

-- DISCUSSION --

PLANT REVIEWS - MAJOR PROJECTS

(NOTE: Many plant people were involved in these projects. To save space, only the statisticians are listed.)

AVON LAKE -- T. E. Neff, B. A. Prusinoski

- A. Environmental problems with ambient vinyl chloride. The plant started about six months before most of the other plants. This included much exploratory work in methods of measurement, instrument selection, computerization, relating different methods of measurement, and EPA perimeter measurements. Twelve projects were described.
- B. Geon 103EP F-76, Alioop Project. This was a very large program to improve quality which included all phases of material handling, production, and testing. The study provided information leading to revised equipment and improved procedures in the various phases of the operation. Off specification production has been reduced at least 75% with savings well in excess of \$100,000.
- C. Control of excessive build-up in G-92 polymerizers. This is a current major project.

AKRON -- C. A. Brunot

- A. ARD -- Determined optimum conditions to obtain less than 10% heat loss and still retain production rates. Implemented. Also reduced testing of heat loss.
- B. Quality control of Hycar 1091X50. Related extruder torque to alum, coagulation temperature, and extruder valve settings.
- C. Raw Materials. Ran quality audit. Found much variation. Following up to establish better controls where needed.
- D. Hycar 1561 Latex viscosity problem. Traced viscosity problem to lot-to-lot differences in Daxad 17.
- E. ARW -- Optimize wash cycle.

CALVERT CITY -- A. L. Keller

- A. Fuel Efficiency. 1% improvement = \$100,000. Looking at boiler and furnace efficiencies. Developed computer program to calculate efficiencies and run simulations to determine critical variables and means for improvement.
- B. Chlor-Alkali. Major effort in sulfide treatment to keep mercury out of waste stream. Have achieved levels that are 1/5 the 1977 EPA standard. Chlorine specs now meet industry standards and testing has been reduced.

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Current project is to reduce cell shutdowns by 80%.

- C. Ethylene plant. Have an effective computer control system now working. Saving more than \$200,000 per year. Extending to all furnaces and will then realize even more savings when complete. Have current project to optimize operation of the gasoline column.
- D. EDC-VC1 - Catoxid reactor. Current project is to optimize operation where conflicting objectives of corrosion control vs. effective operation must be overcome. Water in EDC - new project - must reduce to control corrosion, big potential. Optimize VC1 column operation new project with good potential. May evolve into computer control when complete.
- E. Acrylic Acid Carbopol. Major effort in solving many dimensional quality problems. 1973 PIC contest winner. Overall effort worth over \$1MM.

HENRY -- C. J. Lee

- A. Environmental problems - VCM. 36% of total effort. 15 projects were involved, including development of paired sampling system for optimum building surveillance, health records information, worker-time study with C. A. Brunot, quality control approach to eliminating VCM excursions. Current work is involved with meeting the new OSHA standard and perimeter sampling.
- B. Geon resins. 45% of total effort. Major effort by PIC team to complete detailed cause and effect study of Geon 103EP F-76 process followed by training, revised manufacturing procedures, and quality control system. Quality superior to 18 months ago despite process changes and speed-up. Paste drying and grinding study with 120X283 is continuing.
- C. Polymer chemicals. 18% of effort. Current major effort in Stalite process to increase productivity and at the same time control isomer formation, improve efficiency, and optimize column operation.

LONG BEACH -- R. A. Vanko

- A. Essentially all 1974 work was with VCM environmental problems, more as environmentalist than statistician. Problems included OVA sampling, developing sampling system for Bendix probes, automated analysis of Bendix data, work sampling study with C. A. Brunot, studies of hydrocarbon components in ambient air. Current work includes personnel monitoring and EPA work with perimeter monitoring, studies of wind speed and direction, plus sampling in the city.

LOUISVILLE -- J. P. Sandoz (plus J. R. Kute through June, 1974)

- A. VCM environmental problems. Major PIC effort has been in this area where six buildings have been involved. In addition to the usual problems of the other PVC plants, special effort was spent in developing parts of the

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health records study. A number of studies comparing employee health, especially precursors of angiosarcoma, have been carried out. Recent work indicates high SGPT and GGTP may be associated with liver fibrosis and angiosarcoma, respectively. Special studies of VCM profiles about reactors during turnaround were conducted as well as studies of VCM levels within reactors after HRC treatment.

- B. Geon resins. G-92 particle size control is a current project.
- C. Hycar dry rubber. Studying Mooney control of Hycar 1041-2 types and way to reduce reaction time of Hycars 1052-3.
- D. Effluent. Study of components in plant effluent found large variability in BOD, COD, total solids, pH. Correlations were weak.

ORANGE -- D. R. Hager

- A. Epcar, 10%. Worked with H. S. Haller and J. C. Schaap in developing and installing improved Mooney control models in the computer. Major improvements in uniformity resulted. Major problem in quick accurate estimation of oil in oil-extended rubber was solved.
- B. CB rubber - 40%. Major effort to resolve high hysteresis problem was completed. Revised manufacturing recipe has assured improved rubber for tire sidewalls. Current studies will try to improve production rates and continue controlling low hysteresis.
- C. SN rubber, 20%. Studied effect of monomer impurities on catalyst efficiency. Current work is concerned with cause of low modulus in rubber for Bandag, Inc.
- D. Lab, 30%. Most work concerned with new rheological testing specs for CB and SN rubbers.

PORT NECHES -- W. J. Mailey (E. D. Thames until June, 1974)

- A. Black Masterbatch. A simulation model enabled the plant to predict composition of rubber meeting new mill-matched Mooney values and to produce the rubber in the first trial run. The model also enabled the plant to optimize oil and black levels in normal production. These moves saved more than \$300,000. Current major effort is to reduce off-grade rubber due to the new chunk Mooney test which is not sufficiently quantified.
- B. Substantial savings in Styrene and Geltrol costs were achieved in a series of moves backed up by statistical evaluation of their effects.
- C. Current other studies in progress include
 - 1. Determining what affects rheometer properties.
 - 2. Identify cause and effect relationships in hot rubber production.
 - 3. Resolve lump problems in 1606 rubber.

PEDRICKTOWN -- Not represented, No PIC Engineer since June, 1974

- A. The major effort in early 1974 was with VCM environmental problems similar to those in other PVC plants.