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Three Mile Island Resources

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Three Mile Island Alert

The Newsletter of Three Mile Island Alert May 1998

Three Mile Island Slips in Engineering SALP Rating

from a March 16, 1998, Inside NRC article

Engineering at GPU Nuclear's Three Mile Island-1 (TMI) slipped from a Category 2 rating to a low Category 3, according to the latest NRC systematic assessment of licensee performance (SALP) report. Plant operations and maintenance kept their Category 1 scores while plant support maintained a Category 2 rating.

NRC Region 1 Administrator Hubert Miller said in a letter to the utility that the unit's overall performance was "mixed." Concerning engineering, Miller stated that this was "the second consecutive assessment in which a decline was noted, indicating that previous efforts to improve performance in that area were not effective. Corrective action programs, while improved, were not fully effective in achieving timely resolution of some problems."

According to Nucleonics Week, TMI-1, an 871-MW Babcock & Wilcox PWR, had an annual gross capacity factor of 88.73% in 1995. The annual gross capacity was 98.17% in 1996 and 80.68% a year later.

NRC Issues Notice of Violation but No Civil Penalty to TMI

from a January 1, 1998, Nucleonics Week article, a January 28, 1998, NRC press release, and a February 2, 1998, Inside NRC article

Despite four incidents at Three Mile Island-1 involving personnel errors, including one involving contamination and another the type of valve that stuck open and led to the Three Mile Island-2 accident in 1979, the Nuclear Regulatory Commission staff has issued a Notice of Violation -- but not a civil penalty -- against GPU Nuclear Corporation..

The employee contamination occurred when the fuel transfer canal was drained and cleaned. The reactor vessel head seal plate was lifted and parked. Hot particles were found and cleaned but a hot particle area was not formally established nor was radiation control supervision notified. Subsequently, two hot particles were found on a worker's face, resulting in a dose of 14 rem to the skin and 50 millirem whole body. The annual NRC limits are 50 rem to the skin and 5 rem whole body. The NRC faulted the company for failing to conduct detailed radiation surveys and control the spread of radioactive particles.

In the valve incident, a pressurizer power-operated relief valve (PORV) was left shut and inoperable for nearly two years at TMI-1 due to a wiring error and operators' failure to conduct a post-maintenance test. The agency had classified the violation as Severity Level III.

The company said the valve remained closed due to a wiring error and operators' failure to conduct a post-maintenance test. The PORV was left inoperable from the time of a refueling and maintenance outage that ended in October 1995 until the most recent such outage last September.

The two other incidents were actions by an operator which resulted in uncontrolled spill of water from the control rod drive mechanism vents and the failure to lock a hatch in a high-radiation area.

GPU Nuclear spokeswoman Laura Karinch blamed bad communications for the uncontrolled water spill. She said employees are now aware that it is inappropriate procedure to perform significant plant evolutions while the shift turnover is in progress. At the time of the incident, company tasks and individual accountabilities were not made clear to workers.

Poor communication was also the root cause of the hatch being

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Three Mile Island Alert

Three Mile Island Alert (TMIA) is a non-profit citizens' organization dedicated to the promotion of safe-energy alternatives to nuclear power, especially the Three Mile Island nuclear plant.

Formed in 1977 after the construction and licensing of TMI Unit-1 and the construction of the infamous Unit-2,. TMIA is the largest and oldest safe-energy group in central Pennsylvania.

TMIA members interested in specific aspects of nuclear power are encouraged to join one of TMIA's committees. These committees include:

- Radiation Monitoring
- Low-level Radioactive Waste
- Health Effects of TMI
- Nuclear Plant Security

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$55,000 Fine Against Susquehanna Plant

from a January 12, 1998, NRC press release

The Nuclear Regulatory Commission staff has proposed a $55,000 fine against the operator of the Susquehanna nuclear power plant for a violation of agency requirements involving a misaligned emergency diesel generator at the facility. Susquehanna, which is equipped with two reactors, is located in Berwick, in northeastern Pennsylvania. It is owned and operated by PP&L Inc.

A predecisional enforcement conference was held on December 16 at the NRC Region 1 office in King of Prussia, Pa., to discuss the infraction.

Susquehanna has five emergency diesel generators. In the event of a loss of power to the site, the generators would be called upon to operate safety-related systems and safely shut down the plant.

Last July 11, an NRC inspector found that the load limit setting on one of the generators had been positioned at approximately 35 percent, when it should have remained at 100 percent. The misalignment, which was subsequently determined to have occurred sometime between June 16 and July 11, could have resulted in the generator not starting within the required time and not being able to provide sufficient emergency backup power during an accident. Furthermore, the operation of the generator at a lower-than-normal speed could have damaged emergency core cooling system motors.

PP&L investigated the misalignment but was unable to determine the cause, though the utility did not rule out that it may have been the result of a work sequence error, inadvertent human interaction or tampering. The company has since taken steps to prevent a recurrence, including the installation of a protective cover over the controls, known as the Woodward governor.

The NRC staff has found that PP&L committed a violation by failing to establish adequate controls for the generator's alignment.

In a letter to PP&L announcing the enforcement action, NRC Region 1 Administrator Hubert J. Miller said that the failure caused "important safety-related equipment to be inoperable for an indeterminate period, thus degrading the plant's capability to respond to accidents."

"Further, the NRC is concerned that you failed to implement effective controls for the alignment of the Woodward governor controls despite the fact that multiple events involving the functioning of the Woodward governors have been identified in the industry between 1985 and the present," including three at Susquehanna, Mr. Miller wrote. "Also, the NRC is concerned that your investigation of the event could not preclude tampering as a cause and that the investigations revealed at least two other recent instances of unexplained misalignment of out-of-service EDGs (emergency diesel generators) similar to the misalignment of the 'A' EDG."

The administrator added that it appeared that personnel performance issues were persisting at the plant, and that there was an "adverse trend in equipment status control events."

Tritium Release at Oyster Creek Under Investigation

from an April, 1998 Nuclear News article

Small traces of the radioisotope tritium being released into the atmosphere at Oyster Creek nuclear power plant are being investigated by company personnel. Tritium is a radioactive isotope that naturally occurs in the environment wherever there is water, and is also produced as a result of operating a nuclear reactor.

The releases at Oyster Creek are nonthreatening to residents or the environment, according to GPU Nuclear, Inc., operators of the plant.

An Oyster Creek employee discovered recently that occasional wisps of steam from isolation condensers are carrying the tritium as the plant is operating. The isolation condensers serve as large heat exchangers that are used to reduce pressure in the plant's General Electric boiling water reactor.

Radiation produced by tritium is so weak that radiation monitors do not detect it, and it is instead monitored through laboratory analysis. According to GPU Nuclear, the maximum radiation dose an individual would have received in 1997 from the release of tritium from the isolation condensers at Oyster Creek is about 0.04 millirem, which is equivalent to spending less than a day at the beach.

The Nuclear Regulatory Commission and the New Jersey Department of Environmental Protection have been updated on the status of the monitoring.

PA Nuclear Dump Site Opposed

from a March 5, 1998, Associated Press article

Not in my backyard, say residents of Athens Township, Crawford County, who don't want a low-level nuclear waste dump.

Officials of Chem-Nuclear, the company contracted by Pennsylvania to build a nuclear dump in the state, have spoken to township supervisors about the possibility of locating the dump there. The facility will be safe and bring jobs and tax relief to its neighbors, the company has said.

Township supervisors assured a crowd of at least 100 people Tuesday night that they will sign a resolution against the dump if their solicitor approves the resolution. The resolution states that the supervisors will not negotiate for a nuclear waste dump or volunteer any township land for such a facility.

Also Tuesday, county commissioners declined to sign such a resolution, saying municipalities should make the decision.

Chem-Nuclear has been unsuccessfully searching for years for 50 acres on which to put the dump, but no community has volunteered. The company hopes to find a site by the end of the year.

Athens Township, southeast of Erie, has a population of 700 on about 27 square miles.

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unlocked in a high radiation area. "Despite the fact that a camera monitored the area, the contractor near the site was not supposed to leave the area without putting a bar back over the hatch. He apparently did not know that," Karinch said.

Overall, NRC Region I Administrator Hubert Miller said there was some "gross performance" that should not be happening with the experienced work force at TMI. Neil Sheehan, a spokesman for NRC, said the agency believes, for example, that in the hot particle incident, "work should have stopped. Contamination took place and they continued to do the work. The work should have been suspended."

The NRC claims that the principal factor in the decision not to fine GPU was that under the NRC's enforcement policy, the utility was credited for efforts to identify the problems and take prompt and comprehensive corrective actions.

GPUN spokeswoman Laura Karinch said in reaction to the NRC decision that GPUN "had identified the issues all along and we had communicated openly about them and our corrective actions to the NRC. We were very thorough."

EPA Proposes to Recycle, Refabricate, and Reuse Radioactively Contaminated Scrap Metal in Unlabeled Consumer Products

from a recent Pennsylvania Sierra Club Newsletter
by Dr. Judith Johnsrud, Director of the Environmental Coalition on Nuclear Power

The Environmental Protection Agency (EPA), under pressure from the Nuclear Regulatory Commission (NRC), Department of Energy (DOE), and the nuclear power industry, is preparing to set standards for public exposures to radioactivity in consumer products made from scrap metals. As nuclear waste disposal costs continue to soar, the commercial nuclear industry and DOE are demanding deregulation of massive amounts of radioactively contaminated scrap metal ("RSM") from nuclear power plants, nuclear weapons production facilities, and other nuclear industry facilities. Generators of contaminated equipment and components want to sell off more of their wastes as scrap metal to be recycled into consumer goods of all kinds, as is now allowed in Europe and elsewhere.

The radioactive scrap would be smelted with uncontaminated metals, then refabricated into a host of consumer products. These could include building materials, automobile bodies and parts, tools, kitchen equipment (e.g., cast iron frying pans), furniture, possibly children's toys, jewelry, coins. Major metals include carbon steel, nickel, and copper, plus numerous other metals.

Each object could contain a mix of radionuclides, with a dose standard set for each radionuclide, based on a proposed release level of one picocurie per gram of scrap metal for each radionuclide. Members of the public come into contact with many metal objects every day, and would encounter many such small exposures, but would have no way to detect them, no way to measure the amount of each of the doses, and no way to add up the total amount of these numerous radiation exposures. These doses from the radioactive metal products will be in addition to the naturally-occurring background radiation we all receive and to all other exposures allowed from nuclear facilities and workplaces, plus doses from medical diagnosis and treatment and from continuing fallout from atmospheric nuclear tests 40-50 years ago.

The National Academy of Science concluded in 1990 that there is no evidence to contradict the hypothesis of a linear relationship between dose and response. This means that there is no safe dose; that there is a risk of mutational effect and consequent adverse health effects from all exposures to ionizing radiation, including those from natural background sources.

As nuclear plants begin to be decommissioned, storage and disposal costs of "low-level" radioactive wastes (LLRW) are rising, and huge volumes of "hot" metals will accumulate. The nuclear industry is seeking the least cost solution to waste disposition.

Now EPA is considering what level of exposures to permit from the recycling of much of the equipment, piping, and other metal components that have volumetric contamination, too. Increasingly, EPA has received complaints from scrap dealers, steel mills that smelt scrap metals, and refabrication facilities that they are receiving "hot" scrap -- and having to pay for cleanup when their scrap yards and factories become contaminated. In addition, the NRC has now approved regulations for international transboundary trade in radioactive materials and wastes. The DOE, in its "environmental remediation" program for cleanup of its atomic bomb plants, is generating enormous amounts of scrap metal. NRC licensees and DOE want to sell the stuff into the free market economy, without warnings or labels.

More than 1.6 million tons of scrap metal are currently in storage, awaiting the EPA green light for recycling. There is far more to come when nuclear reactors are decommissioned in the next two or three decades. Moreover, the EPA analysis looked at only 11 DOE sites (of at least 85) and 123 power reactors of some 22,000 NRC and Agreement State licensees.

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EPA is considering dose limits for the "Reasonably Maximally Exposed Individual" member of the public, ranging between 0.1 millirem per year and 15.0 millirem per year. These doses, received from many metal sources, will be in addition to the naturally-occurring background level of approximately 100 millirem per year, plus other sources of exposure. The EPA decision will consider cost savings for the generators of the scrap metal (from zero to $1.7 billion) and the resultant additional cases of cancer (estimated to range from 6 to 29 additional cancer cases expected in the next 1000 years).

EPA had issued its preliminary Draft Economic Analysis and Technical Support Reports on recycling and reuse of scrap metal for comment from "Interested Stakeholders." Comments were due January 31st, 1998, but it is very important that you keep writing, anyway. You may request the documents from the EPA Center for Cleanup and Reuse, Radiation Protection Division, Office of Air and Radiation, U.S. Environmental Protection Agency, 401 M Street SW, Washington, DC 20460. Ask for copies of "Radiation Protection Standards for Scrap Metal: Preliminary Cost-Benefit Analysis" and the three volumes of Technical Support Documents, "Evaluation of the Potential for Recycling of Scrap Metals from Nuclear Facilities."

Peco Looks to a Nuclear Future

from an April 17, 1998, Megawatt Daily article

Peco Energy believes nuclear power will fuel its future growth.

In two speeches this week, Peco Chair and CEO Corbin McNeill cautioned that banking on nuclear power is not without risk, but that he is secure in the company's track record of performance, combined with standardized regulatory processes, will lead to safe, efficient operation of nuclear facilities.

"Nuclear power is very attractive and a highly competitive source of generation," McNeill said, adding that Peco's nuclear plants in Pennsylvania and New Jersey generate electricity for as little as 1.43 cents/kWh. "So we will couple our national footprint in generation with our capabilities as a wholesale marketer of power. From this emerges a profitable growth strategy."

Peco owns the two-unit Limerick nuclear plant, co-owns the two-unit Peach Bottom plant and co-owns the two-unit Salem plant. When all six units are running at full capacity, nuclear power can meet 60% of the utility's electricity needs, Jones said.

Nuclear power generation is "one of three main business strategies of ours going in to deregulation," Jones said, mentioning bulk power marketing and managing the energy needs of large industrial customers as the other two.

While many utilities are selling off their fossil-fueled and hydroelectric generation assets and reconsidering the viability of their nuclear plants, Peco is one of a handful of utilities counting on nuclear power. Duke Energy and Entergy are looking to expand their nuclear portfolios and Baltimore Gas & Electric earlier this month became the first utility to begin the license renewal process of a nuclear facility.

Last September, Peco formed an alliance with British Energy, whose eight nuclear plants provide 21% of Britain's electricity. The goal of the alliance, called AmerGen Energy, is to acquire, own and operate generation facilities, including nuclear plants, in the United States.

AmerGen is in discussions with the owners of several nuclear plants, Jones said, declining to give details.

GPU, which operates the Three Mile Island and Oyster Creek nuclear plants in Pennsylvania, has publicly stated it wants to sell them, along with all of its other generation assets. On Wednesday, GPU sent information about the 5,350 MW of fossil-fueled and hydro capacity it is auctioning to qualified bidders. Jones said Peco is not commenting on whether it is looking at GPU's facilities.

In his comments, McNeill said Peco's success depends in part on the willingness of the Nuclear Regulatory Commission to reform its regulatory requirements. "Like it or not, we're about to enter the fast-moving, competitive electric generation business of the 21st century," McNeill said. "We can't keep dragging behind us the heavy weight of 1970-era prescriptive regulation."

Zion Permanent Closure Follows INPO Bust

from a January 16, 1998, NIRS press release

Commonwealth Edison announced yesterday the permanent shutdown of its two unit Westinghouse Zion nuclear generating station.

ComEd said that it will write off the unrecoverable cost of the reactors from stockholdings, approximately $515 million or $2.38 per share. The announcement precedes the Nuclear Regulatory Commission's Periodic Briefing on Operating Reactors and Material Facilities (a.k.a. "Watch List") scheduled for January 21, 1998. The Illinois based utility had 6 of its 12 reactors on the 1997 Watchlist including the Zion reactors.

ComEd's decision to close Zion follows the release of a scathing industry internal report by the Institute of Nuclear Power Operations (INPO) in late November, 1997. The report criticized the nuclear utility for consistently failing to remedy problems, for failing to inform employees who their supervisor was, for cycling 104 different managers through the utility's top 30 nuclear positions during the past four and a half years, and for promoting short term economics over nuclear safety. INPO was organized by the nuclear industry as the "shadow" regulator and trouble shooter following the Three Mile Island accident in 1979, recognizing that the industry could not afford another TMI. Unlike the NRC, INPO findings and reports are held back from public disclosure as industry trade secret information.

Federal Government Won't Be Able to Keep Promise on Waste Disposal

from a January 30, 1998, Associated Press article

It was a promise made 16 years ago. By Feb. 1, 1998, the government would find a place to safely store the thousands of tons of highly radioactive waste generated by civilian power plants. At midnight Saturday the deadline passes. And there won't be any trucks hauling wastes from power reactors -- only more legal sparring over what has become the nuclear industry's most perplexing problem.

A federal court last November reaffirmed that the Energy Department, which has collected billions of dollars from electricity users to build a waste burial site, has an obligation to accept the used reactor fuel rods that remain deadly for thousands of years.

And, the court declared, the government can't hide behind the excuse that it has no place to put it. Since then, utilities and department officials have dueled over what steps should be taken next. "Obviously it's impossible for us to meet this (obligation)," Deputy Energy Secretary Elizabeth Moller said recently when asked about the dilemma. With no permanent burial site -- or even temporary warehouse -- available, department officials have offered to help pay for continued storage at reactor sites.

That's unacceptable, argue the reactor operators. "What the utilities want is for the Energy Department to take their spent fuel, and they're simply not willing to do that," said Jay Silberg, an attorney representing 36 reactor operators who have asked the courts to require the wastes be taken to a government facility.

More than 40,000 tons of used reactor fuel have piled up at 71 civilian nuclear power plants in 34 states, with the amount growing every year. Reactor storage pools are filling up, and 10 plants have had to put fuel in dry-cask storage, which has been expensive and in some cases locally controversial.

"The Energy Department's handling of this matter is inexcusable," said Joe Colvin, president of the Nuclear Energy Institute, the industry's trade group. He said utility customers already have paid nearly $14 billion into a federal fund to develop a centralized waste storage facility, but so far not even a site has been found.

But others argue that the utility industry is exaggerating the urgency, and some nuclear critics maintain the industry should take care of its own waste.

"It's one of the biggest industrial bailouts ever," argues Michael Mariotte of the Nuclear Information and Resources Service, an anti-nuclear advocacy group. He said a central storage facility would mean thousands of nuclear waste shipments crisscrossing the country by truck and rail, posing increased

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safety hazards.

Sen. Harry Reid, D-Nev., whose state has been talked of as the most likely long-term storage place for the waste, maintains that even if the government should eventually take the material, there is no need for a "mad rush" to transport it. "If it's so safe, leave it where it is," he argues.

But utility executive say it's a matter of fairness and of government's keeping its word since Congress in 1982 assured the industry that the Energy Department would take the spent reactor fuel, which will remain highly radioactive for thousands of years. Industry officials say the fuel pools at reactor sites never were meant for long-term storage. And putting the fuel rods into metal casks and concrete bunkers will be expensive and foment local opposition to the power plants themselves.

Both the Senate and House have passed legislation that would require the government to build a temporary warehouse for the waste in Nevada until a permanent burial site can be located and built. But the measure, which would require the first shipments in 2003, faces an almost certain veto by President Clinton if it passes Congress. The administration has opposed a temporary storage site because, officials say, that would shift efforts away from developing a permanent repository.

Sweden Committed to Phasing out its Nuclear Reactors

from a February 3, 1998, Agence France Presse article

Sweden is preparing to close down two nuclear reactors at the Barsebaeck power plant in southern Sweden in the first step toward a total phase-out of nuclear power amid fierce protests from the opposition, industry, unions, and the public.

Barsebaeck 1 is to be shut down by July 1 this year, and Barsebaeck 2 is to close by July 1, 2001, provided that the loss of energy (six percent of the electricity produced in Sweden) can be adequately compensated for. But opponents argue that prematurely abolishing safe and functioning energy sources is a waste of money and would contribute to unemployment. They stress that no environmental alternative energy sources have been found.

The Social Democratic government has said it will "respect the will of the people" who called for a total nuclear phase-out by 2010. Although the 2010 deadline has been officially abandoned, it remains a symbolic target.

The opposition Conservative and Liberal parties have accused the minority Social Democrats of striking a deal with the Centrist party in order to maintain its hold on power, instead of considering the country's energy needs.

The agrarian Centrist party supports the government on crucial issues in parliament, and had threatened to withdraw its support if the government did not close one of the Barsebaeck reactors before the September 20 legislative elections.

The Conservatives, headed by former prime minister Carl Bildt, have said they would revoke the law if they come to power in the elections.

The private owner of the Barsebaeck plant, the Swedish electricity group Sydkraft, is also vehemently opposed to the closure, arguing that the dismantling would cost some 20 billion kronor (2.5 billion dollars). Sydkraft believes the government should begin its phase-out program by dismantling the reactors operated by the state-owned group Vattenfall.

Meanwhile, the heads of some of Sweden's largest companies -- Ericsson, Volvo and ABB to name a few -- do not believe that the energy alternatives (wind power, biofuels) would be sufficient to supply the country's energy needs. Hydro power, which produces 38 percent of Sweden's electricity, cannot be expanded further due to a law protecting Sweden's rivers.

Swedish unions are concerned about the employment effects of closing down the nuclear power plants, with unemployment currently at 11 percent.

Neither is the general public in favor of decommissioning. A recent poll showed that 58 percent of Swedes would like to continue the use of nuclear power, while only 20 percent are opposed.

Local Governments Monitoring Nuclear Plants Themselves

from a December 19, 1997, Hartford Courant article
By Gary Libow

It took Haddam officials a quarter of a century to discover that groundwater at the Connecticut Yankee nuclear power plant had been tainted by a nuclear fission byproduct.

Now, awakening from decades of self-imposed slumber, Haddam has told its new health director to conduct its own well testing and has hired a consultant to monitor plant decommissioning and off-site contamination issues.

Tritium, a health threat when ingested and inhaled in large doses, remained in wells at Connecticut Yankee from the 1970s into the early 1990s, according to annual figures provided to federal regulators. About the same time, the plant began serving bottled water to its employees.

But Dr. John Korab, the town's part-time health director from 1971 until this fall, said he was never made aware of the contamination. Several other past and present town leaders said the same.

Northeast Utilities, the plant's principal owner, said the information was included in annual reports filed with the town, but no copy of any year's report is on file in town hall. Neither is an aquifer map of the area that would show a resident whether he or she shares the same groundwater.

"Connecticut Yankee had carte blanche," said Haddam's newly elected first selectman, Keith Ainsworth. "The town never questioned them. ... All the things they are uncovering now. Where was that information?"

Local governments in Connecticut and elsewhere, which have long ceded oversight of nuclear plants to federal and state authorities, are growing increasingly skeptical and are taking steps of their own to monitor the plants.

In Waterford, where the town recently learned that fill from the Millstone nuclear power plants makes up part of the town's ballfield complex, similar steps are being taken. The town is conducting its own radiation tests of the ballfield dirt -- even though the state has found the earth to be clean.

David Lochbaum, a nuclear engineer with the Washington, D.C.- based watchdog group Union of Concerned Scientists, said municipal oversight, though not mandated, is an important supplement to federal and state regulation. "It flushes out the issues," said Lochbaum.

The influence of county and municipal governments is based almost entirely on lobbying and diligence, exerting political pressure and doing their homework. The law grants regulatory power largely to the federal government, with some duties shouldered by the states.

The Nuclear Energy Institute, an industry organization based in Washington, notes that the industry is one of the most regulated in the country. "Regulatory requirements became progressively more detailed and prescriptive. New requirements were often layered on top of old ones, without weeding out duplication and inconsistencies," according to the institute. Excessive regulation, it contends, does not translate into better or safer performance.

Waterford officials were taken by surprise this year by allegations that Millstone illegally dumped hydrazine, a cancer-causing chemical, into a prohibited area of Niantic Bay, and by unsafe practices that drew a record $2 million federal fine.

Waterford First Selectman Thomas Sheridan acknowledged that the town long deferred to the state and the NRC for oversight. He said he still relies heavily on town officials who work at the Millstone plants as his primary source of information.

"Were we ever unsafe? I don't think so. [But] the risk factor was increasing," Sheridan said.

Of course, "Hindsight is easy," said Haddam's Ainsworth, who is also an

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environmental lawyer.

With it, Haddam officials surely would have tried to monitor the removal of Connecticut Yankee fill and thousands of concrete blocks to residences, a fairground and a day-care center. In one location, the fill was contaminated with low levels of cobalt-60; more than 100 concrete blocks removed from the plant in the 1970s also tested positive for radiation.

Now, Ainsworth has instructed Dr. Arthur Blake, the newly appointed health director, to test wells for residents worried about drinking-water quality. Ainsworth said the town's clout rests in the pressure it can exert at the state and federal levels. For instance, he suggested, town officials could align themselves politically with the Citizens Awareness Network, an anti-nuclear organization that has asked the NRC to revoke Northeast Utilities' operating licenses.

"We could make it very difficult," said Ainsworth, who believes communication between Connecticut Yankee and the town has markedly improved. "At this point, the pendulum has swung to the opposite end of the spectrum," he said.

NRC to End Environmental Monitoring Program with States

from a January 13, 1998, NRC Press release

The Nuclear Regulatory Commission has ended its contracts with 34 states to perform radiation monitoring around certain nuclear facilities at the end of 1997.

Elimination of this program, however, will not impact the NRC's ability to monitor and regulate safety at the facilities. Licensees are required to continue their own environmental monitoring activities to verify that radiation levels around their facilities are negligible.

The separate monitoring program began in the 1970s as a joint effort between NRC and the states to independently compare the results of environmental measurements with those performed by NRC licensees. The program was also intended to help states develop their own radiological health programs, but not to fully fund them. Participation by states was voluntary.

In April 1995, NRC requested public comment on its plans to eliminate the program, citing both the cost (over $1 million a year) and the excellent record of licensees in maintaining their own environmental monitoring programs. NRC also reviewed this issue as part of its strategic assessment and rebaselining initiative.

Based on this review, the staff has determined that information received from the states appears to be of limited value from a safety perspective. In addition, staff believes that states have been provided ample opportunities to develop their own regulatory programs with financial and technical assistance provided by the NRC for more than 20 years.

NRC requires licensees to monitor extensively the air, water, soil, and food products around their facilities. Laboratories where licensees' samples are analyzed must be cross-checked with other laboratories to insure precision and accuracy of measurements. All measurements are submitted annually to NRC and placed in local public document rooms. NRC also inspects licensees' conformance with the requirements on a regular basis.

Licensees may still contract with outside entities (including states) to perform environmental monitoring if they choose. However, the NRC holds each licensee ultimately responsible for adequate monitoring regardless of who performs it.

TMIA Prepares for 20th Anniversary

March 28, 1999, will be the 20th anniversary of the partial meltdown at Three Mile Island. TMIA is planning a number of activities to commemorate the event. Call the TMIA office to learn more or to help.

DOE-TVA Tritium Plan Caution Urged

from a March 24, 1998, Chattanooga Free Press article

Dr. Arjun Makhijani, president of the Washington, D.C.-based Institute for Energy and Environmental Research, visited the Chattanooga area Monday to speak on the possible global effects of the production of tritium at TVA nuclear facilities. The federal agency is considering the program for its nuclear reactors under a proposal submitted to the U.S. Department of Energy (DOE). The United States stopped producing new tritium in 1988 and DOE is looking for a new production source for the radioactive isotope of hydrogen, a necessary component of nuclear weapons.

Dr. Makhijani, the principal editor of *Nuclear Wastelands: A Global Guide to Nuclear Weapons Production and its Health and Environmental Effects*, questions whether the United States needs to further tritium production at this time. "The rush for tritium production clearly sends a message to the Russians that the U.S. intends to maintain a huge arsenal. ... That's a dangerous signal at a time when the Russian command and control over their weapons is declining."

Dr. Makhijani said the search for a new tritium source also sends a bad message to non-nuclear countries: "Mixing up the military and commercial side of tritium production is a very bad signal." He also questioned assumptions "that there's going to be a flow of money into this region because tritium requirements are going to be there."

Dr. Makhijani called that a "risky proposition" because "I think there are clearly a large number of voices already, growing every day because of the dangers of control in Russia, that the number of weapons should be brought down drastically. ... There's absolutely no need to rush into tritium production on the kind of time scale that they're talking about, which is 2005" for the nuclear reactor process to be ready.

A second option being considered by DOE is the building of an accelerator system for tritium production at DOE's Savannah River site near Augusta, Ga.

The accelerator option is estimated to cost $4.5 billion, while completion of TVA's Bellefonte Nuclear Plant near Scottsboro, Ala., is estimated by TVA at about $2 billion, with DOE helping with the financing but TVA retaining ownership.

Jack Bailey, TVA's vice president for nuclear engineering, told Nuclear Regulatory Commission officials recently that TVA's proposal is "the best deal for the taxpayer," according to the Associated Press.

Dr. Makhijani's visit was sponsored by the Knoxville-based Tennessee Valley Energy Reform Coalition (TVERC).

Major Symposium on Radiation and Health

September 26 and 27, 1998
New York City

A two day symposium examining new discoveries on the effects of radiation on human health is planned for September 26th and 27th to be held at the Academy of Medicine, 1216 Fifth Avenue, New York.

Two days of papers by respected epidemiologists, physicians, and scientists will summarize the recent literature on radiation and its biological implications with specific reference to medicine, the nuclear power and nuclear weapons industries.

Presenters include:

* John Gofman, Professor Emeritus of Molecular Biology, University of California and Lecturer at Department of Medicine, University of California School of Medicine, San Francisco

* Alice Stewart MD, FRCP, Department of Public Health and Epidemiology, University of Birmingham

* John Little MD, Professor Radiobiology, Harvard School of Public Health

* Arjun Makhijani, President of Institute for Energy and Environmental Research

* George Woodwell, Director, Woods

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Hole Research Center

* Marvin Resnikoff, Ph.D., Senior Associate Radioactive Waste Management Associates

* William Arkin, Consultant, Natural Resources Defense Council

* Steve Wing, Ph.D., Department of Epidemiology, University of North Carolina at Chapel Hill

Dr. Helen Caldicott, who organized the original PSR symposia, will act as chief coordinator of this event.

For registration information, please contact: The STAR Foundation, P.O. Box 4206, East Hampton, NY 11937; 516.324.0655.

Environmental Conference Announced

The National Wildlife Federation and Zero Population Growth, along with Penn State-Harrisburg Environmental Program are sponsoring **Wildlife and People: Balancing Needs and Resources in a Finite World.**

The conference will be held June 13, 1998, at the Penn State-Harrisburg campus, in the Capital Union Building. For more information, call 1-800-767-1956.

Pilgrim Nuclear Power Station Seeks Interested Buyers

from a April 17, 1998, NRC press release

On April 16, 1998, Boston Edison Company (BECo) issued letters soliciting expressions of interest in purchasing the Pilgrim Nuclear Power Station (PNPS). The letters were sent to more than 100 firms worldwide with experience in operating nuclear power plants.

Office of Consumer Advocate Moves

The Office of Consumer Advocate has moved to 555 Walnut Street, Forum Place, 5th Floor, Harrisburg, PA 17101-1921. Phone: 717-783-5048.

Please renew your TMIA membership

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Intervention Fund Contribution: ❑ $10 ❑ $20 ❑ $50 ❑ $100

Checks of $50 or more can be made payable to the TMI Legal Fund for tax deduction purposes.

RETURN TO: **TMIA, 315 Peffer Street, Harrisburg, PA 17102**

The official registration and financial information for Three Mile Island Alert may be obtained from the PA Department of State by calling toll free, within PA, 1-800-732-0999. Registration does not imply endorsement.

TMIA Alert

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Three Mile Island Alert

The Newsletter of Three Mile Island Alert October 1998

Activists Target Vermont Yankee in Nuclear-Free New England Drive

from an August 6, 1998, Nucleonics Week article

With the closure of four nuclear power plants in New England in the last six years, anti-nuclear activists believe a "nuclear-free New England" is within reach, and Vermont Yankee is their next target.

The Nuclear Information & Resource Service (NIRS), a national, Washington-based group, and the Citizens Awareness Network, a New England group based in western Massachusetts, are sponsoring a week-long activist training session later this month in Vermont.

According to organizers, in addition to training and networking sessions, the "Northeast Action Camp," to be held within 10 miles of Vermont Yankee August 21-28, will include a public rally in Brattleboro calling for the shutdown of the plant as well as a demonstration involving civil disobedience at the plant site in Vernon. "What we're doing is trying to rekindle a coordinated effort of resistance," said Paul Gunter, director of the reactor watchdog project at NIRS. "There has historically been local opposition to

(Continued on page 6)

Long-time TMI-1 Opponents Vow to Fight Unit's Sale to AmerGen

from a July 30, 1998, Nucleonics Week article

A Pennsylvania citizens group that has long alleged there were serious public health effects from the 1979 Three Mile Island-2 disaster is devising strategy to fight the proposed sale of TMI-1 from GPU Inc. to AmerGen Energy Co.

It's like "the Three Stooges are selling a nuclear reactor to the four Marx Brothers," said Eric Epstein, chairman of Three Mile Island Alert. He alleges there are safety questions and other concerns that merit U.S. regulators blocking the sale.

TMI Alert unsuccessfully opposed TMI-1 restart in a six-year NRC proceeding after the TMI-2 meltdown. Epstein said the group wants TMI-1 decommissioned, but had GPU reached a deal to sell the unit to someone the citizens group considers a better operator -- Epstein specifically mentioned Duke Power -- TMI Alert probably would not have objected to the sale, he said.

But Epstein said the group is uneasy about PECO's safety record. Epstein cited a proposed $55,000 fine against PECO as evidence of the company's alleged problems. NRC proposed the fine a few weeks ago for equipment operability violations at Limerick, and PECO hasn't yet decided whether to pay or protest it. (Ed. note: see related article, page 14.)

AmerGen -- a joint venture of PECO Energy and British Energy -- could pay up to $180-million for TMI-1. The lion's share of that would be for the unit's fuel. TMI-1 has averaged 90% capacity factor for the 36 months ending May 31 and had no unplanned outages in the first five months of 1998, according to McGraw-Hill's World Nuclear Performance. PECO's plants have averaged 85%-86% capacity in the same 36-month period.

If the deal is approved, it will be the first sale of a nuclear power plant in the U.S. The announcement has generated some optimism for the U.S. nuclear industry, and even some critics say it marks the dawn of a "secondary market" for U.S. reactors.

AmerGen is now in a 90-day due

(Continued on page 8, column 1)

Three Mile Island Alert

Three Mile Island Alert (TMIA) is a non-profit citizens' organization dedicated to the promotion of safe-energy alternatives to nuclear power, especially to the Three Mile Island nuclear plant.

Formed in 1977 after the construction and licensing of TMI Unit-1 and the construction of the infamous Unit-2, TMIA is the largest and oldest safe-energy group in central Pennsylvania.

TMIA members interested in specific aspects of nuclear power are encouraged to join one of TMIA's committees. These committees include:

- Radiation Monitoring
- Low-level Radioactive Waste
- Health Effects of TMI
- Nuclear Plant Security

Three Mile Island Alert
315 Peffer Street
Harrisburg, PA 17102
Phone: (717) 233-7897
FAX: (717) 233-3261

On the Web at:
http://www.enviroweb.org/tmia/

Email Address:
tmia@pipeline.com

Beware of the Buyer

A TMIA Opinion
by: Eric Epstein, Chair, Three Mile Island Alert

On July 17, 1998, AmerGen, a corporate venture comprised of PECO Energy and British Energy, made an offer to buy Three Mile Island-1 for $100 million ($500 million less than its book value). The proposed sale would pay the current owners, General Public Utilities (GPU), $23 million for the nuclear plant and $77 million for nuclear fuel over a five year period. Unfortunately, this marriage is a Faustian Pact that would yield PECO and GPU short-term economic relief while exposing area residents to increased health and safety risks:

— PECO Energy has the highest electric rates in the state for all classes of customer. (Pa PUC, Electric Utility Operational Report, January 30, 1997.) PECO also has the second highest average residential gas rates in the Commonwealth. (Pa PUC, Natural Gas Utility Update, August 19, 1998.) In addition, "Philadelphia Electric was significantly worse than average" in the handling of consumer complaints and "the worst in the industry" in collections. (Bureau of Public Liaison, Pa PUC, Fall 1995.)

— On June 12, 1998, the NRC fined PECO $55,000 for "two program deficiencies that led to the impaired performance of the Unit-3 emergency cooling pump ... ." (NRC Inspection Report Numbers 50-277/98-03 and 50-278/98-06.)

— On May 27, 1998, the US Justice Department sued PECO for more than $67 million in damages caused by PECO's alleged reneging on a contract to buy 30% of the River Bend nuclear power plant owned by Cajun Electric Power Cooperative. (*Reuters*, Wednesday, May 27, 1998.)

— In March 1998, "The Company reported a net loss of $1.5 billion or $6.80 per share. Included in these results was an extraordinary charge of $3.1 billion ($1.8 billion net of taxes) or $8.24 per share, in the fourth quarter to reflect the effects of the December 1997 PUC order (as revised in January 1998) in the Company's restructuring proceeding." (Report to Shareholders, C. A. McNeill, Jr., Chairman, President and CEO, PECO Energy.)

— PECO was ordered by the NRC to shutdown Peach Bottom-2 and -3 on March 31, 1997, due to operator misconduct (e.g., sleeping, spitball battles, and purveying "adult" magazines). This was the first and only occasion that the NRC ordered a nuclear plant shut down. Zack Pate, President of the Institute for Nuclear Power Operations (an industry think-tank), declared that Peach Bottom "was an embarrassment to the industry and to the nation ... . The grossly unprofessional behavior by a wide range of shift personnel ... reflects a

(Continued on page 8, column 3)

Sale and Early Closure of Units, A Glimpse at Industry's Future

from a July 23, 1998, Nucleonics Week article

Last Friday offered a illuminating peak into the U.S. nuclear industry's near-term future. In the span of just a few hours, it was announced that one nuclear unit was being sold and another was closing down prematurely.

The sale of GPU, Inc.'s Three Mile Island-1 to the U.S.-British joint venture AmerGen Energy Co. was hailed by analysts and industry leaders. The Nuclear Energy Institute (NEI) said the proposed deal "demonstrates that nuclear power plants are well positioned for competition in the electricity generation business." Nuclear critics called it a "fire sale."

If approved, the deal would be the first sale of a nuclear power plant in the U.S. and the first of a planned series of acquisitions by AmerGen, formed last year by PECO Energy Co. and British Energy (BE) to buy and operate U.S. nuclear plants.

AmerGen could pay as much as $180-million under terms of the transaction. The $100-million initial price, including $23-million for the Babcock & Wilcox PWR itself and $77.6-million over five years for its fuel, could increase by tens of millions of dollars depending on what happens with energy prices.

PECO and GPU said the final sale price depends on additional payments to GPU based on the wholesale price of energy in the area surrounding the plant at the time of settlement. GPU spokesman Jeff Dennard said GPU could get an additional $80-million based on the formula.

GPU had trouble defending portions of the deal -- such as why the reactor was worth less in the deal than the fuel used to run it and why GPU agreed to buy the energy from the plant for a two-year period (beginning in January 2000 if the deal closes December 31, 1999, as planned).

"I'm not sure I can give you an answer," Dennard said. "This is the first and only deal of its kind." As to the value of the reactor versus the fuel, "that's what the market says they are worth," Dennard added. "We are breaking new ground here. I don't think you can say it was because of this or because of that. These people were all breaking new ground, and that is what they came up with."

PECO spokesman Bill Jones said the figures were agreed upon as the fair price for the assets following months of discussions with GPU.

The agreement in principle also addresses decommissioning costs for TMI-1, which is licensed to operate until 2014. When and if the sale closes, GPU is supposed to have $320-million in its decommissioning trust fund.

Dennard said GPU Nuclear has $202-million in the decommissioning trust fund and has agreed to put in another $118-million at settlement. "That's the limit of our liability," Dennard said.

Late last year, GPU estimated decommissioning TMI-1 would cost $409-million, Dennard said, "so we feel that's a darn good deal for our customers." Recovery of that money from ratepayers is subject to state regulatory body reviews in both Pennsylvania and New Jersey. GPU will maintain the fund at the investment direction of AmerGen, Jones said.

Everybody A Winner

Gary Hovis, an analyst with Argus Research, said there were no losers in the sale. "It's good for PECO, good for British Energy and good for GPU," he said. "I think the wave of the future is nuclear power, and this puts PECO far ahead of the pack," Hovis said, adding that it shows "a lot of courage" on the part of PECO.

While he speculated there would not be a rise in the stock price in the short-term, he said stockholders will see the benefits within the next four or five years. On Monday, GPU's stock closed at 37 and nine-sixteenths, down one-half. The day before the deal was announced, it closed at 38 and five-eighths. PECO

(Continued on page 4)

(Continued from page 3)
finished the day Monday at 29 and three-sixteenths, up one-sixteenth. It had closed at 28 and thirteen-sixteenths the previous Thursday.

Hovis called the selling price "fair" and said he believes as the country focuses more attention on the limited supply of electricity sources, there will be an increased willingness to extend the life of existing plants and to "throw more financial resources" into technology to lower nuclear plant costs.

Chris Neil, a senior consultant at Resource Data International Inc., a Boulder, Colo.-based firm that analyzes energy and natural resources, called it "exciting" to see the "first whole nuclear plant sell."

"It's nice to see that a nuclear plant can trade owners if it wants," he said. Neil said the seemingly low selling price likely reflects that there was "not much value" in the plant. He noted that single unit plants like TMI-1 generally have higher operating costs, but that by combining it with its other nuclear plants, PECO can "run the plants better and be more competitive." TMI-1 is located near PECO Energy's existing nuclear stations (Peach Bottom and Limerick) in Pennsylvania, which offers potential management and infrastructure benefits.

Neil said the economies of scale don't apply to GPU's other operating nuclear unit, Oyster Creek. "Oyster Creek is not nearly as good an opportunity," he said. "It's too small and too expensive" to operate.

AmerGen considered buying Oyster Creek, but decided not to take the plunge because of a "big difference" between energy production and costs per kilowatt-hour compared to TMI-1, PECO's Jones said. In all likelihood, GPU will prematurely close Oyster Creek in 2000.

TMI-1 is the first of several potential U.S. investments AmerGen is considering.

TMI-1 is a high-quality plant, with excellent safety and commercial track records, the companies said. Issued an operating license in 1974, the reactor has been a consistently good performer, currently returning load factors of around 90%.

TMI-2, the site of the worst U.S. commercial nuclear accident, will continue to be owned by GPU, which will be solely responsible for its liabilities.

Due diligence, involving an in-depth review of TMI-1, is expected to take several months, and regulators will have to approve the sale. Agencies that must give their okay include the NRC, the Federal Energy Regulatory Commission, the Securities & Exchange Commission, the Pennsylvania Public Utility Commission, and the New Jersey Board of Public Utilities. Regulatory approval is expected to take up to two years.

A decision to acquire the plant will also be subject to approval by British Energy's board of directors. British Energy's share of the cost of investment would be 25-million pounds (U.S.$41-million). The operating license for the station isn't expected to be transferred until well into 1999.

AmerGen is working on other U.S. acquisitions. BE's chief executive, Peter Hollins, said "We've made real progress in North America over the last year in developing business opportunities and are now ready to undertake due diligence on what we hope will be the first of a tranche of AmerGen nuclear plants. I am confident that BE, working with our partners PECO Energy, can play a significant role in the developing competitive U.S. electricity marketplace. But we won't rush into anything -- that's what due diligence is all about. We must ensure that we get a well-thought-out deal for our shareholders."

For PECO Energy, Chairman Corbin McNeill said, "We're pleased with the way AmerGen is developing. When we formed our joint venture with BE, we broke new ground for the U.S. I'm determined that AmerGen will now lead the way in achieving commercial success for nuclear plants in developing U.S. markets. There's a long way to go -- but this is an important step on the road."

Fire Sale of a White Elephant

Mixed metaphors aside, nuclear power critics cautioned that it is too early to proclaim the first sale of a U.S. nuclear plant a major rallying point for the industry.

(Continued on page 5)

(Continued from page 4)

"You are really looking at a white elephant sale here," said Scott Denman, executive director of the Safe Energy Communication Council. GPU, Inc., which is withdrawing from the electric generation business to concentrate on transmission services, sold TMI-1 for "next to nothing," Denman claimed. "When you look at the numbers, it appears GPU is actually paying to get it off their hands."

David Lochbaum, nuclear safety engineer with the Union of Concerned Scientists (UCS), compared the sale to "buying a used car with the contents of the gas tank being worth more than the car itself."

Lochbaum acknowledged, however, that "from a bigger picture viewpoint" the deal is significant. "It seems to be a good transition step" toward development of "a secondary market" for reactors, he said. If such sales become a trend, utilities will have "an option to closing down a plant early...though they are not going to make a huge windfall profit," Lochbaum added. Had such a market existed a few years ago, reactors such as Commonwealth Edison's Zion might still be running, he said.

The UCS official also conceded that AmerGen might do well with TMI-1, given that it is not far from PECO's other units. But he cautioned that PECO's experience is with BWRs, not PWRs like TMI-1. He said that is not an insurmountable hurdle, however, because British Energy has PWR experience.

Another One Bites the Dust

While nuclear industry supporters crowed about the significance of AmerGen's purchase, they were silent about Northeast Utilities' (NU) decision to permanently close Millstone-1, more than 11 years before its operating license expires.

Noting that there were no sale prospects and saying the plant has "insufficient value" for its customers, Michael Morris, NU chairman, president and chief executive officer announced Millstone-1's closing after filing an updated economic analysis on the unit with the state Department of Public Utility Control.

Morris said the analysis showed a slight savings to customers of $19-million by continuing to run the plant. "However, the $19-million is less than one percent of the total cost required to operate the unit through the end of its license in 2010. Because the savings to customers are so small and could be further reduced by changes in the variables assumed in the study, such as the prices for fuel or electricity in New England, the company has decided to cease restart activities at Millstone-1 in preparation for final decommissioning," Morris said.

By comparison, Connecticut Yankee, another NU-run plant that also had 11 years left on its license, had a net present value of $100-million in favor of continued operation when it was retired in late 1996.

Only a year ago, continued operation of Millstone-1, a 690-MW General Electric BWR Mark I, was pegged by NU as saving customers $72-million over an early retirement.

"While this analysis could conceivably be used to support continued operation of Millstone-1, the changing utility structure and electric marketplace lead us to the harsh reality that there is insufficient value in Millstone-1 for our customers," Morris said. "We have decided not to bring Millstone-1 back on line as an operating nuclear unit." NU had offered the unit for sale but it apparently found no takers.

Millstone-1 entered a refueling outage in November 1995 and has never restarted. Whistleblower reports led to the discovery that NU has been off-loading the full reactor core for 20 years -- safely, NRC later decided, but in violation of NRC-imposed plant operating requirements. The plant landed on the cover of Time magazine and additional NRC inspections uncovered a host of licensing issues. The NRC determined that NU had lost control of the design basis for the plant. The investigation spread to Millstone-2 and -3 as well. Millstone-3 restarted only June 30 after a 27-month outage that cost the utility over $500-million. Millstone-2 remains down, but NU plans on restarting it later this year, Morris reaffirmed in his announcement.•

(Continued from "New England," page 1)
Vermont Yankee from the 1970s."

Gunter said the activists aren't singling Vermont Yankee out. "We don't really see good performers and bad performers. They're all egregious to the environment," he said. But Vermont Yankee has two characteristics that make it particularly attractive to the anti-nuclear groups. First, the groups are opposed to Vermont Yankee's attempts, with Vermont and Maine, to form a low-level waste compact and site a waste facility in Texas. Secondly, the plant is a General Electric Mark I BWR, which opponents consider an inherently unsafe design.

While the New England Coalition Against Nuclear Pollution is not co-sponsoring the Northeast Action Camp, it supports the effort, Coalition members Michael Daley and Diana Sidebotham said. But the Coalition, one of the oldest indigenous nuclear watchdog groups surrounding Vermont Yankee, is limiting itself to monitoring plant activities -- especially plans to again expand the spent fuel pool there -- and taking whatever opportunities to intervene present themselves. Daley said he also is trying to work at the state level to force the plant into retirement.

Though Vermont Yankee supplies more than 75% of the state's electricity output and provides a third of the electricity that the largest co-owner Central Vermont Public Service Corp. sells, a bill restructuring the electricity industry in Vermont would have decreed Vermont Yankee's shutdown this year if it had passed the state House. The bill passed the state Senate last year, but failed to pass in the House and can't be reintroduced until the next session in January 1999.

Vermont Yankee plant officials, however, seemed largely immune to all the attention. Company officials directly running the plant, at least, are highly focused on keeping the 26-year-old, 540-MW General Electric BWR shipshape.

Managing An Aging Plant

As nuclear plants go, Vermont Yankee is getting old at 26. Of the New England reactors that have closed, Yankee Rowe made it through 31 years of commercial operation; Connecticut Yankee, 28 years; Maine Yankee, 24; and Millstone-1, 27.

According to Bruce Wiggett, Vermont Yankee vice president for finance, annual economic analyses of Vermont Yankee show it has a net present value in favor of continued operation, versus premature retirement, ranging from $14-million to $485-million, "depending on assumptions." For comparison, Connecticut Yankee shut down with a net present value of $100-million and Millstone-1 went from a net present value of $72-million to just $19-million in one year's time, before it was shut down.

On the other hand, the recently announced decision by AmerGen Energy Co., the PECO Energy-British Energy joint venture, to purchase GPU Nuclear's Three Mile Island-1 suggests there may be a market for older, well-run plants. TMI-1 is 24 years old, although it had a six-year operational hiatus after the 1979 accident at Unit 2. Though no substantive discussions have taken place, Vermont Yankee is one of those plants which AmerGen has been toying with and PECO executives have said New England is an attractive target.

"All the single unit plants are good prospects to be sold to a buyer," said Barry Abramson, a senior utilities analyst with Paine Webber in New York. "Vermont Yankee certainly fits that categorization. And it's in a region where there has already been a lot of capacity retired, which could increase the value of the remaining plants," he said. TMI-1's advantages were that it was a well-run plant and in PECO's backyard. But unlike TMI-1, Vermont Yankee (and Boston Edison's Pilgrim) is a BWR, the same as the plants PECO has experience running in Pennsylvania, Abramson said. PECO Energy's one contract for managing a plant, Illinois Power Co.'s Clinton, is also a BWR, Abramson noted. Unlike TMI-1, though, Vermont Yankee has nine co-owners. "Some have made it clear they want to divest, but I'm not sure there's a consensus there," Abramson said.

Planning For The Future

Vermont Yankee's operators certainly aren't acting as though they

(Continued on page 7)

(Continued from page 6)
plan to retire the plant soon. In 1995, Vermont Yankee was the first GE BWR in the world to replace its low pressure steam turbines, casings, and related components. The job cost $33-million, but was predicted to have a net present value over the remaining life of the plant of $105-million and add 14 megawatts to the plant's capacity.

Plant officials interviewed recently noted that the plant's recirculation piping was replaced in the mid-1980s, that the core shroud has already been repaired, and that enhancements to the shroud were made during the last outage to accommodate possible future power uprates.

The company is spending an estimated $17-million between 1996 and 2000 to reconstitute the plant's design basis, and Director of Operations Greg Maret said one of the reasons is to facilitate future power uprates. "Vermont Yankee should be upratable by several percentage points," Maret said, "without any hardware changes." The scope of the design basis reconstitution effort includes a detailed review of 23 systems identified as safety significant in the plant's probabilistic risk assessment, Maret said.

The design basis reconstitution is one of the company's four highest goals for 1998. Conversion to improved standard technical specifications was put on hold until the completion of the design basis job.
Two of the company's other priorities for 1998, an improved corrective action program and a "systems engineering initiative," are related to the design basis effort, according to Maret and Don Leach, vice president for engineering.
Maret said the plant's existing corrective action program, dating back to the plant's origins, was inadequate to keep up with the mushrooming input of information over the years. "The system was getting overloaded and in some sense, incoherent," Maret said. "The original system was becoming overwhelmed, fundamentally because of a great influx of information into the system."

Maret said it used to be "the business plan was running the plant. Now it's, 'What is the information coming in from the plant?'" Maret said. "What does the plant need?" The corrective action program now informs plant operational decisions such as design changes, training needs, and budget requirements, Maret said.

Leech said the systems engineering initiative assigns individual systems to individual engineers who are responsible for trending their performance, "kind of the quarterback in understanding the health of the system."

What About The Waste?

Vermont Yankee's spent fuel pool is getting full and there is no reracking option that will get the plant through the end of its currently licensed life in 2014. The problem of spent fuel pool capacity is a particular sore spot among local plant opponents -- and its planned expansion, along with encouragement by larger regional and national groups, could rekindle broader local opposition.

Sidebotham, a founder of the Coalition in the 1970s, said Vermont Yankee signed a legal agreement with her group in 1977, the first time it sought approval to expand the pool. The agreement called for the plant's shutdown if no site were found for permanent disposal of the spent fuel by the time the spent fuel pool was full again. That occurred in 1987 and Vermont Yankee reneged on the agreement, claiming, according to press reports at the time, that it wasn't legally binding and that new technologies and better analysis options were available. Vermont Yankee sought and received approval to expand the fuel pool's capacity a second time. Now, they are going for a third expansion, which is one the corporation's four highest priority projects for 1998.

Vermont Yankee will lose full core off-load capability in spring 2001. The company is also evaluating dry storage options. In June, John Hoffman, Vermont Yankee spent fuel and decommissioning manager, said the licensee is only looking at "a relatively small capacity expansion of the existing spent fuel pool."

Vermont Yankee plans to submit a license amendment to NRC this month and would like to have approval for contractor Holtec International to install the additional racks by the fourth quarter 2000.•

(Continued from "TMI Opponents," page 1)
diligence period, reviewing all aspects of TMI-1 operations. Regulatory approval is expected to take 12 to 24 months. Because of this lag time, Goldman Sachs Investment Research has not changed its 1998 or 1999 estimates for GPU or PECO, and continues to rate both as "market outperformers."

Goldman Sachs suspects the deal could be better than expected for PECO down the road. AmerGen agreed to sell 100% of TMI-1's output back to GPU during the first two years after the sale.

Conservative projections released by PECO Energy have not factored in added marketing opportunity for Power Team, PECO's wholesale power marketer, once that two-year deal expires. The benefit of TMI-1 power marketed by Power Team could be substantial, according to Goldman Sachs.

Good performance by Power Team was cited by PECO in announcing its third quarter fiscal 1998 dividend. "Power Team maintained its successful growth strategy of focusing on reliable physical delivery of wholesale power in short-term markets across the country," PECO said July 27. As a result the PECO unit was well prepared for the volatile price markets, the company said. PECO declared a common stock dividend of 25 cents per share for the quarter.

PECO Energy's common stock earnings for the quarter that ended June 30 was 66 cents/share, compared to 53 cents/share for the same quarter last year. Earnings for the first six months of 1998 were $1.16/share, compared to $1.02/share for the first half of 1997, PECO said.

At the end of trading on July 27, GPU stock remained unchanged at $35.312. After dropping to $32/share last summer, GPU stock crested at $44/share in April. PECO stock was trading at $29.562 and the company was issuing an upbeat report on quarterly earnings. •

1999 Peace Calendar on Sale

Once again, TMIA is offering the Syracuse Cultural Workers' Peace Calendar. This 28th edition of the Peace Calendar features artwork honoring Cuban Liberation Day, Sojourner Truth, Urban Gardening, Butterflies, Community Cash, and Disability Rights Activists. The calendar is full-color, 14 x 11 folded and is union-printed in the USA on postconsumer recycled paper. The calendar contains quotes, poetry, and information, and people's history annotations.

The price is $10, plus $1.50 postage and handling. Call TMIA at 717-233-7897 to order, or write us at 315 Peffer Street, Harrisburg PA 17102.

(Continued from "Beware," page 2)
major breakdown in the management of a nuclear facility."

PECO's partners at Peach Bottom, Public Service Electric & Gas Company, Atlantic City Electric Company, and Delmarva Power & Light Company, sued PECO for breaching the Owner Agreement. PECO agreed to pay $130,985,000 to resolve the litigation.

-Although PECO may be competent to operate its own Boiling Water Reactors, it has no experience in operating a Pressurized Water Reactor (like TMI-1).

-The sale of TMI to AmerGen would violate the Atomic Energy Act which precludes transferring nuclear technology to a foreign entity.

-In the first eight months of 1998, "PECO has cut its dividend nearly in half, announced 1,200 job cuts, and written off $3.1 billion in assets." (*Patriot News*, Business, September 3, 1998.)

Historic and fiscal trends are valid and instructive barometers of future performance. PECO Energy has demonstrated an operating arrogance unmatched by any Pennsylvania utility. Rather than acquiring aging nuclear reactors, PECO should put its own financial house in order, marshal its resources toward improved performance, and make a concerted effort to reduce their electric and gas rates.•

Ex-owners of Pennsylvania Uranium Plant Ordered to Pay $36.5 Million

from a September 18, 1998, Star Tribune (Minneapolis, MN) article

The owners of a uranium plant that fueled submarines during the Cold War were ordered by a jury on Thursday to pay at least $36.5 million to eight cancer-stricken residents of the small town of Apollo, Pa., or their relatives. Atlantic Richfield Co. and Babcock and Wilcox Co. were found negligent in their operation of the now-closed Nuclear Materials and Equipment Corp. plant.

Nearly 100 of the 1,900 residents of the river town, about 30 miles northeast of Pittsburgh, have claimed that three decades of radiation from the plant have caused an unusually high incidence of cancer. The jury deliberated nine days before awarding $36.5 million in compensatory damages.

"Yes!" exulted Patricia Ameno, an Apollo resident who was among the first to suggest a link between the plant and the cancer that struck her and her neighbors.

Only eight cases of cancer were addressed in the monthlong federal trial. The damages will be divided among seven cancer patients, three of their spouses, and the parents of a woman who died of leukemia. The other plaintiffs, including Ameno, have filed separate lawsuits that are still pending.

The plant processed nuclear fuel from 1957-86 and was torn down in the early 1990s. It once supplied uranium to power U.S. submarines.

When she heard the verdict, Jennifer Marks Kettering, 26 - who has leukemia - cried, shook and lowered her head. She was awarded $2.82 million.

The largest payment, $8.5 million, will go to the estate of Tina Hall, who died of leukemia at age 24 on Christmas 1992.

The companies had argued that the plaintiffs failed to prove the plant exceeded allowable releases of radiation, show any increased likelihood of cancer after purported releases or provide any estimates of radiation doses that residents received. The companies cited two state Health Department studies that showed no unusual rates of cancer in Apollo.

The plaintiffs disputed the Health Department studies. Dr. James Melius, an occupational and public health specialist, testified that the department should have compared the incidence of cancer near the plant with rates in surrounding rural areas, rather than with national and state rates. •

NRC Suspends SALP Program Until Review of Performance Assessment Process Is Completed

from a September 16, 1998, NRC press release

The Nuclear Regulatory Commission has suspended its Systematic Assessment of Licensee Performance (SALP) program for an interim period until the NRC staff completes a review of its nuclear power plant performance assessment process. At the end of the process, the Commission will decide whether to resume the SALP program or substitute something regarded as more effective.

The decision to suspend SALP is part of a larger plan to improve NRC's regulatory effectiveness. The plan represents a consolidation, refinement and acceleration of a set of ongoing initiatives in the following areas: reactor licensee performance assessment; risk-informed, performance-based regulations; reactor inspection and enforcement; licensing activities; NRC's organizational structure; and a number of specific issues requiring prompt and sound decisions.

L. Joseph Callan, NRC's Executive Director of Operations, outlined the plan in a recent memorandum to NRC Chairman Shirley Ann Jackson.

Resources saved by suspending the SALP program will be used to accelerate the staff's effort to redesign its regulatory practices to reflect in a more timely and efficient manner the performance of a mature nuclear industry. The NRC staff will make recommendations to the Commission at the conclusion of the review early next

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NRC Auditing Nuclear Power Plant Year 2000 Readiness Programs

from a September 21, 1998, NRC press release

As part of its efforts to address the Year 2000 problem, the Nuclear Regulatory Commission has begun a series of audits that will examine 12 nuclear power plants throughout the nation to spot-check measures licensees are taking to assure that key computer systems will function in the year 2000 and beyond.

The process, which will extend through January, started this month with audits at the Monticello nuclear power plant in Minnesota and the Seabrook plant in New Hampshire. Other plants will be audited as follows:

October: Brunswick (North Carolina), Hope Creek (New Jersey) and Davis Besse (Ohio).

November: Wolf Creek (Kansas), Watts Bar (Tennessee), and Limerick (Pennsylvania).

December: Waterford (Louisiana).

January: North Anna (Virginia), Braidwood (Illinois), and WNP-2 (Washington State).

Results of the audits will be used to determine if NRC needs to take further regulatory action. Based on preliminary findings during early audits or other relevant emerging information, NRC may need to adjust these schedules and may consider conducting audits at other plants.

The NRC selected plants for the Year 2000 audit based primarily on the following criteria:

-- Three plants located in each of NRC's four regions;

-- Plants designed by all four vendors (Babcock & Wilcox, General Electric, Combustion Engineering, and Westinghouse);

-- Plants of different ages; and

-- Extent of use of computer systems in plants.

The "Year 2000" problem refers to computers' potential inability to recognize 21st Century dates beginning with January 1, 2000, and beyond. It is caused by computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). If the problem is not corrected, vulnerable computer systems will read "00" as 1900, rather than 2000, possibly causing some plant systems or equipment to malfunction.

Thus far, NRC has no indication that such computer-related problems exist with safety- related systems in nuclear power plants. "Year 2000" problems have been found in non-safety, but nevertheless important computer-based applications, such as security computers, control room display systems, engineering programs, control systems, radiation monitoring, and emergency response.

In January, the NRC issued a letter to all licensed utilities with operational nuclear power plants requiring that they inform the NRC of steps they have taken or will take to deal with the Year 2000 problem. All licensees have responded that they are implementing programs designed to assure that computer systems will operate effectively into the 21st Century. All have indicated they will follow a program similar to the NRC-endorsed industry guide for Year 2000 readiness programs.

By July 1, 1999, licensees must submit a written response confirming that their plants are or will be Year 2000 ready at the turn of the century and if not, must provide a status report, including completion schedules for work remaining to ensure Year 2000 readiness.

More information about the Year 2000 problem can be found at the NRC Internet web page at: http://www.nrc.gov/NRC/NEWS/year2000.html.

Details about the NRC audit plan can be found at: http://www.nrc.gov/NRC/Y2k/y2kaudit.html.

Three Mile Island Vulnerable to Terrorists

from a September 10, 1998, Three Mile Island Alert press release

Despite the installation of 14 vehicle barriers at the Three Mile Island Generating Station following a 1993 intrusion, TMI is not adequately protected from truck bomb attacks. The current vehicle setback distances from vital areas of the plant are so small that a large truck bomb detonated from outside the barriers could trigger a disaster. While recent terrorists threats and security precautions at other US installations have prompted an increase of security measures to unprecedented level, security at TMI remains less than adequate.

Since 1994, Three Mile Island Alert has been requesting that the Nuclear Regulatory Commission correct this problem. Scott D. Portzline, Security Committee Chairman for TMIA, documented the security gaps in a presentation to the NRC's Independent Advisory Committee on Reactor Safeguards in 1994. His map of the plant plots a path to a specific area where the layout of the buildings would actually focus a bomb blast onto the vulnerable target.

More specifically, because the North Entrance vehicle barrier is open 50 percent of the day, a pathway exists whereby a terrorist could quickly and easily drive a truck bomb to within 75 feet of an especially vulnerable and dangerous target (the exact location is considered safeguarded information). Detonating a bomb from this spot could create a tremendous radioactive release, even larger than that of a full scale reactor accident.

According to Portzline, "The NRC and GPU have ignored this problem in spite of a 1984 classified report which concludes that a truck bomb can cause a disaster from outside the protected area."

Three Mile Island is the second smallest plant in the country. Following bombings linked to the Osama bin Laden organization, the US military has requested setbacks of 300 feet at its own installations for protection from large truck bombs. Although the NRC has stated that some small plants need to install blast deflection shields to protect vulnerable area, TMI has not installed these shields and the NRC is not enforcing the guideline.

Osama bin Laden funded the terrorists who bombed the World Trade Center. These terrorists trained only 30 miles from TMI. They threatened to attack "nuclear targets" with "150 suicide soldiers" and performed a night-time mock assault on an electrical substation near the training camp. As recently as September 4, 1998, the State Department considered bin Laden a continuing threat to the US and recommended that extra security precautions be taken.

Although the NRC recently issued a safeguarded communiqué to nuclear plants, entitled "Threat Assessments and Consideration of Heightened Physical Protection Measures," the NRC described the communiqué as only a "suggestion." According to Portzline, "Although the NRC is aware of the threats and the need for better protection, they are not enforcing the rules which are already on their books."

Three Mile Island Alert is urging that TMI and the NRC take immediate corrective action regarding this matter of national security.•

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year.

SALP evaluations were conducted by regional and headquarters NRC staff every 12 to 24 months to assess performance of each licensed nuclear power plant. The SALP program has been in existence for almost 20 years.

During the interim period that the SALP program is suspended, the NRC will utilize the results of its plant performance reviews to provide nuclear power plant performance information to licensees, state and local officials, and the public. These reviews are intended to identify performance trends since the previous assessment and make any appropriate changes to the NRC's inspection plans. Since beginning the Plant Performance Review process in 1988, the NRC has continuously improved it to the point that these reviews now use similar information and address many of the objectives of the SALP program. As a result, licensee performance will be assessed in much the same way as in the SALP process, and on a more frequent basis.•

Compact Supports Suspending LLRW Siting Process

from a June 19, 1998, DEP Update article

Members of the Appalachian States Low-level Radioactive Waste Compact Commission on June 18 unanimously approved a resolution supporting DEP's proposal to suspend the siting process for a low-level radioactive waste disposal facility.

Earlier this month the department announced it would be exploring the possibility of suspending the process based on the ready availability of disposal capacity to Pennsylvania generators of low-level waste at Chem-Nuclear's disposal facility in Barnwell, South Carolina.

The commission decided it would meet again in December to hear a report on the outcome of DEP's negotiations with Chem-Nuclear Systems, Pennsylvania's contractor for the siting process.

Pennsylvania joined Delaware, West Virginia and Maryland in 1985 to form the Appalachian States Low-level Radioactive Waste Compact. It was agreed that the compact's site would be located in Pennsylvania since the state generates about 85 percent of the compact's low-level waste.

The commission indicated that it expects DEP to resolve the contract in a manner that would assure resumption of the siting process if the need arose or if the availability of disposal ceased for any reason.

42 of The Nation's Nuclear Reactors Are Not Competitive

from an April 22, 1998, Critical Mass Energy Project press release

Forty-two nuclear reactors are more expensive to operate and maintain than the cost of replacement power in their own regions, reports a study released today by Public Citizen's Critical Mass Energy Project.

Owned and operated by 28 utilities in 21 states, these 42 nuclear reactors are among the least competitive in the United States. "If deregulation is really about competition, at least 42 nuclear reactors should be shut down as the industry is restructured," said Wenonah Hauter, Director of Public Citizen's Critical Mass Energy Project. "These non-competitive nuclear reactors should be retired and replaced with clean, safe and renewable sources of electricity."

"The threat is that in an effort to cut costs, nuclear utilities will cut corners on safety and increase the risk of an accident." said James Riccio, Staff Attorney for Public Citizen's Critical Mass Energy Project and author of the report. "Economic pressure on aging nuclear reactors in a deregulated electricity market could be a recipe for disaster."

"The lives of aging nuclear reactors should not be prolonged by multi-billion dollar bailouts of nuclear utilities," said Hauter. "The bailout of California's nuclear reactors under the guise of deregulation should be a warning to utility customers across the country." "Even if nuclear utilities can bring operation and maintenance costs under control, the combination of cheap replacement power and the rapid aging of reactors will likely doom many of these nuclear plants long before the expiration of their licenses," Riccio concluded.

Based on a 1994 study conducted by the Edison Electric Institute (EEI), Public Citizen's analysis compares operation and maintenance costs to the price of replacement power for each nuclear reactor over a three-year period, 1994-1996. The results of the 1994 Edison study were so abysmal that the report was never released.

Judging from the results below (see chart on page 13), EEI's reluctance to release the comparisons is understandable. Public Citizen's analysis indicates that 42 nuclear reactors from 28 utilities were more expensive to operate & maintain than the cost of replacement power in their own regions.

Reactor Site	State	O&M 1994-1996 Mills/KWH*	Replacement Power Costs Mills/KWH	Margin
Maine Yankee	ME	212.45	26.6	185.85
Millstone-1&2	CT	132.42	23.2	109.22
Big Rock Point-1	MI	61.18	23.7	37.48
Salem-1&2	NJ	49.3	23.5	25.8
Perry-1	OH	36.87	11.9	24.97
Indian Point-3	NY	53.36	31.4	21.96
Fort Calhoun-1	NE	30.55	9.7	20.85
Millstone-3	CT	41.91	23.4	18.51
Fermi-2	MI	36.01	18.6	17.41
River Bend-1	LA	28.95	11.7	17.25
Cooper Station	NE	28.56	11.9	16.66
Clinton-1	IL	23.93	9.3	14.63
Dresden-2&3	IL	42.08	29	13.08
Duane Arnold	IA	23.42	10.8	12.62
Sequoyah-1&2	TN	19.66	7.7	11.96
Browns Ferry-2&3	AL	18.92	7.6	11.32
Oyster Creek-1	NJ	31.71	22.4	9.31
Haddam Neck	CT	31.05	21.9	9.15
Cook-1&2	MI	19.91	12.3	7.61
Quad Cities-1&2	IL	32.6	25.4	7.2
Beaver Valley-1&2	**PA**	**20.92**	**14.1**	**6.82**
Davis-Besse-1	OH	20.28	13.5	6.78
Monticello	MN	17.12	12.4	4.72
Grand Gulf-1	MS	16.47	12.2	4.27
Pilgrim-1	MA	28.72	25.4	3.32
Callaway-1	MO	15.08	13.2	1.88
Waterford-3	LA	17.18	15.4	1.78
Hatch-1&2	GA	19.76	18.4	1.36
Wash. Nuclear-2	WA	19.62	18.5	1.12
Prairie Island-1&2	MN	13.53	12.6	0.93
Arkansas-1&2	AR	15.56	15.3	0.26

* One mill is equivalent to one-tenth of one cent. Public Citizen is a consumer advocacy organization founded by Ralph Nader in 1971. Copies of Questioning the Authority may be purchased for $40 by calling Public Citizen's publications department at 202-588-1000.

NRC Issues $55,000 Civil Penalty Against PECO for Violations Involving Ineffective Valve Repairs at Limerick

from a July 8, 1998, NRC Press Release

The Nuclear Regulatory Commission has proposed a $55,000 fine against PECO Energy Company for violations of agency requirements involving equipment operability at the Limerick nuclear power plant. PECO owns and operates the twin-reactor facility, which is located in the Philadelphia suburb of Limerick, Pa.

Identified during NRC inspections conducted between October 20, 1997, and March 16 of this year, the violations were discussed during a predecisional enforcement conference held on June 10 at the NRC Region I office in King of Prussia, Pa.

One of the infractions involves PECO's failure to aggressively and comprehensively fix a Unit 2 valve that was experiencing difficulties. Part of the high-pressure coolant injection (HPCI) system -- one of the plant's emergency core cooling systems -- the exhaust valve failed to close during testing on five occasions between March 1994 and January 1998.

Despite efforts to fix the problem, ineffective corrective action led to the valve being inoperable for an extended period of time.

"Although the valve does not have an automatic isolation function, it is necessary to isolate HPCI system leakage and is considered an extension of the (plant's) containment boundary," NRC Region I Administrator Hubert J. Miller wrote in a letter to PECO notifying it of the enforcement action. "In each of the first four occurrences, root cause analyses were not adequate to detect the root cause of the problem. Of particular concern is the fact that after the fifth failure on January 8, 1998, the valve was not declared inoperable even though subsequent data revealed internal binding of the valve."

Another violation was a failure to effectively troubleshoot a problem affecting a Unit 2 residual heat removal system valve. One function of the residual heat removal system is to maintain water level in the reactor vessel following a loss-of-coolant accident. Part of that system is a minimum flow valve, which is designed to open when a residual heat removal pump is in operation with the system's flow at low levels in order to prevent pump damage.

However, between Sept. 1, 1997, and Jan. 21, 1998, PECO efforts to prevent recurrent failures of the valve proved ineffective. The valve was not declared inoperable even though it was found closed four times, with the flow at less than the required 1,500 gallons per minute, during that period.

"The NRC considers this violation significant since pump damage could occur under no flow conditions in as little as three minutes. The NRC is particularly concerned that similar to the issue concerning the high-pressure coolant injection system exhaust valve, this problem revealed a lack of comprehensive troubleshooting by the engineering staff, as well as improper acceptance by the operators that the pump was operable even though the cause of the problem was not identified," Mr. Miller said.

The two violations have been categorized in the aggregate as a Severity Level III problem. (The NRC issues four levels of violations, ranging from Level I, which is the most significant, to Level IV, which is the least significant.) A fine of $55,000 is being issued for those infractions.

In addition, the NRC cited, but did not fine, PECO for a Level IV violation. It pertained to a failure to promptly identify and correct a misinstalled bearing in one of the plant's emergency diesel generators.

PECO has 30 days to pay the fine or to request in writing that all or part of the penalty be withdrawn.•

Buried Nuclear Waste 'Can Escape Through Plant Roots'

from an August 27, 1998 AAP Newsfeed article

Buried nuclear waste can escape to the surface by climbing up the roots of plants, it was claimed today. The discovery was made by accident during experiments with radioactive waste in America, New Scientist magazine reported. And Nirex, the British nuclear waste agency, had discovered the same phenomenon in tests in the UK, the magazine said.

Researchers at Oak Ridge National Laboratory in Tennessee embedded resin contaminated during the Three Mile Island nuclear accident in 1979 in small capsules of cement and polystyrene. These were then buried at the bottom of 90 cm deep steel cylinders filled with sand. The aim was to test whether radioactivity from buried waste could leach through the soil.

Eight years ago contamination was detected on the surface of one of the sand-filled cylinders. At the time scientists thought it was due to a spillage, but now a lengthy investigation has concluded that the radioactive material came from the buried waste.

William Sanford, of Colorado State University, who led the study, thinks the radioactive particles were probably carried upwards in water absorbed naturally by the roots of tiny plants.

The particles traveled about 20 cm a year and took five years to reach the surface. Sanford said: "This could result in direct exposures and off-site releases from underground storage facilities."

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RETURN TO: **TMIA, 315 Peffer Street, Harrisburg, PA 17102**

The official registration and financial information for Three Mile Island Alert may be obtained from the PA Department of State by calling toll free, within PA, 1-800-732-0999. Registration does not imply endorsement.

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