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TOXIC LEAKS

Silicon Valley's electronics industry has finally lost its undeserved reputation as a clean, light industry. When residents in a South San Jose neighborhood near a Fairchild Semiconductor plant heard this January that a toxic solvent from the plant had leaked into their water supply, they quickly associated the exposure with what appeared to be a cluster of birth defects on babies born of women living in the neighborhood. Authorities are still studying possible links, and given the numerous materials in our environment which can increase the risk of birth defects, it may be impossible to prove that the trichloroethane (TCA) was the cause. But the story caused an outcry which has opened up a Pandora's box of previously unreported problems.

Shortly thereafter, officials closed a private well in Mountain View, in the heart of Silicon Valley, after it was discovered to be contaminated with the more toxic relative of TCA, trichloroethylene (TCE), also apparently from an industrial leak.

It turns out, reports the Regional Water Quality Control Board, that a large number of electronics companies store toxic chemicals in underground tanks. Several companies, including Intel, Fairchild, IBM, Hewlett-Packard, and Micro Metalics (a recycling firm that

serves the electronics industry) have accidentally released toxic chemicals into the environment. Subsequent to that report, Signetics, concerned by the reports of leaks elsewhere, discovered a major leak of TCE at its Sunnyvale facility. Ironically, most of the spills have been detected at large companies, generally believed to be more environmentally responsible than smaller firms.

Public officials are now calling for increased testing of water in Silicon Valley. Industry spokesmen profess concern over the problem as well, and they are proposing changes in the Uniform Building Code to prevent such leaks in the future.

S. KOREA WAFERS

The South Korean government has approved its first plant to supply silicon wafers to the semiconductor industry. The venture, jointly owned by Samchok Industrial and Monsanto, should begin operation in 1983. With a capacity of 29 million square inches annually, the plant is designed to make South Korea self-sufficient in wafer production. The plant will cost about US\$21 million to build. (*Electronics News*, December 21, 1981). Presumably Monsanto will supply the raw silicon from its U.S. plants.

INDUSTRIAL HEALTH

CAL/OSHA, the State of California's Division of Occupational Safety and Health, has released the results of a survey of semiconductor plants in Silicon Valley. Though the report, "Semiconductor Industry Study - 1981," contains detailed information about the potential exposure of workers to hazardous materials and a toxicologist's summary of the dangers, the survey concluded that hazards are well controlled. It identified only one common process, the production of gallium arsenide light-emitting diodes (LED's) as particularly hazardous. It also warned that accidents and equipment breakdowns could also be dangerous.

The survey found that employers generally followed safe production procedures, and that the need to protect semiconductor wafers from particulate contamination has caused companies to build large, effective ventilation systems. The report warned, however, that "false perimeter facades on most semiconductor fabrication facility roofs tend to promote eddy currents at roof level, which under certain meteorological conditions, could create the potential for contaminant re-entrance into the general air handling system." This is not considered a major problem, but it is ironic that the architecture which has given electronics the image of a clean industry - that is, without smokestacks - may indeed be responsible for health hazards.

In conducting the survey, CAL/OSHA identified about 60 semiconductor firms employing more than 42,000 employees in Silicon Valley in 1980. Forty-two manufacturers responded to a CAL/OSHA questionnaire, and the CAL/OSHA task force reviewed health records, past inspections, and other data. Then it conducted on-site inspection at 13 plants.

Labor organizers immediately attacked the CAL/OSHA report as a whitewash. The United Electrical Workers, for instance, listed

ten methodological shortcomings. Most significant, it noted that the task force did not consult with unions or with workers who had made complaints about health problems. Workers were interviewed on the job, frequently in the presence of supervisors.

Second, the UE charged (February 1, 1982 press release), "Plants studied were selected by the Industry itself to showcase sites it would permit to be inspected. Industry cooperation was rewarded with advance screening of the report before release. CAL/OSHA specifically refused to allow workers, unions, or other interested tax-payers who helped finance the study, to review the report prior to its official public release."

INDONESIA

In Indonesia, the electronics industry is primarily involved in the assembly of consumer electronics. Sixty-one plants, 90% of which are in the capital city of Jakarta, assemble radios and televisions. Well known companies include ITT, Neutron, Grundig, Senator, Sharp, Sony, Galindra, Hitachi, Polytron, National, Toshiba, Teac, JVC, Philips, Sanyo, and Crown. Indonesian sources supply only about 35% of the components and materials used in the production of black-and-white TV's and 25% used to make color sets.

Only two semiconductor firms operate assembly plants in Indonesia. Fairchild and National Semiconductor, both headquartered in Silicon Valley, have subsidiaries in Jakarta and Bandung, respectively. **Indonesia Development News** (December, 1981) reports that both companies export all their output. "The combined value of their exports rose from US\$23.73 million in 1978 to \$74.79 million in 1979 and \$94.01 million in 1980." (The report does not say how much of that increase represents value added in Indonesia and how much represents the increased value of imported wafers and materials.)

HONG KONG HEALTH

Hong Kong's electronics industry employs about 90,000 workers. **Voices** (January-February, 1982) reports that after twenty years, "workers are beginning to discover the potential hazards they are exposed to." **Voices** cites two surveys.

The Hong Kong and Kowloon Electronics Industry Employees General Union conducted medical check-ups on 800 electronics workers in late 1981. It found that 45% of those checked had myopia and other eye problems, 15% had gastro-intestinal disorders, 13% had bronchitis, 11% had anemia, and 10% had nasal problems. The union surveyed electronics factories, and found that less than 12% had any medical facilities or health service.

Another study of 75 workers, conducted by a community clinic in Hong Kong, showed that 90.2% of the workers who used microscopes suffered from eyestrain. 23.5% had double vision. 60.8% reported deteriorating eyesight. About 20% of the workers in noisy factories reported deteriorating hearing. 20% also reported problems in respiration.

The second survey also found problems among workers who contact chemicals such as organic solvents. 48.7% reported deteriorating eyesight. 35.5% suffered from frequent sore throats. 25% had running noses. 43.3% suffered backache. 25% reported insomnia.

Overall, 47.5% of the workers had "constant headaches." 38.8% reported frequent drowsiness. 38.8% reported deteriorating eyesight. 38.3% suffered pain in their arms and legs. 31.7% suffered from dizziness. 30.6% had frequent backaches.

The clinic study blamed working conditions for most of the problems. In addition to the obvious physical conditions, it criticized the stress created by the quota system and the long hours of overtime. Finally, the clinic found that only three of the workers it checked had received physical exams either before or during employment.

PUERTO RICO

Fomento, the Puerto Rico Economic Development Administration, has released a study of that island's electrical and electronics industries. The survey counts 168 companies in those sectors (SIC classifications 361 through 369), including 143 owned by U.S.-based firms. Ten more firms, including eight from the U.S., are planning to start production soon.

Numerous firms operate more than one plant in Puerto Rico. Westinghouse leads the list with 25, followed by GE with 21. GTE operates 14 facilities, while Motorola ranks fourth with six.

Electrical equipment and electronics is the third largest manufacturing industry, measured by employment, in Puerto Rico. In October, 1979, it employed 17,335 workers, or 11% of the Commonwealth's manufacturing workforce. Most of those workers (15,255) worked directly in production.

The two busiest sectors (measured by three-digit Standard Industrial Classification) are Electrical Transmission and Distribution Equipment (SIC 361) and Electronic Components and Accessories (SIC 367). In October, 1979, the former employed 5,178 people, including 4,601 production workers. The components sector employed 3,997, including 3,549 in production.

Though Puerto Rico offers investors tax exemptions ranging from 10 to 25 years, depending upon location, wage rates are not as low as other offshore locations. U.S. Federal minimum wages levels, currently \$3.35 per hour, apply in Puerto Rico. Nevertheless, the 1980 average hourly wage of electronics and electrical workers in Puerto Rico was \$4.29, compared to \$7.19 in the U.S. The report's table on typical wage rates, however, indicates that the wage differential within particular job classifications may not be so great - at least when compared to non-union branches of the U.S. industry. (**Puerto Rico Business Review**, November, 1981)

FRANCE

Datar, the French government's regional development agency, has published a series of articles in its September, 1981 newsletter to reassure foreign investors that the new Socialist government still welcomes foreign ventures in high technology industry.

The report describes the government's commitment to a public-private partnership in advancing "telematics," the convergence of telecommunications and data processing. It cites a high government official who asserts that France is second, behind the U.S., in software and computer services.

Datar list the top foreign-owned electronics firms in France. The Dutch firm Philips employed 30,400 workers in 1979. IBM, with 21,000 employees, led foreign-owned companies in sales with 1979 turnover of 12,480 million francs. ITT's workforce totalled 12,000. Burroughs (2,200), Motorola (1,950), Texas Instruments (1,570), and Hewlett-Packard (1,350) rounded out the top seven. NCR's computer operation employed 1,660, but NCR does no manufacturing in France.

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