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OFFICE OF SECRETARY  
RULEMAKINGS AND  
ADJUDICATIONS STAFF

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Terrorists have a ready made arsenal of nuclear weapons to use against the U.S. because of the NRC's deliberately ignoring these dangers. Profitability in order to stay in business is the goal and modus operandi of the D.O.E., N.R.C. and the ruling nuclear industry - SAFETY IS NOT PART OF THIS EQUATION BECAUSE THE EXPENSE WOULD PUT THE NUCLEAR INDUSTRY OUT OF BUSINESS.

I am forwarding the attached paper I wrote. The appendix is over 90 pages and is comprised of copies of all the articles I quote. The appendix is not scanned onto my computer. However if you would like me to snail mail you a copy including this appendix I will be glad to do so.

NUCLEAR WASTE, D.O.E, NEVADA & YOU

By Adrian Zolkover

May 2003

A good example of the Dept. of Energy's modus operandi is found in THE BULLETIN OF THE ATOMIC SCIENTISTS May-June/2000 "Energy in Decay" by Robert Alvarez, a former Advisor to the Secretary of Energy and Senate's energy staff experts. "In the summer of 1997, I received a phone call from Jim Bailey. Bailey was an ex-Marine who worked out of the department's Oak Ridge site. He was one of 238 Energy Department special agents who trucked nuclear weapons around the country. Jim's infant daughter Kelly died in 1995 of three rare brain tumors, and he was fearful that his exposure to radiation had caused genetic damage that he had passed on to her. Subsequently, Bailey was tested by a cancer specialist who told him that he had chromosomal damage linked to radiation exposure. At the advice of his doctor, Bailey refused to go back to work. He was fired in September 1996. A few days later, the department, without explanation, removed radiation monitors from all the vehicles.

In the late summer 1997 ABC news did a story that asked whether the couriers who hauled nuclear weapons about the country were properly protected from radiation. Energy's Albuquerque Operations Office responded by calling in the FBI, alleging that classified information had been given to the news media. By this time, Bailey was caught up in a protracted legal battle with the department. Meanwhile, the FBI was investigating alleged security breaches and 18 couriers had been put on suspension after refusing to undergo lie detector tests regarding the alleged leaks. Later investigations found several serious problems with the department's nuclear courier system. Couriers were not being provided with adequate information about radiation dangers. And despite having critical responsibilities, they were paid substantially less than drivers who hauled vegetables. After more than a year, the FBI could not substantiate the charges made against the couriers. The 18 couriers who were wrongfully suspended are still not back on the job because of bureaucratic indecision over whether they should take mandatory lie detector tests related to alleged leaks. All couriers have been told not to communicate with anyone involved in independent reviews of their program, and radiation monitors have yet to be placed back on the trucks. Moreover, the Energy department official who was transferred after investigations found problems was recently promoted. Overseeing the couriers is once again part of his job description. If the Energy Department were a private concern with more than 100,000 employees, it would be one of the nation's largest and most powerful corporations. And if it were privately held, it would be filing for bankruptcy.

In 1988, Congress required the Energy Department to establish a nuclear safety enforcement program that included fines, penalties, and criminal sanctions against contractors who violate nuclear

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safety. Eleven years later, the department's Office of Environment, Safety and Health, has a staff of six people and is almost totally dependent on the self-reporting practices of contractors. 'The case of DOE's nuclear weapons program has been made particularly acute by some vicious circle' Frank Rowsome, a senior Energy Department safety expert wrote. 'Those of us who help to cover up deficiencies are rewarded, and those that bring them to the fore, are at best ignored, resented, or dismissed as troublemakers.' He also stated that Energy Department officials heavily censored safety reporting while engaging in wholesale removal of safety experts."

To keep life simpler and rather than possibly be accused of making inflammatory statements, I will quote the following publications verbatim. I have added the bolding and underlining for emphasis. Statements in brackets [ ] are not part of the quotation.

The topics that follow:

1. What About Spent Fuel
2. The NRC: What me worry?
3. More Nuclear Follies
4. Fiscal Follies
5. A Dump Trump - Dump the Nuclear Waste on Top of the Land East of Yucca Mtn.
6. Nuclear Terror
7. A Possible Solution That Does Not Create More Problems Than It Solves
8. President George W. Bush Approves Yucca Mountain for Application for a Repository Construction Authorization
9. What More Can Go Wrong - Just Ignore Nuclear Waste Problems and Deregulate! !
10. Conclusion

1. "What about spent fuel?"

**BULLETIN OF THE ATOMIC SCIENTISTS Jan./Feb. 2002 by Robert Alvarez**

"Spent fuel pools, containing some of the largest concentrations of radioactivity on the planet, can catch fire and are in much more vulnerable buildings' says Gordon Thompson, a physicist and engineer and senior scientist at the Institute for Resource and Security Studies. Spent fuel pools pose severe risks. The most serious risk, he says, is loss of the pool water that cools and shields the highly radioactive spent fuel assemblies. Water loss could expose spent fuel, leading to a catastrophic fire with consequences

potentially worse than a reactor meltdown. Most U.S. reactors store spent fuel in high-density pools. If that fuel were exposed to air and steam, the zirconium cladding would react exothermically, catching fire at about 1,000 degrees Celsius. A fuel pond building would probably not survive, and the fire would likely spread to nearby pools. The Nuclear Regulatory Commission (NRC) concedes that such a fire cannot be extinguished; it could rage for days."

An article from December 2001 THE NUCLEAR MONITOR A Publication of the Nuclear Information & Resource Service applies: CASTOR AND TERROR "A recently published German report by Dr. Helmut Hirsch and Wolfgang Neumann . If a large commercial aircraft crashes on an intermediate storage facility, a fire lasting several hours could result. Large aircraft can contain some tens of thousands of liters of kerosene fuel and temperatures in such fires can reach 1000 degrees C for several hours. The crash of an airplane on a storage hall would result in the failure of considerable number of casks. An amount of more than 1000 Tera Becquerel of cesium-137 would leak from the casks and become airborne. Due to the fire, the radioactive substances could spread over a large area. Thousands of square kilometers of land would become contaminated."

Back to the BULLETIN article: "On average, spent fuel ponds hold five to 10 times more long-lived radioactivity than a reactor core. Particularly worrisome is the large amount of cesium 137 in fuel ponds, which contain anywhere from 20 to 50 million curies of this dangerous isotope. With a half-life of 30 years cesium 137 gives off highly penetrating radiation and is absorbed in the food chain as if it were potassium. According to the NRC, as much as 100 percent of a pool's cesium 137 would be released into the environment in a fire.

In comparison, the 1986 Chernobyl accident released about 70 percent of the reactor core's 6 million curies of cesium 137 into the atmosphere, resulting in massive off-site radiation exposures. A single spent fuel pond holds more cesium 137 than was deposited by all atmospheric nuclear weapons tests in the Northern Hemisphere combined.

If the water level dropped to just a few feet above the spent fuel, the radiation doses in the pool building would be lethal. The procedures fuel handlers need to follow to recognize problems, repair heavily damaged equipment, and command off-site resources have yet to be formalized, much less tested.

In 1982, the NRC's Atomic Safety and Licensing Board ruled that reactor owners 'are not required to design against such things as . kamikaze dives by large airplanes. Reactors could not be effectively protected against such attacks without turning them into virtually impregnable fortresses at much high cost.'

Incredibly, a day after the September 11 attacks, the NRC ruled that concerns about terrorists raised by Georgians Against Nuclear Energy (GANE) regarding the mixing of plutonium in nuclear fuel at the Energy Department's Savannah River Site were not valid because 'GANE does not establish that terrorists acts . fall within the realm of 'reasonably foreseeable' events.'. STORAGE SOLUTIONS In light of the NRC's admissions about spent fuel vulnerabilities, it seems it would be easier to cause an accident at a spent fuel pond than to breach and release the radioactive contents of multiple hardened concrete and steel dry storage casks."

## 2. "The NRC: What me worry?"

THE BULLETIN OF THE ATOMIC SCIENTISTS Jan./Feb. 2002 by Daniel Hirsch "Just hours after the terrorist attacks, NRC spokesperson Brech Henderson said U.S. nuclear plants were safe because 'containment structures are designed to withstand the impact of a 747.' Ten days later he admitted that 'the initial cut we had on that was misleading.' A typical nuclear power plant contains within its core about 1,000 times the long-lived radioactivity released by the Hiroshima bomb. The spent fuel pools at nuclear power plants typically contain some multiple of that - several Chernobyls' worth. NRC estimated years ago that a meltdown at one of the San Onofre reactors in Southern California could produce 130,000 'prompt' fatalities, 300,000 latent cancers, and 600,000 genetic defects. As Bennett Rambert pointed out in 1984 in his seminal book on the subject, Nuclear Power Plants as Weapons for the Enemy: An Unrecognized Military Peril, conventional explosives - a truck bomb, for example - could cause a massive radiological release, with terrorists turning their adversaries' own technology against them.

Security personnel at power reactors are not required to be prepared for:

- . more than three intruders;
- . more than one team of attackers using coordinate tactics;
- . more than one insider;
- . weapons greater than hand-held automatic weapons;
- . attack by boat or plane; or
- . any attack by 'enemies of the United States,' whether governments or individuals.

For years, reactor sites were not even required to provide protection against truck bombs. But after a decade of efforts by the Committee to Bridge the Gap and the Nuclear Control Institute to get the agency to strengthen security and repeated refusals by the NRC to require greater protection, the 1993 World Trade Center bombing and an intrusion event at Three Mile Island finally propelled the agency to amend the rules. But the truck bomb rule is still a concern because of the limited size of the explosion that operators must protect against. It apparently requires protection against truck bombs of roughly the size used at the World Trade Center in 1993, but not the larger quantities of explosives that have been used in similar attacks since then. The NRC is behind the curve, 'fighting the last war' rather than protecting against threats that can materialized without warning."

"In 1985, the Committee to Bridge the Gap testified before the Safeguards and Security Subcommittee of the NRC Advisory Committee on Reactor Safeguards, pointing to data showing increasing terrorist capabilities and actions, urging the agency to upgrade the regulations to deal with larger attacking forces and with truck bombs. The response was unenthusiastic, with many subcommittee members indicating that there were so many ways to destroy a reactor that, if you protected against truck bombs, you'd have to protect against all those other vulnerabilities as well.

In late 1968, the NRC had recently terminated its only counterterrorism program, called the Operational Safeguards Response Evaluation program, (OSRE). Given six months advance warning, including the date on which the security test would occur, plants prepared by increasing their guard force by as much as 80 percent. In nearly half of the tests conducted at the country's reactors, mock terrorists penetrated security and reached at least one 'target set' that, had the intruders been actual terrorists, could have resulted in a meltdown and massive radioactivity release. And these tests were against the existing DBT [design basis threat] - against only three intruders. And what was the response to this dismal failure rate? The NRC killed the program - there could be no more failures if there were no more tests.

After September 11 our two organizations have persisted in so-far-fruitless attempts to get the DBT upgraded. Last year, we met with NRC Chairman Richard Meserve, trying once again to get the NRC to

fix gaping security problems. Nothing came of the meeting. If it admits its reactors are vulnerable, the industry's dream of a nuclear renaissance is diminished.

Having received a big boost from the Cheney energy plan, the industry had been hoping to build new reactors, supposedly of the new pebbled design. In order to save money these 'passively safe' reactors would be built without a containment structure. In addition, they are made of graphite, which burns readily, as evidenced by Chernobyl.

And why has the NRC not imposed upgraded security requirements? Put bluntly, the NRC is arguably the most captured regulatory agency in the federal government, a creature of the industry it is intended to regulate. The NRC's principal interest is in assisting the industry, keeping regulatory burdens and expenses to a bare minimum, and helping to jumpstart the nuclear enterprise."

### 3. More Nuclear Follies

NIRS [Nuclear Information Resource Service] NUCLEAR MONITOR, January 11, 2001 "Behind the 'Ironic Curtain': The U.S. Public and NRC License Renewal for Aging Nuclear Reactors" "Most European Union and other nuclear countries have speculated on the theoretical design life for their reactors but require periodic reviews every 10 years to justify continued operation of the reactor. Only the United States has set a legal operation license of 40 years for its nuclear power stations. Embrittlement of reactor vessels, fatigue and corrosion of safety equipment, through-wall cracking of extremely pressurized piping circulating radioactive reactor coolant water and the leaching of concrete from the enormous containment structures are but a few significant premature aging events quickly preceding the projected 40-year license. Operation-driven cracking in major safety components such as in the steam generators can grow from 100 to 1000 cracks in a single 18-month fuel cycle. No one completely understands or can accurately predict how quickly the embrittlement can weaken or cracks can grow into the failure of a component and a serious accident. The inadequacy of 'crack-growth-rate' analysis means that nuclear proponents and their regulators' justification for continued reactor operation is like driving a car by just looking through the rear-view mirror. It is foolish and extremely dangerous."

The LAS VEGAS SUN February 8, 2002 presented an article from the NEW YORK TIMES by Matthew L. Wald "A plan finally may be in place for nuclear waste"... "Still the department's [DOE's] strategy has risks, because it is trying to build while it is still solving problems. It is the common approach in what nuclear engineers call 'first-of-a-kind' projects. The strategy stretches back to the Manhattan Project, where it produced a weapon in time for a test over Hiroshima.

But it has also led to some horrifying dead ends. For example, at the Savannah River Site, a nuclear weapons plant near Aiken, S.C., the department spent more than \$2 billion to build a factory that takes liquid radioactive wastes from aging tanks and turns them into a solid by mixing them with glass, which makes disposal (possibly at Yucca) easier. When it built the plant, it had not figured out how to get the wastes out of the tanks.

The plan was to put a chemical into the tanks that would make the most radioactive materials sink, so they could be pumped to the solidification plant. But in the tanks, that chemical was converted to an explosive gas. The department has spent over 16 years and about \$500 million trying to solve the problem; meanwhile, much of the waste stays in the tanks."

"The Next Nuclear Plant" by David Talbot as discussed in "MIT's Magazine of Innovation TECHNOLOGY REVIEW" January/February 2002: ".A pebble bed reactor is relatively simple to build and inexpensive to operate. The pebble bed reactor is cooled with helium gas instead of water, operates at higher, more efficient temperatures and - thanks to the inherent safety claimed by its builders - dispenses with the containment dome and regional evacuation plan now required of U.S. nuclear facilities. Individual pebble-bed plants would also have a smaller footprint than today's plants and produce a mere 100 megawatts or so of electrical power - a tenth as much as today's typical nuclear behemoth. And these reactors don't solve the same two basic problems that dog the entire nuclear industry: they create highly radioactive fuel waste and are potentially vulnerable as terrorist targets. Burning Questions: But no matter how unlikely a fire might be, its mere possibility is a good reason to require pebble bed plants to have the same thick, expensive containment structures as today's plants, counters David Lochbaum, a nuclear safety engineer with the Union of Concerned Scientists."

#### 4. Fiscal Follies

LAS VEGAS SUN Nov. 30-Dec. 2, 2001 by Mary Manning "GAO calls for delay on Yucca decision" "The report by the General Accounting Office is a crushing blow to the department's plans to proceed with Yucca, Nevada lawmakers said. According to the report, the department has no reliable estimate of when or at what cost the repository could be opened, and even the project's main contractor says it is premature to recommend Yucca Mountain. The report surfaced just a month or two before the Energy Department is expected to recommend to Bush establishing a permanent nuclear waste repository at Yucca Mountain, 90 miles northwest of Las Vegas. Nevada lawmakers said they were troubled that the GAO said the plans for Yucca Mountain shown to Congress and Nevada residents 'may not describe the facilities that DOE would actually develop. They're trying to sell us a project that doesn't exist - what they're actually going to do they haven't shown us yet,' Berkley said. 'It's immoral, unethical and illegal.'

Nevada lawmakers said they also were concerned that the report said the department, in reviewing its options, may consider a 'staged' waste shipment plan in which high-level radioactive material is gradually moved to Nevada. That essentially establishes a temporary waste site in Nevada until Yucca is complete.

Bush, during the presidential campaign, told Guinn that he would veto a temporary waste site because scientific issues at Yucca are unresolved.

The GAO study also put new light on the stance of the Energy Department's major contractor, Bechtel SAIC. The report revealed that Bechtel told the government that it would take until January 2006 to complete detailed research and cost estimates for a repository. The DOE and its contractors are still analyzing nearly 300 technical issues, the GAO report says.

Nuclear industry lobbyists argue that the government had a legal obligation to begin hauling waste away from plants by 1998."

Nuclear Information Resource Service (NIRS) reports in their December 7, 2001 e-mail: The Price-Anderson Act Reauthorization HR 2983 Price-Anderson subsidizes the liability insurance costs of the commercial nuclear industry and caps their liability in the case of a catastrophic accident. The nuclear power industry should be able to hold its own in a supposed free-market economy. "Current reactors are covered by PA whether or not it is reauthorized. The only incentive for voting to extend PA coverage is for a NEW generation of INHERENTLY UNSAFE reactors such as the Pebble Bed Modular Reactor (PBMR)

which are designed without a containment building. Price-Anderson would cap nuclear liability at about 10 Billion while the US Government estimates a reactor accident can cost from 24 Billion to 590 Billion dollars."

THE NEW YORK TIMES December 25, 2001 "Report Faults Fiscal Review of Nuclear Plants" by The Associated press reports: "The Nuclear Regulatory Commission has failed to adequately ensure that owners have enough money to safely own, operate and later decommission nuclear power plants, a Congressional review says. The commission's 'reviews were not always rigorous enough to ensure that decommissioning funds would be adequate,' it said. 'Moreover, N.R.C. did not always adequately verify the new owners' financial qualifications to safely own and operate the plants.'"

### 5. A Dump Trump -

#### Dump the Nuclear Waste on Top of the Land East of Yucca Mountain

Another scenario is to dump the waste near Yucca Mountain before the tunnels are built.

#### Nuclear Waste Policy Amendments Act of 2000

This Congressional bill was sponsored by Alaska's Republican Senator Murkowski, introduced 6/24/99. This bill passed in the Senate 64-34 in February 1999, and the House 1677-253 in March 1999. President Clinton vetoed this bill 4/25/00. The bill repealed the 1982 limit of 70,000 metric tons placed upon a first repository. It vests the Secretary of Energy with responsibility to cause to be used preferred shipping routes from each shipping origin in accordance with regulations promulgated by the Secretary of Transportation. LAS VEGAS SUN 3/23/00 Benjamin Grove in "Nevada dodges a nuclear bullet": "Although there are future bills lurking in Congress that would ship the nation's nuclear waste to Yucca Mountain, Nevada appears to have dodged a current effort to create a high-level radioactive dump in the state. The bill designates Yucca Mountain, 90 miles northwest of Las Vegas, as the nation's nuclear waste burial ground. Waste now stored at nuclear power plants nationwide would be shipped by truck and train across 43 states to Nevada by 2007." The repository is scheduled to open, at earliest, 2010. This means the nuclear waste was to be placed on top of the ground.

Benjamin Grove reports in the LAS VEGAS SUN August 1, 2000 "[Republican] Platform backs nuclear storage" "Clinton this year rejected a Congress-approved bill that would have sped up a timeline for shipments of waste hauled by truck and train to Nevada. 'Meanwhile,' the Republican platforms says, 'nuclear plants are choking on waste because the current administration breached its contract to remove it - and then vetoed legislation to store it at a safe, permanent repository for which the taxpayers had already paid \$7 billion,' referring to Yucca Mountain."

The Supplement to the Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County Nevada dated May 2001 issued by the U.S. Department of Energy discusses placing nuclear waste at Yucca Mountain

before the tunnels are built. Page 2-8 "Commercial spent nuclear fuel would be the major contributor of heat in the repository. Placing younger fuel in a surface aging area to allow its heat output to dissipate so it could meet thermal goals for later emplacement. DOE would consider aging as much as 40,000 MTHM of commercial spent nuclear fuel (Mattsson 2000, p.2) during a 50-year period. Aging would require an extended emplacement period." Page 2-9 "For analytical purposes, DOE assumes that the receipt and emplacement of these materials would begin in 2010 and would occur over a 24-year period, except if DOE used aging to achieve the lower-temperature repository operating mode. With aging, the emplacement [this is not talking about receipt] period would extend from 2010 until 2060. You can't emplace the nuclear waste in 2010 unless it is already there and in the aging scenario they mention no time limit for receipt of nuclear fuel. I would conclude that the fuel rods for cooling could be placed there at any time, including the present. Page 2-20 shows 4 repository layouts for the Draft high, intermediate, and low thermal load scenarios, and the flexible design. One goal is to keep the nuclear rod storage tunnels below the temperature that boils water. When water turns to steam, steam takes up slightly over 600 times the space of the water that generated it. This could present problems in the tunnels. The tunnels are planned to be about the length of a football stadium beneath the ground surface, and an approximately equal distance from existing water table. The federal government contracted with the nuclear plant owners to remove their waste nuclear fuel rods, removal beginning by January 31, 1998, and instead the U.S. government has assumed responsibility for the 40,000 tons of rods and has not removed them. The federal government is now being sued because the fuel rods are still at the plants. In order to place the 40,000 tons of fuel rods in the tunnels and keep the temperature below the boiling point, from the graphs shown on page 2-20, it appears that they would have to construct about 3 times as many tunnels.

In the LAS VEGAS SUN February 5, 2002 by Benjamin Grove "DOE plans 'temporary' nuke dump at Yucca" "Yucca tunnels likely would not be complete by the 2010 deadline, so when Bush unveiled his budget Monday he asked Congress for enough money to keep the project on track, even if it means shipping waste to Nevada before the underground dump is complete."

THE NUCLEAR MONITOR December 2001 "Yucca Heats Up" reports ".In fact, the GAO [Government Accounting Office] reported that DOE is considering building a parking lot style 'interim storage' facility at Yucca in order to expedite waste shipments away from utilities that are presently suing DOE for breach of contract and seeking damages because DOE failed to begin hauling radioactive fuel rods away by January 31, 1998 - the arbitrary, unrealistic deadline Congress mandated in the 1982 Nuclear Waste Policy Act."

## 6. Nuclear Terror

The LAS VEGAS SUN January 23, 2002 presents an article from the NEW YORK TIMES by Matthew L. Wald "Suicidal threat seen at nuke plants". He quotes "A scientist. Frank N. von Hippel, who is a physicist and a professor of public and international affairs at Princeton, said in a telephone interview that a 100-pound mass of uranium dropped on a second 100-pound mass, from a height of about 6 feet, could produce a blast of 5 to 10 kilotons. The Hiroshima bomb, which used uranium, was 12 to 17 kilotons."

An article in the NEW YORK TIMES by Bruce G. Blair October 22, 2001 "The Ultimate Hatred Is Nuclear" states: "Sophisticated terrorists would be able to make an atomic bomb if they could get the necessary fissile materials - highly enriched uranium or plutonium. Huge quantities exist around the world. There has

been concern for years about the vulnerability of Russian bombs and bomb materials. More than 1,000 tons of bomb-grade plutonium and uranium remain in the former Soviet Union, half stored in its raw form and half inside 20,000 bombs. The United States is already working with Russia in a limited way to secure its nuclear facilities by installing fences and surveillance sensors, but only half of the needed security improvements have been completed.

BUSINESS WEEK October 1, 2001 "The Nuclear Nightmare Just Got More Real" Catherine Arnst and William C. Symonds report: "V. Alan Mode, a former division leader of the counterterrorism effort at Lawrence Livermore national labs, says. 'The effects of a nuclear attack are so massive that you must give it a tremendous amount of respect and thought.' The production of homemade nukes is more than a hypothetical problem. The International Atomic Energy Agency reports that illicit trafficking in nuclear materials has doubled since 1996, and it counts 370 confirmed cases of smuggling in the past eight years. A State Dept. study notes that as many as 130 terrorist groups worldwide have expressed interest in obtaining nuclear capabilities. 'Many of the Russian nuclear sites remain vulnerable to insiders determined to steal enough material to make several nuclear weapons,' states a report issued by [co-chair of an Energy Dept. Task Force Senator Howard H.] Baker's researchers. 'The Task Force was advised that buyers from Iraq, Iran, and other countries have actively sought nuclear weapons-usable material from Russian sites.' If you had a softball-size lump of enriched uranium, some materials (mostly) available at Radio Shack, and an engineering grad of an American university, you would have a reasonable chance of making' a crude nuclear weapon, says Graham T. Allison, director of the Belfer Center for Science & International Affairs at Harvard University and an expert on nuclear terrorism. The resulting bomb could level the tip of lower Manhattan, he warns."

The height of nuclear terror is described by Len Ackland in "The day they almost lost Denver" in THE BULLETIN OF THE ATOMIC SCIENTISTS July-August, 1999. "Len Ackland, the Editor of the BULLETIN from 1984 to 1991, has written MAKING A REAL KILLING: ROCKY FLATS AND THE NUCLEAR WEST. Rocky Flats [a Department of Energy owned facility] had difficulties. In June 1989, the FBI raided the 6,500 acre site, which by then included more than 100 buildings. And no other plant management has plea-bargained criminal charges.

Instead of siting the plant where the prevailing winds were unlikely to send emissions over Denver, planners set it down so that Denver was directly [16 miles] downwind. The emphasis at Rocky Flats, which operated from 1952 to 1989, was always on production, not safety.

Plutonium, a lethal substance that always requires careful handling, could, and sometimes did, spontaneously ignite. [Seven millionths of one twenty-eighth of an ounce of plutonium ash or dust inhaled can give you lung cancer as mentioned in SCIENTIFIC AMERICAN article "Hanford's Nuclear Wasteland" by Glenn Zorpette May 1996.] In September 1957, fire broke out in Room 180 of Building 771, which was packed with gloveboxes made of flammable plastic and nearly 140 pounds of plutonium that was being machined into triggers for thermonuclear weapons. A combination of gases and dust that had accumulated for the past four years - during which time the filters had not been changed - caused an explosion that knocked flat the firefighters on the floor below. Heat-detecting equipment in the filter bank had been designed to shut down exhaust fans in the case of fire, but this highly sensitive equipment had sometimes slowed production, so it had been disabled. The explosion also blew out the cap at the top of Building 771's smokestack, sending contaminated air out into the Denver area.

Fires flared frequently at Rocky Flats. The plant's fire department had been called out to hundreds of fires in the years since the 1957 blaze heavily damaged building 771. The most serious was a 1965 plutonium fire ignited in Building 776-777 when workers tried to unplug a clogged drain. Although the fire was quickly extinguished, more than 400 employees were contaminated during this accident. Most of them inhaled radioactive particles and received internal exposures from alpha radiation, so their exposures didn't show up in the plant's figures for external penetrating radiation caused by beta particles, gamma rays, and

neutrons. From 1966 to May 1979 alone, the department responded to 164 fires. Countless other plutonium fires had broken out but were extinguished by workers and the fire department was not even called in. 'There is no good estimate of the number of plutonium fires not reported to the Fire Department,' a 1969 Rocky Flats document stated. 'When plutonium filings, or chips, ignited spontaneously, workers dropped the chips into machining oil to put them out. The unpredictable nature of plutonium metal is well recognized but not completely understood,' a 1969 document stated. 'It is difficult to assign an ignition temperature to the many physical forms and crystalline phases of plutonium metal. For example, small plutonium filings ignited easily'. From 1965 on, workers handled increasingly large quantities of plutonium metal in Building 776-777. At any one time, more than 7,000 pounds were located there.

The building also had no sprinkler system, due to fears that water would react with the plutonium and cause a localized 'criticality' chain reaction which could deliver a lethal dose of radiation to anyone close by. Building 776-777 was a firetrap.

Some employees were worried about the state of Building 776-777. about the rags and other waste in the plutonium-filled glovebox lines. The production lines were occasionally left unattended. [Union president Jim Kelly] proposed that Dow assign roving radiation monitors to the building to do spot checks around the clock. The company [managing this DOE facility] declined. 'Dow Chemical would have nothing to do with that.'

**Mother's Day** Sometime late in the morning of Sunday, May 11, 1969, plutonium flecks in rags on the floor of a briquette press glovebox on the north foundry line spontaneously ignited. The rags began burning. When the Building 776-777 day shift had ended on Saturday, May 10, the facility held 7,641 pounds of plutonium. [Again, as cited above, seven millionths of one twenty eighth of an ounce of plutonium ash or dust can cause lung cancer]. The fire should have immediately triggered heat detectors, but they had been removed from the storage gloveboxes about two years earlier to make room for the new anti-radiation 'jewel boxes.'. The fire spread quickly. At 2:27 p.m., the building heat detectors finally triggered an alarm at the Rocky Flats fire station.

**Fire Capt. Wayne Jesser** and three firemen arrived. within minutes. and found heavy smoke and fire, with flames shooting. ordered one fireman to attack the fire with a hand-held carbon dioxide extinguisher, while he moved. with a 50-pound carbon dioxide carrier mounted on a cart. The carbon dioxide had no effect. Jesser faced a momentous decision. The Rocky Flats firefighters had been ordered repeatedly never to use water on a plutonium fire because of the dangers of criticality, an explosion, or both. If the water caused a hydrogen explosion, the whole building might be destroyed and the Denver area contaminated. Against those risks, Jesser knew for sure that if the fires weren't controlled the building would collapse and radiation would be released. Water was his only option.

The blaze burned brighter than anything Bill Dennison, a plant guard and auxiliary firefighter, had ever seen. It reminded him of forest fire movies, 'except that back in the smoke and flame we could see the distinctive brilliance of burning metal, which we assumed was plutonium'. The huge ventilation fans pulled flames into the filter system designed to prevent plutonium contamination from leaving the building. About 4:00 p.m., the water was beginning to contain the fire inside the building. But it caused extreme danger for the firefighters. Although no criticality occurred, 41 firefighters, guards, and other employees who fought the fire sustained radiation doses. The firemen contained the fire by 6:40 p.m.

Lending credence to the conclusion that heat and moisture would ignite plutonium, workers discovered a fire Monday morning in a plutonium storage glovebox on the south foundry line far away from the big fire. A few months later, a local group of independent scientists discovered plutonium in soil near the plant.

The AEC [now named DOE] completed its investigation in August. Its report, classified secret, criticized both AEC and Dow management for neglecting fire safety in the Building 776-777 complex. AEC officials 'were afraid it was going to implicate certain individuals so the lawyer didn't allow us to put that into the report,'. moreover, AEC officials didn't want to remind anyone that they had completely ignored the findings of the investigation report prepared after the 1957 fire at Rocky Flats. 'The Dow official in charge

of nuclear safety emergency planning, seemed singularly unswayed by the fire on May 11. The possibility that it might have resulted in a significant off-site release of plutonium was countered by the observation that it did not happen.'

In contrast, top AEC officials knew Denver had barely escaped a catastrophe. If the fire had burned through Building 776-777's already softening roof, thousands of pounds of deadly plutonium in the form of powdery ash would have exposed hundreds of thousands of women, men, and children living nearby to toxic radiation. Testifying before Congress in 1970, [U.S. Air Force General Edward] Giller admitted that if the fire hadn't been contained 'hundreds of square miles could be involved in radiation exposure and involve cleanup at an astronomical cost as well as creating a very intense reaction by the general public exposed to this.' He continued, 'In the fire we had last year we kept it in the building. If the fire had been a little bigger it is questionable whether it could have been contained.'

In "Hanford's Nuclear Wasteland" by Glenn Zorpette SCIENTIFIC AMERICAN May 1996 we explore that the "Hanford site [owned by the Department of Energy and located about 100 miles east of Seattle, Washington] slowly devolved into a nightmarish agglomeration of decaying, contaminated facilities that each consume tens of millions of dollars a year just to be kept stable or safe." At the Hanford Site there are 177 underground tanks many the size of the Capital Dome containing high-level nuclear waste. Most of the storage tanks are rotted out at the bottom and have leaked liquids or are building up heat or flammable gases. "Although they were intended to hold some radioactive products with half-lives of thousands of years, the tanks were designed to last only 25 years - and were built without any means for draining the waste." Also at the Hanford Site are five gigantic and profoundly contaminated buildings where plutonium was extracted from irradiated nuclear fuel. "Some of these buildings are comparable in size to the Empire State Building, if it were lying on its side." In areas these buildings are so radioactive they have no instruments to measure that high an amount of radiation.

"In 40-year-old, water-filled basins near the Columbia River, the DOE and its contractors have been storing 2,100 tons of spent nuclear fuel, much of it corroded and releasing radioactive elements into the basin water. A strong earthquake, it was realized, could release up to 9,000 cubic meters [a meter = 39.37 inches; a cubic meter = 1.307 cubic yards] of contaminated water from the basins into the solid and river, allowing radiation in the area above the basins to soar to lethal levels and dispersing fine radioactive particles into the air. When the DOE's contractors at Hanford are not trying to keep urgent risks from becoming disasters, they are generally rounding up contaminants that were improperly disposed of that are near groundwater or the river. Millions of curies of potentially harmful radioactive materials were also released into the air and nearby river water at Hanford and other sites, sometimes intentionally. Some of the damage is permanent; cleanup technologies either do not exist or could never make a dent in the level of contamination. For example, at Hanford, a plume of groundwater containing tritium, nitrates and other contaminants occupies at least 250 square kilometers and is leaching into the Columbia River, which runs for 82 kilometers through Hanford. The contaminated plume is only one of the dozens below the site. The TPA, which lists specific activities and milestones and can fine the DOE for missing them, was the template for many other documents, called compliance agreements governing environmental work on a number of DOE sites. Other than the federal deficit, the cost of the work that the DOE has committed itself to in the compliance agreements at all of its cleanup sites represents the single greatest liability of the U.S. government. As spokesman Michael V. Bernochoa of Westinghouse Hanford puts it, 'There isn't enough money in the world'.

Only lately, as part of Energy Secretary [appointed by President Clinton] Hazel R. O'Leary's initiative to make the DOE more open about its past and present, has the department begun revealing the extent of its transgressions. The DOE and its contractors generated hundreds of thousands of cubic meters of less radioactive effluents. The DOE now admits that enormous amounts of the liquids and solids were simply pumped or dumped into the ground. Most of the wastes contain both radioactive and chemical contaminants. The DOE estimates that throughout all the weapons complexes, billions of cubic meters of soil, ground water and surface water are contaminated." I have since read that this amount of liquid would fill a lake 80 feet deep about the size of the island of Manhattan.

## 7. A Possible Solution That Does Not Create More Problems Than It Solves

"MIT'S Magazine of Innovation TECHNOLOGY REVIEW" January-February 2002 in Whose Nuclear Waste? by Gary Taubes observes: ". The more geologists have learned about Yucca Mountain, however, the less viable that model has become. [Director of the State of Nevada Commission for Nuclear Waste, Robert] Loux cheerfully lists the litany of Yucca Mountain's potential failings, all of which the DOE acknowledges. The immediate region, for instance, has over 30 fault lines running through it - 'an extraordinary number' for an area of some 250 square kilometers - one of which registered a magnitude 5.6 earthquake in 1992, causing significant damage to the DOE buildings at Yucca Mountain. There are also three or four relatively young volcanic structures within a few miles of Yucca. 'If you're trying to find a good, stable geologic foundation for a repository,' says Loux, 'it's not available at Yucca Mountain.' What's more, he adds, the DOE originally assumed that the arid environment and the fused volcanic rock of the mountain would keep water from percolating down into the repository, but geologists quickly discovered that the mountain is riddled with tiny fractures, and what water does get in moves relatively quickly, in geologic time, on down.

If there is an easy way out of the impasse, say experts, it isn't obvious. However, in the past year both the National Research Council [this is the National Academy of Sciences research arm] and the Harvard/University of Tokyo collaboration advanced an idea that seems to be gathering support among experts in the nuclear-waste debate. The gist of it is to slow down, rethink and do it right. The current repository plans were motivated in the early 1980s by the specter of reactor shutdowns and blackouts as spent-fuel storage pools around the country filled to the brim. Since then, the industry has learned to store spent nuclear fuel on-site in dry-storage casks. These concrete or steel casks are easy to use, easy to license and, according to the Nuclear Regulatory Commission, will keep the spent fuel safe for a century. Indeed, says the DOE's Williams, everyone agrees that dry-cask storage, known technically as monitored surface storage, is an adequate temporary solution to the problem of spent fuel, at least from the safety and security points of view."

Benjamin Grove reports in the LAS VEGAS SUN February 11, 2002 "Nuke casks can be damaged" "In the video the cask is called 'Super Castor,' but it is not clear who makes that cask. According to the congressional delegation's fact sheet, the cask is licensed by the Nuclear Regulatory Commission for storage but had not yet been licensed to transport waste at the time of the experiment. It is licensed for transport in other nations, according to IFC. The nuclear industry currently uses NRC-licensed casks to make shipments of high-level waste in this nation. The tape shows two experiments conducted in cooperation with the U.S. Army at the Aberdeen Proving Ground in Maryland on June 25, 1998.

In one test, a TOW anti-tank missile, less than 50 pounds and common worldwide, is placed on the cask and detonated. The explosion pierces the cask, which is more than one foot thick. The missile creates a softball-sized hole all the way through the container.

In the second test, the cask is protected by a 'flak jacket' of concrete, to simulate how waste storage casks currently are protected at the nation's nuclear plants. The missile cracks the cask surface but does not completely penetrate it.

The tape does not show what would happen to both casks if the missile had been fired. A TOW missile is about six inches in diameter and in use by 40 nations, according to manufacturer Raytheon Co. It has a range of more than 3,000 meters.

Still, the experiments may bolster arguments that it is safer to leave nuclear waste casks encased in concrete at nuclear plants than to ship casks cross-country to Nevada, state officials could argue.

If the Yucca project is eventually approved by Bush, Congress, and the NRC, as many as 100,000 shipments of high-level waste could roll across America for 30 years or more."

It seems logical to me that since that video was made in 1998 they may have improved the design of the 100-year storage casks, or could improve them when they design them to be more terrorist proof. If they could not leave them where they are, they could transport the nuclear plant fuel rod waste in the steel casks to huge areas all over the U.S. These areas should be more than 100 miles away from a densely populated area. These areas would also be much closer to the existing storage areas. They could then place each steel cask into the many feet thick concrete surrounding sealant. Additionally, in the estimated 100-year life of the metal and concrete casks, the nuclear fuel would become less radioactive. And during that time other technologies for dealing with nuclear waste might be found.

#### 8. President George W. Bush Approves Yucca Mountain

##### For Application for a Repository Construction Authorization

In a letter from President Bush to the House and Senate dated February 15, 2002, reported in THE LAS VEGAS SUN February 16, 2002 President Bush states soon after receiving a recommendation from Energy Secretary Abraham "Proceeding with the repository program is necessary to protect public safety, health, and the Nation's security because successful completion of this project would isolate in a geologic repository at a remote location highly radioactive materials now scattered throughout the Nation. In addition, the geologic repository would support our national security through disposal of nuclear waste from our defense facilities. I consider the Yucca Mountain site qualified for application for a construction authorization for a repository. This recommendation is the culmination of two decades of intense scientific scrutiny involving application of an array of scientific and technical disciplines necessary and appropriate for this challenging undertaking.. Therefore, I now recommend the Yucca Mountain site for this purpose. Successful completion of this program also will redeem the clear Federal legal obligation safely to dispose of commercial spent nuclear fuel that the Congress passed in 1982." [As reported in THE NUCLEAR MONITOR, a publication of the Nuclear Information & Resource Service (NIRS) December 2001 "In fact, the GAO reported that DOE is considering building a parking lot style 'interim storage' facility at Yucca in order to expedite waste shipments away from utilities that are presently suing DOE for breach of contract and seeking damages because DOE failed to begin hauling radioactive fuel rods away by January 31, 1998 - the arbitrary, unrealistic deadline Congress mandated in the 1982 Nuclear Waste Policy Act".]

The LAS VEGAS REVIEW JOURNAL February 16, 2002 "Bush: President's decision a milestone" by Steve Tetreault reports: "Speaking to reporters on Friday, Abraham defended his recommendation. 'It is my strong belief that the science supports the safe use of this repository,' he said. Abraham also previewed the DOE's responses to Nevada charges that nuclear waste shipments might be vulnerable to attack or accident. 'The fact is the waste is already closer to the people every day of the week than it will be if it moves past a community for five or ten minutes.'. Terrorists, he said, would have a clearer shot of waste kept in immobile on-site storage. He added that transportation routes and shipment schedules wouldn't be publicized."

## 9. What More Can Go Wrong -

Just Ignore Nuclear Waste Problems and Deregulate! !

Nuclear Information Resource Service (NIRS) Nuclear Monitor Nov. 22, 2002. On 6 November 2002

"The U.S. Nuclear regulatory Commission has announced that it will proceed to make a rule regarding deregulating or 'releasing' nuclear waste from regulatory control... The NRC's previous efforts to deregulate radioactive 'wastes' materials, emissions and practices were the 'Below Regulatory Concern' policies of 1985 and 1990. These were revoked by the US Congress in 1992 due to public opposition and inadequate technical support... This time the NRC is expending significant staff and contractor time and resources to produce technical reports that claim to be able to estimate the doses to the public from unregulated... materials that will be unleashed on the public. If risk or dose based standards are adopted, we will never know how much exposure we receive because they will be neither verifiable nor enforceable. In addition, there is no limit to the number of different, multiple exposures we and future generations will receive because the standards intend to provide across-the-board exemptions for many types of wastes from all kinds of nuclear waste generators and practices."

Another new development, in the NIRS Nuclear Monitor December 6, 2002 "A mid-November 'Platts Nuclear News Flash' reported that the U.S. Nuclear Regulatory Commission may grant an operating license to Private Fuel Storage as early as mid-December to 'temporarily store' 40,000 metric tons of high-level radioactive waste on the tiny Skull Valley Goshutes Indian Reservation in the US state of Utah." Skull Valley is about 70 miles from Salt Lake City. This 40,000 tons is in addition to the 40,000 they want to put for 50 years "to cool" on top of the land east of the planned Yucca Mountain Nuclear Repository. Then in the April 11, 2003 Nuclear Monitor "U.S.: PFS Blocked, But For how Long?" "Administrative Law Judges ruled that the State of Utah's (UT) contention that 'there is enough likelihood of an F-16 crash into the proposed facility that such an accident must be deemed 'credible', and that 'the PFS facility cannot be licensed without that safety concern being addressed'...PFS has amended it application, and is now requesting a temporary license for a much smaller 336 cask storage site... PFS Chairman John Parkyn made clear that the proposed smaller size was merely an interim move in order to secure a license so that marketing, construction, and operation could begin, while allowing PFS to continue seeking permission to load 4,000 casks."

In an NIRS Action Alert! February 6, 2003 Michael Mariotte informs and warns about the Price-Anderson reauthorization bill: "House and Senate conferees are now negotiating the long-delayed spending bill for fiscal year 2003. The Senate-passed bill includes a 'rider' (unrelated legislation snuck into the bill) that reauthorizes the Price-Anderson Act. Originally enacted in 1957, Price-Anderson limits the liability of nuclear power plant operators in the event of an accident or attack. This leaves the public inadequately protected, the nuclear industry unaccountable, and taxpayers potentially on the hook for billions in clean-up costs. Price-Anderson also results in a substantial annual subsidy to the nuclear industry in terms of foregone insurance premiums. Reauthorizing the Price-Anderson Act would unnecessarily extend this unfair subsidy to proposed new reactors licensed within the next 15 years, without addressing their security vulnerabilities. This anti-consumer, anti-environment, anti-taxpayer rider has no place in the appropriation package."

January 17, 2003 NIRS Nuclear Monitor "U.S. NRC Excludes Terrorist Issue From Licensing Hearings" reports "While refusing to address the actual structural vulnerabilities at the nuclear reactors and the protracted risks associated with license extension and such security deficiencies, the five Commissioners instead chose to reject all intervenor arguments on the 'unquantifiable threat of terrorism.' 'It is decidedly not predictable,' said the Commission order, because there would be 'no meaningful way' to postulate the probability of a specific facility being the target of a terrorist attack. 'Therefore, consideration of those issues in a license renewal proceeding would be unnecessary and wasteful,' the Commissioner added. Similarly the Commission ruled that threat of terrorism to be too speculative to consider in any licensing proceeding."

These governmental free? enterprise moguls are eliminating free market economics and creating a welfare state for private companies to bilk the public out of tax dollars. At the same time they discourage responsible approaches to providing nuclear energy and waste storage. Moreover, they expose the public to thousands of years of genetic defects if they survive terrorist attacks and or "accidents" that are the result of malfeasance on the part of their government regulators and those private enterprise companies that avoid financial responsibility for their continual and deliberate negligence and high crimes.

## 10. Conclusion

As reported in MIT's TECHNOLOGY REVIEW, scientific experts think that the initial plans for the Yucca Repository should be rethought and they recommend that 100-year metal and concrete casks closer to where the nuclear waste is now being stored should be used instead. If President Bush is fearful of some kind of energy embargo or disruption or terrorist attacks, what seems reasonable to me is to set up a crash program to manufacture these steel casks, transport the nuclear waste in the steel casks to local areas near where they are now kept, but farther from populated areas, and quickly set up programs to put them in more missile-proof, fire-proof concrete.

The importance of not losing World War II was one thing. The necessity or advisability(?) of developing nuclear power plants is something else. We have barely begun to utilize solar, methane and wind energy. And, what under real-world U.S. market, security, and energy dependent conditions would be judged a safe and financially viable nuclear plant is another question. And to deregulate nuclear waste, even when the deregulation policies are couched in fancy language, I think is highly criminal. The nuclear mess left from developing the atom bomb would have required a major effort to clean up back in the 1940's. Back then the DOE was named the Atomic Energy Commission [AEC]. The avoidable and unnecessary nuclear nightmares that were created afterwards were due in large part to the modus operandi of the U.S. Department of Energy, the nuclear industry whose pocket the DOE is often in, and the NRC that when the chips are down has been a function of nuclear industry and the DOE. Again, I think many of the aforementioned nuclear policy blunders fall into the category of highly criminal. And we are faced with a dilemma of government wanting to classify information vs. the publics' need to know. I think much of the basis of "freedom, democracy and liberty" requires that the public be informed, or you no longer have a representative government. Every time a president issues a decree, such as a military tribunal requirement, he must be careful that he does not appoint himself sole dictator in that area, particularly when other agencies can do the job. I think the same holds true regarding nuclear power. Lack of competence, judgment, and trustworthiness can make the nuclear industry, the government involved, and the president the enemies of their people. They are needlessly subjecting the United States, and

eventually neighbors, to accidental or terrorist nuclear holocausts of the dimensions of a nuclear World War III. I think in most cases discussed in this paper, the need of the public to hold the government accountable far outweighs the government's need to classify and keep secret from the public nuclear energy policies. These are policies that will affect the publics' health and well-being now and for thousands of years into the future.

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## APPENDIX

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