	767

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EXHIBIT II
PRODUCTION VARIANCE SUMMARY

() Unfavorable

<u>Agricultural Chemicals</u>	<u>August</u>		<u>Year to Date</u>		<u>September</u>	
	<u>Actual</u>	<u>Budget</u>	<u>Actual</u>	<u>Budget</u>	<u>Estim.</u>	<u>Budget</u>
Ammonia	(58.4)	2.6	(288.5)	1.9	23.6	(1.9)
Nitric Acid	44.0	2.0	319.0	1.4	(2.0)	(1.4)
83% AN	34.8	0.6	286.3	0.4	5.5	(0.4)
Prills	(56.4)	1.2	246.3	0.9	(2.0)	(0.9)
Urea	6.3	0.6	5.3	0.4	1.2	(0.4)
Bay-Sol	6.5	0.1	26.9	0.1	3.8	(0.1)
Total	(23.2)	7.1	595.3	5.1	30.1	(5.1)
<u>Industrial Chemicals</u>						
Amines	(94.9)	4.1	(505.0)	2.9	20.0	(2.9)
Methanol	26.9	3.2	(489.9)	2.1	65.0	(2.1)
Total	(68.0)	7.3	(994.9)	5.0	85.0	(5.0)
<u>Plastics</u>						
PVC	(51.3)	3.6	(151.3)	2.6	(36.0)	(2.6)
<u>Overheads & Utilities</u>	(28.6)	0.0	(386.2)	0.0	(30.0)	0.0
GRAND TOTAL	(171.1)	18.0	(937.1)	12.7	49.1	(12.7)

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EXHIBIT III
VARIANCE SUMMARY
OVERHEAD AND UTILITY
 () Unfavorable

	<u>Spending</u>	<u>August Budget</u>	<u>Variance</u>	<u>Year to Date Variance</u>
Plant Administration	\$ 14,410	\$16,323	\$ 1,913	\$ 22,872
Engineering & Drafting	23,710	12,362	(11,348)	5,832
Maintenance	27,774	14,386	(13,388)	(27,506)
Instrument & Electrical	7,991	11,808	3,817	36,874
Personnel & Training	8,910	7,088	(1,822)	(18,723)
Safety & Medical	9,071	10,109	1,038	(6,225)
Purchasing	8,873	7,281	(1,592)	(8,808)
Warehouse	5,797	7,881	2,084	7,421
Equipment Pool	9,421	8,140	(1,281)	(1,112)
Process Development	17,184	10,336	(6,848)	(56,006)
General Yard	22,877	15,886	(6,991)	(93,730)
Electricity	-	-	230	(10,130)
Steam	-	-	(5,808)	(112,025)
Water	<u>12,982</u>	<u>11,483</u>	<u>(1,499)</u>	<u>(7,124)</u>
Total	\$169,000	\$133,083	\$(41,495)	\$(268,390)

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Plastics

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- e) Leak Patrol - The leak patrol program which had begun in previous months was continued throughout August. The value of the program is now well established in that fewer leaks, all of a minor nature are being found. This points out the effectiveness of leak repairs in prior months.
- f) Equipment Modification - The two VCl charge pumps were removed from the first floor of the reactor building and relocated outside the building. The VCl filter was also relocated outside the building, now any seal or gasket leaks will not be venting VCl into the operating area.
- After unloading a VCl tank car, the flexible lines used to connect the car must be vented before disconnecting. This vents less than 1/2 lb. of VCl, but to remove it from the operating area a vent stack was installed.
- g) Procedure Changes - A revised "Safety and Emergency Procedures" book was prepared. It will be issued as soon as the copies are made.

SEPTEMBER

Production and efficiency in September are forecast at budget. Variance is forecast at \$36M unfavorable due to the following:

Volume -	(\$3.0M)
Bagging Volume -	5.0M
Utilities -	3.0M
Maintenance -	(12.0M)
Major Maintenance -	(17.9M)
Labor -	(4.0M)
Laboratory -	(5.0M)
Materials & Supplies	(2.0M)
Total	(\$35.9M)

W. C. Wilde
W. C. Wilde

WCW:aw

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EXHIBIT I

STATISTICS

	August		Year to Date	
	Actual	Budget	Actual	Budget
Prime Production, M lbs.	6,075	6,422	68,058	68,825
% of Budget	94.6%		98.9%	
Off-Grade				
Homopolymer	134	0	539	0
Tails	115	96	1,555	
Sweeps & PTS	29	0	430	0
	<u>278</u>	<u>96</u>	<u>2,524</u>	<u>0</u>
Total Production	6,353	6,518	70,582	69,857
% of Budget	97.5%		101.4%	
Off-Grade, % of Total	4.4%	1.5%	3.6%	1.5%
Bulk Production, % Prime	77.3%	---	75.8%	---
VCM Efficiency	92.0%	94.0%	93.5%	94.0%
Reactor Availability	70.3%	---	72.8%	---

PRODUCTION SEQUENCE, August 1974

North Line			South Line		
Type	Hours	Batches	Type	Hours	Batches
2250	61.5	5	1230	517.5	79
2200	776	77	1225	602	56
2250	248.5	16	1230	973.5	106
2200	930	93	1225	280	28
2250	98	7	2200	255	23
2200	468.5	50	1230	<u>1697.5</u>	<u>180</u>
2250	133.5	10		4325.5	472
2200	<u>396.5</u>	<u>29</u>			
	3112.5	287			

PRODUCTION SUMMARY - PRIME

Type	M lbs.		lbs/hr.			lb/annual gallon	
	August	YTD	August	Budget	% Budget	Actual	Budget
1225	682	9,224	645	709	91.0%	1,310	1,439
1230	2,998	32,651	784	787	99.6%	1,592	1,598
2160	82	2,011	---	642	---	---	1,380
2200	2,064	20,521	609	668	91.2%	1,309	1,436
2250	249	3,650	381	544	70.0%	819	1,170

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