

Exhibit VIII

T A S K F O R C E R E P O R T

ON

PYRANOL DISPOSAL

FEBRUARY 1971

REAL ESTATE AND CONSTRUCTION OPERATION
SCHENECTADY, NEW YORK

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TASK FORCE REPORT ON PYRANOL DISPOSAL

PURPOSE OF REPORT

On June 25, 1970 in a letter to Mr. E.S. Weaver, Manager-Real Estate and Construction Operation, Mr. C.J. Meloum, Vice President-Power Distribution Division, recommended the establishment of a Task Force for the purpose of: (1) reviewing the status of plans for the purchase and installation of incinerating equipment for disposing of Pyranol at Company facilities, and (2) examining the Company's needs relating to such equipment in the Northeast. A study to determine the feasibility of utilizing small low-capacity incineration equipment at specific Company locations was also recommended.

A Task Force, comprised of representatives from the Real Estate & Construction Operation, Hudson Falls, Waterford, Pittsfield and the Service Shops was organized in response to the above request. Numerous meetings were held during the last several months between the Task Force representatives, Monsanto Company personnel and other potential contractors outside of the General Electric Company in an effort to describe and analyze the overall needs. The assignment proved to be unusually time consuming due to the magnitude of the problem, lack of sufficient technical data on specific materials, and the difficulties and uncertainties involved with obtaining firm quotations for acceptable disposal services outside the Company.

Although all pertinent information regarding designs and construction costs have not been generated, the Task Force feels that sufficient information has been obtained to make certain recommendations and submits the following encapsulated report. Additional support data not included herein remains in Real Estate & Construction Operation for those interested.

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RECOMMENDATIONS

1. HUDSON FALLS-FORT EDWARD, N.Y.

Liquid Pyranol - Continue shipments of spent liquid pyranols to The Rollins-Purle Company for disposition until the economics favor either another contractor; shipment to Waterford or disposition in a new facility at Hudson Falls. (Liquids containing PCB's - 52,000 gal/yr.)

Contaminated Solids - A potential problem of incinerating aluminum wound capacitors filled with Pyranol has been identified. There is reason to believe that violent reactions may occur between fresh aluminum surfaces reacting with chlorinated hydrocarbons during the incineration process, consequently further study is recommended. Results might very well demonstrate compatibility with the proposed Pittsfield design. In the absence of such data, however, the design and construction of a disposal facility at Hudson Falls is recommended due to unique waste character and the large volume of wastes involved. (1,500,000 lbs. of trash impregnated with PCB's)

2. SERVICE SHOPS

Liquid Pyranol - Continue to dispose of liquid Pyranols by shipment to the Monsanto Company until some other contractor demonstrates technical capability at acceptable prices. At that time, examine the reasonableness of continuing with the Monsanto Company. (Liquid PCB's - 33,335 gal/yr.)

Portable incineration for Service Shop application is not considered economically feasible at this time.

Contaminated Solids - Solid wastes from the Service Shops are comparable to those generated at Pittsfield and are therefore amenable to decontamination in the proposed Pittsfield facility. We recommend that contaminated solids be stored at the individual Service Shop sites until late 1971 when the Pittsfield system is expected to be available. (Solid PCB's - 109,200 lbs/yr.).

A jointly funded (Apparatus Service Business Division and Medium Transformer Department) bench top experimental program to determine other methods of removing Pyranol from contaminated solids for long term application is recommended.

3. ROME, GEORGIA

Liquid Pyranol - Continue to ship spent liquid Pyranols to Monsanto Company for incineration until the economics favor another contractor. The Waterford facility can be expected to provide back-up capabilities late in 1972. (Liquid PCB's - 5,000 gal/yr.)

Contaminated Solids - Materials are compatible with the proposed Pittsfield facility. Continue to store contaminated solids on-site in sealed drums until late in 1971 when the Pittsfield facility is expected to be available (Solid PCB's - 20,000 lbs/yr.)

4. PITTSFIELD, MASS.

The recommended program for the Pittsfield complex lies in construction of an on-site facility to handle all incinerable wastes generated at Pittsfield as well as handling contaminated solids from the Service Shops and Rome, Ga. The facility should accommodate Pyranol contaminated waste liquids, solids, and recoverable copper as well as other incinerable liquids. A facility is expected to be operational late in 1971 and is considered necessary due to the particular needs associated with copper recovery. (Liquid PCB's - 225,000 gal/yr; Solid PCB's - 118,000 lbs/yr.)

5. WATERFORD, N.Y.

The recommended solution to the Waterford problem continues to be the construction of an on-site facility to handle all solids, liquids and sludges generated at Waterford. Sufficient capacity will be incorporated into the Waterford design to handle the spent liquid Pyranols from Hudson Falls, Service Shop, and/or Rome - if the subsequent analyses prove desirable. Chlorinated bi-phenyls represent only about 4 percent of the total waste stream at Waterford. Present plans call for an incinerator to be operational during the second quarter of 1972. Design requirements differ significantly from those at Pittsfield, consequently there is no apparent advantage in centralizing the disposal of waste generated at Waterford and Pittsfield. (Liquid PCB's - 85,000 gal/yr.)

INDIVIDUAL PLANT PROGRAMS

HUDSON FALLS, FORT EDWARD, N. Y.

The PCB pollution problem facing the Industrial & Power Capacitor Department's operations in Hudson Falls and Fort Edward, New York has been summarized by N.O. Vonsild into the following categories:

1. Pyranol contaminated and not reclaimable by known methods.
2. Liquid and solid indirect materials contaminated in lesser or higher degrees with Pyranol.
3. Direct materials failing to meet Q.C. standards, contaminated with Pyranol but with some salvage value.
4. Direct materials failing to meet Q.C. standards, contaminated with Pyranol without any salvage value.

After improvements in processes, equipment, and facilities, the following quantities of liquid and solid PCB contaminated wastes remain for treatment:

<u>WASTE</u>	<u>Quantity/Year (Gal.)</u>
Contaminated Pyranol	26 000
Pyranol contaminated materials	20 000
Pyranol contaminated materials	
Pyranol contaminated materials	5 000
Pyranol contaminated materials	
Lab. & Q.C. Samples & Waste (High content of Pyranol)	1 000
<u>TOTAL LIQUIDS</u>	<u>52 000 Gal.</u>

	<u>Quantity/Year (Lbs.)</u>
Failed Capacitors (Drained but saturated with Pyranol)	1,500,000
Winding (Alum. Foil, Polypropylene, Paper) Wrapping, Terminal Covers	

<u>WASTE</u>	<u>Quantity/Year (Lbs.)</u>
Fullers Earth (Filters)	7 500
Alumina (Filters)	1 000
Speedy Dry (Floor Compound)	20 000
Miscellaneous	<u>5 000</u>
TOTAL SOLIDS	1 533 500 Lbs.

SERVICE SHOPS

This section contains a brief summary by R.C. Osthoff on the possibility of utilizing a "portable" Pyranol incinerator at the Service Shops. Usage and, hence, disposal requirements have been summarized by D. Thomas as follows:

PYRANOL GENERATION IN SERVICE SHOPS BY LOCATION

	<u>Gal/Yr.</u>		<u>Gal/Yr.</u>
Philadelphia	1750	Albany	980
Chicago	2400	Pittsburgh	4350
Charleston, W. Va.	2850	Atlanta	1100
North Bergen	3650	Jacksonville	820
Richmond	1070	Milwaukee	730
Houston	1260	Baltimore	1000
Charlotte	2400	Oakland	725
New Orleans	1200	Los Angeles	830
Kansas City	1700	Detroit	1000
Medford (Boston)	1200	Buffalo	970

TOTAL = 33,335 Gallons per year.

For consideration of a single "portable" unit to handle this load, the following assumptions were made:

Out Time for Portable Incinerator

Vacations, Holidays, etc.	4 weeks
Travel Time	8 weeks
Set-up	4 weeks
Start-up Times	4 weeks
Maintenance	<u>1 week</u>
TOTAL	21 weeks

- (a) Assuming a one-day set-up time at each location.
- (b) Assuming two shifts for set-up and start-up.

Therefore, 31 weeks of actual operation time are available. It is unlikely that more than a two shift operation could be sustained in the typical shop. (Private communication--D.J. Thomas, October 23, 1970). At best, there could be $31 \times 16 \times 5 = 2680$ hours per year of actual Pyranol incineration. Since, in the Service Shops, relatively pure Pyranol will be generated, it would be necessary to add a combustible material such as kerosene to attain sufficiently high flame temperatures in the combustion chambers and insure conversion of Pyranol to CO_2 , H_2O , and HCl . This corresponds to an incineration unit of about 150 pounds per hour of Pyranol capacity. When allowance is made for the necessary dilution with kerosene, a 600 pounds per hour unit is in the appropriate ball park to do the job based on the assumptions detailed above. J. Thayer has refined his calculations for the Service Shops application and these are detailed below:

COSTS

Incinerator Unit	\$ 100K
Trailer	<u>20K</u>
Total Cost - Mobile Unit	\$ 120K

At each Service Shop location, the following would be required:

- 1) 50 foot stack and scrubber for incinerator (investment and expense at each location - \$30K each) = \$ 630K.
- 2) Fuel - natural gas or fuel oil, steam, electric power, water (about 4" line), compressed air.
- 3) Tank capacity to store about one year's supply of scrap Pyranol (assuming mobile unit tours country once per year).

Assuming that the service facilities and space were available at each of the locations, a total investment and expense budget would approximate \$750K to implement the plans for a mobile disposal unit.

The annual expense of operating the mobile unit is estimated as follows:

2 Driver-operators	\$ 50K
Maintenance	20K
Fuel and other services provided at each site	<u>35K</u>
Total Costs	\$ 105K
Depreciation	<u>75K</u>
Total Annual Operating Cost	\$ 180K

* Based on three shift operation, but at 50% level at night. Approximately 16 hours per day full operation.

On the other hand, to have the scrap incinerated by an outside contractor, for example, Monsanto Company, the costs are estimated as follows:

Monsanto incineration	3.0c lb/year
Freight (average)	3.5c lb/year
Drum Cost	<u>1.3c lb/year</u>
Total	7.8c lb/year
Estimated labor cost	<u>10.0c lb/year</u>
Total Incineration cost	17.8c lb/year

Total cost for Service Shops - \$77,172 based on 433,355 pounds per year of scrap Pyranol generated.

Therefore, the scheme for a portable incinerator is not an attractive alternate based on the cost aspect alone. Additional negative features are summarized below:

- 1) Most of the Service Shops locations do not have either the space or the services required to operate the portable unit.
- 2) The stack height must conform to local regulations and may be greater than 50 feet (with appropriate costs) in some locations.
- 3) The HCl generated must be disposed of in water by dumping in the local sewer system. Additional investments would be required for neutralization.
- 4) The intermittent nature of the Service Shops operations and the adverse effects of this on the refractory system would substantially reduce the design life specified by the vendor.
- 5) It will be necessary to obtain permission to incinerate at the approximately 20 locations.
- 6) Monitoring of the effluent must be provided to substantiate the satisfactory operation of the unit. This requires additional expenditures and perhaps the development of portable instrumentation.
- 7) Very little utility demand for Pyranol disposal service can be expected (private communication---J.J. Frederickson, Manager-Marketing, Power Transmission and Sales Division).

PITTSFIELD

This section contains a brief summary by J.H. Thayer of the Pyranol disposal problem at Pittsfield.

Pittsfield operations generate 2,262,000 pounds of Pyranol contaminated liquid waste each year. This total consists of 162,000 pounds of Aroclor and approximately 2,100,000 pounds of contaminated 10-C, vapor phase and pump oils.

Pyranol contaminated solids consist of 40,000 pounds per year of miscellaneous solids (rags, fullers earth, etc.) as well as 78,000 pounds of scrap transformer core and coils. The latter materials pose an additional requirement - the removal and destruction of contaminated insulation, herkolite, wood, etc. leaving the copper components suitable for sale as scrap.

In addition to the foregoing Pyranol wastes, other incinerable liquid wastes approximating 880,000 pounds per year require disposal.

Research and development efforts over the past year, in conjunction with the John Zink Company and Monsanto Company, have established that a retention time of three seconds and a temperature of 2000°F are required for proper incineration of Pyranol. The most desired incineration scheme would include a liquid waste burner with an auxiliary for solid waste disposal. It is estimated such a complete waste disposal system at Pittsfield with appropriate waste handling facilities would cost approximately \$300,000.

Centralized Disposal at Pittsfield

To evaluate the feasibility and associated costs of centralizing disposal of solid wastes at Pittsfield, the following appraisals were made:

Service Shops:

Based on data submitted by D.J. Thomas, the Service Shops will require the processing of an estimated 109,200 pounds of scrap core and coil units per year. The net combustible insulation from these units is estimated at 430 pounds per week.

This loading can be processed by the proposed Pittsfield System at the following estimated cost, not including transportation:

Operating Cost	- \$ 12,000/year
(Including handling, on-site preparation, etc.)	

Investment Share	- Yet to be determined
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In burning the coils, the copper would be raised from a Class 4 scrap to a Class 2. The net effect would be an added return of \$16,500 per year over its present scrap sales value. It would be possible to recycle this material to the copper pool as a credit to Pittsfield and partially cover the costs of processing, handling and shipping the finish scrap.

Rome:

Contaminated solid wastes from Rome are reported by T.E. Bethel to approximate 20,000 pounds per year of miscellaneous solids, i.e. fullers earth, rags, paper and wood. While this material can be burned in the solid waste auxiliary of the type under consideration at Pittsfield, it is more adapted to a rotary kiln type of unit. The small volume involved, however,

can be handled by the proposed Pittsfield system. The estimated cost, not including transportation is estimated as follows:

Operating Cost	- \$10,000/year
Investment Share	- Yet to be determined

Hudson Falls:

Data submitted by J.E. Donnelly reveals the total solids problem at Hudson Falls to be principally scrap capacitors, generated at a rate of 30,000 pounds per week.

For the purposes of initial analyses, it has been assumed that these solids can be incinerated without extraordinary hazard. However, correspondence between R.C. Osthoff and G.E. Moore documents concern with the potential reaction between chlorinated organic materials and aluminum, which is common to these capacitors. This possible safety hazard should be resolved.

If incineration is the proper course of action, this can be accomplished by:

- (1) Expansion of the Pittsfield incinerator.
- (2) An on-site incinerator at Hudson Falls, capable of handling trash and scrap capacitors.
- (3) Contract incineration with an outside firm.

Alternate (3) has possibilities; Rollins-Purle, Monsanto and others are interested in contract incineration. At this point in time, however, no one has demonstrated the required capability. Due to the special requirements for the destruction of PCB's, this alternate does not look promising.

Alternate (1) does not appear to be a desired course of action. The capacitors can be mechanically shredded and substantially oxidized in a rotary kiln type of incinerator. The effluent from the rotary kiln can be subsequently passed through the liquid waste oxidizer to satisfy the requirements for destruction of the PCB's. Pending pilot burning, sizing of the oxidizer is a matter of conjecture. In any event, this would require the addition of a waste handling area, a rotary kiln auxiliary and a substantial increase in the liquid oxidizer size to accommodate the additional loading.

Estimates of costs for Alternate (1), less transportation, are as follows:

Operating Cost	- \$ 1600/Week
Investment	- \$ 300,000

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Alternate (2), on-site incineration at Hudson Falls, involves essentially the same functions as Alternate (1). Required are the waste handling area, rotary kiln and an afterburner for PCB destruction. Considering the waste load volume and characteristics, this would be a more efficient arrangement. Enlarging the Pittsfield unit to accommodate a load of this magnitude would decrease overall efficiency and increase the investment costs.

Estimated on-site costs:

Operating Cost	- \$ 1600/Week
Investment	- \$ 250,000

WATERFORD, NEW YORK

This section reports upon the total solid waste disposal problem at Waterford based upon information submitted by D.J. Bowden.

This particular problem is unique in that the waste materials differ considerably from those at other Company locations and only about 4 percent of the total waste problem is related to chlorinated bi-phenyls. Current plans are to have the incinerator operating during the second quarter, 1972.

The following materials will have to be incinerated at Waterford:

<u>Waste Material</u>	<u>Pounds/Yr.</u> <u>(000)</u>
Liquid Silanes and Centrifuge Cake	4 000
Non Polar Neutral Solvents	14 000
Aqueous Polar Acidic Solvents	24 000
Semi Solid Filter Cake	7 000
Plant Trash	8 000
	57 000

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Pittsfield	- R.C. Osthoff, J.H. Thayer, E.C. Hoffman
Service Shops	- W.C. Kernahan, D.J. Thomas
Rome	- T.E. Bethel
Research & Development Ctr.	- G.E. Moore

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PITTSFIELD

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