

CELANESE CHEMICAL COMPANY
Chemcel Plant
Bishop, Texas

To: C. W. Harrison

From: W. H. Meyer-*Bi*

WHM-19-77

February 16, 1977

Laboratory Department Summary
January, 1977

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CELANESE CHEMICAL COMPANY
Chemcel Plant
Bishop, Texas

To: C. W. Harrison

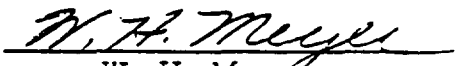
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Laboratory Department Summary
January, 1977

Bishop Plant Laboratory activities during January are attached. Section I contains a summary of the Analytical Group activities with a table of analytical and sample shipping statistics. Section II contains a Quality Assurance Summary and a table listing shipments, quality waivers and quality complaints. Section III describes the status of Special Problems Group projects by Unit Chemist assignment. A table listing the priorities, justifications and estimated completion dates of current Special Problems projects is also included in Section III.


W. H. Meyer

WHM/jm
Attached Report

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I. ANALYTICAL GROUP

Competitive Evaluations:

A sample of tech grade PE obtained from Mobile Chemical Co. was analyzed and compared to typical Chemcel production. The manufacturer is unknown, but Mobile stated a preference for this material in their use. Major differences observed were a higher di-PE content (10.0 versus 7.5 Chemcel average), and a smaller particle size (12% through 200 mesh versus 4-6% Chemcel average).

Polyol

TMP - Analytical support was provided for a trial, five-day, loss accountability study in the TMP unit. The additional work load of approximately 10 analyses per day was absorbed by the Group.

Base case data was again generated (TMP reactor and T-202 column) for the proposed increased formaldehyde feed concentration trial. This project has been delayed due to a shortage of inventory.

A Sartomer Chemical Co. method for benzene-sulfuric acid wash color was applied against TMP lot retain samples. Potential customer specification (Sartomer and Ware Chemical Co.'s) of 10 max. Gardner color units was not met by our product. Results of 12 lots checked ranged from 11-15 Gardner units. Ware Chemical Co. has been sampled with our typical product for their evaluation.

1,3-BG - Extensive analytical support was provided for the determination of the acetal impurity in our 1,3-BG product (100 hours technician overtime). An inordinate level of acetal make in hydrogenation was carried through to the finished product. Methodology firm-up is underway while the unit is down. Coverage will be provided for startup.

DAA - Analysis was provided for reactor samples as part of the ongoing study for optimization of acetone conversion. Variation of reactor temperature (current study) was interrupted for sales demand.

PE - Typical tech grade and pure grade PE product was checked against Ashland Chemical Co. special specifications for Melt Color and Phthalic Ester Color. Their spec = 1 max. Gardner units. Results of the testing indicate that we do not routinely meet these parameters. We have requested Ashland's evaluation of our product.

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Paraform

n-Butyl Acetate - TOC analysis was provided for water layer samples around T-103, the alcohol recovery column. This is preliminary to column optimization studies currently being considered.

Trioxane - Customer complaint spotlighted benzene contamination in our pure grade TO product. Contamination has been quantified on all production back to and including November, 1976, and recall of customer inventory is underway. Temporary quality control procedures are allowing the packaging of replacement material while purchase specifications and equipment modifications are being expedited. The contaminations apparently occurred through leakage into transfer vessels and/or lines at the Plastics Co. production point. Then current methods of analysis at the Chemical Co. packaging level gave no indication of benzene. Benzene determinations are being made both before and after each transfer of TO product with a temporary specification of 10 ppm max. Sharing of analysis equipment and time have resulted in some loading delays and extensive manpower is required to monitor around-the-clock loadings, (85 hours technician overtime to date, with more expected).

Oxo BuH/BuOH

The change-over of one Corpus Christi terminal transfer line and tank from MeOH to n-BuOH service was effected this month. The first barge load of n-BuOH has been shipped with no apparent quality problems. Product mix and cutoff points were monitored via G. C. procedure with approximately 19 hours technician overtime involved.

MS Unit

Analytical assistance was provided for 4 column profiles this month on towers T-280 and T-288. A recurring low permanganate time problem is the main object of the search.

Utilities - BOD

Anaerobic Study - Additional effluent and/or process streams added to the list of those being composited for CCCTC study feed are: back ditch effluent and V-1331 overhead. Sample handling, compositing and analysis requirements are presently requiring 2 manhours per day from the Analytical Group. First samples of the system product returned from CCCTC indicate good conversion from the anaerobic filter.

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General

Recurring operation problems with the Instrument Lab computer have necessitated the loan of spare parts from the Tech Center. These will be returned as soon as ours can be repaired or replaced. A computer (EAI) representative will be requested to aid in pinpointing and solving our problems.

See attached Analytical and Sample Shipping Statistics:

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Analytical and Sample Shipping StatisticsSample Count

	<u>January</u>	<u>January</u> <u>Y-T-D</u>	<u>Previous</u> <u>Y-T-D</u>
Chemical Section Samples	4,460	4,460	3,773
Instrument Section Samples	<u>2,235</u>	<u>2,235</u>	<u>2,067</u>
Total	6,695	6,695	5,840

Overtime

Technician Overtime:

Chemical	69	69	32
Instrument	<u>140</u>	<u>140</u>	<u>28</u>
Total	209	209	60

Sample Shipping:

Domestic	NA*	NA	96
Export	NA	NA	2
Plastics	NA	NA	6
Other	NA	NA	<u>21</u>
Total			125

* NA= Not currently available. Will be included next month.

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II. QUALITY ASSURANCE

Methylal - Methylal storage inventory is borderline to off-test on water (spec is 1.5% max.). The methylal in TK1492 was over 3.0% water, and high in aldehydes at 0.30% (spec 0.10%). A tentative reprocessing run is scheduled for the current inventory of methylal while the acetate unit is down.

Methanol - A water problem developed in our MS-II methanol inventory during the third week of January and the first week of February. No assignable cause was evident. Tank 386 had 0.36% water and tank car loadings were made out of MO inventory. The water level is now down to 0.02% .

1,3-BG - Efforts are being made to bring the purity of the product back to the 99.5+%,

Complaints - The major valid complaint during the month was from Van Brodie regarding benzene in TO. Replacement of the TO at Van Brodie is over 70% complete. All of the Sylvannia Delkit material has been replaced and we have since filled another order to Sylvannia.

Formaldehyde Blending - Blending inhibited formaldehyde continues to be a problem because of problems with the in-line blender. Three out of seven inhibited blends were missed during the month, causing resampling, adjustment followed by resampling, and increased truck demurrage. We consider this to be a continuing and serious problem, which could affect product quality since we make calculated adjustments in the shipping container. Engineering is working on the request to replace the blender.

See attached Quality Assurance Statistics:

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Quality Assurance Statistics

	<u>January</u>	<u>January</u> <u>Y-T-D</u>	<u>Previous</u> <u>Y-T-D</u>
Shipments (Number of Orders)	843	843	612
Delayed Shipments	4	4	4
Quality Waivers	2	2	0
Quality Complaints	4	4	2
Quality Complaints Accepted	1	1	2

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III. SPECIAL PROBLEMS GROUP

Methanol Oxidation, Formaldehyde Blending
A. J. Branecky

MO Efficiency Improvement with Trace Amounts of Halogenated Hydrocarbons - Preparations for the plant trial continue. Testing should begin in 2 - 3 weeks.

MO New Catalyst Screening - A sample of Matthey-Bishop silver needles has been evaluated. The silver appeared acceptable for MO use based on sinter test, particle size, bulk density, purity and micro unit performance. A plant trial has been recommended as the next step in qualifying Matthey-Bishop as an approved supplier. Handy and Harmon's analytical method for copper in silver catalyst was evaluated and found comparable to the Celanese method.

MO Catalyst Reuse - Contaminated silver catalyst from MO-III was subjected to four treatment schemes to attempt cleaning or regeneration of the catalyst. The contaminated catalyst performed at 87.8% efficiency in micro unit testing. Treatment and the resultant micro unit efficiency of the treated silver were:

3% HNO ₃ for 2 minutes	- 89.5%
3% HCl for 2 hours	- 90.3%
5% AgNO ₃ for 18 hours	- 90.6%
Demineralized H ₂ O wash	- 90.6%

A complete reactor charge from MO-IV was washed with demineralized water in the lab. Before the catalyst was removed from MO-IV, it performed at 86% efficiency. After water washing the catalyst and placing it back in service in MO-IV, it performed at a level comparable to new catalyst. After 2 1/2 weeks on line, 89.5% efficiency was demonstrated.

MO Analytical Manual - The manual is complete and will be issued in the near future.

MS-II Crude to MO - Work will begin now that MS-II has essentially reached steady state operation.

MO-Support - Samples of MO-II catalyst were analyzed after an extended run. (One catalyst bed had been on-line for approximately 8 months.) The catalyst showed relatively low levels of impurities compared to catalyst from MO-III and MO-IV that generally had been on-line a shorter time. This follows historical data that shows MO-II can run longer without efficiency loss due to contaminated catalyst.

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Efficiency losses in the MO-IV absorber were examined with the unit operating in a high concentration run (>52%). No significant increase in efficiency loss was observed.

Pentaerythritol, Weak Formaldehyde
H. H. Thigpen

PE Efficiency - Unit efficiency for January was 75.9% based on AcH versus a stretch objective of 73% for 1977. This was in spite of a power failure on January 27, which appeared to cause PE losses equivalent to 15-20 M lbs. The relatively high efficiency for January can probably be attributed to:

- a) The absence of major mechanical problems
- b) Continued satisfactory operation of the dam on the "A" filter
- c) Higher "A" evaporator gravity and better stripping of formaldehyde in T-286 than was typically maintained in 1976.

Continuing laboratory studies of the effect of variables on efficiency during the "A" evaporation and crystallization steps have indicated that there is a maximum efficiency which can be approached by manipulation of these variables. This maximum efficiency is about 78% during pure production and may be as high as 84-85% during tech production. Studies of the tech PE system are continuing and will be completed in February. The maximum efficiencies are obtained when the crystallization drop temperature is 70°F, and the evaporator gravity results in 32-33% sodium formate in undiluted AML. Results of the lab study will be published, with recommendations, in March.

The economic potential of maintaining better control of the gravity and temperature during the "A" crystallizer process is 2 - 4% efficiency.

Data from current studies indicate that impurities (primarily cyclic formals) significantly increase the solubility of PE in AML, and that the impurity level controls the maximum efficiency attainable in the unit. This could explain why the efficiency during tech production is significantly higher than during pure production. More cyclic formals are present during pure PE production since more of the linear formals are hydrolyzed to meet purity specs. Continuing studies will attempt to confirm and quantify the effect of cyclic formals on efficiency. If confirmed, studies of the hydrolysis step to minimize cyclic formal production will be initiated. If this is not successful, methods of removing cyclic formals from the "B" mother liquor will be studied.

The economic potential of minimizing cyclic formal formation may be equivalent to an additional 5 - 8% efficiency during pure PE production and 2 - 3% during tech production.

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Low Sulfate PE AML Sodium Formate - No laboratory work.

PE "Fines" Problem - The production of "fines" in pure PE is being studied. A report with recommendations will be written this month.

Methanol Synthesis
F. R. Dow

Fuel Gas Quality - Fuel gas quality has remained relatively unchanged during January, even though it was sampled twice during extremely cold weather.

The Process Analyzer group has installed an on-stream Bendix Total Sulfur G.C. to monitor total sulfur in incoming fuel gas. Preliminary analyses have shown approximately 600 ppb total sulfur. The fuel gas to the MS carbon beds shows the total COS, H₂S and SO₂ to be approximately 400 ppb.

MS-II Analytical Support - Tower profiles of T-280 and T-288 were analyzed several times during the month in an attempt to monitor the fusil oil band and to obtain data on upper and lower drawoff streams. Analysis has shown that an upper drawoff may not be necessary to maintain the permanganate time spec, but lower drawoff of approximately 0.8 gpm is necessary for removal of PrOH, s-BuOH, iso-BuOH and n-BuOH. This investigation was also attempting to quantify the by-product make of Lurgi catalyst. Due to the extremely low concentration of impurities in crude MeOH, direct analysis yields unreliable data. Future work should include a lab distillation of crude MeOH to accurately determine by-product components and concentration. A report will be written showing all purification tower profile data.

Esters, Methylal, Paraform, Formcels
R. G. Hilbrich

Methylal Build in Methyl Formcel - A new study has been initiated to determine if aluminum 6061-T6 in methylal Formcel storage causes increased methylal formation. In an initial study, the test samples were mistakenly destroyed. The original samples had shown no methylal increase in 2 1/2 months contact with aluminum 6061-T6.

Paraform Material Balance - Progress on this project is delayed due to the current lack of Process Engineering coverage on paraform.

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Ester Unit Support - A recent n-butyl acetate run used n-butyl alcohol from T-67 and T-101 residue streams of the butyl alcohol unit. The run was closely monitored analytically by the Laboratory. No problems were encountered.

Samples around the ester unit water recovery column (T-103) were analyzed in support of a Process Engineering project to determine the justification for continued operation of T-103.

Alternate n-Butyl Acetate Process - Results of the latest laboratory run show 99% one pass conversion to n-BuAc based on HAc feed. Reactor column residue product analysis showed 0.5% acetic acid, 4.3% BuOH and approximately 94% n-BuAc by difference. Work continues in an effort to reduce acetic acid concentration in the product.

Paraform, Formcels and
Ester Unit Analytical Manuals - No work due to priorities.

Oxo, 1-Butanol, 1-Propanol
A. J. Bacon

Oxo Reactor Accountability - Through a continuous extraction procedure, a large portion of "unknowns" were separated from Oxo catalyst solution. It was approximately 85% P, M. W. TPP and contained 60:40 aliphatic to aromatic hydrogen. It was undoubtedly a mixture. Some progress has been made in detection through thin layer and infra red methods. This work continues as time permits.

PrOH Material Balance - No balance done. However, a loss analysis was done to try to explain low yield accounting efficiencies. All losses were normal. Process traced the problem to lack of temperature compensation. The Lab worked with Production and the Computer group to finalize implementation of temperature compensation data into yield accounting.

T-229 Residue Aldol - No progress due to priorities. Aldol make remains

T-210 Residue Burning - Letter covering lab work on No. 1 boiler scale was completed. Similarities with residue at Bay City from a phosphorus containing stream were reported.

Oxo, n-BuOH, n-PrOH Unit Support - a) Reassay of catalyst ash from the July 6, 1976 dump was completed. Results showed 3.95% rhodium as compared

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to the 3.68% originally found. No reason for the discrepancy is known. Engelhard and Celanese have settled on the 3.95% value. A report was written.

b) Sample bombs were prepared and sent to Clear Lake so that our lab can check the quality (chloride) of CLP pipeline propylene which may be used here for Oxo.

c) Spec tests were begun on T-133 overhead as part of steam savings project in BuOH.

Trimethylolpropane
D. W. Harris

TMP Unit Analytical Manual - Revision of the TMP unit analytical methods manual is in progress.

Increased Formaldehyde Feed

Concentration to the TMP Reactor - The plant trial planned for January was not conducted. The unit operated at approximately 40MM rates and 25% formaldehyde feed concentration. The trial will be conducted after rates are reduced.

TMP Daily Carbon Accountability - A plant trial of the carbon accountability procedure outlined in JRK-01, JWH-09 was conducted January 23 - 27. Carbon accountability for the 5-days averaged 102.2%. A report estimating the cost for implementing the procedure, and results of the trial will be issued.

TMP Unit Support - Analysis of V-1331 overhead (NaFo concentrator) samples showed 0.8 wt. % ethyl acetate and 6 ppm Na⁺. Process Engineering is evaluating the feasibility of using this stream as make-up condensate to T-204 (solvent recovery column). A report is in progress.

T-206 Receiver and V-759 Vent Emissions - Sampling of T-206 receiver vent has been delayed. Plans are to pipe the vent into the TMP concentrator (V-759) vent line. The combined vent will be sampled after piping is completed.

1,3-Butylene Glycol
J. W. Hermann

1,3-BG Daily Carbon Accountability - A report on the results of a plant trial and estimated cost for implementation is in preparation.

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1,3-BG Efficiency - Measurement of crotonaldehyde produced in V-1478 is underway to determine if there is significant efficiency loss due to residence time and temperature.

1,3-BG Unit Analytical Manual - No work due to priority given to unit support.

1,3-BG Unit Support - The unit experienced several major upsets between January 15 and 20, 1977: loss of air pressure, low 240 psi steam pressure, and loss of hydrogenation catalyst. These upsets resulted in an unusually large amount of the cyclic acetal of 1,3-BG and acetaldol in the hydrogenation system. The BG finishing system is unable to remove this impurity due to T-227 overhead recycle of BG light ends. On January 19 the finished product contained >1% of the acetal impurity. The unit broke the T-227 overhead recycle to remove the acetal and was correcting hydrogenation problems when a shutdown became necessary to reprocess off-test inventory. The Laboratory will continue to closely monitor the finished product when the unit is restarted. Special Problems will continue to monitor acetal make in the hydrogenation system, and assist operations in minimizing acetal production.

Utilities Raw Materials BOD

M. F. Brady

Purchase Specifications Update - A major revision in the format is under consideration. Work continues.

Demineralizer Support - The plugged caustic distribution laterals in the weak anion resin bed were cleaned. The unit produced good quality water when put back into service. The material which plugged the laterals was identified as resin fines from the strong anion bed. The unit has increased the backwash frequency of the strong anion resin bed to reduce fines carryover to the weak anion distribution laterals.

As followup to this problem, the Laboratory showed the capacity of the weak anion resin to be acceptable. The triethyl amine demand of the demineralizer was determined at the request of Celcon. The triethyl amine demand was within acceptable limits.

Utilities Support - Assistance was provided to the Utilities Department in improving the test method for O₂ in boiler feed water. Problems in obtaining consistent results proved to be technique related. A permanent sample tap was installed and procedural problems were corrected.

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A method was developed by A. E. Retherford for determining ammonia (ppm) in front ditch (001) outfall. A report will be written.

Evaluation of Rohm and Haas

IRA -94 for Formaldehyde Service - No progress due to priorities.

BOD Unit Analytical Methods Manual - Revision of test methods have been written. A report is in progress.

Anaerobic Pilot Testing

Of Chemcel Waste Streams - Sampling of effluent streams has proceeded relatively smoothly. The CCCTC Anaerobic Pilot unit was started January 6, 1977, and required eleven days to acclimate to 100% Chemcel feedstock. The system has operated smoothly since then. The aerobic polisher is operational and is in the process of acclimating to anaerobic outfall.

Addition of Betz Neutraneen

To the Plant Steam System - The Laboratory cooperated with Operations in locating sample points. A report has been issued describing the location of these points and sample schedule. Methods for determining amine levels in the steam system have been set up. Particular attention will be given to areas in which live steam contacts process streams.

OSHA Monitoring

J. M. Jackson

The following personnel were monitored for 8-hour TWA exposure to benzene:

Laboratory Janitor	- Solutions prep. room, Main Lab
Technician	- Solutions prep. room, Main Lab
Technicians (3)	- Wet Analytical, Plastics , Main Lab
Technician	- Wet Analytical, Chemical, Main Lab

Area benzene samples, 8-hour TWA, were obtained in the Solutions Prep room, Main Lab, and in the Plastics Company area of the Wet Chemical Section (Main Lab).

The space velocity of all Main Lab hoods was determined. Out of 9 hoods, only 3 were capable of lowering employee exposure to airborne contaminants to approximately 1 ppm. A report will be written recommending corrective action.

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Diacetone Alcohol
A. E. Retherford

DAA Unit Support - T-295 was opened for maintenance inspection, and the trays were found to be fouled with a fine, grey powder. Elemental analysis of the material showed 15.2% Ca, approximately 2.02% Fe, 1.2% Na, and approximately 4% P. The material also gave a positive carbonate test. T-295 had been showing abnormally high pressure drop. Reboiler and overhead condenser leaks were also suspected due to abnormally high water levels in T-295 overhead product. From this information the powder was concluded to be predominately CaCO_3 , Na_2CO_3 , $\text{Ca}(\text{PO}_4)_2$, and Na_3PO_4 . Source of the Ca and CO_3^{2-} was probably cooling water and/or DAA catalyst. The Na^+ and PO_4^{3-} probably came from cooling water. Reoccurrence of the problem is not likely since the new DAA catalyst charge has aged in, and the T-295 leaks have been repaired. The powder was removed by water blasting.

DAA Reactor Temperature and Residence Time Study - A plant trial to determine the effects of temperature and residence time on the DAA reactors was begun January 25, 1977. The reactor (V-1266) was allowed to line-out at 80 ppm recycle rate and 70-72°F outlet temperature. Recycle was then cut to 40 gpm while holding the outlet temperature 70-72°F. Plans were to follow conversion to DAA and MesOX make through these changes, then lower the reactor outlet temperature to 65-67°F to determine the effect of reduced temperature on conversion to DAA and MesOX. At this point refrigeration machine failure caused a unit shutdown. The study will resume when the unit is restarted.

Miscellaneous
B. C. Kerr

Trioxane Quality - Customer Service Call - A customer service call was made to Van Brodie in Clinton, Mass. to help resolve a quality problem with trioxane. Laboratory work had shown that most of the trioxane shipped to Van Brodie was contaminated with benzene. The visit to Van Brodie on January 12 and 13 showed a more serious contamination than had been seen in plant retain samples.

A discussion between Van Brodie personnel, Gary Kastor and Bob Kerr concluded that the only safe solution to the customer's problems was to replace the contaminated trioxane with specification product.

A full discussion of the service call is given in BCK-02-77, January 20, 1977.

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Perstorp Formaldehyde Stabilizer Problem - Perstorp licenses the Celanese formaldehyde solution stabilizer to European customers. One of their customers has experienced problems with ion exchanging stabilized formaldehyde from the ion exchanged product.

A letter was written to Perstorp (BCK-04-77, January 28, 1977) recommending a methanol wash to remove stabilizer from the ion exchange bed. However, the foaming problem associated with distilling resins was outside plant knowledge. Mr. J. M. Ramey was requested (BCK-03-77, January 28, 1977) to provide any data for foam control that the company can, without violation of confidentiality.

Ester Unit Statistical Data for the November and December, 1976, Butyl Acetate Production Runs - A letter is being typed which gives a detailed examination of the unit data for the subject production runs. These data were assembled to assist in the design of a microprocessor control system for the acetate reactor system.

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Current Special Problems Projects

Project	Chemist	Priority	Justification	Estimated Completion Date
MO Efficiency Improvements With Trace Amounts of Halogenated Hydrocarbons	Branecky	1	Raw Material Savings	Plant Trial Complete by May 1, 1977
MO New Catalyst Screening		2	To Establish Alternate and/or Improved Quality Supplies	Continuing
MO Catalyst Reuse		2	Reduction in Ag Inventory; Full Potential Not Yet Defined	September 1, 1977
MO Analytical Manual		2	Maintenance of Business	March 1, 1977
MS-II Crude to MO		1	Steam Savings	March 1, 1977
MO Support	↓	1	Maintenance of Business	Continuing
PE Efficiency	Thigpen	1	Raw Material Savings	Continuing
Low Sulfate PE AML Sodium Formate		1	Comply With Virginia Chemical Co. Request	June 1, 1977
PE "Fines" Problem	↓	1	Customer Complaints	March 1, 1977
Fuel Gas Quality	Dow	1	Improve Plant Fuel Gas Accountability	April 1, 1977
MS-II Analytical Support	↓	1	Maintenance of Business	Continuing

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Current Special Problems Projects

Project	Chemist	Priority	Justification	Estimated Completion Date
Methylal Build in Methyl Formcel	Hilbrich	2	To Define Methylal Storage Stability in Aluminum	September 1, 1977
Paraform Material Balance		2	Possible Raw Material Savings	September 1, 1977
Ester Unit Support		1	Maintenance of Business	Continuing
Alternate n-BuAc Process		1	Steam Savings	July 1, 1977
Paraform, Formcels, Ester Unit Analytical Manuals	↓	2	Maintenance of Business	July 1, 1977
Oxo Reactor Accountability	Bacon	2	Improved Reactor Control and Analytical Balance	Unknown - Work as Time Permits
ProOH Material Balance		1	Raw Material Savings	April 1, 1977
T-229 Residue Aldol		2	Raw Material and Possible Steam Savings	June 1, 1977
T-210 Residue Burning		1	>\$100/year Fuel Value	Work as Requested by Engineering
Oxo, BuOH, ProOH Unit Support		1	Maintenance of Business	Continuing
TMP Unit Analytical Manual	Harris	1	Maintenance of Business	September 9, 1977

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Current Special Problems Projects

Project	Chemist	Priority	Justification	Estimated Completion Date
Increased Formaldehyde Feed Concentration to the TMP Reactor	Harris	1	Steam Savings	June 1, 1977
TMP Daily Carbon Accountability		2	Possible Raw Material Savings	March 1, 1977
TMP Unit Support		1	Maintenance of Business	Continuing
T-206 and V-759 Vent Emissions	↙	2	To Ensure TACB Compliance	Unknown - Work Pending Engineering Changes
1, 3-BG Daily Carbon Accountability	Hermann	2	Possible Raw Material Savings	April 1, 1977
1, 3-BG Efficiency		1	Raw Material Savings	June 1, 1977
1, 3-BG Unit Analytical Manual		1	Maintenance of Business	May 1, 1977
1, 3-BG Unit Support	↘	1	Maintenance of Business	Continuing
Purchase Specifications Update	Brady	1	Maintenance of Business	April 15, 1977
Demineralizer Support		1	Maintenance of Business	Continuing
Utilities Support	↘	1	Maintenance of Business	Continuing

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Current Special Problems Projects

Project	Chemist	Priority	Justification	Estimated Completion Date
Evaluation of Rohm and Haas IRA-94 for Formaldehyde Service	Brady	2	Resin Cost Savings	August 1, 1977
BOD Analytical Methods Manual		2	Maintenance of Business	March 1, 1977
Anaerobic Pilot Testing of Chemcel Waste Streams		1	To Test Anaerobic Process as Alternate BOD Expansion	April 15, 1977
Addition of Betz Neutramene to The Plant Steam System		1	Reduce Steam System Corrosion	August 1, 1977
OSHA Monitoring	Jackson	1	Ensure Employee Health and Safety - OSHA Compliance	Continuing
DAA Unit Support	Retherford	1	Maintenance of Business	Continuing
DAA Reactor Temperature and Residence Time Study		1	Increase Unit Capacity and Steam Savings	August 15, 1977

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