

GE's HART inspects affluent monitoring equipment at Hudson Falls, N.Y., plant.

GE pushes to the limit on PCBs

Holding basins, activated-carbon treatment are major additions to capacitor plant cleanup drive to meet proposed EPA standard

Late last month the Environmental Protection Agency proposed stringent standards for polychlorinated biphenyls in waste water—zero discharge from manufacturing processes and 1 part per billion (daily average) from nonprocess areas. Yet, Lucas P. Hart, Jr., general manager of General Electric's beleaguered capacitor manufacturing plants at Hudson Falls and Fort Edward, N.Y., is confident of meeting the standards.

The two GE units are among 19 capacitor plants throughout the U.S. that use some 20 million lbs./year of PCBs as dielectric fluid to prevent electrical breakdown in the equipment they turn out. In addition, transformer manufacturers and Monsanto, the sole U.S. producer of PCBs, will be faced with meeting the standards, which were published in the July 23 *Federal Register*.

The two GE plants gained considerable attention when New York state's Dept. of Environmental Conservation ordered the company to reduce discharges of PCBs to zero by September 1976 after fish in the Hudson River were found to contain levels of the materials exceeding the Food and Drug Administration's 5-ppm. limit (*CW, Sept. 17, 1975, p. 19*). GE is fighting that order and is still awaiting final recommendations from the state hearing examiner.

Previously, the company had obtained a permit from the state (in December 1974) permitting discharge of up to 30 lbs./day of PCBs into the river. Then in August 1975 the state changed its PCBs limit to 1.5 lbs./day after high levels of the materials were found in fish and in silt dredged from behind the Fort Edward dam by the Corps of Engineers.

The state has now accepted GE's plan for cleaning up the discharge from the two plants. Still at issue: GE's indemnity for damages and the extent to which the river bottom must be cleaned up.

Renovation Effort: GE has already reduced PCBs discharge to 12 oz./day, partly as a result of a $12-million renovation effort at the two plants, which are less than three miles apart on the Hudson River north of Albany. And $5 million will be spent on waste-water control that will reduce the discharge of PCBs to less than 1 oz./day.

The control problem doesn't seem too difficult at the Hudson Falls plant, where a closed PCBs delivery system has been built and large industrial capacitors are filled by a closed manifold system.

But the Fort Edward plant, which consumes 80% of the 8 million lbs./year used by the two plants, operates under more difficult conditions. The small capacitors made at the plant for lighting fixtures, air conditioners and small motors are filled with 0.1-3 lbs. of PCBs. Previously, the capacitors were loaded into cases, which were flooded. Now an automatic system is used. And although it is not a closed system, Hart says, "We have very little loss of PCBs now."

The capacitors are filled in two stages. First, a vacuum is produced, then mechanical pumps flood-fill the units. Overflow PCBs run into a pit.

Much of the Hudson Falls cleanup has resulted from reducing the number of discharge points from nine to one. GE found that most of the PCBs runoff was from old drainage and ventilation systems buried when the plant, which had been used to make paper boxes, was converted to capacitor manufacture.

New Plans: Some cooling towers will be added to reduce use of river water. Impoundment basins will cut discharge to the river from about 1.8 million gal./day of treated water to 150,000. And an activated carbon treatment system will eliminate the PCBs from the waste water.

The impoundment basins—400,000-gal. capacity at Hudson Falls, 1.8 million gal. at Fort Edward—will be 15-18 ft. deep and lined with bentonite. The basins will act as clarifiers. The waste water will then pass through a diatomaceous earth prefilter and flow downward through two 8-ft.-high, 10-in.-diameter activated-carbon columns in series. Total contact time will be 45 minutes.

Robert Marquis, GE engineer in charge of the PCBs cleanup, estimates that 80,000 lbs./year of activated carbon will be consumed. GE will rent the activated carbon system from Calgon for $160,000/year. Calgon will run the unit for the first six months, train GE personnel and regenerate activated carbon.

"Lots of equipment suppliers have asked for samples of our wastes to see if they could clean them up, but none has been as good as the activated carbon system," says Hart. In a pilot-plant test last year the Calgon system cut PCBs level in the effluent to about 0.0027 lb./day.

Meanwhile, Hart says, the days of PCBs are numbered. "Logic no longer applies to this situation. We will be out of PCBs use by 1978," he adds.

Hart maintains that PCBs are still the "best material for the job and probably less of a health hazard than running the risk of fires with some substitutes." GE has already shipped electrical equipment to Japan, which has banned PCBs, filled with its own phthalate ester substitute, called Econol. And it will probably shun substitutes recently developed by some chemical companies (*CW, Dec. 10, 1975, p. 18*). It is developing a new material, reportedly in the ester family, called only by the code number 1131.

And GE says its cleanup system should be able to operate as well no matter what PCBs substitute the company eventually turns to.

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