

NEWS

From GEORGIA TECH'S ENGINEERING EXPERIMENT STATION

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COMPUTER SYSTEM BEING DESIGNED
TO ENHANCE NUCLEAR SAFETY

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ATLANTA, GA....If an emergency occurred in an average American nuclear plant today, control room operators would have to analyze a flood of complex data to solve the problem.

Georgia Tech engineers hope to make operators' work easier and more dependable by designing a computer system which automatically evaluates the plant's vital functions.

"As it now stands, too much information is coming at operators too fast in too many different forms," said Tech computer researcher Dr. James Mahaffey. "They don't know which data to trust and which to question. Computers could preprocess this information into more manageable form."

As an example, Mahaffey cited the highly-publicized accident at Three Mile Island, Pennsylvania. He said the incident occurred when two reactor coolant valves were left closed after a routine maintenance operation because "they were not included on a check list.

"If a computer had been interfaced to the valves and if it had been programmed to check this condition the incident probably wouldn't have occurred," Mahaffey said.

Mahaffey is heading an effort by Tech's Computer Science and Technology Laboratory to design a computer system to improve operator performance in control rooms. The work is being undertaken for the Loss-of-Fluid Test (LOFT)

(more)

Integral Test Facility at the Idaho National Engineering Laboratory.

The main objective of the design is to increase safety margins in reactors and to reduce the time when computer systems are out of order.

Computers always have been used in nuclear plant control rooms but usually in a subsidiary role. Plant operators have turned to them sparingly in emergencies because of doubts about computer reliability.

Mahaffey accepts this criticism but explains that most computer systems are out of date by the time the nuclear plants they serve go into operation.

He hopes to avoid this pitfall by using the mil-spec computer developed for the U.S. military -- a type of hardware which Mahaffey calls "the ultimate in computer reliability."

The mil-spec series is small, relatively simple and neither exceptionally fast nor large. However, Mahaffey says that its specifications are ideally suited to the nuclear industry's need for high dependability. The model has few moving parts, can tolerate extreme temperature fluctuations, is built into a sealed box and can withstand high levels of external vibration.

The mil-spec costs two to three times more than comparable commercial models but Mahaffey believes the price is small to pay for enhanced nuclear safety.

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