Anniston

C. K. Eastman
W. H. Hunter
A. E. Leisy
G. W. Miller
W. B. Papageorge
W. F. Taffee
H. L. Williams
TSD Engineers

General Offices

J. O. Bright
H. C. Carder
D. Danna (3)
D. E. Cayard
H. O. Hehner
A. Heininger
D. B. Hosmer
R. E. Howard
C. F. Luecke
H. L. Payton
N. L. Sample
A. J. Speziale
J. A. Stephens
R. J. Stratmeyer
H. S. Trail
J. H. Zwemer

South Second St.

C. E. Anagnostopoulos
M. E. Gibbs
H. L. Hubbard
J. F. Quinn
W. R. Richard
J. R. Savage - JFQ

Other Locations

D. B. Edwards - DR
J. W. Graves - Luling
W. R. Kellogg - Nitro
G. F. Knollmeyer - Seattle
J. F. White - Everett
R. F. Wiesenborn - CB
W. J. Wilson - WGK

Monsanto

Anniston Plant

TECHNICAL SERVICES DEPARTMENT

MONTHLY REPORT

Summary

October 1967

Third Quarter Cost Improvement figures show year to date savings of $305,055 vs. a target of $271,000 or 112% target.

PR&D developments in the Aroclor product line have resulted in patent application for In Line Electrical Measurements. Jim Bryant, Senior Research Chemist, is the Inventor. Patent applications for Porocel Column treatment, impregnation of the drum liner and for adding Bauxite directly to the drum etc. all pending.---Messrs. J. G. Bryant and G. W. Miller visited five Aroclor customers with P. G. Benignus, R. H. Munch, and G. R. Graham involving technical discussions on Aroclor quality and test procedures. Earlier in the month Westinghouse personnel visited the Anniston Plant for a similar review.---The Porocel Column continued excellent performance on the initial bed charge. To date, 600,000 gallons of Aroclor 1242 have been treated and resistivity remains 25-30 M.

Continued studies of the Biphenyl Capacity problem resulted in a recommended three phase program to meet the 1972 requirements with a 30% surge capacity. An evaluation report was issued and will be reviewed with CED and the TPM before upgrading work on #1 tube is started. Phases 1 and 2 involve debottlenecking the stills and upgrading the #1 tube unit. Phase 3 involves a new tube unit by CED. Estimated capacity will be 97.5 M pounds per year. Total savings will exceed $500,000 in addition to added profits.---Scope and Cost Estimate for a new Column for the Santowax R flash still were received from CED. A project will be prepared following plant review.---Outdoor storage facilities for Santowax R have been completed and should be used in early November.

Rough draft of Chlorine Manufacturing Improvement Plan is ready for plant review. Plan outlines project work in 1968 with savings of $116,000.---Anniston portion of CED/TSD steel bottom cell evaluation was forwarded.---A plant Chlorine meeting was held with Messrs. Hosmer, Carder, and Chandler in attendance. A set of essential objectives were developed using the Kepner-Trego approach for effective cell house operations. Subsequent to the meeting a revised maintenance-operating and TSD program with target dates was developed to implement all objectives.

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Phase I of the Niran Sulfur Recovery program was completed resulting in a $5,000/month (5%) yield gain with no residue handling problem. PR&D studies indicate a process which will recover sulfur meeting P_2S_5 specifications. Plant tests are planned for February 1968.

The Waste Heat Recovery unit was started on 10/16/67, one month ahead of schedule. Unit was operated one week prior to shutdown of #8 Boiler for repairs. Entrainment problems limited operation to 60% design rate. Tests will resume when #8 Boiler is returned to service.

L. C. Fahrmeister
Technical Services Department

LCF:kd

TOWOLDMON0044362

MEETINGS

The November Engineering Planning Meeting is scheduled for November 21.

DETAILS

AROCLOR J. MacPherson, C. R. McIlwain

Job No. 456 - Fixed Bed Refining: (Quality)

To date 600,000 gallons of Aroclor 1242 have been treated in the fixed bed refining unit; the initial Bauxite charge continues active with no change in treatment ability.

Job No. 452 - AFE 2342 Install Railroad Spur for Chlorine Tank Cars and Necessary Unloading Facilities: Net Savings $3,620 B.T. Net Earnings $22,300 B.T.

Second safety review (10/12/67) accepted shift from nitrogen padding on the unloading system to an air padding arrangement. This scope change, plus increased trackage needs, required an overrun request for $15,100. Project total is now $31,700.

Job No. 736 - Quaterphenyl Effects, Solid Aroclors: $400,000 Cost Improvement Incentive

Study is to be delayed until the following are accomplished:

1. Manufacturing receives and accepts Research approval of OMP based 5460.
2. Level instrument is installed on No. 4 still receiver.
3. Flow instrument installed on No. 4 still circulating line.

BIPHENYL-SANTOWAX L. L. Faulkner

Job No. 744: Upgrading of #1 Tubular Unit to Equal #2 Efficiency

Proposed program to provide facilities for a 97.5 $\bar{M}$ pound Biphenyl Plant was reviewed with Mr. Carder on October 18. Program was detailed in a Progress Report issued on October 27. A meeting will be scheduled with CED to review the program.

Job No. 731: Post Start-Up Assistance to Santowax R Still

CED transmitted a proposed scope and cost estimate for adding an eight tray column to the Santowax Flash Still. AFE was prepared, based on CED Estimate, but is being held pending plant review of proposed CED scope.

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BIPHENYL-SANTOWAX - continued

Job No. 769: Install 6" Gas Line To Tubular Area

Construction is in progress. A leaking acid sewer in the area of the gas line has necessitated construction of a concrete trench to minimize pipe damage and safety hazard. As a result, a revision of the project will be necessary to cover additional expenses.

Job No. 780: Alternate Benzene Supply

Special (5) samples from Atlas have been analyzed. Atlas benzene meets our specification, with a slightly lower content of Aliphatics than Enjay. However, a market price reduction, unavailability of Atlas tank cars, and alternate supplies within Enjay have eliminated the justification for this work. No future work is planned.

Job No. 790: Temporary Santowax Storage

Lake has been cleared for temporary storage of excess Santowax. Pipe modifications are in progress. Less than 10,000 gallons of Santowax storage is left in existing storage tanks at this time.

General:

Verbal approval was received for $3400 to order new Multi-point Temperature Recorders for the (2) old Biphenyl stills. (Shipping date of November 17 has been promised by L&N). Old Biphenyl stills will be used for a Santowax OM run scheduled to begin November 27.

CHLORINE D. W. Dudley, W. G. Niemeyer, W. B. Dunlap

Job No. 1000:(Savings - $116,000) - MIP

Rough draft complete. Plan will be reviewed by Plant personnel prior to typing. Scope covers five year capacity projection and one year work plan for two engineers. Annualized savings for projects outlined for 1968 are $116,000.

Job No. 411: (Savings Undetermined) - Steel Bottom Cells

CED and Anniston's TSD active in studying several alternates for Chlorine Department. Anniston's portion of study 100% complete.

Job No. 704: (Plant Imrpovement) - Cell Room Ventilation

Progress Report 704-1 published 10/13/67, giving status of mercury concentrations in cell house. Studies are now being performed to determine the effect of repeated washings and sulfur treating to mercury contamination. Water washing reduces the concentration below minimum acceptable levels, but concentration increases as soon as floor dries. Present indications point out the need to resurface the floor as soon as possible.

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CHLORINE - continued

Job No. 391: (Annual Savings - $18,000) - Single Stage Decomposers

Overrun approved by TPM 10/10/67. Revision covers graphite conversions, wage increases and minor design changes effective since the project was initiated in November 1965. A program to expedite conversion was developed in October by Maintenance. All units will be converted and operable by 12/31/67. Complete inspection and follow-up is to be finished by 6/1/68.

A routine surveillance was set up by which the Area Accountant monitors and reports performance of all decomposers.

Job No. 46: (Savings Defined Below) - Mercury Losses

1. Mercury recovery from cell house residue will result in $4,000 annual savings. Recovery unit to consist of one stage, gravity separating washer. Plant level AFE being prepared.

2. Lab studies of mercury recovery from cell house waste water indicate savings of $11,000 per year. A Pilot Recovery Tower will be tested on a portion of waste stream as the next step of this study.

3. Radioactive inventory analysis of Anniston cell house to be made November 29, 1967, by Central Research.

Job No. 491: (Savings $15,000) - Debottleneck DC System

Results of plant survey was published in memo from J. A. Veazey to L. C. Fuhrmeister 10/16/67. A follow up program was developed for reducing losses for 1968.

Job No. 783: (Savings - $21,000) - KCl Overflow

AFE prepared and approved on plant level 12/2/67. Equipment ordered 10/10/67. Transmittal scheduled for November.

Reduce Anniston Chlorine Manufacturing Costs

Meetings were held with H. C. Carder and D. B. Hosmer 10/17 and 10/18. Follow-up meetings using a Kepner-Tregoe problem solving technique have resulted in a revised plant approach to improve Chlorine cell house operations.

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HCl K. J. Buturla

Job No. 497: Muriatic Acid Storage

Foundation work for the 150,000 gallon HCl storage tank was started the early part of October. A safety review, held on October 13, raised several questions concerning the acid attack of the tank foundation due to acid leaks. In addition, there is concern about clearances from an adjacent Chlorine tank car spot. Construction work has been stopped until necessary revisions can be investigated and incorporated in the existing design.

Job No. 746: HCl Efficiency Studies

Field tests for the material balance studies have been rescheduled to the first week in November. Previously planned tests were postponed due to periods of full sturage, which made it impossible to determine production rate, and because of shutdown of Aroclor's No. 9 chlorinator. Scheduled tests will determine the recovery efficiency of the entire system and should also indicate the efficiency of the absorber unit.

Job No. 1000: HCl Long Range Plan

The HCl Manufacturing Improvement Plan has been revised and completed. Plan is now in for typing and will be distributed the week of November 6.

PNP K. J. Buturla

Job No. 450: Phase I - PNP Debottlenecking

New pre-mix tank and a larger charge line was installed the week of October 30. The larger charge line will reduce transfer time from the pre-mix tank to the reactor. Batch timing tests will be run after Niran turnaround. Tests will include determination of charge time, reactor time, and letdown time. Investigation of Big Batch and/or High Temperature Batch need to be carried out, but can't be done until Niran is back at full production rate.

NIRAN D. C Malm, O. J. Norris, K. G. Hale

Job No. 600: Sulfur Recovery - (Annual Savings $400,000 Plus a 31% Reduction in SO_2 Load To Air)

Phase one of Interim Process Tests in Methyl Parathion have been completed. A 5% yield gain with no residue handling problems has been demonstrated in Methyl PCT by high Nitrogen Sparging during chlorination and Xylene addition to the still residue. Phase two (High Nitrogen Sparging for the last 2400 pounds of Chlorine vs. the last 1600 pounds of Chlorine in Phase one), these tests will start after the spring turnaround to Methyl Parathion. Testing on the Niran Process will begin on December 1.

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NIRAN - continued

A Process Research Report indicating that crude Methyl PCT is stable up to 120% chlorination level, was published 10/13. A Tentative Amendment to the Methyl Parathion Process has been written to stepwise increase average chlorination levels 110%. Testing on this process change will follow Phase II of High Nitrogen Sparging tests.

Development work continued on a process to recover high quality sulfur from still residue. Test results indicate that the quality of recovered sulfur will meet specification for sulfur in P_2S_5. Lab centrifuge separation tests will be made in November. Plant centrifuge tests are planned to begin in February, 1968.

Job No. 712: Parathion Recovery (Annual Savings $70,000 Plus a 10-15% Reduction In COD Loading)

Received approval of $29,665 N.F.C. Appropriation Request. Major equipment will be placed on order in mid-November. Project Design will be complete by 12/1. Installation targeted for March, 1968.

Job No. 475: Fume System (Improved Working Conditions And Reduced Corrosion)

Detailed Design work continued. Complete Design Package will be submitted 11/15.

Job No. 499: Condensation EVOP (Annual Savings $39,000 Plus A 3% Reduction in COD Loading)

EVOP Program will be resumed on the Niran Process after start-up.

Job No. 339: Refractometer Pump (Experimental Project)

The Experimental Refractometer pump was installed in the #3 chlorinator in late October during Niran turnaround. Refractive index chlorination control tests are scheduled to begin in December after calibration of the Refractometer and installation of the Recorder.

Job No. 792: Evaluate Malathion Production

Evaluation Report will be issued by 12/1.

Job No. 701: Corrosion Testing

Corrosion Test Coupons installed in Thio Acid, chlorination, distillation, condensation, and residue environments to develop corrosion data on various metals. Test coupons and holders were provided by O. W. Siebert, W.G.K. Corrosion Specialist.

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The following TSD Projects were installed during Niran Turnaround.

1. Project 2388 - Dual Relief Valves on #3 Thio Acid Freon System (Safety).

2. Project 2252 - New 1,000 gallon G/L Still and Agitator - #1 Still Unit. (Improve Quality)

3. Project 2268 - Revised Catch Pot Drain Lines - #1 and #2 Chlorinators. (Safety)

4. Project 2338 - Drainage Pad At Niran Car Dock. (Stream Pollution)

5. Project 2655 - Parathion Recovery Unit. Tie-ins were made in the Cone Tank over-flow piping to eliminate downtime during installation of the Recovery Unit.

Cost Improvement - Third Quarter

$10,775 Savings YTD vs. Target Savings of $27,700.

Cost Improvement - 1968

1968 Target savings set at $208,500. Detailed report on 1967 results T/D and itemized 1968 Program will be sent to Mr. D. E. Cayard in early November.

MECHANICAL & ELECTRICAL INSTRUMENT DESIGN J. C. Price, J. A. Veazey

AFE 2576: Ejector For NaCl Elevator Pit (Safety - Estimated Capital $1500)

Design Package was transmitted to the Maintenance Department on October 30, 1967.

Job No. 413: Winterization of Safety Showers
(Plant Improvement - Estimated Expense $28,000)

Preliminary drawings have been completed. Justification and AFE are being prepared and are expected to be forwarded for approval in November, 1967.

Job No. 491: Electrical Debottlenecking - Chlorine Cell House

Electrical measurements of the cell buss system were taken during the month and are being evaluated. Possible improvements resulting from the study will be incorporated in the Cell Rebuilding Program.

Job No. 783: KCl Overflow (Estimated Savings $40,000 - Estimated Capital - $4100)

AFE 2650 was approved on 10/2/67. Design Package is expected to be transmitted in November.

TOWOLDMON0044368

Design review, estimating and procurement assistance was provided in the following areas:

Aroclor

Fixed Bed Refining.

Biphenyl - Santowax

Upgrade #1 Tubular Unit, New Gas Line to Tubular Units, and Multi-point Temperature Recorder for Santowax OM.

Chlorine

Control Room upgrading and technical operating difficulties.

HCl

150,000 Gallon Storage Tank, control of recycle line to adsorber and flange guards.

Niran

Parathion Recovery and Fume Collection System.

Waste Heat Pilot Plant

Instrumentation and piping revisions.

DRAFTING G. C. Goodwin, R. L. Brewer, E. A. Brown

Completed in October

1.	Biphenyl	Redesign Preheat #1 Unit
2.	Aroclor	Revise Cl_2 Railroad Spur
3.	Plant	Winterization of Safety Showers
4.	Plant	Charts For Plant Inspection
5.	Chlorine	Revise Water Ejector NaCl Elevator Pit
6.	Aroclor	Survey work for CED on New Aroclor Storage Tanks and New Warehouse

Scheduled for November

1.	PNP	Revise Tempered H_2O Piping
2.	Chlorine	Mercury Recovery
3.	HCl	Revise HCl Storage Tank

TOWOLDMON0044369

DRAFTING - continued

Scheduled for November

4.	Aroclor	Drum Washing
5.	Plant	Fire Alarm System
6.	P_2S_5	Eliminate Fumes in Building

LIAISON AND PLANT IMPROVEMENT — M. E. Twigg, (W. F. Taffee)

CEA 1232 - Utilities

No. 8 boiler shut down, coincident with Niran turnaround, to replace tubes indicated as thinned during inspection after initial tube failure in June. Also installed new water level controller for #8 boiler. New back pressure control valve installed in steam main from Nos. 6 & 7 boilers to provide protection of steam supply to forced draft fan turbines in the event of boiler failure and to aid in pressure control during boiler startups.

CEA 1430 - Aroclor Expansion

Reviewed and approved storage tank farm layout. Reviewing flow sheets at month's end.

CEA 1452 - Warehouse

Project draft completed by Carl Sigler. Soil borings for Warehouse and tank farm completed. Negotiations underway to provide railroad spur connection. Sewer problems surveyed by CED with recommendations expected in early November.

Building 28

Work continues on Dispensary - hallway - office project. Dismantling complete, electrical installation in progress, floors poured and plastering preparations underway at month's end.

Fire Break

Storage of Santowax in south Clegorn's Lake makes construction of fire break in this area mandatory. M. E. Twigg assigned to job. Project approved, design complete and transmitted to Maintenance.

Dike Study

Project covering replacement of Benzene dikes with concrete ($19,000 NFC) forwarded 10/18. 1967 Corporate Inspection Committee comments included recommendation to replace Methanol and Ethanol dikes with concrete.

TOWOLDMON0044370

Flange Guards

Polyethylene flange guards installed on selected lines in HCl Department for test. Project covering additional flange guards for HCl being prepared.

WASTE HEAT RECOVERY J. F. Benson, C. E. Woodward (Taffee)

Unit started 10/16/67 one month ahead of schedule. Shutdown 10/20 when Therminol charge lost. Schedule included shutdown from 10/23 when No. 8 boiler taken off line for repairs until boiler started again, probably 11/1.

Gas feed rate reduced to about 60% of predicted to minimize Therminol in stack. Determination of Therminol in stack by carbon tetrachloride adsorption train appears successful. Entire statistically designed test program will be run at this gas rate when flue gas is again available. Performance data at hand not sufficient to support major conclusions.

Jim Benson (Ch.E. Ga. Tech. 9/67) of Anniston TSD and Ben Gardner, Central Engineering Department are assisting in the start-up.

ENGINEERING MANPOWER DISTRIBUTION

	% Of Total TSD Time			
Category	October	Year-to-date Through Oct.	September	Year-to-date Through Sept.
1. Process Improvement	39.9	47.9	41.2	48.9
2. New Products	6.6	5.1	3.97	4.9
3. Plant Imrpovement	9.8	6.7	11	6.4
4. Assist Operations	3.7	2.9	1.3	2.8
5. Special Engineering Services	3.2	8.4	5.1	9.0
6. Technical Manpower	11.7	8.8	9.1	8.4
7. Miscellaneous	25.1	20.2	28.3	19.6

Remarks:

Category 1 Hours in October equal to September. Department total hours increased. Additional time spent on Waste Heat Recovery primarily.

TOWOLDMON0044371

Category 2 - Waste Heat Recovery start-up added one man (Benson).

Category 3 - Manpower not available until October 16, resulting in less hours spent in October.

Category 4 - Reflects emphasis in Chlorine.

Category 6 - Reflects training new man.

Category 7 - Shows end of vacation season.

QUALITY CONTROL & STATISTICAL ASSISTANCE W. B. Dunlap

The Right First Time Index for October was 98.1 with 9 lots rejected out of 466; 9 out of 431 from the Organic Division. The October Quality Score was 96.0, up 4.5 from September.

A new Operating Control Chart was put into service in the P_2S_5 Department. The new Quality Divergence Report was approved by the Quality Board for review by the Supervisors.

PERSONNEL

1. Messrs. J. G. Bryant and G. W. Miller visited five Aroclor customers the week of October 16.

2. Messrs. D. B. Hosmer, H. C. Carder and W. B. Chandler visited the plant October 17-18 to review Chlorine operations.

3. W. F. Taffee participated in three sessions of the Auburn Chemical Engineering Design Course.

4. Messrs. Harvey Pickett and Jim McNally from Westinghouse Corporation visited the plant 10-3-67.

5. Messrs. J. R. Buss, M. McEwen and H. Hileman visited the plant 10/19 re: Waste Heat Test Unit.

6. O. J. Norris attended the Company Wide Material and Corrosion Seminar in St. Louis, October 11-12.

7. L. L. Faulkner participated in Corporate Recruiting trip to University of Alabama, October 9-10, and Auburn University on October 11, 12 and 13.

8. Seven TSD - Lab men attended the Coaching and Appraisal Interviewing Course presented by Ed. Pipken the week of October 2.

ADDITIONS

J. F. Benson, B.S.Ch.E. - Ga Tech - joined us 10/2/67 and is assigned to the Waste Heat Unit.

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TEMPORARY ASSIGNMENT

M. Twigg, Jr., from Lab to TSD 10/16, and assigned to Plant Improvement.

Ben Gardner on loan from CED 10/10, and assigned to Waste Heat Unit.

PROMOTION

E. G. Wright, B.S. in Chemistry, Jacksonville University, was promoted to Pollution Control Engineer 10/31.

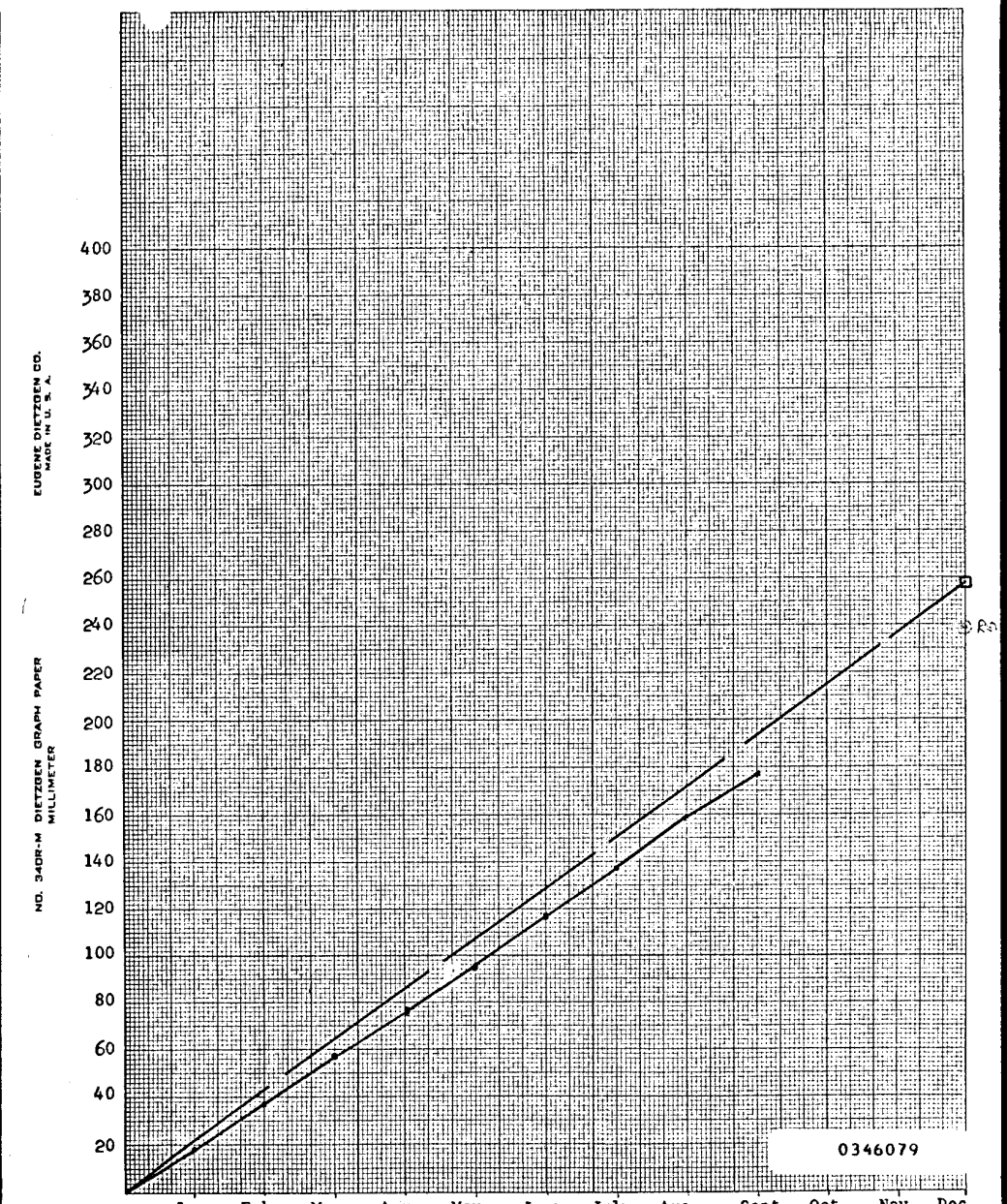
SAFETY

The October TSD Safety meeting was conducted by C. McIlwain, on "Fire Protection."

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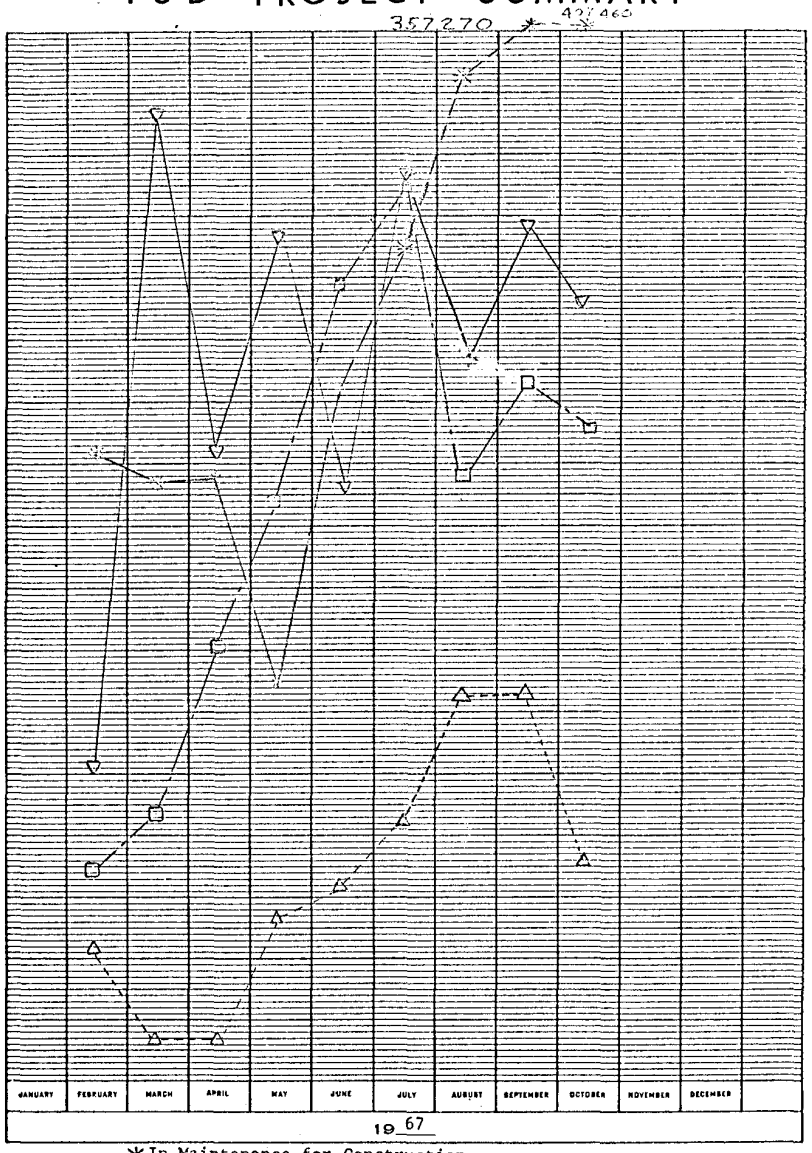
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BUDGET COMPARISON - TSD - 913.70 ($257,712) 1967



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TSD PROJECT SUMMARY



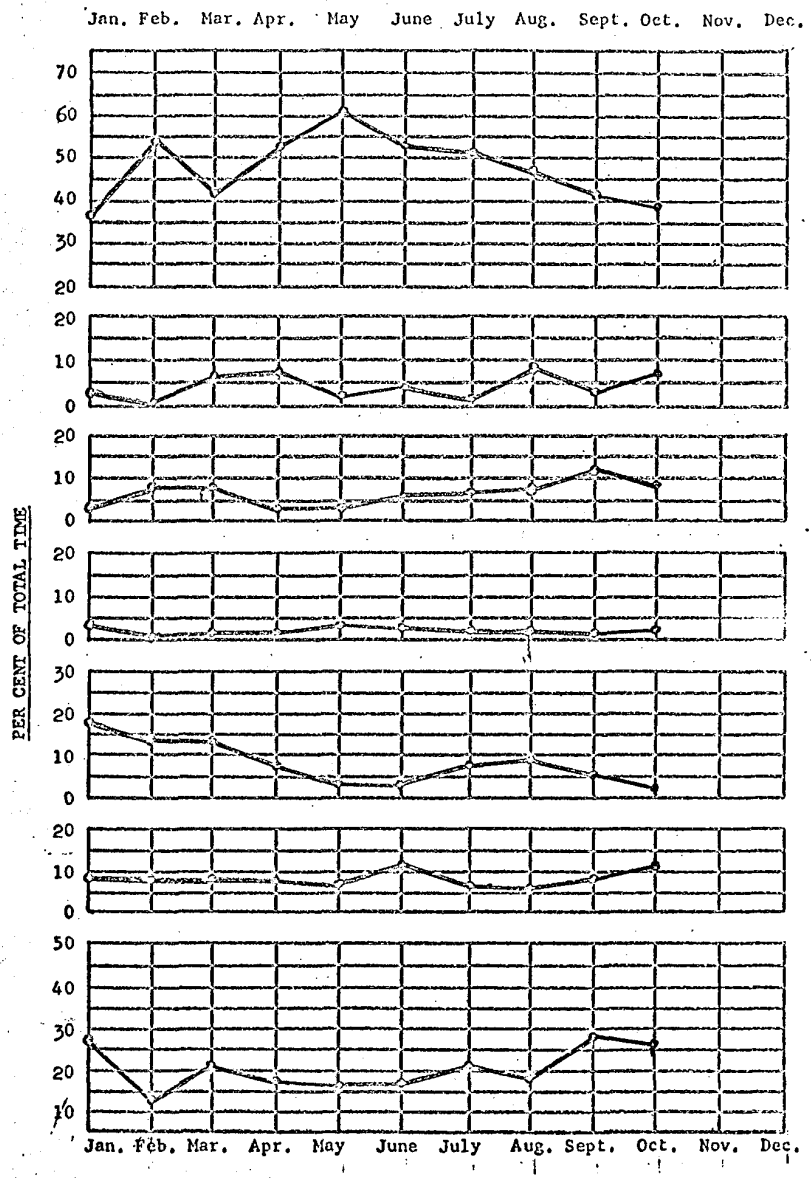
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DISTRIBUTION OF TIME BY TECHNICAL SERVICE



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