



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

D. Evans

EXTRA

August 31, 1979

MEMORANDUM

Note for: Bill Parler

From: Larry Vandenberg *AV*

Attached is an April 16 Philadelphia Inquirer article relating to the 'Rush to Commercial Operation Issue' that reporter Rod Nordland sent to me. As we discussed, I believe we have to talk to every person named in the article. Dave Evans and I plan to meet with Nordland to discuss the allegations and see if he is willing to provide additional supporting information.

Attachment: article

- cc: D. Evans
- E. K. Cornell
- R. C. DeYoung
- G. Frampton
- M. Rogovin

*USE Fritterbein deposition
as well as Wahlers*

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3 Mile Island workers talk of 'rush job'

WCA PR 16 '79 (6) RAO JORDLAND

It was just another routine, 12-hour-long day of testing on Three Mile Island's new reactor number two — "that rush job," in the contemptuous words of former maintenance man Norman Reismiller.

On that particular November day, his six-man crew was sent into the 100-degree heat of the turbine room basement to test safety valves by letting superheated steam rush out of them into a standpipe that would take the steam outside the building and into the air.

"When we jacked the first ones (valves) open, they wouldn't shut, and it blew some metal sleeves into the air like missiles; it's lucky nobody was killed," said Reismiller, a 21-year employee of Metropolitan Edison Co., operator and co-owner of the nuclear power plant 10 miles southeast of Harrisburg.

Testing a second set of valves revealed another problem: There was no standpipe. The escaping steam "blew all the aluminum siding off the side of the turbine building," Reismiller said.

"We were damned scared in unit two when they were starting up," he said. "I'm telling you, unit two was rushed. Everybody who works there knows that."

Reismiller quit his job last year. One of the 50 present and former Three Mile Island employees interviewed by The Inquirer say that Metropolitan Edison, in its haste to get reactor number two into commercial operation, deliberately cut corners on vital repairs, worked employees in sensitive jobs to the point of exhaustion and skimmed on important maintenance work.

To many of those workers, the crippling accident that startled the nation March 28 was, at least in retrospect, no great surprise.

"The company has pushed its luck on lots and lots of things because the name of the game is money," a worker said. Many workers, in fact, jokingly refer to the plant's generating capacity not as megawatts, but as "megabucks."

Employees cited such incidents as faked tests on safety equipment, maintenance budget cutbacks in the midst of continuing troubles with the new reactor and inspection reports about faulty equipment that were ignored by higher up. In one case, substantiated in federal Nuclear Regulatory Commission (NRC) documents, a welder was ordered to make improper welds in the core of the reactor — a construction de-

*Tommy Linnarsson
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Reismiller*

WORKERS TALK OF 'Rush Job'

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fact that went undiscovered for five years.

Other NRC documents reveal an unusually large number of major breakdowns at the plant. Those problems included numerous instances of earlier failures similar to the ones that the NRC has determined were the immediate causes of the March 28 accident.

"Nobody ever did like unit two," said a technician who has worked on it from the start. "It just always was a disaster. The equipment never ran right."

Many Three Mile Island workers have been quitting since the accident, according to sources there. The company conceded that "five or six" had quit since then.

Two of them are health physicists — workers who handle radiation monitoring and are specially trained in the effects of radiation exposure.

"I was concerned for my own safety," said one of those health physicists, Tom [?].

A foreman who quit said, "I've just mentally and physically had it."

The Inquirer also contacted numerous employees who had quit before the accident because, they said, they were overworked or concerned about safety and maintenance violations.

Dave Labby, 35, who now lives on a sailboat in Hilton Head, S. C., and runs his own machine shop, was a first-class repairman at the Three Mile Island. He had a long background in nuclear plants, beginning with the Navy and including work as an assembly inspector for the United Nuclear Corp. in Connecticut. He quit his job on reactor number one, which became operational in 1974, "because I was dissatisfied with management and safety precautions and shortcuts."

Paul Baker, 33, also quit his first-class repairman's job at Three Mile Island because, he said, he was upset over maintenance procedures that "left a lot to be desired."

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that "left a lot to be desired."

Richard Blakeman, 49, who is now a painting contractor in Gibson, R. C., was one of unit two's mechanical maintenance foremen until he quit in August. He complained that his overworked repair crews were forced to make hurried makeshift fixes on vitally necessary equipment.

Those and many other workers complained particularly about the long hours they had been forced to work, even before the accident.

at least 11 unplanned reactor shutdowns, known as "scrams," according to NRC reports.

Those included at least 10 "trips" in the reactor's cooling systems. "Trip" is nuclear-industry jargon for an automatic shutdown of equipment. If a piece of equipment fails, it will "trip" to prevent damage to other parts of the system.

Trips are routine in nuclear plants; scrams are not, especially if they are not planned. When one happens, it means that there has been some potential failure in one of the many complex systems that prevent the reactor from going out of control. The NRC therefore insists on a detailed report of each scram.

During the reactor's first scram, according to NRC reports, a fuse blew, causing an electrically operated valve to stick open; vital cooling system pressure dropped, and half of the nuclear instrumentation in the control room blew out. But backup systems worked successfully, and the problems were brought under control in five minutes.

Valves fail

On April 23, after less than a full month of operation, the plant's \$54,000 main steam-relief valves failed. That resulted in such a serious scram that operators were afraid the nuclear core might have been exposed (which could result in the danger of a melt-down). The reactor was shut down for repairs until September.

According to testimony by company officials before the Pennsylvania Public Utility Commission (PUC), those valves were untested, experimental models. The state's consumer advocate called their use an unacceptable risk, and eventually a hearing examiner penalized the company by reducing its rate-increase request by \$7.86 million.

Shortly after the valves had been replaced and the reactor had come back "on line" — jargon for functioning — there were further scrams.

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On Sept. 20 a feedwater valve tripped and caused a scram. The same valve did it again on Sept. 25. On Oct. 13, the reactor scrambled because a pressurizer valve failed to function.

Failures of the feedwater pump and a pressurizer valve were major contributing causes to the accident March 28, according to NRC officials.

There were two more scrams in November, and four more in December — three of them on the same day, Dec. 2.

The plant was shut down for six days after a Dec. 6 scram because



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port noted, would have been to cut dividends to stockholders, but the company regarded that alternative as "disastrous" and continued paying its dividends at the same rate as earlier.

What the company did instead was cut spending on unit two by 22 percent while increasing spending on unit one, which was already generating electricity, by 9 percent.

But there was still pressure to get unit two on line as soon as possible.

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Those and many other workers complained particularly about the long hours they had been forced to work, even before the accident.

"I've seen guys work around the clock 24 or 32 hours," Blakeman said. "You just go, go, go, go. It's crazy."

"They work us to death," said a veteran maintenance technician.

"Some of the guys are working 18 to 20 hours a day. We're overworked in a job where we should be alert."

A unit-two foreman quit after the accident rather than face continued long hours and lack of days off. An instrument technician quit before the accident after being forced one week to work 100 hours.

The typical worker is offered 500 to 1,000 hours of overtime a year, workers said; if his job skill is in demand, the overtime is mandatory and often runs up to 1,200 hours a year.

"The power industry," said a unit-two foreman, "believes that it's cheaper to work its people long hours than to hire more people."

A spokesman for the NRC said the federal government had no limit on the number of hours or days that nuclear plant workers can put in on the job.

The busiest time in a nuclear power plant is during refueling, when the reactor is shut down, as is number one now, because many complex maintenance and repair jobs can be done only while the reactor is off. There is a rush to get all those jobs done so that once the plant is refueled, it can go immediately back into operation.

"I know of guys who just got done doing 40 days straight," said a technician. "You're probably not as efficient."

Union officials have raised little protest about these policies.

"No one approached me to say 'this is not safe,'" said James Kinney, president of Local 563 of the International Brotherhood of Electrical Workers, which represents most Three Mile Island employees. "Everyone just accepts what's there and goes about doing their job."

Unit two's troubles began the day after it first "went critical" — that is, when the first atomic reaction began in its uranium core — during refueling on March 28, 1978.

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There were two more scrams in November, and four more in December — three of them on the same day, Dec. 2.

The plant was shut down for six days after a Dec. 6 scram because of problems with the main feedwater pump. It started up again only eight days before full commercial operation officially began on Dec. 30 at 11 p.m.

There would be further scrams before the big one that crippled the plant March 28.

By contrast, Three Mile Island's unit one — a reactor similar in design but smaller than unit two — has had far fewer problems. In its first year of operation, it scrammed only twice; in its first six months, it did not scram a single time.

During 1978, plant officials reported twice as many "recordable occurrences" — problems serious enough that the NRC has to be informed — for unit two than for unit one according to Richard Hartfield, director of the NRC's management and program analysis office. Those included 14 cases of "personnel error" on unit two compared to six on unit one.

Unit two had 50 percent more "reportable occurrences" than the nationwide average for nuclear reactors, Hartfield said.

By the time unit two began commercial operation — that is, started producing at 100 percent of its capacity — it had cost its owners hundreds of millions of dollars more than they had expected to spend on it.

The cost overruns totaled \$600 million by the time construction was finished early last year — five years behind schedule. Then came the trips and scrams, which delayed even further the time when the reactor would begin paying for itself.

The prestigious consulting firm of Touche Ross Inc., reporting to the New Jersey public advocate on the finances of the plant's ultimate owner, General Public Utilities (GPU), wrote that:

"As a result of underestimating the scope of nuclear-construction projects, GPU was unable to support the overall generation-construction program with adequate financial resources."

GPU therefore faced a serious cash-flow problem, Touche Ross said. One way to solve that, the re-

dividends to stockholders, but the company regarded that alternative as "disastrous" and continued paying its dividends at the same rate as earlier.

What the company did, instead, was cut spending on unit two by 22 percent while increasing spending on unit one, which was already generating electricity, by 9 percent.

But there was still pressure to get unit two on line as soon as possible. Full commercial operation would transform the plant's operator, Metropolitan Edison, from a net buyer of electricity from other utilities to a net seller of electricity. The utility would benefit in other ways as well.

By beginning commercial operation prior to Jan. 1, 1979, it would qualify for a \$20 million depreciation allowance and an investment tax credit of \$12 million on its 1978 tax return, and it would be able to begin passing the cost of the plant along to its consumers through a rate increase. Metropolitan Edison lost at least \$30 million in requested rate hikes during 1978 because the plant was not commercially operational, and it was in the middle of another rate case when unit two finally did go into commercial operation.

That hike was granted on March 29, 1979, the day after unit two's most disastrous scram. About two-thirds of the increase, or \$33 million, was based on the fact that unit two had become commercially operable.

"In terms of incentives," said consumer advocate David Barasch, "there's no question but that there were strong, strong incentives to make that plant commercially operational before the rate case ended."

Many workers at Three Mile Island said that was just what happened.

"When I left," said a former union official who quit his mechanical maintenance job last year, "unit two wasn't ready. It was a rush job. They were just on you all the time, (saying), 'Let's get it done; we got to get back up there; we got to get on line.'"

In December, just before unit two went on line, NRC inspectors visited the plant. Their report noted that "containment integrity" was not ensured because plant officials had not made sure that valves into the containment building, the four-foot-thick concrete enclosure that shields the reactor, were properly closed.

The December inspection team also found a generally unkempt appearance inside the plant, with radiation suits and boots lying around on stairways, radiation-area warning signs missing or down, and so on. The inspectors cited instances of "improperly or inadequately complete open-

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NRC Dec
Report

Island preparation

The austerity program, which Metropolitan Edison told workers would mean cutbacks by a third in maintenance programs, was necessary because the company suspected — correctly — that it would not receive as much of a rate hike as it wanted.

In January the reactor operated only 336 out of a possible 744 hours, according to NRC documents.

On Jan. 14, repairs were made on the pressurizer valves, and no sooner had they been completed than the reactor scrambled again because a joint had ruptured, releasing steam and knocking out transformers. That put the unit out of service until Jan. 31.

Finally, in February, the reactor went full-tilt all month, operating 672 hours out of a possible 672. There were no scrams, but a feedwater pump tripped and power had to be reduced to check the pump. No problem was found, and it was started up again. Again the same pump tripped; again it was checked; again no problem was found, and the reactor was finally brought up to full power.

Feedwater pumps were among the components that failed in the scram of March 28.

One day before that, on March 27, an operator in unit one discovered that a valve had been left closed on the emergency cooling system, a violation of federal regulations, and he quickly reopened it.

But no one, apparently, thought to check the identical emergency cooling valve on unit two. It too was closed. Illegally, and was a major factor in the accident.

Baker recalled that frequently when there had been pump leakages, they would be fixed with packing rather than mechanical seals. Seals are more costly, and often require cutting back operations.

"The attitude was if we shut it down, we'll have to cut it (the reactor) down to 75 percent power, so we'll run it till it (the pump seal) goes."

He said he recalled packing instead of sealing being done at least seven times on emergency cooling pumps and heat removal pumps.

An indication of how much repair

There was apparently no further investigation of improper welds, or other welds on the anchor plate were tested and proved to be adequate.

Often, workers said, testing procedures were sloppy, contrary results were ignored and in some cases there were indications that results were faked.

"In the secondary (nonradioactive) system," said a first-class electrician, "we'd test new stuff, and it didn't work. We used to complain.

How could they accept (from the contractors) so many things that didn't work?" He said his reports about inoperative equipment were ignored.

Labby said that frequently new parts, particularly for standby or backup systems, were routinely checked off as if they had been inspected when they had not been.

For such reasons, backup or standby equipment often would not work, Blakeman said. "Say they had four feedwater pumps — two on and two on standby. If one broke down, they'd find that the reserve wouldn't work. I remember running unit one with only one (feedwater) pump for two or three hours because of that."

One of the most blatant violations of testing procedures concerned the hydraulic snubbers on unit one, Blakeman said. There are hundreds of those devices, which look and work something like shock absorbers on an automobile, and they are intended to absorb shock in the event of an earthquake to protect vital components.

'Very, very sticky'

"The NRC is very, very sticky about these things," Blakeman said. "I was supposed to be in charge of that testing program (in March 1978). I was off for two days. When I came back, almost overnight all of them were passed except 12 or 18 of them. Some engineer came along and zapped them all with his pencil. That kind of tore me up."

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Associated Press

Procedures for Easter services

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One foreman in a key area of unit two said that supervisors had been well aware of the need to meet the year-end on-line deadline, although no one explicitly ordered corner-cutting to meet it.

"We heard that it was important to get the thing on line because of the money. But nobody said, 'Hey, forget the safety.' Part of the job is to realize that the company's going to lose \$100 million if you don't get the plant on the line," the foreman said.

'Big rush'

"There's always a big rush where anybody is trying to make a buck," said Robert Lewis, who is superintendent of Catalytic Inc., a contractor that helps with maintenance work at Three Mile Island. But he insisted that maintenance at the plant was thorough. "In making that big rush, you do not cut corners," he said.

Even though there were austerity moves, said James O'Hanlon, a former Three Mile Island superintendent who now manages a nuclear plant in Arkansas, they affected only nonessential maintenance, "not nuclear safety."

But Blakeman, the former maintenance foreman, said there was a general attitude of "let's just jury-rig it and get the damned thing back in operation and hope it'll hold."

He said he would have his maintenance crew begin a job only to be interrupted by a bigger crisis. "We were pushed; it was a simple case of having too much to do and not having enough people to do it."

One subordinate of Jack Herbein, Metropolitan Edison's vice president for power generation, recalled over-riding many conversations about mechanical breakdowns between Herbein and "white hats," the company slang for supervisory personnel, who wear white hard hats.

"I used to say to Herbein, 'It seems like the men are taking shortcuts,'" the subordinate recalled. He would say, "A lot of times you've to take shortcuts to get back on line." It would be when we were on line, he would make statements like that.

Herbein has refused to talk to reporters since shortly after the March accident.

The new year began on two unsettling notes: The company announced a new austerity program, and the reactor began scrambling again after only two weeks at full power.

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An indication of how much repair work was put off is given by the quantity of back orders for it.

Workers said the backlogs occurred because unit two had too many problems to handle during shutdown periods, no matter how much overtime was worked. And rather than keep the reactor shut down to catch up on repairs, the company had them put on back orders, workers said.

Referring to the pile of backlogged work orders in the electrical maintenance shop, a maintenance worker said, "I'd say it's probably a foot or two high. You just can't get them done. Most of them are just normal maintenance and PM (preventive maintenance). We can only cope with so much of what we got to handle."

"There were drawers of them," said Blakeman, the former maintenance foreman. "This was mainly because there was a manpower shortage. Take the oil changes (for pumps and other machinery)—I'll bet you could find work orders for that that are a couple years old."

But one unit-two foreman maintained that work orders for really important repairs did not get backlogged. Still, he said, "a lot of preventive maintenance could have been done. If something broke, then it got preventive maintenance."

Many workers cited instances in which equipment did not work properly from the time it was built or delivered.

A former mechanical maintenance worker recalled that when his crew took over a polishing-system tank from construction crews, it leaked.

"We had to go inside the tank and patch it because it was in dire need of repair. . . . At the time they ran the tests (on the tank) everything was patched up with liquid rubber, all kinds of things just to keep the water in," he said.

According to documents on file with the NRC, a welder reported that he had been ordered to make substandard and inadequate welds to attach an anchor plate in the core of the reactor. An NRC investigator reported that he found the allegation to be true and ordered the proper repairs.

The welding took place in June or July of 1973 during construction of unit two, but it was not until March of last year that the welder reported the incident.

"Performance of the work in this fashion had been of concern to him (the welder) since that time and he had finally decided that the NRC should be informed," investigator L. Narrow wrote. "The alleged knew of no other examples of improper work."

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On paper, the operations of a nuclear generating station are very finely regulated. The "switching and tagging" process is an example.

For instance, if a pump somewhere in a line has to be repaired, two valves on a line might have to be closed in order to work on it.

Switching and tagging is an elaborate procedure designed to make sure no one works on that pump until those valves are closed and also to make sure that supervisors know at all times what parts of the system are closed off.

In that process, distinctively colored tags are put on each piece of equipment, and a report has to be signed each shift, three times a day every day, until the job is completed.

The NRC has reported that three valves on unit two's critically important emergency cooling system had been left closed for two weeks prior to the accident—an illegal condition that, if discovered by NRC inspectors, would have resulted in an order to shut down the plant. Because those valves were closed, they cut off desperately needed cooling water during the March 28 scram, allowing temperatures in the reactor to soar dangerously.

Because those valves had been deliberately closed for repairs, according to workers, the switching and tagging procedure meant that one of two things must have happened:

Either the control-room supervisors and responsible foremen on every shift over a two-week-long period signed the switching and tagging reports routinely, without reading them, or control-room supervisors and foremen were well aware that their emergency cooling system valves were illegally closed.

No doubt, the official investigations that are already under way will answer those and other questions about unit two's final scram.

But perhaps GPU's president, Herman Dieckamp, unwittingly provided an answer of sorts while testifying before the PUC about the problems that safety and environmental regulations cause nuclear plant operators.

"These changing requirements," he said, "when imposed on a project of immense magnitude, create a demand for attention to detail that is almost impossible to satisfy."

This report was written by Inquirer staff writer Fred Nordland, based on his reporting and that of Inquirer staff writers Mary Bishop, Art Carey, Frederick Cusick, Phillip Dixon, Josh Friedman, Bob Trump, Ray Holton, Linda Lovel, Tom Masland and Jane Shoemaker in Harrisburg and Richard Ben Cramer in Washington.

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