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## Industry incidents often unreported

The number of chemical accidents in the semiconductor industry — while believed to be small — is not known. Local, state and federal regulators largely rely on companies to report their own incidents. They do not have to report all incidents, only those of certain sizes.

Skill, the General Accounting Office, the investigative arm of Congress, in a 1996 report, noted "significant evidence" that spills in all industries are underreported.

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The national databases reviewed for this series did detail 48 incidents between 1993 and 1997 at semiconductor companies.

Employees were evacuated four times. Evacuations occur much more often than the database notes, consultants and industry officials say.

Here are some incidents included in Environmental Protection Agency and Occupational Safety and Health Administration databases and local fire department records:

**September 1997.** Eugene, Ore., fire officials find the McCracken Moving & Storage warehouse illegally storing 11,800 gallons of chemicals bound for Hyundai Semiconductor. The chemicals, including hydrofluoric and phosphoric acid, are in 55-gallon drums and are considered extremely hazardous. If they leak, McCracken Moving has no means to contain the leak. Buildings storing such chemicals are supposed to double-contain them. That means the drums should be inside bigger drums or tanks that would catch leaks. McCracken says it was unaware.

"We're warehouse people, not chemists," Vice President Bob Russell says.

**August 1997.** 219 5-foot cylinders of silane gas, used to insulate circuit layers on chips, ignite while stored at Matheson Gas Products in Newark, Calif. One cylinder leaks and starts the fire. The heat causes other cylinders to release gas, fueling the fire. Forty-five cylinders of other nontoxic gases explode. Some become flying missiles. One crashes through a building. A plume of white and gray smoke rises 500 feet and moves over heavily populated areas near San Jose. Several businesses are evacuated. Several

**June 1997.** A reddish-brown plume comes out of an exhaust stack at a Sumitomo Sitix plant in Phoenix. Later that month, a white plume comes from the same stack. Sumitomo investigates both incidents and adjusts pollution-control equipment to get rid of the plumes. Neither incident results in emissions above permitted levels. Sumitomo is still testing ways to get rid of a rotten-egg odor sometimes emitted. In June and August, the plant was cited eight times for violating air-pollution regulations. Among other things, it failed to submit operation, maintenance and test plans for pollution-control devices.

**November 1996.** Massachusetts fines Digital Equipment \$19,000 because its 2-year-old pollution equipment fails to work on an addition to its 20-year-old chip plant in Hudson, Mass. Over seven days, the plant emits almost 700 pounds of volatile organic compounds, which create smog. If equipment had worked, only 7 pounds would have been emitted. Digital spends \$1.2 million to replace the unit.

**October 1996.** An 80-pound cylinder of deadly phosphine gas, mixed with hydrogen and argon, leaks while on a truck near Stafford, Texas. At chip plants, such gases must be inside gas cabinets so leaks don't spread. But double containment is not the rule when gases are in transit. Some industry consultants say that's an added hazard. The Department of Transportation disagrees. Double containment has never been deemed necessary because of the ruggedness of the cylinders, says Alan Roberts, associate administrator for hazardous materials. "We think the safety record is such that there is not cause for great alarm."

**June 1996.** A worker at California Micro Devices in Tempe, Ariz., releases an unknown quantity of hazardous materials, including dichlorosilane, which can irritate respiratory tracts, skin and eyes, to the atmosphere. He does so by improperly purging gas lines during a plant shutdown, a Tempe fire department report says. Twenty-foot flames spike off the roof, spewing pollutants far enough that four workers watching from a nearby plant become dizzy and are taken to the hospital. The worker doing the purging, investigators say, was unaware of the dangers. Since then, the company has improved training and put in equipment so that the situation does not happen again, the company says.

**June 1996.** Ten people are sent to the hospital and released after a 30-gallon tank of acid splits open in the basement of the Mitsubishi Silicon plant in Salem, Ore. The tank was new and probably had a stress fracture, Mitsubishi says. About 30 workers are evacuated. No injuries are reported. The employees are exposed to clouds of nitric acid and hydrofluoric acid, which are dangerous to sinuses, eyes and respiratory systems.

**October 1995.** Fire officials in Fremont, Calif. — which is in the crowded, earthquake-prone San Francisco Bay area — find a tank of skin-burning hydrogen chloride on a semitrailer outside a Sumitomo Sitix Silicon plant. The chemical is piped into the plant. The trailer's tires are secured only by blocks. "If the big one had hit, the trailer could have easily rolled away from the pipe and this toxic cloud would have moved over the community," says Jim Butera, who did the 1995 inspection. The tank is now secured with steel seismic braces. Sumitomo says the city approved the tank seven years earlier, and that the tank had automatic shut-off valves that would have activated if the trailer had pulled away.

**July 1995.** Seventeen workers at a Fujitsu Microelectronics plant in Gresham, Ore., go to the hospital, some with sore throats, headaches and dizziness, after 2 to 5 gallons of hexamethyldisilazane overflows onto the floor. The accident occurs when a worker replaces an empty tank with a full one. A valve inside the machine is left open, allowing the chemical to flow. Since then, Fujitsu Vice President Richard Romano says equipment has been fixed and training improved.

**January 1994.** A faucet mistakenly left open allows 90 gallons of diluted sodium hydroxide to flow into a creek near the NEC Electronics plant in Roseville, Calif. The chemical contaminates the creek for a quarter mile and results in fish and amphibian deaths. It takes three months for the creek to get back to normal. NEC is fined \$25,000. The creek has not been affected since, the company says.

*By Julie Schmit, USA TODAY*

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