Miscarriages high for some Digital workers

By Bruce D. Butterfield
Globe Staff

Female production workers at Digital Equipment Corp.'s large semiconductor plant in Hudson have suffered significantly more miscarriages in the last five years than women workers not exposed to processes used in making computer chips, a study commissioned by the company has found.

In one principal area of production, the level of miscarriages was twice that of nonproduction female workers.

The study, conducted by the University of Massachusetts' School of Public Health and the first of its kind in the computer industry, also found "statistically significant" increased levels of headaches, nausea, and rashes reported by production line workers.

But no evidence of a wide range of other potential health disorders the study looked for, including birth defects, was detected among the high-tech workers, researchers said.

Massachusetts-based Digital confirmed the results of its study this week, and said it immediately passed along the findings to all its production-line employees and to computer chip manufacturers nationwide.

"We've kept our employees informed all along," said Jeffrey Gibson, a Digital spokesman. He added that the company, following a policy adopted before the study was completed, is "encouraging" workers to leave the production line if they are pregnant and take other work within Digital.

As a further precaution, Gibson said Digital is also offering to transfer any female production worker of child-bearing age to nonproduction work if they have concerns about future pregnancy.

Both Digital and the authors of the study stressed that the link between production-line work and increased miscarriages was a statistical one only and that no "causal" relationship between the health of workers and specific chemicals used in making computer chips had been established.

Nonetheless, the findings of the study have possible broad implications for the computer chip industry. There are more than 55,000 workers engaged in the production of computer chips in America, according to the industry, and the majority are believed to be women.

The Semiconductor Industry Association, headquartered in the Silicon Valley south of San Francisco, said Digital sent it a summary of the findings and that the information was passed along to 60 of its computer chip manufacturers.

"The reaction (of manufacturers) was that the firms all felt an obligation to communicate the information about the study to their employees," Sheila Sandow, association spokeswoman, said.

She added that the industry is concerned about the "obvious issues" raised by the study, but said there have been no major changes in employment practices or calls for them by employees until additional information about the study is received.

The full study – conducted by Harris Pastides, an associate professor of public health at UMass-Amherst, and Edward Calabrese, a professor of toxicology – has not yet been released and is still going through review before publication in a medical journal.

But Digital officials said they received a copy of the study last month, and felt – along with its authors – a responsibility to release at least a summary of the findings immediately to employees and the industry in general because of the health concerns.

Of Digital's nearly 2,000 workers at the Hudson semiconductor plant, the UMass health study surveyed 744. Of that group, 294 were production-line workers and the remainder a so-called "control" group of nonproduction workers.

The study, based on the history of the workers at the plant for the last five years, was designed to measure a wide range of possible health problems among both women and men. In all, 471 female workers were studied and 273 male workers.

Among pregnancies that occurred in the control group, the study found that 18 percent resulted in miscarriages – similar to what would be expected in the general population.

The incidence of miscarriages among production workers involved in what is known as photolithography, however, was found to be 29 percent. UMass researchers say a variety of solvents are used in this process, which essentially involves the printing of circuits on computer chips.

In a second phase of production, meanwhile, researchers say they found a miscarriage rate among female workers of 39 percent – twice that of the control group or what may be expected in the general population.

This phase of production is where a variety of acids are used in an etching process.

Pastides said the 29 percent rate among production workers was higher than expected, but that the sample size was not large enough to achieve statistical significance.

Among workers in etching, or so-called diffusion production work, however, the doubling of the miscarriage rate was statistically significant. Further, Pastides said the study was constructed to rule out such things as smoking and drug abuse as accounting for the elevated miscarriage rate.

The UMass study, meanwhile, looked for and found no evidence of elevated rates of high blood pressure, cancer, and lung disease among workers. More notably, among women workers, the study found no evidence of increased incidences of birth defects or infertility.

Digital said it planned to continue to study the workers at the Hudson plant, and added that it hoped other semiconductor manufacturers would pick up the ball with further studies. "Further study is needed," agreed Pastides of UMass. "I feel strongly about that."

Pastides, meanwhile, credited Digital with undertaking the study on its own initiative, and said the company had encouraged virtually all its 300 production workers to take part in it.

"I would say Digital did all they could. They funded the study and gave it their full support," Pastides said. "Now, I think it's time for other companies to get involved."

Gibson said Digital decided to do a study after a group of employees at the Hudson plant began noticing increased cases of miscarriages among their colleagues and asked the company to look into it.

Miscarriages high for some at Digital