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Secretary of the Commission
U. S. Nuclear Regulatory Commission
Washington, DC 20555
Attn: Docketing & Service Branch

RE: **No Extension of Nuclear Power Plant Licenses Without Review**

Dear Nuclear Regulatory Commission:

I do not want any extension of licenses for nuclear power plants and reclamation centers. Your proposed rule of extending all existing licenses without plant modification would eliminate an already weak review process of nuclear power plants' and their compliance in correcting unresolved safety issues. It is often years after the fact, i. e., the Hanford nuclear emissions, that the public is told about leaks or radiation exposures and potential health risks and then no one accepts accountability for the "accidents".

The nuclear power industry has proven over and over again that it is irresponsible to the American public. **The nuclear power industry has consistently gone over budget** even during the construction phases of nuclear plants, not to mention the astounding costs above initial projections for repairs and operation. Any other industry operating with such incredibly poor financial returns, would have folded or gone bankrupt. But the American taxpayers are paying for these increased costs through their local gas and electric companies which are somehow connected to the Department of Energy which created/supports you, the Nuclear Regulatory Commission, whose members are appointed/supported by our Senators who supposedly represent us-the American taxpayer. So it appears to be perfectly fine that we are paying for these excesses. Do you see where my outrage starts?

I am paying for something I did not ask for, something I was promised would cost billions of dollars less (per nuclear facility) than it is costing the American taxpayers, something that has very little energy-saving return, something that is potentially so harmful that we have no suitable containment for it, something that can destroy thousands of lives and hundreds of thousand of acres of land and entire watersheds.

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Please regulate our nuclear power plants. Please stop granting operating licenses/renewals, and carefully assess the functionality of all current nuclear power plants/reclamation centers, i. e., any plant currently built on or near a fault must be immediately shut down. It is irresponsible to allow these plants operating licenses. It is also once again using the American taxpayer to pay for these financial disasters known as nuclear power plants.

It is time to say, "We have been mistaken about nuclear power/energy. It is not cost effective. It is not safe. It has consistently cost many times the initial projections to merely build the power plants. Also, nuclear waste is not containable."¹ Regardless of how often it has been analyzed, you know that nuclear waste is not containable. There are not only problems in storing nuclear waste temporarily, but there are also problems in locating viable long-term storage facilities.

There have been too many safety violations and accidents at our nuclear plants and reclamation centers to justify allowing any nuclear plant clearance to operate. I would rather live without the 5% energy which is supplied by our nuclear power plants than continue living with the accumulating toxic waste from our nuclear facilities.

It is my understanding that the Nuclear Regulatory Commission serves the people of the United States of America; so why are there so many safety hazards in our nuclear power plants and reclamation centers? Why does it take so long to correct these safety hazards? Why are temporary employees often unprotected from excessive radiation? Why do nuclear power plants consistently cost billions of dollars above budget? Is the American taxpayer being used by the nuclear industry for financial gain? I do not want a policy passed which would endanger America. There must be review procedures in order to ensure our safety. I would prefer that all nuclear locations to be shut down immediately. Thank you for your time and I will deeply appreciate your information.

Sincerely,



Susan Patton
882 Cleveland #26
Oakland, CA 94606

¹Please see photocopy attachments.

THE WASTE NOBODY WANTS

BY DAVID FERIMAN

Engineers who design new generations of nuclear power plants that promise abundant electricity more cheaply and safely must still face one intractable problem that engineering alone can never solve.

More than 23,000 tons of intensely radioactive nuclear wastes have accumulated around the nation's 111 operating nuclear power plants today, and the total will rise to 60,000 tons within a decade.

Yet nobody knows what to do with it all.

Storing the wastes safely undisturbed for tens of thousands of years while their radioactivity decays to safe levels is both a technical problem and a political one, and it has plagued the nuclear power world for more than 30 years.

Leaders of the atomic energy industry concede that until the waste problem is solved, their enterprise is dead in the water, despite increasing demands for electrical generating capacity.

Today most of the wastes lie immersed in "swimming pools" built to hold spent reactor fuel rods at guarded sites next door to every reactor in the country. The rods are stacked in their underwater racks with meticulous care, each one separated from its neighbor so the nuclear heat cannot build up and the radiation cannot escape.

At power plants in Virginia and North Carolina, where the swimming pools are already filled, fuel rods are now being shielded in concrete casks and placed on-site in "dry storage."

But the nation still has no permanent repository for the waste material, and after decades of technical studies and promises of progress, the federal government is embroiled in political battles over where and how to store the deadly stuff underground without risking environmental damage or the

Nuclear power's everlasting nightmare

ers and carved channels carrying the radioactive materials into widespread water supplies.

"Negligent and uncommunicative" were the kindest words the National Research Council could find to say about the agency's experts after the Kansas project was finally canceled in 1972.

Even less plausible ideas for waste disposal have since been advanced: Sink the toxic garbage five miles down in the deep undersea trenches of the far Pacific, or bury it beneath the thick sediments of the seabed; fire it by rocket into the sun, where the solar corona's 3 million-degree heat would strip its atoms apart; bury it far beneath the Antarctic ice sheet. All those wild ideas were quickly abandoned.

Later, the Department of Energy launched major studies of geological disposal sites in the basalt formations around the military reactor enclave near Hanford, Washington; in the granite of Ranier Mesa at the Nevada nuclear weapons test site north of Las Vegas, and in dry salt formations in Deaf Smith County, Texas.

But Congress finally became impatient at the delays and the spate of obviously impractical proposals for storing wastes safely, and in its 1982 Nuclear Waste Policy Act ordered the Department of Energy to begin to receive and store highly radioactive commercial wastes from the nation's reactors by 1988.

Already, however, the Department of Energy has had to acknowledge that its planning is mired in controversy, duplicative efforts and incompetence. Its target date for accepting wastes first slipped to 1993 and more recently Watkins himself

the spent fuel that the reactors can ever generate, most of the nation's older nuclear facilities already face a storage crisis.

Which is why the Department of Energy is now desperately trying to pursue work on its congressionally-mandated "permanent" waste repository deep inside Yucca Mountain, a huge rocky formation within the desert boundaries of a nuclear weapons test site 100 miles north of Las Vegas.

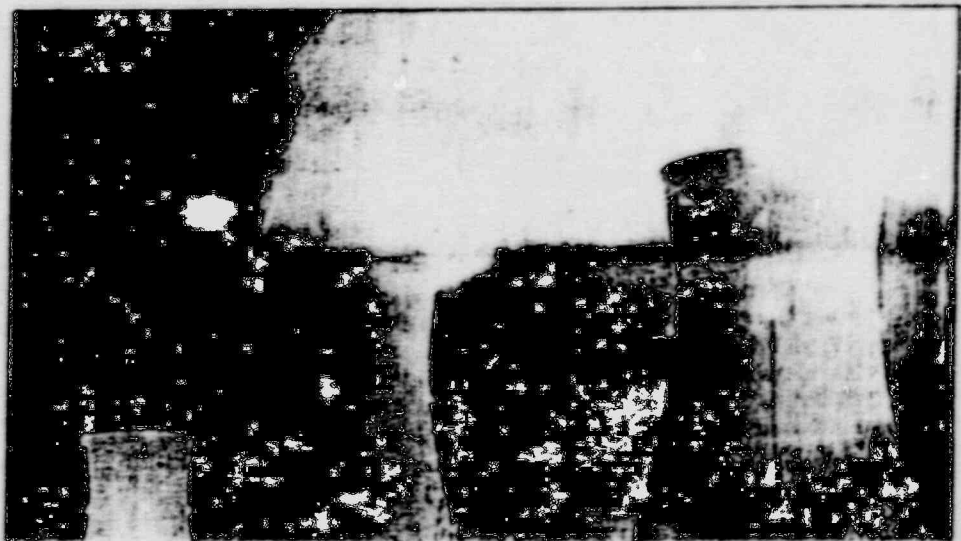
Completing that permanent underground storage facility will cost at least \$25 billion, and perhaps double that, according to current estimates.

But even before the mountain repository can be designed and excavated, years of research must be undertaken to determine whether the mountain's rocks of welded volcanic tuff are volcanically and seismical-

sound, not fiscally sound, not technically sound," Watkins said last December, and he charged that the costly environmental risk studies for both projects "were incomplete, misleading and not properly done."

So Watkins ordered a new assessment of the sites. But Nevada's political leaders had already begun battling the Energy Department's plans for Yucca Mountain, and the legislature had passed a law banning any future high level waste disposal in the state. Nevada environmental officials also refused to grant the federal agency permits to conduct new feasibility studies at the mountain, and the state's lawsuits in federal court remain unresolved. The Energy Department, for its part, is now contemplating counter-suits to block the state's efforts at obstruction.

"The solution is no more achievable now than it was in 1982, despite spending of more than \$2.5 billion of nuclear power utility customers' money," says Robert R. Loew, director of Nevada's nuclear waste project office. "The Yucca Mountain repository is



up and the radiation cannot escape.

At power plants in Virginia and North Carolina, where the swimming pools are already filled, fuel rods are now being shielded in concrete casks and placed on-site in "dry storage."

But the nation still has no permanent repository for the waste material, and after decades of technical studies and promises of progress, the federal government is embroiled in political battles over where and how to store the deadly stuff underground without risking environmental damage or the chance that some later event — a volcanic eruption or an earthquake — will expose the material to the surface.

The Department of Energy is under fire from both utilities and the nuclear industry. Congress is furious, and Nevada — which the government now insists is the only state where it can even hope to build a permanent underground storage facility — is suing Energy Secretary James F. Watkins to keep his engineers from fiddling with the desert mountains where the government wants to sink its storage shafts.

"Radwaste" has been a political, managerial and technical nightmare since the atomic age began and enthusiasts promised it would one day yield electricity "too cheap to meter."

As far back as 1956 the Atomic Energy Commission — which from its creation in 1946 until it was abolished in 1976 had the conflicting duties of promoting and regulating nuclear power development — proposed using a network of abandoned salt mines deep beneath the small Kansas town of Lyons as the nation's "ideal" permanent dry-storage site for high-level radioactive. Then it turned out that the salt formations were far from safe: Deep pockets of brine in the salt beds could have corroded the waste contain-

David Robinson is *The Chronicle's* science editor.

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One temporary solution to the mounting waste problem is a congressional mandate for the energy department to build a "monitored retrievable storage" facility, or MRS, to which heavily shielded casks of spent fuel could be transported and deposited — perhaps in some huge above-ground building carefully guarded and staffed with radiation monitoring devices — until such time as a final permanent repository is created. At that time the casks could be retrieved from temporary storage and deposited in the permanent underground facility.

But Congress stymied that idea with a bizarre Catch-22. The law forbids the energy department from selecting a site for any temporary storage until a final repository is licensed — but no final site for the permanent repository has been chosen, and construction is at least 20 years away. Yet the retrievable storage facility is supposed to be a badly-needed interim solution, and if the permanent repository ever gets built, the temporary storage won't be needed.

While some nuclear plants, like the Pacific Gas and Electric Company's Diablo Canyon, have more than enough room in their on-site "swimming pools" to store all



These MRS behind Nuclear Power Plant in Middletown, Pennsylvania

ly stable, and whether there is any possibility that deep aquifers inside the mountains might pose a danger that water could one day carry radiation-laced material into distant underground channels.

Studies at Yucca Mountain were already long under way last December when Secretary Watkins conceded that the environmental research was seriously flawed. He also challenged the integrity of another underground storage site near Cochise, Pinar Mexico, known as the Waste Isolation Pilot Plant, or WIPP, where the department had planned for years to isolate dangerously toxic plutonium wastes from the nation's bomb factories.

The schedules for completing both waste repositories were "not scientifically

paralyzed; DOE has blown it again."

So long as the storage problem remains mired in conflict — and most experts believe that radioactive wastes from the nation's nuclear power plants will continue to pile up far beyond the 2010 target date — all new plans for new and safer reactors are likely to remain only paper designs.

It is truly a political dilemma. For if the nuclear issues cannot be resolved, then America's near-term demands for more and more electricity can be met only by burning more coal and oil. And those fuels, in turn, expose us to the growing threat of increased pollution and accelerated global warming from the greenhouse effect created by carbon dioxide emissions into an already overburdened atmosphere.

Plutonium concern clouds weapons plant

By Donie M. Searles
The Associated Press

GOLDEN, Colo. — As the energy department prepares to resume making nuclear warhead triggers at the Rocky Flats weapons plant, concern remains about 62 pounds of plutonium in the plant's air ducts.

At issue: whether enough plutonium has accumulated to lead to "criticality" — the point at which a nuclear reaction becomes self-sustaining and can release deadly radiation.

Phil Warner, general manager at Rocky Flats for plant operator EG&G Inc., said the plutonium in the air ducts poses no threat, but state officials and environmentalists want the plutonium removed from the air ducts before plutonium processing resumes at the plant.

Energy Secretary James Watkins suspended plutonium operations at Rocky Flats in November and said they only resume when safety problems are solved. Rocky Flats, 16 miles northwest of Denver, has been operating since 1953.

The plutonium, discovered in the air ducts earlier this year, got into them over many years because filters that were supposed to catch the plutonium sometimes failed to work and sometimes were removed after becoming clogged, officials said.

EG&G scientists have said that, in a worst-case scenario,

the plutonium in the air ducts "could release neutrons that could injure or kill within 10 feet," Warner said.

"To my knowledge, there's never been a criticality accident that involved a nuclear explosion," said Robert W. Terry, senior health physicist for the Colorado Department of Health.

"The hazard is to the plant workers in the immediate vicinity of the accident," he said. "It's not the type of accident likely to create a widespread environmental hazard to the off-site population."

Witnesses to nuclear criticality elsewhere say that when the nuclear reactions occurred, they saw a blue flash followed by ovenlike heat.

Workers within the deadly 10-to-15 foot radius are bombarded with neutrons and gamma radiation. Their skin reddens and severe nausea sets in quickly. In extreme cases, the victim becomes comatose within 20 minutes and death follows in a few hours or days.

The plutonium accumulation is the latest in a nearly chain of problems that began in June 1989 when the FBI and Environmental Protection Agency raided Rocky Flats, looking for evidence of illegal disposal of hazardous wastes.

A federal grand jury is examining evidence gathered during that raid but has not issued indictments.

* Texas Nuclear Plant Granted License

The Nuclear Regulatory Commission granted an operating license yesterday to the Comanche Peak nuclear power plant in Glen Rose, Texas, 80 miles southwest of Dallas.

The plant, which is a decade behind schedule and billions of dollars over budget, could reach full power by this summer. It is owned by TU Electric Co.

The commission, meeting in Washington, approved the license despite arguments by opponents that evacuation plans for the area are inadequate.

Comanche Peak is Texas' second nuclear plant. The other is the South Texas Project near Bay City.

Hanford nuclear plant's safety doubted since '70s

The Washington Post

WASHINGTON — Energy Department officials and contractors have known since the 1970s that tanks of liquid radioactive wastes at the Hanford, Wash., nuclear weapons plant could explode, but failed to inform superiors or take corrective action, according to an internal investigation made public Tuesday.

The investigation by the Energy Department's Office of Nuclear Safety is one of several parallel inquiries into safety issues at Hanford that have reinforced fears of an explosion in the waste storage tanks and demonstrated that the department is unsure how to cope with the threat.

Two independent panels of nuclear experts disagreed Tuesday about the seriousness of the explosion threat. But Sen. John Glenn, D-Ohio, who presided at a hearing about Hanford Tuesday, said the Energy Department's management of the Hanford tank farm raises the specter of a mammoth explosion on the scale of the 1957 disaster at Kyshtym in the Soviet Union, which forced evacuation of 10,000 people.

Leo P. Duffy, the Energy Department's waste management director, said he recently visited Kyshtym and concluded that "the situation at Hanford is quite different" because the temperatures of the wastes are kept low enough to avoid an explosion. But he acknowledged that the department's only proposed method of disposing of the wastes — vitrification, or fusion into glass that would be stored in an underground

repository — is being reevaluated because of technical problems with a similar program at the Savannah River, S.C., plant.

The 570-square-mile Hanford reservation was created from scratch on the plains of eastern Washington in 1943 to produce plutonium for the first nuclear bombs created by the Manhattan Project. Its production reactors are inactive now, and the facility's principal mission is to clean up after itself — a task that is proving dangerous and expensive.

More than 64 million gallons of radioactive and toxic liquid wastes from plutonium processing are stored underground at Hanford in 149 single-shell tanks and 28 double-shell tanks.

TUESDAY, JULY 31, 1990

Risk of Explosion of Hanford Nuclear Waste Tank

New York Times

Washington

Tanks that store millions of gallons of extremely radioactive waste at the Hanford nuclear reservation in Washington state could explode, according to a government advisory panel led by a former chairman of the Nuclear Regulatory Commission.

Previous reports have raised the possibility of such an explosion but minimized the risk. The new report is far more pessimistic.

It says one or more of the 177 tanks may be vulnerable to detonation from heat generated inside the tanks or a spark or a shock from outside.

The panel's primary concern is not a nuclear explosion but a chemical reaction that would spread radiation produced over four decades in Hanford's nine nuclear reactors.

"The Hanford tanks present a serious situation, if not an imminent hazard," said the report, from the Energy Department's Advis-

ry Committee on Nuclear Safety. "A situation of this type at a nuclear reactor would lead to ordering a shutdown."

But, the report observed, "One cannot 'shut down' the tanks."

The tanks, in the desert of south-central Washington, hold one of the largest concentrations of man-made radioactivity in the United States.

The wastes are liquids, salts and sludges, which would spread far more readily in an accident than the solid radioactive material

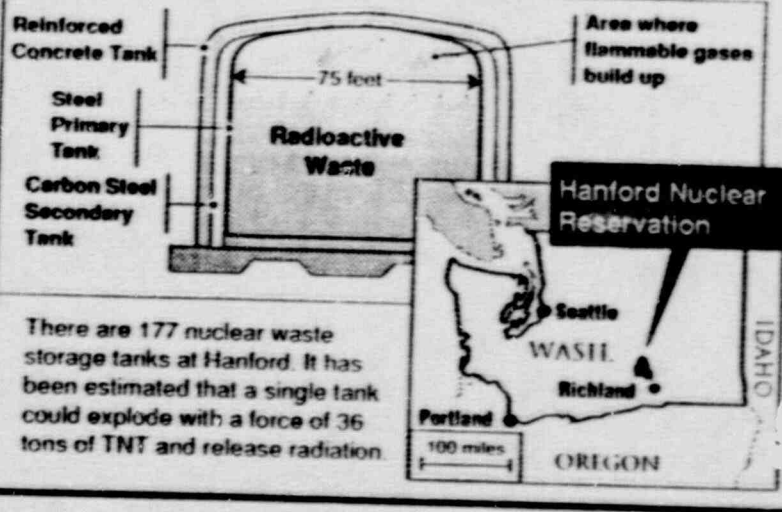
in a nuclear reactor.

An accident involving similar wastes released huge amounts of radiation in the Soviet Union September 1957, forcing the evacuation of 10,000 people from hundreds of square miles in the U.S. Mountains.

The review panel chastised the operator of the plant, a subsidiary of the Westinghouse Electric Corp., saying that despite years of warnings, it failed to determine the risk of explosion or explosion from the tanks.

TANKS MAY POSE EXPLOSION HAZARD

Radioactive wastes from plutonium production have caused a buildup of flammable hydrogen gas in underground nuclear waste storage tanks at Hanford Nuclear Reservation in Washington.



There are 177 nuclear waste storage tanks at Hanford. It has been estimated that a single tank could explode with a force of 36 tons of TNT and release radiation.

NATION

Court Setback For Rocky Flats Weapons Plant

New York Times

Denver

A U.S. district judge in Denver has ruled that thousands of barrels of plutonium-laced material at the Rocky Flats nuclear weapons plant contain wastes subject to regulation by Colorado and are being stored illegally.

The decision is a setback for the Department of Energy, the plant's owner, because it appears to put the inventory of waste at the plant far above the legal limit.

The department had asserted that the substance at issue, mostly incinerator residues, was not waste but material awaiting recycling.

Dr. Eugene Demayo, chairman of the Rocky Mountain chapter of the Sierra Club, said the decision meant that the department "must drop its plans to restart Rocky Flats plutonium operations, at least until the plant complies with hazardous waste laws," including the limit on waste storage.

The Sierra Club was the plaintiff in the suit. As part of the same suit, the department agreed in August 1989 to close down the Rocky Flats incinerator that had been used intermittently to burn the disputed material.

The plant has been largely closed since late last year, partly for a seasonal inventory and partly because of technical problems. The department had said it hoped to reopen the plant in the late spring.

The ruling, issued Friday by Judge Lewis T. Babcock and distributed yesterday by the Sierra Club, does not call for fines or other penalties against the plant, which makes triggers for thermonuclear weapons.

Experts say don't restart nuke plant

The New York Times

WASHINGTON — A high-level panel of experts has recommended postponing the reopening of Rocky Flats nuclear plant from midsummer until at least October, and many say the complex cannot be safely opened before the end of year.

The Rocky Flats Plant, near Denver, was shut down in November 1989 to install new safety procedures, repair equipment and to change the management of the plant. It did not reopen a month later as scheduled.

The plant had been run by Rockwell International Corp.

The company that took over management of the plant for the Energy Department on Jan. 1, EG&G Inc., has said the plant could reopen in June, although the department had refrained from publicly stating when the plant could be safely reopened.

The panel of experts commissioned by the Energy Department identified a number of problems that need to be corrected before the plant, the sole producer of plutonium triggers for thermonuclear weapons, could be safely restarted.

In addition to retraining personnel, the problems include removal of plutonium from ducts at the plant and a better means of dealing with waste from the plutonium-processing operations.

"The committee's position is that so much remains to be done that restart on the schedule indicated to us appears impractical," panel chairman John A. Ahearne wrote in a June 4 letter to Energy Secretary James D. Watkins.

"Furthermore," he continued, "many believe it unlikely that restart can be accomplished this calendar year."

The Navy has warned failure to open the plant soon would force it to devise temporary alternatives to its plans to equip the missiles on its Trident submarines with new powerful warheads.

The Navy contends the deployment of new weapons is necessary to modernize American strategic nuclear forces.

Engineer Calls A-Plant Vulnerable to Quake

Washington Post

Washington

A structural engineer hired to study the effects of a possible earthquake on the Energy Department's nuclear weapons plant at Oak Ridge, Tenn., was fired after he reported that the walls would fall down.

Other engineers rewrote the study to say that they would not.

The engineer, Paul Nestel, reported on September 25 that the unreinforced clay tile walls of the main building of Oak Ridge's Y-12

nuclear plant would give way if struck by an earthquake with a lateral force of 0.12 percent of gravity, well below the 0.19 percent used nationwide as the design basis for quake-vulnerability studies.

By October 30, after a series of meetings at which his conclusions were discussed, engineers from Lockwood Greene Inc. of Oak Ridge, Nestel's employer, and Martin Marietta Energy Systems Inc., which operates the Oak Ridge plant for the Energy Department, had reported to the department that the walls "have the capacity to withstand the design basis earthquake."

Nestel, an experienced structural engineer from California whom Lockwood Greene recruited in July to conduct the study, was fired November 3.

Nestel gave copies of the documents to the Washington Post because, he said, he had "no reason to stay silent" after he was dismissed, and accused the contractors of "burying unfavorable reports."

By means of comparison, San Francisco's Marina District was leveled in the October earthquake by a force of .15 percent, Nestel said.

WEDNESDAY, MARCH 26, 1990

U.S. Revamps Monitoring of A-Arms Plants

By Keith Schneider
New York Times

Washington

Energy Secretary James Watkins ordered major changes yesterday in how the nuclear weapons industry monitors the health of 100,000 workers at 17 principal plants and laboratories.

Under the changes, responsibility for studying the effects of radiation on those workers will be transferred to the Department of Health and Human Services.

Watkins also said he will establish an executive officer, preferably a medical specialist, to become the nuclear weapons industry's first occupational safety and health director.

The actions represent the latest steps to end the secrecy surrounding the nation's embattled nuclear weapons industry, which operated for decades with little oversight by Congress, the public, workers or even its own top officers.

The changes also will end a potential conflict of interest that has existed for decades. The agency responsible for making atomic weapons has also been the government's largest source of information on the effects of radiation on workers.

Watkins' actions followed the recommendations of a special nine-member panel of health experts that he appointed last August to study how the Energy Department was overseeing the health of its atomic workers.

Yesterday, he received the group's final report, which laid out a 50-point plan for reorganizing the management of the Energy Department's health programs, starting at the top of the agency.

Watkins said he is taking the actions to restore the Energy Department's scientific credibility and to regain the trust of weapons plant workers and people living around the principal production sites in 12 states.

Weapons workers in Nevada, Colorado, Ohio, Utah and other states have filed lawsuits charging that extraordinary safety lapses endangered scores of workers.

Weapons lab incinerator

By John Miller
The Tribune

LIVERMORE — Congressman Pete Stark yesterday joined critics of a plan to restart a hazardous waste incinerator at the Lawrence Livermore Lab, calling it a "sad commentary on the state of waste disposal."

Stark, D-Hayward, wants to withhold approval of the restart until the state holds a public hearing on the safety of the incinerator, which failed two trial burns and has been shut down for nearly two years.

Stark yesterday wrote the California Department of Health Services, saying that the nuclear weapons lab, which faces monumental waste-storage and clean-up problems, should not be allowed to restart the incinerator "until the community's concerns and questions (are) addressed."

"How can we blindly make changes to a system whose environmental impacts remain unknown?" Stark asked.

Environmentalists fear the incinerator, built more than a decade ago without pollution con-

trol equipment, will spew contaminants over Livermore Valley and could be used eventually to incinerate radioactive animal carcasses and other waste contaminated with low-level radioactivity.

The laboratory has no plans "at this time" to restart the incinerator, and won't burn hazardous or radioactive material, according to Paul Conners, lab spokesman.

"The laboratory does not intend to burn any material that has been exposed to ... a radioactive isotope in the course of research," he said.

Conners said the kind of material that would be burned includes waste paper, and other non-radioactive wastes "similar

Friday, July 27, 1990 **M C-3

fans heated opposition

to those burned at local hospitals."

He said the incinerator is a "potentially viable tool" to get rid of waste generated by the lab's nuclear weapons and other research work, but it will not be used "unless it makes economic sense and the operation of the incinerator is in strict compliance with all applicable regulations."

But Maryna Kelley, spokeswoman for Citizens Against a Radioactive Environment, a watchdog group, said the lab should completely dismantle the incinerator.

Kelley said because new regulations proposed by the Nuclear Regulatory Commission would allow certain low-level radioac-

tive waste to be disposed of as non-radioactive waste, the lab could conceivably burn such waste as if it were non-radioactive.

She said her group is gathering signatures against restarting the incinerator for any reason. "We feel betrayed (by the lab)," she said.

Congress held a hearing yesterday on the NRC's plan to declare certain low-level radioactive waste "below regulatory standards" and suitable for disposal in communities, amid threats by legislators to nip the plan in the bud.

The lab has filed a so-called "closure" plan with the EPA and State Department of Health Services that would allow the lab to decontaminate the incinerator and restart it.

Urgent Plea For Chernobyl Medical Aid

Associated Press

Washington

A Soviet parliamentary delegation made an urgent appeal to the United States and the world yesterday for help in dealing with towering medical and human problems caused by the Chernobyl nuclear accident four years ago.

Severe shortages exist in medical equipment, radiological and other scientific laboratories, radiation detectors, housing for scores of thousands of relocated people and even baby food, the five-man delegation said at a news conference at the Soviet Embassy.

"The history of mankind never knew an ecological catastrophe which is so disastrous and having unknown consequences for the nature, health and life of the present and future generations," the delegation said.

The accident, on April 26, 1986, began with a fire in one of four reactors followed by a core meltdown and an explosion. Huge quantities of radiation billowed into the atmosphere.

Yuri Shcherbak, chairman of the ecology subcommittee of the Supreme Soviet and a physician, said thyroid disorders are beginning to appear, along with the first cases of leukemia and cancer, including thyroid cancer in infants.

He said serious medical effects are now expected to last decades, perhaps centuries.

Cost of Chernobyl Disaster Soars in Study Accident Dwarfs Other Soviet Peacetime Catastrophes

By RICHARD L. HUDSON

Staff Reporter of THE WALL STREET JOURNAL

MOSCOW—A new Soviet study concludes that continuing economic fallout from the Chernobyl nuclear accident may cost 20 times more than Moscow's prior estimates, ranking Chernobyl as the most costly catastrophe in Soviet peacetime history.

The study, by a Soviet nuclear industry economist, estimates that by the year 2000 the Chernobyl accident may cost the country 170 billion to 215 billion rubles in lost electricity production, contaminated farmland and other economic consequences. Moscow's previous estimate, which counted only the immediate cleanup costs, was 10 billion rubles.

Because the ruble isn't freely convertible, the new estimate can't be expressed accurately in Western currencies. At the official exchange rate in Moscow, it amounts to \$283 billion to \$358 billion in any currency, the sum far exceeds cost estimates for such previous Soviet disasters as the 1988 Armenian earthquake. The April 26, 1986, accident was "the biggest socioeconomic cataclysm in [peacetime] history," the study says, adding that Chernobyl also contributed to the country's worsening economic problems.

The study supports Western speculation that Moscow initially underestimated Chernobyl's cost. But its scheduled publication in Soviet news media this year will contribute to a mounting internal debate over the accident's cleanup costs. Local government officials near the Ukrainian reactor are pressing Moscow to provide 35 billion rubles in projected cleanup expenses. And the Supreme Soviet, the country's standing parliament, plans a public debate on the issue later this year.

The report was commissioned by a participant in this debate, and is thus a rare example of a Soviet special interest group

learning such Western lobbying techniques as commissioning research. The study's sponsor was the Chernobyl Union, an organization of accident survivors pressing Moscow for more aid. The economist who performed the study is Yuri Koryakin, chief economist of the Research and Development Institute of Power Engineering, a Soviet government institute that designed the Chernobyl reactor. In an interview, Mr. Koryakin said he agreed to conduct the study in the interests of promoting wider public debate about the Chernobyl accident.

Mr. Koryakin's findings will likely be contested by some Soviet officials. But to minimize official criticism, he said, his study used only information culled from previous Soviet publications—and avoided use of any of his institute's official, non-public documents. He said, however, that he believes his study is the first anywhere in the Soviet government to attempt to add together all the direct and indirect accident costs.

Cleanup and study of the Chernobyl accident has become a major, permanent segment of Soviet industry. The accident, caused when operators lost control of a reactor, spewed radiation for days over the surrounding Ukrainian, Byelorussian and Russian countryside. It forced the permanent evacuation of thousands, and contaminated about 31,000 square kilometers (12,400 square miles) of farmland and forests with long-lived radioactive cesium, strontium and other elements.

By Mr. Koryakin's estimates, the cost of losing agricultural production on the contaminated land is among the single biggest costs of Chernobyl to the Soviet economy. From 1986 to 2000, the lost land value totals 57.5 billion to 94.5 billion rubles. A few years ago, Soviet scientists were blithely forecasting a quick return to agriculture by, for instance, using special breeds of cattle and switching them to im-

ported, non-radioactive feed a few weeks before slaughter. But lately such optimistic talk has died out, leading some specialists to consider the contaminated land a total loss for at least two generations.

The second biggest economic consequence of Chernobyl, Mr. Koryakin's study says, is lost electricity production—valued at about 66.8 billion rubles through 2000. Following the accident, Soviet public opinion turned sharply against nuclear power, and Soviet authorities were forced to halt or cancel plans for 32 nuclear power reactors.

In some areas of the Soviet Union, the nuclear cutbacks have worsened power shortages. For instance, closure of two reactors in Armenia cost the Transcaucasus region 15% of its power supply, leading to restrictions in local electricity consumption. Also, post-accident safety projects at many of the country's other reactors will raise their average electricity costs by 0.08 kopecks a kilowatt hour, or 9%, the study says.

Gradually decontaminating the countryside, evacuating people and completing other cleanup tasks may cost 35 billion to 45 billion rubles through 2000, the study says. Other costs include 3.9 billion to 5.1 billion rubles to install new safety equipment at Soviet reactors, and the loss of five billion rubles in capital invested in reactors closed after Chernobyl.

The total bill suggests that the Soviet Union may have been better off if it had never begun building nuclear reactors in the first place. Since the Soviets opened their first power reactor in 1954, Mr. Koryakin estimates, the net economic contribution of the Soviet nuclear industry has been 10 billion to 50 billion rubles. The sum is a measure of how much money the country saved by using cheaper, nuclear generated electricity than more costly coal burning plants. The Chernobyl accident costs exceed that sum by several times.

14,000 to be moved away from Chernobyl

By Susan Cornwell
REUTERS

MOSCOW — Realizing they underestimated the extent of the Chernobyl accident, Soviet authorities will evacuate 14,000 more people this year from the site of the world's worst nuclear disaster, Pravda said Monday.

The Communist Party daily indicated more work was needed to limit the damage from the April 26, 1986, explosion and fire at the nuclear power reactor that killed 31 people, according to official figures.

Pravda said radioactive dust that had piled up in the 20-mile danger zone around the plant would take decades to remove and would have to be processed by a special, as yet unbuilt, complex.

And a new, more secure shelter for the damaged reactor must be built at a cost of tens of millions of rubles, Pravda said. It will replace the concrete case that was built around the crippled reactor after the accident.

The continued evacuations are the result of belated recognition by authorities that the accident spread more radioactivity over a wider area than at first thought.

"In 1986, and three, two and even a year ago we did not know

these numbers, but now they trouble the soul of everyone," Pravda said.

"Thirty-two districts of six regions of the republic (the Ukraine) are affected by radiation to varying degrees; nearly 60,000 people live in the area that is strictly monitored," it said.

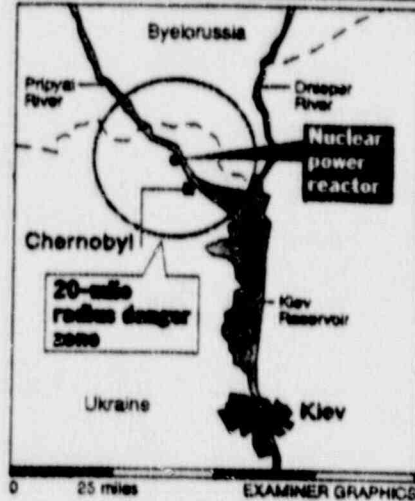
"And on the territory with more than five curies (a measure of radioactivity) live more than 200,000 people," it said. This area includes districts more than 30 miles from Chernobyl from which 14,000 people would be moved this year, Pravda said.

Pravda said 90,000 people had been moved from their homes in the years following the accident, apparently in addition to the 100,000 who were taken out of the 20-mile zone a few days after the disaster.

The accident contaminated 12.4 million acres of land in the Ukraine, of which 8.6 million were agricultural land, it said.

Tass news agency said the Ukrainian Parliament was working out a program for closing the plant, which has three undamaged reactors, by 1995. But it said it would take another 10 years to dismantle the complex.

Amid charges that authorities



covered up the extent of the disaster, the Soviet Parliament is due Wednesday to consider a proposed \$26 billion emergency program to help people in affected areas.

Tens of thousands of Ukrainians marched through their capital, Kiev, Sunday in a protest over Chernobyl.

They called for leaders of the republic, including President Valentina Shevchenko, deputy prime minister at the time of the accident, to be put on trial for failing to alert the public to the dangers of the leak.