C. Buehler

J. J. Burbage - GO
C. P. Cunningham - GO
W. R. Corey - GO
H. S. Bergen - GO
C. D. Culberson - GO
R. J. Kozacka - GO
C. W. Roos - GO
G. L. Bratsch

MONSANTO INDUSTRIAL CHEMICALS COMPANY

APPROPRIATION REQUEST

October 4, 1972

TO: C. P. Cunningham
Managing Director

FUNCTIONAL PRODUCT GROUPS

SPECIALTY PRODUCTS BUSINESS GROUP

W. G. KRUMMRICH PLANT

REQUEST NO. 8020

TITLE: Aroclors - Install PCB Off-Gas Scrubber

New Fixed Capital $73,000

A. E. Leisy 10/4/72
A. E. Leisy, General Superintendent

G. L. Bratsch 10/4/72
G. L. Bratsch, Plant Manager

DWM

Approved:

H. S. Bergen, Business Director

W. R. Corey, Group Director

C. P. Cunningham, Managing Director

DSW 250530

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FINANCIAL SUMMARY ($M)

| | |
|---|---|
| New Fixed Capital | $73 |
| Additional Investment | 0 |
| Gross Investment | $73 |
| Expenses: | |
| Start-Up | $ 0 |
| Dismantling | 0 |
| Retirement Loss | 0 |
| Modifications | 4 |
| Repairs | 0 |
| Total Expense | $ 4 |

After-Tax Income Non-Earnings ($13.8/yr.)
Additional Operating Costs

## I. BACKGROUND AND NEED FOR PROJECT

At present, the HCl off-gas from the chlorination process step in the production of Aroclor contains about 15-30 pounds of poly-chlorinated biphenyls(PCB's) per day. The HCl off-gas flows to the chlorosulfonic acid department where chlorosulfonic acid is produced. PCB's in the off-gas are essentially converted to sulfonyl chloride by passing through a scrubber at the acid department. Organics formed in the scrubber are sewered.

Production in the Aroclor and the chlorosulfonic acid departments must be balanced such that excess HCl off-gas from the Aroclor department which contains PCB's not be sewered. The Aroclor operation must be shut down or reduced when chlorosulfonic operations are shut down or reduced because the plant has adopted the policy not to intentionally discharge PCB's into the environment via off-gas sewering into the plant sewer system.

Although no regulation exists at present we believe the Federal Environmental Protective Agency will establish a guideline which will limit PCB in any receiving water stream at 0.01 ppb PCB. One pound of PCB from the department is equivalent to about 0.001 ppb in the Mississippi River.

Sewering off-gas containing 15-30# PCB per day when not producing chlorosulfonic acid would exceed the expected EPA guidelines, and Aroclor operations could not be continued with such an environmental discharge of PCB to the sewer.



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## I. BACKGROUND AND NEED FOR PROJECT(Cont'd.)

This project would provide HCl off-gas scrubbing facilities in the Aroclor department where the PCB content of the HCl off-gas could be reduced to an average value of about 2.5# PCB per day. The Aroclor department could operate independent of chlorosulfonic acid operations. When HCl off-gas would not be required for chlorosulfonic acid production, the scrubbed off-gas from the Aroclor department could be sewered. The amount of PCB discharged to the sewer would be within the expected EPA guideline of 0.01 ppb PCB in the receiving water(Mississippi River).

## II. DESCRIPTION OF PROJECT

This project would provide HCl off-gas scrubbing facilities in the Aroclor department. A 15 plate valve tray column is to be provided with auxiliary scrubber liquor circulating tank and pump. Distilled residue liquor containing the higher chlorinated, low vapor pressure PCB's will serve as the scrubbing liquor. The spent scrubber liquor will be returned to the process for total recycle.

Scrubbed HCl off-gas would flow to the chlorosulfonic acid department, the adiabatic absorber for muriatic production(project in preparation) or to the sewer.

## III. PROFITABILITY

This is a non-earnings project. This project is related to controlling the entrance of PCB's into the environment.

Additional operating costs are $13.8M/yr.

| | |
|---|---|
| Utilities | $ 1,865/yr. |
| Repairs | 4,000 |
| Laboratory | 600 |
| Depreciation | 6,100 |
| Factory Indirect Expenses | 1,275 |
| | $13,840/year |

## IV. ALTERNATE COURSES

Alternate courses that have been considered are:

I. Continue as is by operating Aroclor department in balance with chlorosulfonic acid department. Off-gas passes through scrubber at chlorosulfonic department.

| | |
|---|---|
| Advantages: | No capital required and PCB discharge to sewer at Aroclor department in compliance with expected EPA guidelines. |
| Disadvantages: | Aroclor operation dependent on chlorosulfonic operation. Potential problems could develop |



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## IV. ALTERNATE COURSES (Cont'd.)

if needs were such that Aroclor had to operate to meet sales and chlorosulfonic department could not operate. During past six months the Aroclor department was idle about 25% of the time due to no HCl outlet.

II. Carbon treat HCl off-gas in gaseous phase

Advantages: Could further reduce PCB content of off-gas to essentially zero.

Disadvantages: More costly and exact process not defined.

The above two alternates are not recommended.

## V. CAPITAL ESTIMATE

The estimate is based on installation with plant people. Major equipment cost based on equipment manufacturer's quotation.

Proposed facilities can be installed within six months of approval. Expect to have in operation by 7/1/73.

Project has been reviewed with the Corporate Engineering Department.

## VI. PERSONNEL

No personnel changes are involved.

## VII. POLLUTION AND TOXICITY PROBLEMS

This is a pollution control project. It is a part of the WGK strategy to continue Aroclor production at the W. G. Krummrich Plant indefinitely in such a manner to restrict knowing discharges from the manufacturing department to the lowest technical achievable level.

Reduction of PCB's in the off-gas to essentially zero would be desirable. Based on limited laboratory data it appears that achieving this goal might be technically feasible, however, the economics at this time might not justify such action. Any additional PCB removal facilities beyond what is considered in this project would require this scrubber as a first step in the clean-up facilities.

## VIII. PRODUCTION RISKS AND HAZARDS

This project will not affect the fire or explosion hazards in the department.

## IX. PATENT PROBLEMS

Does not apply.

## X. LEGAL

Does not apply.

## XI. PHYSICAL DISTRIBUTION

Does not apply.

## XII. SUPPORTING SCHEDULES

Project authority for expenditure.

Prepared by: Edward E Stewart
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