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PROCESS RESEARCH AND DEVELOPMENT LABORATORY

Long Term Objectives

I. 1968 Goals and Actions

- A. Reduce manufacturing costs by process improvements.
- B. Improve product quality by process improvements.
- C. Maintain properly equipped laboratory for prompt process investigation.
- D. Maintain or obtain sufficient technical information to aid engineers in meeting departmental objectives.
- E. Aid in obtaining and holding plant safety at the highest possible level.
- F. Improve customer relations and assist in sales promotion.
- G. Protect and improve corporative image.
- H. Develop skills of personnel.

I. 1968 Goals and Actions

A. Reduce manufacturing costs by process improvements

- 1. Finalize the design of "in line" electrical measurement equipment
 - a. Redesign the "in line" analyzer on the column. Set up specifications with Balsbaugh Laboratories. Install a finalized designed unit on plant storage.
 - b. Assist in patent clearance.
 - c. Continue to follow up on plant porocel column system for efficiency and connect system for maximum efficiency.
 - d. Continue drum study to obtain a satisfactory economical container for Aroclor.
- 2. Sulfur recovery of methyl and ethyl PCT still residues
- 3. Improve residue handling to facilitate yield improvements.
- 4. Investigate yield improvements on P-NP.
- 5. Review other processes for costs improvement.

B. Improve product quality by process improvements

- 1. Continue porocel treatment of Aroclors and the development of information for general quality improvements for other Aroclors and blends.

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PROCESS RESEARCH AND DEVELOPMENT LABORATORY
Long Term Objectives - Page 2

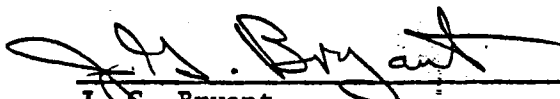
- B. Improve product quality by process improvements (continued)
 - 2. Continuous distillation and vacuum degassing of Aroclors.
 - 3. Investigate chlorination levels for methyl PCT assay improvement.
 - 4. Investigate P-NP yields for quality improvement.
 - 5. Continue liaison on biphenyl research.
- C. Maintain properly equipped laboratory for prompt process investigations
 - 1. Purchase the necessary equipment for stocking the laboratory.
 - 2. Continue to explore future needs for process research and development facilities.
 - 3. Set up and maintain an inventory control for laboratory equipment.
 - 4. Evaluate the necessity for borrowing, contracting, or purchasing equipment for special investigations.
 - 5. Add personnel as necessary to complete programs.
- D. Maintain or obtain sufficient technical information to aid the engineers in meeting department objectives
 - 1. Conduct the necessary liaison for retrieval of process information.
 - 2. Maintain an up-to-date file on process information.
 - 3. Up-date text books to keep adequate technical information.
 - 4. Assist in Niran operations on sulfur recovery and new process development.
- E. Aid in obtaining and holding the plant safety at the highest possible level
 - 1. Conduct at least one plant safety program.
 - 2. Review all process changes for safety.
 - 3. Point out all safety hazards recognized.
 - 4. Conduct laboratory investigations safely and observe good safety practices at all times.

PROCESS RESEARCH AND DEVELOPMENT LABORATORY
Long Term Objectives - Page 3

- F. Improve customer relations and assist in sales promotion
 - 1. Conduct technical reviews with customers when necessary.
 - 2. Write magazine articles as necessary for public information.
 - 3. Continue liaison with marketing and customer service.
- G. Protect and improve corporative image
 - 1. Write publicity articles as necessary.
 - 2. Assure adequate patent coverage on PR&D work.
 - 3. Make talks as necessary.
- H. Develop skills of personnel
 - 1. Improve performance of people.
 - 2. Screen out non-performer.
 - 3. Recommend people for promotion when felt ready.

II. Personal Development

- A. Improve communications, both oral and written, by self study.
- B. Improve knowledge of organic chemistry by a self study program.
- C. Attend at least one course to improve management abilities.
- D. Study organization and methods to make work more effective.
- E. Develop a program for controlling experimentation and improving coordination of programs.
- F. Continue self development to improve performance of patent filing and legal aspects.
- G. Continue background studying to quality for market technical service type work, particularly in functional fluids or Aroclors.



J. S. Bryant

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PR&D PROGRAM FOR ANNISTON PLANT

Priorities Listed According to Capabilities and Needs

(See Table on page 2)

Distribution of Manpower

Available Manpower = 2.5 men

Basis of Calculation

Total man days/yr. = 260

Loss days for vac. & holiday = 20

Actual days available = 240

60% utilization of time = 144

Total Man Days Available/yr. = 144 man days/yr. x 2.5

= 360 man days/yr.

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Time Table

Product	Year (Accumulated Man Days/Man Days Accomplished)				
	'67	'68	'69	'70	'71
Liquid Aroclors 1242 & 1254	200/140	60/60	---	---	---
Methyl & Ethyl Parathion	390/80	310/130	180/60	120/100	20/20
P ₂ S ₅	90/15	75/20	55/35	20/20	--/--
Decachlorobiphenyl	40/10	30/20	10/10	--/--	--/--
PNP	280/20	260/70	190/125	65/65	--/--
Chlorine	480/20	460/60	400/120	280/145	135/135
Solid Aroclors 5460 & 5060	80/10	70/--	70/10	60/30	30/30
Biphenyl - Santowax	90/5	85/--	85/--	85/--	85/85
HB-40	80/--	80/--	80/--	80/--	80/80
Total	1730/300	1430/360	1070/360	710/360	350/350

Realistic Accomplishments for '67 Program

Liquid Aroclors 1242 & 1254

- (1) Improve electrical properties of Aroclors 1242 and 1254 beyond specification goals.
 - a) Column treatment
 - b) Improved storage
- (2) Improve stabilities (TC) approaching specification goals.
 - a) Column treatment (bauxite or attaclay)
 - b) Modifying distillation (continuous)
 - c) Vacuum degassing of plant crude followed by distillation
- (3) Develop and install a more accurate (three terminal) guarded in-line measurement of electrical properties (P.F., Resist., and capacitance)
- (4) Improve analytical measurement on electrical properties
- (5) Improve shipping containers to retain electrical properties

Methyl & Ethyl Parathion

- (1) Develop method for laboratory handling of residue
- (2) Develop stability data for disposable solvents with residue
- (3) Develop stability data for solvents and residue for recovery system
- (4) Outline larger scale approach for sulfur recovery

P₂S₅

- (1) Establish specification for recovered sulfur for P₂S₅ manufacture
- (2) Study steps necessary to purify sulfur re-used in P₂S₅ manufacture

Decachlorobiphenyl

- (1) Assist in setting up a pilot reactor (if necessary)

PNP

- (1) Purchase necessary equipment
- (2) Collect necessary background data
- (3) Conduct preliminary tests

Chlorine

- (1) Investigate areas of the system to explore, including back up data
- (2) Initial investigation

Solid Aroclors
5460 & 5060

(1) Assist operations to keep on stream

Biphenyl-Santowax

(1) Liaison

HB-40

(1) Nothing

Miscellaneous

(1) Develop an additional PR&D laboratory

Product	Potential Savings from PR&D	Est. Man/Days	Est. Added Equip. Cost	Est. PR&D Cost	Start Date	Finish Date
<u>Liquid Aroclors 1242 & 1254</u>	Protect market position. Prevent loss of sales. Improve competitive position in world market.	236	25,000	20,000	Present	3-30-68
<u>Methyl & Ethyl Parathion</u>	\$980,000/yr. and reduction in pollution	390	5,000	31,200	Present	1-30-71
<u>P2S5</u>	Tie in on S2 recovery to detect build-up of impurities (part of \$980,000 in Item 2)	90			9-1-67	6-30-70
<u>Decachlorobiphenyl</u>	Future potential	40	1,000	3,200	6-1-67	2-1-69
<u>PNP</u>	\$850,000/yr. plus reduced pollution	280	10,000	22,400	11-1-67	6-30-70
<u>Chlorine</u>	\$1.5M in mercury (estimated currently under the cellhouse). \$56,000/yr. plus a reduction in pollution.	480	10,000	38,400	12-1-67	11-30-71
<u>Solid Aroclors 5460 & 5060</u>	Protect market position	80	3,000	6,400	12-1-67	2-28-71
<u>Biphenyl-Santowax</u>	Present 4 Ø discarded. Separate OM for sales and re-use the residue. Terphenyl-suppression liaison with Organic Research \$260,000/yr. (savings).	90	2,000	7,200	12-15-67	4-30-71
<u>HB-40</u>	\$10,000/yr; increased productivity without capital investment.	80	5,000	6,400	1-1-71	12-30-71

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