E. E. Bowles

Monsanto

Anniston Plant

TECHNICAL SERVICES DEPARTMENT

MONTHLY REPORT

Anniston

C. K. Eastman
A. J. Koenig
C. Landwehr
E. Leisy
G. W. Miller
W. B. Papageorge
W. F. Taffee
H. L. Williams

General Offices

H. S. Bergen
J. O. Bright
H. C. Carder
D. E. Cayard
D. Danna (3)
L. C. Fuhrmeister
H. O. Hehner
D. B. Hosmer
R. E. Howard
R. M. Kountz
W. A. Kuhn
C. F. Luecke
H. L. Payton
W. R. Richard
N. L. Sample
A. J. Stratmeyer
S. Trail
H. Zwemer

South Second St.

O. DeGarmo
M. E. Gibbs
J. F. Quinn
J. R. Savage - JFQ

Other Locations

D. B. Edwards - DR
A. H. Forsten - CB
J. W. Graves - Luling
D. W. Jackson - WGK
W. R. Kellogg - Nitro
G. F. Knollmeyer - Seattle
F. White - Everett

Summary

July, 1968

Cost Improvement Results For First Seven Months

	Estimated Actual	Target	% of Target
Month	$23,885	$54,100	44
YTD	$288,790	$260,625	111

Organic Division

Liquid and solid Aroclor MIP issued 26 July. With a potential of $1440 M savings, $585 M savings is expected by end of 1970. AFE will be forwarded in August to gain $67.4 M in solid Aroclors.

Two Montar handling projects will be forwarded in August to gain $24.2 M in drum savings for $17.5 M NFC. Montars will be pumped to pond with Montar 5 being flaked for sales.

A statistical correlation study of the solid Aroclor system was concluded; a simple model with yield as a function of crude softening point and still outage indicates immediate savings of 3.5% ($35,000 annually), and potential up to 15%. A confirming plant trial has shown 5% to date and is continuing.

Reviewed company-wide Chlorine/Caustic needs vs manufacturing capacity with division management representatives on 7/11. Detailed study of plant needs in case of chlorine shutdown is underway, including central tank car storage facilities and lab determination of catalyst usage at HB-40 using biphenyl hydrogen.

A study is in progress to determine how to produce Staley Grade HCl. Carbon tower tests are being run in plant and by the Pittsburgh Activated Carbon Company laboratories. Efficiency of organic removal by the Brink demisters is also being evaluated. Final recommendations are targeted for mid-August.

PNP reaction time vs temperature tests are underway - no conclusive data to date. Acidifier step debottlenecked to 1.97 M lbs./mo. Effective department capacity now at 1.74 M lbs./mo. Debottlenecking study report issued. Work to continue in August.

Agricultural Division

Parathion M.I.P. revision completed, with target savings of $1.645 M over five year period, 1968-1972. Experimental sulfur removal facilities in final check-out stage. Start-up scheduled for 8/5. Work continued on parathion recovery filter problem, filtration tests completed at Purolator Labs. A cellulose filter unit has been shipped for testing.

Engineering Design and Services

Transmitted design packages for emergency lighting at the main office, storeroom and service building. Final report on "Guarding of Moving Parts of Equipment" was forwarded to the plant manager. AFE's for emergency plan radio system and power distribution panel in TSD Annex were forwarded for approval.

Utilities Cost Improvement

Initial meetings with Production Department and TSD personnel, to discuss possible savings, were completed. Progress Report indicating possible savings and a work plan to develop a Utilities MIP will be early in August.

Plant Improvement

Design packages for benzene storage tank dikes, protection of 44 KV feeder transmitted to Maintenance. Progress report published covering status of 1968 Plant Improvement Program at end of first half and schedule for remainder of year.

Liaison

Warehouse office essentially complete, piping work continues on tank farm. Warehouse structural steel being painted prior to installing roof and sides. Toledo Scale strike may delay automated drum filling equipment delivery but project can be operated manually.

Waste Heat Recovery

Phase III experimental program completed 7/26. Despite major reductions in therminol loss demonstrated for boiler at constant load, targets were not achieved. Progress report will be issued in August.

Pollution Control Summary

No water pollution complaints in July. One air pollution complaint was received. Choccolocco creek and Coosa river appeared normal during three visits. Some problems have been encountered with the pilot malathion waste treatment studies.

Quality Control DSW 377325

The RFT Index was 98.4, with 10 lots rejected out of 617; 10 out of 488 from the Organic Division. The July Quality score was 96.5, down 2.1 from June, YTD 97.0 against a 93.0 target. Quality surveillance detected unfavorable trends in liquid Aroclor electrical quality, Muriatic free chlorine, and improved uniformity in PNP. Improved uniformity justified a 40% reduction in P_2S_5 testing in laboratory.

J. C. Landwehr

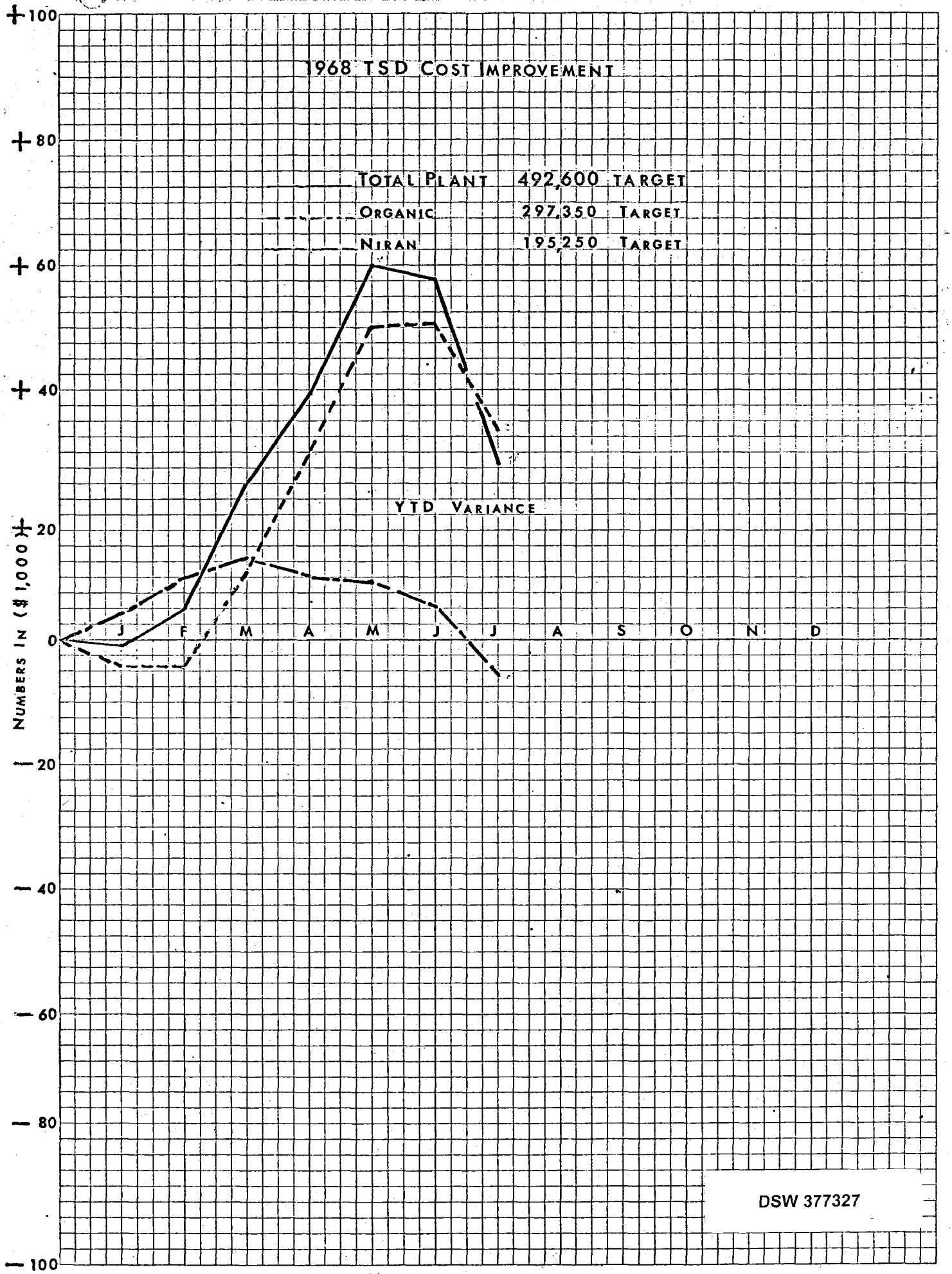
J. C. Landwehr
Technical Services Superintendent

jw

1968 TSD COST IMPROVEMENT

YTD RESULTS VS ANNUAL TARGETS

DSW 377326



DSW 377327

EUGENE DIETZGEN CO. MADE IN U. S. A.

NO. 340-B DIETZGEN GRAPH PAPER 8 X 8 PER INCH

STLCOPCB4099180

AROCLOR E. E. Bowles, C. R. McIlwain, D. A. Self, (V. R. Haupt)

Cost Improvement

	Month	YTD
Target	$8313	$24,163
Actual	$75*	$25,370

*low because Solid Aroclor was made in Liquid Aroclor system

TSD Objective B-1(d) Revise Aroclor MIP by 12/1/68

Liquid and solid Aroclor MIP completed and issued 26 July in a three-ring binder to make it a "living" document and prevent "re-inventing-the-wheel" each time it is revised. With a potential of $1440 M savings, $585 M savings is expected by the end of 1970.

TSD Objective B-8(a) Evaluate Quaterphenyl-Polyphenyl Effects on Solid Aroclor Yields

Instruments measuring specific gravity will be installed on the solid Aroclor chlorinator and still receiver and a nuclear level instrument will be placed on the still to give a low level alarm. These instruments will permit optimization of chlorinator-still performance to maximize yield potential indicated in quarterphenyl/polyphenyl study. Possible yield and productivity savings are $109,800/yr. with $67,400 being claimed on the project. AFE will be written and forwarded in early August.

TSD Objective B-8(e) Provide Assistance to Produce Product Strategy Quality Electrical Grade Liquid Aroclor

WGK-PRD work indicates an improvement in 1242 stability (TCC) will result from using a standard amount of catalyst. Tests started 20 June 1968 and completed 24 July 1968 used premeasured bags of catalyst to test plant results. Analysis of results is expected by 15 August 1968. No obvious improvement in quality has been noticed after a preliminary look at the data.

TSD Objective for 1969 - Montar Handling

Project premise has been approved and issued to provide for pumping of Montars to the Montar pit. AFE 2952 will be circulated for approval by 5 August 1968. NFC is $7.5 M with $13 M savings.

Montar 5 flaking project premise has been approved and issued. AFE 2949 will be circulated for approval in August 1968. NFC is $10 M with $11.2 M savings.

TSD Objective for 1969 - Updating MIP's

An overall material balance was made starting with benzene through Biphenyl, Santowax and ending with Aroclors, HB-40, and HCl. There is approximately $700 M worth of yield loss at present and in 1972. Losses occur as Santowax, Montars, and excess HCl. The Aroclor MIP has included a program for recovery of some of these losses.

BIPHENYL-SANTOWAX W. G. Niemeyer, J. W. McGee, (V. R. Haupt)

Cost Improvement

	Month	YTD
Target	$3,800	$26,600
Actual	$5,200*	$73,000

*estimated

TSD Objective B-7(a) Debottleneck Biphenyl Stills to 87.6 M Lbs./Yr. Biphenyl Rate By 2/69

This work has been included in CEA-1892. CED and the Plant are planning a capacity test run to firm up scope in this area.

TSD Objective B-7(c) Provide Assistance (Liaison) to CED As Necessary On Project To Upgrade No. 1 Furnace, CEA-1892

Formal project approval was received on June 24. Structural, foundation piping, electrical and instrument drawings have been issued by CED. Cancellation of TSD Project 2552, relocate Preheaters at No. 1 Furnace,$65,000 NFC approved, was initiated on 7/24/68. This project has been included in CEA-1892.

TSD Objective B-1 (a) Revise Biphenyl-Santowax Manufacturing Improvement Plan By 9/1/68

Rough drafts of all sections have been completed. Review and revisions are in progress.

Quality

TSD Objective B-7(d) Demonstrate Quality Improvement on Santowax Still via Addition of Eight Tray Column

Piping and structural drawings for column installation are complete. TSD and CED are working together on column auxiliaries and instrumentation.

Laboratory

Biphenyl production control samples have been reduced 50% in the tubular reactor area. A reduction of 20-25 analytical man hours will be realized each month.

HCl K. J. Buturla, G. L. Moore, (D. C. Malm)

Cost Improvement

	Month	YTD	
Target	$300	$1300	Failure to meet this month's target caused by high repair costs on new teflon filter pump seal.
Actual	0	$1200	

TSD Objective B-10(a) Demonstrate Reduction of Unaccounted HCl Losses to 10% of Total HCl Available

Recycle line project in Maintenance backlog. Installation scheduled for Mid August.

TSD Job No. 497 Muriatic Acid Storage

Project in Maintenance backlog. Foundation and tank construction out for bids. No further action.

TSD Job No. 891 Re-route Venting System on HCl Collection Tank

New venting system installed on July 29. Pump recycle line remains to be completed.

TSD Job No. 801 Enable Routine Production of Staley Grade Acid

Work plan was issued on July 16 outlining steps to be taken toward solution of odor problem. Main areas of investigation are the carbon treatment towers and the Brink demisters. Recommendations concerning demister operation were received from Engineering Sales Department on July 26. Samples containing organic-laden acid were sent to Pittsburgh Activated Carbon lab for determination of maximum potential of our towers.

Project to revise carbon tower piping was approved July 30. This revision will increase bed efficiency by flooding the towers. Work will continue in August to determine effectiveness of the present system in producing Staley acid.

PNP O. J. Norris, K. J. Buturla, (D. C. Malm)

Cost Improvement

	Month	YTD
Target	$16,000	$78,500
Actual	$ 5,400	$40,500

DSW 377331

TSD Objective B-9(a) Assist in Demonstration of 20 $\bar{M}$ lbs/yr Rate

Revised acidifier cool-down procedure successfully tested in field. Recommendation to adopt this procedure were transmitted to production 7/26/68. Field tests showed an 8 minute overall acidifier time cycle reduction in addition to a significant reduction in time cycle variability. Major work effort for August will be on the reactor which limited July production to 1.66 M lbs. vs 1.8 M lbs. schedule.

PNP (Continued)

TSD Objective B-9(b) Increase Autoclave Reactor Temperature (9/1 Target)

Field Tests during July at 174°C showed no reaction time reduction possible without affecting letdown cycles. Tests in August will determine if a reaction time reduction is possible at 175°C. Based on July tests, the probability of a time cycle reduction is no greater than 30%. Alternate methods to increase reactor rate will be defined by 8/15/68.

TSD Objective B-9(c) EVOP Study of Molar Ratios NaOH/PNCB 6/1/68

Revised schedule for EVOP study to begin remains 9/1/68.

TSD Objective B-1(g) Revise PNP M.I.P.

Plan developement underway. Target date for plant review is 8/27/68.

NIRAN K. G. Hale, O. J. Norris, J. L. Gaines (D. C. Malm)

Cost Improvement

	Month	YTD
Target	$22,150	$93,100
Actual	$10,900	$87,550

TSD Objective B-1(c) Revise Niran Long Range Plan By 5/1

Final draft typing complete. Plan reviewed and approved by Plant Manager and Ag TPM. Savings of $1.645 M are targeted over 5 year period, 1968-1972.

TSD Objective B-5 (a) Demonstrate Parathion Recovery By 5/1/68 ($70,000/yr. Yield Savings + 10-15% Recuction in C.O.D. Loading)

Recovery unit remains down because of pluggage problems with purolator metal edge filter. Filter tests were completed at Purolator lab with a recommendation to test a cartridge cellulose fitler unit. Purolator has shipped a cartridge filter which will be tested in August. Contacts have been made with two other filter companies for their recommendations. The RPC corporation (manufacturer of membrane separator) is assisting in dealings with filter people.

TSD Objective B-5(c) Demonstrate Solvent Addition to Residue (Interim) Process By 6/1/68 ($59,000/yr Yield Savings)

Yield savings of $10,900 were obtained in July. ($29,300 in four months). Phase 3 tests are continuing with one chlorinator now at 108% chlorination level and the other four at 106% level. High nitrogen sparging remains suspended because of need to reduce hydraulic loading at Waste Treatment.

TSD Objective B-5(d) Evaluate Sulfur Recovery from Residue by 7/1/68 ($400,000/yr Savings + A 31% Reduction in SO_2 to Air

Installation of test facilities essentially complete. Final safety review of project and installation held 7/30. Check out and water batching to be completed by 8/2, with start-up set for 8/5. Test plans and facilities were reviewed with V. Schotte, C.E.D. on 7/22-23.

PR&D work continued on final recovery process. Work plan developed to complete bulk of sulfur clean-up process studies by 9/1.

TSD Objective B-5(e) Demonstrate Reliability of Submerged Pump for R.I. Control of Chlorination

No action this month. Tests in field are expected to be resumed in September when problem with light source has been corrected.

Safety

TSD Objective A-10 Eliminate High H_2S Pressure in Thio Acid Reactor by Demonstrating Temperature Controlled Alcohol Additions by 6/1/68

One month trial by production in progress. Progress report will be issued upon completion.

TSD Objective A-12 Provide Design for High Priority Safety Jobs Resulting from Parathion Safety Audit By 9/1/68

Design completed on seven safety jobs T/D. Status report to be issued in August.

TSD Job No. 815 Survey Water Savings Potential in Parathion Department

Project premise approved on experimental project to re-use water from wash columns at pre-washers. Lab tests indicate process change will not affect project quality or yields. Potential savings of $3,700 plus a reduction of 18 GPM hydraulic loading to Waste Treatment. Progress report on survey of water usage submitted for typing.

P_2S_5 K. G. Hale, (D. C. Malm)

Cost Improvements

	Month	YTD
Target	0	0
Actual	0	0

TSD Objective B-1(f) Publish P_2S_5 MIP by 8/1

Completion of the P_2S_5 MIP will be delayed until 11/68 due to higher priority items.

DSW 377333

P_2S_5 (Continued)

Safety

TSD Objective A-15(a) Provide Design to Reduce Fumes in P_2S_5 Working Areas By 4/1/68 at Surge Tank Vent

Design revisions complete. Transmit by 8/1/68.

ENGINEERING DESIGN AND SERVICES

Mechanical/Electrical/Instrument Design adn Drafting J. C. Price, J. A. Veazey, R. L. Brewer, J. K. Rennie, (W. F. Taffee)

Highlights

Review Drawings were issued for S/W R Stripping Still, Montar Disposal, Montar Flaking, and Steam Desuperheater on the Brine Heat Exchanger at chlorine. Final drawings were issued for Area #1 Maintenance Shop, #9 Chlorinator Pump and Piping, P_2S_5 Air Intake Air Exchanger and the Waste Treatment Experimental Filter. Final Drawings were issued and Design Packages forwarded for Projects 2873, 2874, and 2875 - Emergency Lighting for Main Office, Storeroom and Service Building. Forwarded AFE's for Emergency Plan Radio System and Power Distribution Panel at TSD Annex. Forwarded final report for "Guarding of Moving Parts of Equipment."

TSD Objective A-5 Winterize Safety Showers

Design package transmittal for Project 2770 - Niran Showers have been delayed until August by vendor drawings delay. Project 2769 - Organic Division Department Showers, has been approved and tentatively scheduled for drafting in October.

TSD Objective A-7 Plant Emergency Plan

AFE for radio system was forwarded. Design package to install Emergency Lighting at the Main Office, Storeroom and Service building was transmitted to Maintenance.

TSD Objective D-4 TSD Guidelines - Process Information

Because of changes in job responsibilities this objective will be delayed until December.

TSD Objective E-7 Instruct Draftsmen

R. L. Brewer and G. C. Goodwin have satifactorily completed an in-plant course in "Simple Structural Steel Design" conducted by J. C. Price.

DSW 377334

TSD Objective D-6 Review All Open Jobs Quarterly

TSD Superintendent, Supervisoring ED&S, Plant Manager, and Maintenance Superintendent reviewed open projects status sheet, ED&S drawing schedule, and backlog summaries. Maintenance requested additional jobs.

UTILITIES COST IMPROVEMENT J. C. Price, A. I. Hale (W. F. Taffee)

Meetings to discuss possible savings were held with all production departments supervision and TSD personnel. A progress report indicating possible savings

Utilities Cost Improvement (Cont'd)

and plans for future work will be issued early in August. A progress report and an AFE covering steam meters have been forwarded for typing. Progress reports and AFE's for water meters, gas meters, and nitrogen meters are expected to be forwarded in August.

PLANT IMPROVEMENT G. C. Goodwin (W. F. Taffee)

Progress report published covering status of the 1968 Plant Improvement Program at the end of the first six months and work plan for next six months. Design packages forwarded to Maintenance covering benzene and acetone storage tank dikes at the Biphenyl Department, 44KV electrical feeder protection and a safety platform at therminol heater. Major effort in next two months will be directed toward submitting AFE's covering remaining programmed projects.

CED LIAISON V. T. Langdon (W. F. Taffee)

CEA 1430 - Aroclor Expansion

Tank farm area structual steel and loading docks essentially installed. Liaison continues in flaking-drumming area. Toledo scale strike may delay automated drum filling equipment, but manual operation can continue as at present with existing manpower. Requested pallet dispensers for bagging operation (1 year payout). Operator training for tank farm has been started by Production Department. Field coordination of minor modifications required as construction progresses are being handled by Van Langdon.

CEA 1452 - Warehouse

Warehouse office essentially completed. Painting of steel structure has started. Floor poured, lights essentially installed, temporary power provided because of delivery slippage of new transformer. Roof material on site, installation will start August 1. Siding material not yet received. Revision of tank car loading spot canopies may be required to provide adequate weather protection - decision deferred until present canopy is built and can be checked in field with tank cars used in Aroclor service.

WASTE HEAT RECOVERY C. E. Woodward (W. F. Taffee)

Phase III experimental program completed July 27. Heat recovery averaged 90 to 95% of target. Therminol losses reduced from 15 pounds per hour to 1.0 pounds per hour (vs target of 0.5 pounds per hour) by operating boiler at "steady-state" load conditions rather than the normal varying load. Majority of therminol lost from water spray tower stack.

Inspection of unit by CED specialists indicates physical installation to be within normal tolerances; boiler operation and performance typical of "package" boiler.

Final report compiling data and observations to date will be published in August.

POLLUTION CONTROL E. G. Wright, (J. C. Landwehr)

TSD Objective F-3 Establish a Monitoring System for Air Effluents from the Plant

Investigated sites to set up permanent sampling points. Sampling will begin as soon as owner's permission can be obtained to use sites.

TSD Job No. 808 Install Solids Removal Equipment at Waste Treatment Plant

Project transmitted to maintenance on July 17.

Special Activities

1. Prepared a project to retire absolete equipment at Waste Treatment.
2. Some problems have developed in the malathion waste studies. Indicated COD removal efficiency has dropped to 50 percent. This is being caused by interference in the analytical method.
3. Data on the HCl neutralization pit shows about 80% effectiveness on plant effuent. Recommendations for controlled caustic sewering to give 100% neutralization will be made in August.
4. Compiled and plotted data on flows and solids at the city treatment plant. This data will be used to determine the degree to which we contribute to the city's solids problem.

Waste Treatment:

All wastes were effectively treated during July.

Average values for Monsanto's effluent in July:

	Avg. Daily	Specifications
PNP	1.2 PPM	- 5 PPM
COD	163 PPM	-200 PPM
Parathion	.09 PPM	- 1 PPM
BOD	2 PPM	- 200 PPM

PROCESS AND QUALITY CONTROL J. P. Chadwick (W. B. Dunlap)

TSD Objective C-2 Apply Statistical Control to Solid Aroclor Process

#1 Progress Report was written. A 3.5% yield increase worth $35,00 can be realized by dropping Montar after each still batch. A possible 15% yield increase exists, available all or in part through optimization of the #2 softening point and the still recovery from both #1 and #2 still runs. A level alarm is required. Potential savings: $150,000

A plant study was begun to verify mathematical relationships. A 5% improvement in yield (worth $50,000 annually) has resulted from lowering the Softening Point of the #2 run to 108°C. The test is continuing.

PROCESS AND QUALITY CONTROL (Cont'd)

TSD Objective C-7 Training In Use of Computer

Programs were written and personnel trained for two new applications: calculation of heat transfer and waste stream composition. Calculation time was reduced 80%.

TSD Objective C-6 Correlation of P_2S_5 - Parathion Operations

Study of controlling variables was begun. Data was tabulated and analyzed to determine stable periods of operation. Regressions were made to determine mathematical relationships of Chlorination Level and Nitrogen Sparging to Distilled Intermediate Yields.

DSW 377337

COMMUNITY RELATIONS, PERSONNEL, RECRUITING, AND DEVELOPMENT

Development

1. R. L. Brewer and G. C. Goodwin completed an in-plant course on "Simple Structural Steel Design" conducted by J. C. Price.

2. TSD Superintendent completed one week course in "The Management Process" lead by R. E. Howard at Nitro.

3. I. Ransaw attended a course in "Effective Communication for Engineers and Scientists" at the University of Michigan.

Recruiting - Objective - Provide advanced degree credit course work for technical personnel in TSD and rest of plant

Obtained information about VERB (Victor Electro-Riter Blackboard) program at the Decatur plant with University of Tennessee. Credit course work is being obtained at Decatur over telephone lines from the campus using the VERB equipment. Have scheduled a meeting with Auburn University Engineering School Staff for August to explore their capabilities. Indications are that Auburn has been motivated by the Tennessee competition and that Anniston plant plus the Army Chemical School at Ft. McClellen could develope a class of about ten masters degree candidates.

Visitors

1. Dan Steinmeyer, CED Heat Transfer Specialist, visited the plant July 11, 12, 23, and 24 in connection with the Waste Heat Recovery Unit.

2. John Buss, CED Utilities, and Harold Hileman, Functional Fluids Development, visited the plant July 25 in connection with Waste Heat Recovery.

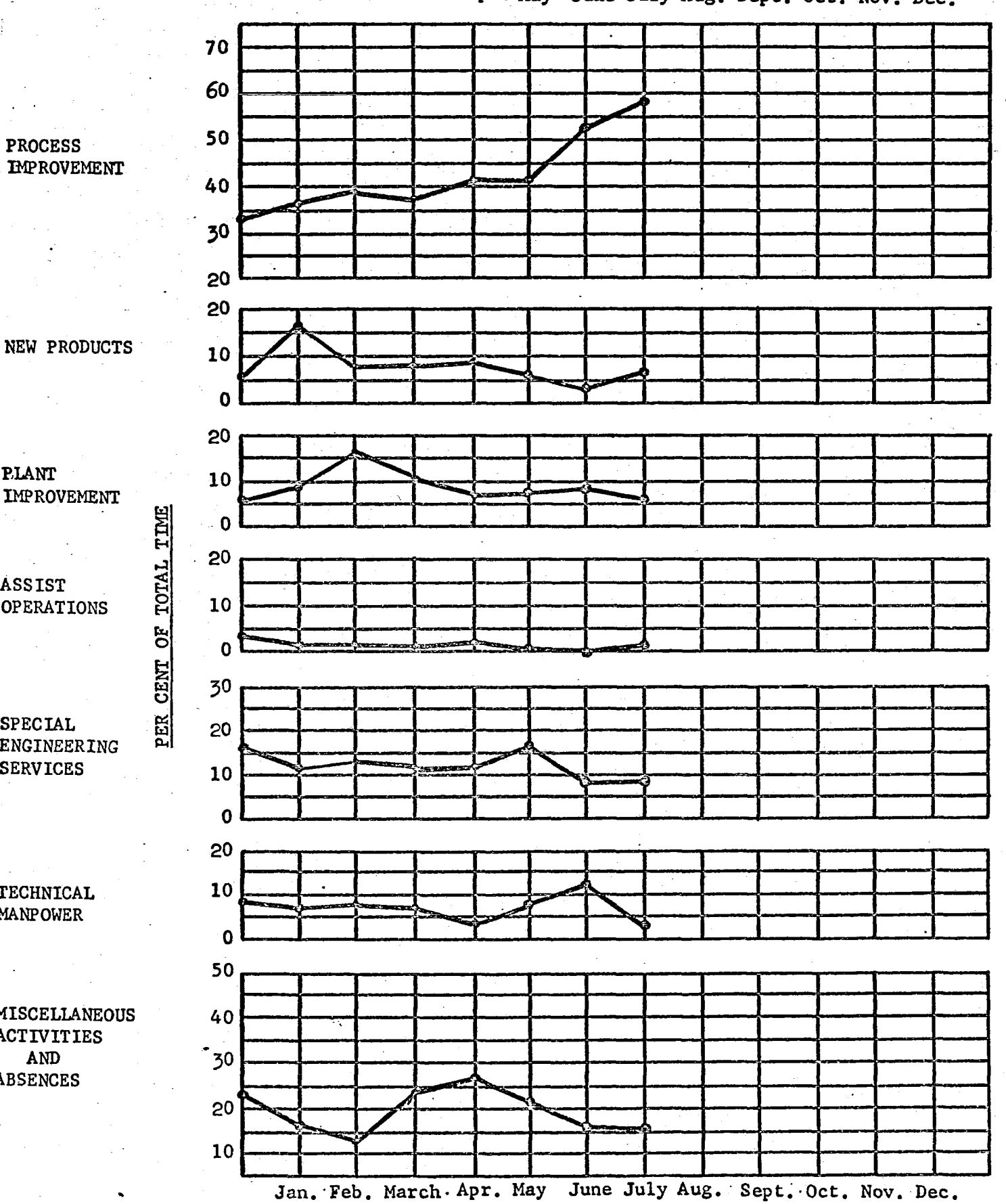
3. E. D. Sundstrom, CED Utilities, visited the plant to review boiler operation in conjunction with the Waste Heat Recovery Unit on July 19, 1968.

4. C. W. Sisler, CED Standards Specialist, visited the plant July 29, 1968 to discuss preparation of a "L" manual for Anniston.

5. D. B. Hosmer, Director of Manufacturing Technology, H. C. Carder, T.P.M. for general chemicals, S. B. Lutkewitte, T.P.S., caustic/chlorine and W. G. Kramper, CED, - 7/11 - to review company wide long range chlorine/caustic manufacturing situation.

6. V. W. Schotte, CED, visited the plant 7/22-23 to review status of Sulfur Recovery process development, test plans, and inspection of test facilities.

DISTRIBUTION OF TIME BY TECHNICAL SERVICE



DSW 377339

TSD PROJECT SUMMARY