

Three Mile Island

Still a problem after five years

Washington

THE fifth anniversary of the accident at Three Mile Island has brought little tranquillity to the reactor site at Harrisburg, Pennsylvania. Efforts to clean up the damaged Unit-2 reactor are slowing down because the General Public Utilities (GPU) Nuclear Corporation is running short of money. Meanwhile, the site continues to provide a focus for bitter arguments about the safety of nuclear power in the United States as well as the integrity of both the industry and the Nuclear Regulatory Commission (NRC).

GPU technicians have not yet begun to remove the radioactive debris from the reactor vessel, although the company planned last week to extract a second batch of samples from the fuel core. Later in the year, 60 studs on the head of the reactor vessel will be loosened to see whether any have been so damaged by corrosion that they cannot be removed when the time comes to lift off the head.

Progress on the clean-up is, however, being hobbled by GPU's financial difficulties, caused principally by the industry's sluggish response to appeals for financial help. Some \$400 million has already been spent on the clean-up, but GPU says more than \$1,000 million is needed. In July 1981, Pennsylvania's Governor Thornburgh proposed a plan under which GPU itself would pay a quarter of the sum, and nuclear utilities a fifth. Another fifth would come from federal matching grants, and the balance from insurance payments and the governments of Pennsylvania and New Jersey.

So far the industry has held back. The Edison Electric Institute reports pledges from industry of \$71 million, but will not release those funds until at least \$100 million has been committed. However, utilities may soon prove more forthcoming as the result of an Internal Revenue Service ruling last December that contributions to the clean-up may be deducted as an ordinary business expense.

GPU's financial predicament may also be relieved if it can persuade NRC to let it restart the undamaged Unit-1 reactor at Three Mile Island. The commission hopes to make a decision by the end of June, and there are signs that it will give GPU a clean bill of health. Most encouraging for GPU was a decision in January by NRC to set aside questions of management integrity when it comes to vote on the restart. But the issue of integrity has recently taken on new importance in the wake of a grand jury indictment accusing the Metropolitan Edison Company, which operated Three Mile Island at the time of the accident, of deliberately falsifying coolant leak rate tests for months before the accident.

Had the leak rates been reported in accordance with NRC regulations, the

plant would have been shut down and the problem identified. The accident occurred when the plant operators ignored control room indicators of high temperature in the system. They did not discover until after the accident that a relief valve was open, allowing the core temperature to rise and hundreds of gallons of coolant to escape. In a plea-bargain agreement last month, Metropolitan Edison admitted its guilt. It is to pay a \$45,000 fine and prosecution costs. In addition, the company must establish a \$1 million account to help the Pennsylvania Emergency Management Agency to formulate an emergency plan for a 20-mile zone around the plant.

Even before the grand jury indictment, GPU had been plagued by allegations that its management of the rescue operation had been incompetent and, on occasions, unethical. Its most implausible critic is NRC commissioner Victor Gilinsky, who insisted last year that the senior management of the company would have to be replaced before he would support a vote to restart Unit-1. GPU, Gilinsky complained, had a "narrow and grudging conception of its public responsibilities", cut corners on safety and held back information from the public authorities.

GPU's relations with the commission have certainly been unhappy since the accident. NRC investigations have been held to find out whether GPU employees cheated during training programmes, whether engineers who expressed concern about safety issues were victimized by management and whether internal accident reports were doctored before they were submitted to NRC. In a report last September, the commission said allegations that GPU had violated safety procedures were true. An investigation of the victimization charges is still incomplete.

So far, the corporation has denied all the charges against it. While conceding that some technical violations of safety procedures had taken place, a GPU-sponsored investigation said that they had been accidental technical errors with no direct impact on safety at the site. The corporation also persuaded retired admiral Hyman Rickover, former head of nuclear operations for the United States Navy, to conduct an independent investigation. In September he declared GPU fit to operate the plant. But the corporation has also bowed quietly to NRC criticism. In November the company's president and senior deputies were reassigned.

These moves may well persuade NRC to permit a restart at Unit-1 but they are unlikely to still public controversy. The Union of Concerned Scientists claimed last month that GPU had not yet introduced the technical modifications needed to ensure the safety of Unit-1. **Peter David**

US accelerators

Super-collider costing

Los Angeles

SEQUESTERED in special offices at Lawrence Berkeley Laboratory at the University of California, a group of 20 high-energy physicists is working round the clock to establish "credible" cost estimates for the United States' proposed super-conducting super collider (SSC). The accelerator, which would collide two proton beams at energies up to 40 trillion electron volts, would be the largest and most powerful in the world.

The group, representing seven institutions and leading competitors who want to design SSC three different ways, expects in three months to produce a 200-page report for the Department of Energy (DoE) detailing how much competing designs will cost.

An important goal of the SSC reference design study, according to Jay Marx of the Berkeley laboratory, is to "do an honest job from bottom up and see what the numbers come out". It will not select a winning design but will compare the favourite approaches on a systematic basis.

"A lot of numbers are floating around this town", said Bill Wallenmeyer, head of DoE's division of high-energy physics in Washington, DC. With some estimates topping \$8,000 million, he said, the government needs "a better handle on costs".

Impetus for the cost study came from the directors of US physics laboratories. Meeting at Cornell University last September, they realized that while many designs were being discussed, costs were pure guesswork. Secretary of Energy Donald Hodell said he wanted to move on SSC by the summer of 1984. As a result, the study group began formal meetings on 1 February and will deliver its report to DoE on 30 April.

According to DoE, the \$2-million study is top priority. "We're expecting (it) to give us 30 to 50 per cent accurate cost estimates", Dr Wallenmeyer said. To meet a 1988 construction start, he said, the government must have credible cost estimates this summer.

In response to fears that a reference design study might "lock in" one approach too early, the group is comparing three designs. Trade-offs in technology, such as type and strength of magnets, determine costs. Some designs favour an accelerator with a 150-mile circumference while others, backed by those without access to cheap land, have a 30-mile circumference.

The mood at Berkeley is very upbeat, according to Dr Marx. "There are no winners or losers in this exercise and no sense of our design versus their design." US physicists are primarily interested in seeing that SSC is built, he said.

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