San Luis Obispo

MOTHERS for PEACE

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July 15, 2003

My name is Rochelle Becker. I am here as a representative of the San Luis Obispo Mothers for Peace. For over three decades our organization has been legal intervenors in proceedings involving nuclear safety issues before the Nuclear Regulatory Commission, the California Public Utilities Commission, the California Energy Commission, the California Coastal Commission, the Regional Water Quality Board, Congress and the California legislature. Today the Mothers for Peace are submitting detailed written comments, but there is not time to read 7 pages this evening.

Rather, as most of the original Mothers for Peace are now grandmothers, tonight I have brought my two granddaughters Marina & Sierra. I want you to look into their faces while you listen to the recommendations of the Mothers for Peace. I want you to consider their future when you are considering 50 years of electricity in return for 50,000 or more years of high-level radioactive waste. Nuclear waste that must somehow be safely stored and safety transported and currently sits in earthquake prone coastal zones in our state.

I want you to look at the faces of two young girls whose children and definitely whose grandchildren will never receive the benefit of one kilowatt of electricity, but will be saddled with the expense of long term nuclear waste storage. If I thought it was just an issue of economics I would be less concerned, but this is also an issue of safe transport, safe storage for a period of time beyond most of our comprehension. A period of time that neither this agency, nor any other agency, is able to guarantee will remain safe.

On behalf of the San Luis Obispo Mothers for Peace, I ask, no I plead with the NRC to seriously consider including the following issues in updated criteria for re-licensing nuclear power plants:

- Security-defense in depth, including but not limited to, containment over highly radioactive spent fuel pools and returning the pools to the capacity required in original licenses (no double or triple re-racking);
- Transportation (currently over 7 million Californian's live within one mile of proposed routes)-recent Commerce train accident;
- Emergency preparedness of reactor communities and all communities on transport routes;
- Cost-benefit analysis of continued production of high-level radioactive waste in earthquake prone coastal zones;
- Impacts of aging components;
- Impacts of climate and sea water and salt air intrusion over time;
- Requirements for cooling towers to reduce thermal degradation of coastal waters and aquatic sea-life.

When I was the age of my grandchildren no nuclear power plants existed. Now there is over 77,000 tons of high-level radioactive waste that still has no safe storage facility and no safe method of transportation. We, you, cannot turn back the clock, but we can stop the insanity.

They're future is in your hands. As the Mothers for Peace our mission is to assure a safer future for our children and grandchildren. The NRC's mandate is to protect public health and safety. More than anything the Mothers for Peace wishes that our mission and the NRC's actions could provide that future. Re-licensing aging nuclear power plants 20 years before current licenses end is not in the best interest of America's future. Considering re-licensing without updating GEIS standards is not in the best interest of America's future.

I ask as a representative of the Mothers for Peace to protect our children and grandchildren and all future children in every way possible from the dangers of continued operation of aging nuclear plants. To protect them from continued production of tons of high-level radioactive waste that will need to be transported somewhere or to be left in earthquake prone coastal zones.

Remember the faces of these two beautiful, intelligent and loving children when making decisions regarding the safety of re-licensing nuclear plants.

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COMMENTS OF THE SAN LUIS OBISPO MOTHERS FOR PEACE REGARDING THE NUCLEAR REGULATORY COMMISSION'S GENERIC ENVIRONMENTAL IMPACT STATEMENT FOR THE LICENSE RENEWAL OF AGING NUCLEAR PLANTS

BACKGROUND

Nuclear power plants are granted operating licenses for a set amount of time - typically 40 years. It has been the practice of the Nuclear Regulatory Commission to allow applications for renewals before the license expires, which, if granted, add an additional 20 years to operation potential. It is time for the NRC to reconsider this practice. The NRC's primary task is to protect public health and safety and it is essential that the NRC abide by its mandate when considering the issues of continued operation of aging nuclear plants.

There exists a myriad of significant problems that must be resolved before license renewals are granted. These issues include, but are not limited to:

- terrorism and acts of malice and/or insanity;
- the absence of a safe site for storage of high-level radioactive waste;
- aging reactor components;
- cost/benefit analysis to determine if continuation of nuclear power is in the best interest of California residents and PG&E and Edison ratepayers.

SECURITY

The NRC and the nuclear industry are in a serious predicament. September 11, 2001 brought attention to the vulnerability of nuclear plants as terrorist targets. The catastrophic consequences of an attack are unthinkable, yet they must be considered in any GEIS for nuclear power license renewals. Our President has warned us that nuclear plants are on terrorists' short-lists and vulnerable to attack from air, sea, and land. In addition, it has been widely reported that the designs for U.S. nuclear plants were found in Al Quaeda terrorist hideouts.

Our President has repeatedly promised that our government will do everything in its power to protect U.S. citizens. Yet, all petitions to the NRC filed by communities and states requesting

defense-in-depth at nuclear facilities have been denied. But residents of reactor communities continue to raise the issue of security. California's Attorney General and Senator Dianne Feinstein have both sent letters to the NRC requesting that security be more adequately addressed.[1]

The NRC must change the assumptions that it previously held before September 11, 2001. As a condition of re-licensing, the GEIS for nuclear plant license renewals must require that the licensee:

- has the means to resist an attack on the reactor building, its support structures, and its spent fuel storage - from air, land and water by a team of well equipped terrorists;
- be required to pass tests and mock-attack drills which would demonstrate the adequacy of its security. These tests should be required every two years and include mock-attacks testing when the licensee is refueling.

AGE DEGRADATION OF COMPOMENTS

When U.S. nuclear reactors were originally built, costly components such as steam generators, turbine rotors, component cooling systems, and reactor vessel heads were thought be able to last the lifetime of the nuclear plant. This has not been the case. Across the nation, these and other very expensive parts have begun the age-related process of corrosion and erosion. The result has been that:

- major, expensive components are not replaced, simply patched;
- components have been identified as substandard or counterfeit -- making it impossible to judge expected lifespan;
- federal oversight has been lacking, allowing undiscovered degradation, i.e. Davis Besse plant.

The escalating potential for accidents at aging reactors has received nationwide attention and derogatory audits by the NRC's own Office of Inspector General. Additionally, the General Accounting Office (GAO) has documented the widespread use of counterfeit and substandard parts in nuclear reactors. Furthermore, in a deregulated electric market, or a hybrid such as currently exists in California, the licensee is motivated to cut costs by delaying expensive repairs. There is thus an economic disincentive to find and remedy problems. Hence, the GEIS must require that site- specific issues be performed by the NRC, not the licensee.[2]

RISK ASSESSMENTS

The NRC must improve its risk assessment guidelines for nuclear power plant renewals. An integral component of the GEIS for nuclear license renewal is the evaluation of consequences and correction of flaws in calculating accident probabilities. Nuclear plant risk assessments are not valuable because potential accident consequences are not evaluated. They merely examine accident probabilities -- only half of the risk equation. Consequences are potentially so catastrophic that they must be considered.

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[1] Letter from Atty. General Bill Lockyer to the NRC, Feb 29, 2003 and Letter from Senator Dianne Feinstein March 3 , 2003

[2] Federal Register Notice.

Moreover, the accident probability calculations are seriously flawed. They rely on assumptions that contradict actual operating experience. The risk assessments assume nuclear plants always conform to safety requirements, yet each year more than a thousand violations are reported. Plants are assumed to have no design problems even though hundreds are reported every year. Aging is assumed to result in no damage, despite evidence to the contrary. Reactor pressure vessels are assumed to be fail-proof, even though embrittlement forced the Yankee Rowe nuclear plant to shut down. The risk assessments assume that plant workers are far less likely to make mistakes than actual operating experience demonstrates. The risk assessments consider only the threat from damage to the reactor core despite the fact that irradiated fuel in the spent fuel pools represents an equally serious health hazard. The results from these unrealistic calculations are, therefore, overly optimistic.

Risk assessment analyzes health impacts by calculating impacts from exposure to a healthy 30-year- old "reference man" weighing179 pounds. However, there are no age, sex, and weight requirements to allow residences near a reactor. The very young, old, and disabled also live in the community and may be impacted. The results from these unrealistic calculations are overly optimistic.

Furthermore, the NRC requires plant owners to perform the calculations, but it fails to establish minimum standards for the accident probability calculations. Thus, the reported probabilities vary widely for virtually identical nuclear plant designs indicating that self-assessment is inaccurate.

Any risk assessment must also include human error and terrorism/sabotage in order to have any real-life validity. For example, a 1987 study found that human error contributed to 74% of all incidents at nuclear power plants.

WASTE

For nearly three decades, residents of reactor communities and the nuclear industry have been promised a solution to safe disposal of nuclear waste. Unfortunately, that has not materialized, and the problem of storing high level radioactive waste – both in the short and long term – remains unresolved.

A. Long term: Yucca Mountain is not certain. Litigation is still pending and technical and transportation issues are unresolved. Even if Yucca Mountain is licensed, it will take decades to transfer all of California's current waste. Re-licensing reactors will result in so much additional waste that Yucca Mountain will be filled to capacity by 2036. 44,000 tons of nuclear waste will remain at reactor sites.

B. Short term: interim, onsite storage in low-density pool storage and independently tested hardened dry casks must be mandatory before re-licensing. In January 2003, a study appeared in the spring issue of "Science and Global Security," a publication of Princeton University. This study confirmed 25 years of government research in concluding that spent fuel pools are particularly vulnerable to terrorist attacks and acts of malice and could generate a pool fire and corresponding contamination of hundreds of square miles. The Science and Global Security study calls for removal of the fuel from the densely packed pools into hardened, dry storage and placing any new fuel in a low density pool.

An example of the dangerous situation exists at Diablo Canyon Nuclear Power Plant. By 2006, Diablo Canyon's two storage pools will contain 2,648 radioactive waste assemblies, yet the pools were originally designed for approximately 500. The pools have no significant reinforcement structures to prevent damage from an external hazard such as an intentional attack on the facility, and it is dependent for its functioning on the operation of even softer targets such as the control room, pumps, and switch yard. If an attack or accident causes sufficient loss of coolant water, a pool fire could result in the release of up to 40 times more highly radioactive Cesium137 than was released at Chernobyl. The radioactive contamination there rendered 12,400 square miles uninhabitable for centuries. For comparison, the entire county of San Luis Obispo consists of 3,316 square miles. Furthermore, a partial loss of pool water could be even more dangerous than a total loss because of the potential of exothermic reactions between the cladding of the waste fuel and water steam. This reaction could result in the production of hydrogen.

The result of the government's inability to find a safe storage site has been applications by utilities around our country for onsite storage of nuclear waste. Most of the proposed onsite storage facilities could never pass a rigorous test for a nuclear waste site. Yet, no other options are made available. And here in our coastal zones, high level radioactive waste continues to mount and will likely remain for many more decades - endangering its citizens and environment. Additionally, the present practice of high-density storage of fuel assemblies in the pools has created additional and unacceptable risks to the surrounding communities. Low density pools and hardened dry cask storage are essential as a pre-condition of re-licensing to protect public safety until all the radioactive fuel can be removed to a safe off-site location.

TRANSPORTATION TO A PERMANENT, HIGH LEVEL RADIOACTIVE WASTE FACILITY

If onsite storage for high level radioactive waste is proposed as a "temporary" solution, then the NRC is obliged to consider the eventual transportation of this waste. When original license proceedings for Diablo Canyon Units 1and2 were held over 20 years ago, the NRC did not allow full evidentiary hearings on the subject of transportation of nuclear waste. This error has resulted in the application of PG&E for a site-specific license for nuclear waste storage in an earthquake prone coastal zone.

Scenarios for transport of nuclear waste include trucks on our major highways, trains, and barges. Seven million Californians live within one mile of proposed routes, and none of these modes can be protected from terrorist strikes or accidents. In California alone there were 1,880 tractor-trailer accidents between1994 and 2000 and 4,264 train wrecks from 1990 to2001. These statistics represent a fraction of the accidents across our nation, and the tragedy of just one accident involving nuclear waste would be devastating.

As recently as July 8, 2003, California requested a halt to medium-waste shipments of nuclear materials. This action was taken to protect California residents and "first responders" from the inherent dangers of nuclear waste spills arising from accidents and/or sabotage - and supported by California's Senator Feinstein.[3] Nuclear power plant license renewals increase the necessity of a greater number of shipments and thus the odds of such a lethal accident.

[3] AP July 9, 2003 AP-WS-07-0903 1809 EDT

To quote from the Los Angeles scenario of the Environmental Working Group: "Given the unanimous agreement that train or truck accidents are inevitable during the tens of thousands of radioactive waste shipment to Yucca Mountain, we believe people have a right to know what would happen if one of those accidents led to a release of radioactive materials in their town. ...The number of people exposed to unsafe doses of radiation is entirely dependent on the timing and location of the accident or attack."[4]

The NRC must consider the full consequences of high-level radioactive waste transportation before it can determine the GEIS of nuclear power plant license renewals.

EMERGENCY PLANNING

Emergency planning for reactor facilities involves many assumptions that may prove to be inaccurate. A recent study commissioned by Entergy Nuclear Northeast, determined that "...the evacuation of the 10 mile zone around the Indian Point nuclear power plant would take roughly nine hours and 25 minutes, almost double the time previously allotted."[5]

Add to this report the fact that emergency planning for communities along proposed transport routes is virtually non-existent, and it becomes clear that new studies are needed. A recent train accident in the City of Commerce resulted in the loss of several homes. Imagine that tragedy coupled with high level radioactive waste as its cargo.

Extensive and realistic emergency planning upgrades must take into account accidents resulting from terrorist attacks and attacks on spent fuel sites. Such accidents are fast breaking and of considerable consequence spreading well beyond the current 10 mile EPZ. Consideration of these scenarios must be made mandatory to protect the residents of this state and must be included in any GEIS for license renewal.

CLIMATE

Most people think of the impacts of the oil and coal industry when global warming is mentioned. However, for coastal reactors global warming is increasing the temperature of cooling waters, eroding coastlines, corroding components. Climate changes must be included in the GEIS for nuclear power license renewal.

WATER QUALITY ISSUES

The two nuclear power plants in California use ocean water for their cooling systems, and the results of this are devastating to the marine life. The water taken in entrains and impinges fish and larvae, decreasing adult fish populations and effecting the ecology of the area and commercial and recreational fishing. The heated water going out forces changes upon the indigenous environment; plants and animal species that survive or move in are ones that can tolerate the elevated temperature. The abalone is an example of one species that cannot tolerate the elevated temperature.

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[4] What if...A nuclear waste accident scenario in Los Angeles, Ca Richard Wiles, James R. Cox, June 27, 2002 www.mapscience.org

[5] Greenwire, July 3, 2003

When considering operating license renewals, the NRC must examine the damage that has already occurred in the coastal waters and the degradation that would continue with plant operation.

COST BENEFIT ANALYSIS

The true costs of nuclear power from uranium mining, processing, insurance, temporary and permanent storage of high level radioactive waste, and decommissioning must be placed on the table. In order for this state to plan its energy future, a candid disclosure of all costs of nuclear power is required. Any EIS update on this issue must be made retroactive for nuclear plants that have already received license renewals under the NRC's current, but extremely outdated, GEIS.

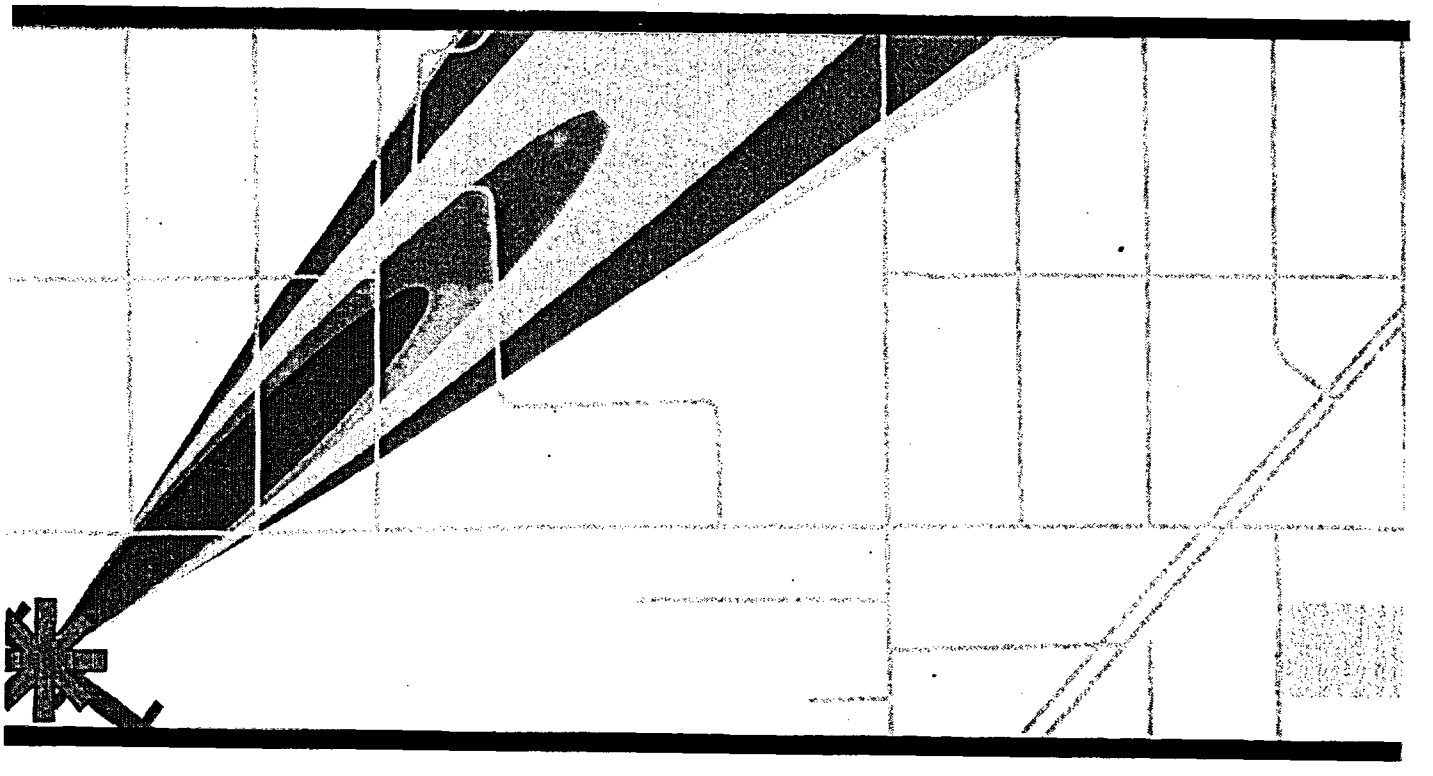
CONCLUSION

All critical issues (detailed above) involving the extended operation of a nuclear facility must be adequately addressed and resolved before any license renewals are granted. Additionally, the NRC has an obligation to update all Environmental Impact Statements for License Renewal with meaningful stakeholder input. The issues of safety and cost-effectiveness must be granted full public hearings. Complete and detailed analyses of the true cost of continued operation must be paramount in NRC decision-making. Safer and less expensive energy alternatives must also be given serious consideration. The NRC must abide by its mandate to protect public health and safety when considering the issues of continued operation of aging nuclear plants.

Respectfully Submitted, July 15, 2003

Rochelle Becker
San Luis Obispo Mothers for Peace

What if...



A nuclear waste accident scenario in Los Angeles, CA

Environmental Working Group™

Nuclear Waste Route Maps

Richard Wiles
James R. Cox

June 27, 2002
www.MapScience.org

Summary

Everyone agrees that there will be accidents if nuclear waste is transported by train and truck through 45 states for 38 years to the repository at Yucca Mountain in Nevada. The Department of Energy (DOE) predicts that there will be about 100 accidents over the life of the project. The State of Nevada predicts about 400 accidents during the same time period. To date, however, the public has not been provided meaningful information about the potential effects of a serious nuclear waste accident in any of the heavily populated metropolitan areas through which Nevada-bound radioactive waste would travel. This report is the first attempt to utilize government data and computer models in order to describe the consequences of a serious, but plausible accident involving the release of high-level radioactive waste in major cities along the DOE proposed nuclear waste transport routes.

This report is the first attempt to utilize government data and computer models in order to describe the consequences of a serious, but plausible accident involving the release of high-level radioactive waste in major cities along the DOE proposed nuclear waste transport routes.

The DOE has developed a series of computer models at its Lawrence Livermore, Sandia, and Argonne National Laboratories, in order to predict the consequences of accidents involving shipments of nuclear materials. These models, known as HOTSPOT, RISKIND, and RADTRAN, among others, are designed to allow anyone to model the radiation plume that would arise from accidents of varying severity, involving different amounts and types of radioactive material, under different weather conditions.

The primary model used in this analysis, HOTSPOT, was developed by Lawrence Livermore National Laboratory and is available online at:

http://www.llnl.gov/nai/technologies/hotspot/

For people who live along the Department of Energy's proposed nuclear waste transport route in Los Angeles, the question is: What if there is a nuclear waste accident in Los Angeles that involves the release of radiation?

The maps presented here by Environmental Working Group are the first attempt to provide the public with answers to this question. We use government models and government assumptions as outlined below and presented in more detail in our national report. *The maps describe the*

consequences of an accident of moderate severity, not a worst case scenario. We did not model the impact of an attack on a nuclear waste shipment that penetrates or explodes the casks or results in a severe prolonged fire, events that would disperse a far greater amount of lethal radiation over a much larger area.

The DOE has not published a detailed analysis of the impact of a terrorist attack on a nuclear waste shipment. Instead, the DOE has produced a generic, one-size-fits-all estimate of the number of fatalities from a serious accident, and conducted complex and lengthy probability analyses designed to show that such an accident is very unlikely to occur. The DOE analysis was an abstract exercise. It did not situate the modeled event in any actual community.

Appendix J — the original DOE documentation, is available online at: http://www.mapscience.org/doe_eis_maps.php

Given the unanimous agreement that train or truck accidents are inevitable during the tens of thousands of radioactive waste shipments to Yucca Mountain, we believe people have a right to know what would happen if one of those accidents led to a release of radioactive materials in their town.

(A)

Assessing the Risks

In order to assess what could happen if there were an accident involving a nuclear waste shipment in a major metropolitan area, Environmental Working Group used the following data and computer models:

- The government radiation plume models (HOTSPOT) developed at the Lawrence Livermore National Laboratory (http://www.llnl.gov/nai/technologies/hotspot/
- Accident scenarios and data on the radioactive composition of nuclear waste shipments developed by the Department of Energy;

- The most recent "cancer potency factor" for a given radiation exposure level published by the National Academy of Sciences, BEIR V.

The results presented here describe the radiation released from a train wreck with the following characteristics:

- The accident occurs at a speed of between 30 to 60 miles per hour;
- The wreck occurs under average weather conditions (median winds) during the day in each of the metropolitan areas modeled;
- Radiation, primarily in the form of Cesium, escapes as a result of a broken seal in the shipping cask and a subsequent modest fire. Again, this is not a "worst case" scenario involving puncture or penetration of the cask, a severe and prolonged fire, or a major explosion that could disperse portions of the spent fuel.

Cesium will be the primary *radionuclide released in a* nuclear waste accident. It is a highly reactive metal and even a small break in the seal will release significant amounts of it. Cesium burns spontaneously in air, and will explode when exposed to water.

Cesium will be the primary radionuclide released in a nuclear waste accident because it is present in what is called the fuel clad gap. This gap is the space between the fuel pellets and the inside wall of the metal tube that contains the fuel. This "gap cesium" can be released in any event where the cladding is breached. Cesium is a highly reactive metal and even a small break in the seal will release significant amounts of it. Cesium burns spontaneously in air, and will explode when exposed to water. In a severe transportation incident, isotopes of Cesium would create a plume of radioactive particulates that would be inhaled and ingested by those downwind from the accident site. In the body, Cesium compounds collect in the gonads, breast milk and muscle tissue. Following an incident, cesium particulates would also settle to the earth and expose residents and cleanup personnel to external gamma radiation.

Different weather conditions would produce different dispersion patterns and exposures, some greater, some lesser. A more serious breach of the cask could release more radiation than assumed here.

Extreme Radiation Exposure

The number of people exposed to unsafe doses of radiation is entirely dependent on the timing and location of the accident or attack.

The number of people exposed to unsafe doses of radiation is entirely dependent on the timing and location of the accident or attack. If an accident occurs near a city center during the middle of a work day, the number of exposed individuals would be very high. If the accident occurs at night in the city center the number of people exposed could be relatively low. These eventualities are impossible to predict. Based on our assumptions of average weather in Los Angeles and a moderately severe train wreck, we found that:

Within two minutes of an accident a zone of radiation equal to an average of 5,500 X-rays – or 3,667 times the EPA's *annual* radiation exposure limit – would extend about a quarter mile, or two to four blocks from the crash site (Map 1). EPA's acceptable one-year radiation dose is 15 millirem, or about 1.5 chest X-rays. In less than ten minutes, contamination plumes equal to average exposures of 750 and 300 X-rays would extend about 0.4 miles and 1.2 miles from the wreck respectively.

A zone of exposure equal to about 55 X-rays would extend from 1.2 miles to 5.3 miles form the crash site, and a zone with average exposure of about 5 X-rays would extend from 5.3 miles to 27.3 miles from the site.

Based on the average residential population in Los Angeles, 8 people, closest to the crash would suffer the effects of severe radiation exposures equivalent to 30,000 X-rays or greater. Slightly farther away from the accident, 81 people would be exposed to the equivalent of 5,500 X-rays within two or three minutes of the crash. Another 104 would be exposed to an

average of 750 X-rays within another five minutes, and about five minutes after that 1,004 people would receive a dose averaging 300 X-rays. In less than one hour after the accident, 18,890 people would be exposed to a 55 X-ray dose of radiation, and by the end of the day another 203,854 people would be exposed to an average of about 5 X-rays.

First responders or others approaching the accident site in the minutes after the crash could be exposed to a radiation dose equal to about 30,000 X-rays or perhaps even greater. There is a very high risk of fatality for rescue, police or medical staff if they must come close to the accident scene instead of securing and evacuating the immediate area.

Latent Cancer Fatalities

Future suffering and deaths from cancer caused by radiation exposure would extend far beyond the immediate zone of highest exposure and would be significantly influenced by longer term radiation exposure – called groundshine – from contamination of the area.

The greatest exposure would occur in the immediate aftermath of the crash, when a cloud of radioactive cesium gas would waft over an area down wind from the accident site. The primary health risk is the elevated, long-term risk of cancer from these exposures. Future suffering and deaths from cancer caused by radiation exposure, however, would extend far beyond the immediate zone of highest exposure and would be significantly influenced by longer term radiation exposure – called groundshine – from contamination of the area. Using cancer potency factors from the National Academy of Sciences' ongoing analyses of cancer rates among World War II atomic bomb survivors and population densities projected for 2020 in Los Angeles based on U.S. census data, we estimate that:

In Los Angeles, 896 people would suffer and die from "latent fatal cancers" caused by one year of exposure to radiation from a moderately serious train wreck involving nuclear waste headed for Yucca Mountain. This estimate assumes that all people in the 1,000 X-ray zone are evacuated on the day of the wreck and receive no additional exposure. The Department of

Energy assumes that all people remain in the zone and are exposed to radiation for an entire year.

A larger release from a more serious crash or attack on the cask could produce more latent fatalities. If a disproportionate number of children were exposed to the radiation, there would be more latent cancers because children have a greater susceptibility to radiation-induced cancer. If a disproportionate number of elderly were exposed, there would be fewer cancer incidences and fatalities.

Areas farther from the accident scene are the least likely to be cleaned up and the most likely to produce longer radiation exposures for the population living there, leading to a high number of latent cancer fatalities miles from the actual crash site.

The rate of fatal cancers per exposed person declines significantly with distance from the accident. This lower exposure, however, is offset by the greater number of exposed individuals, producing significant numbers of fatalities at locations miles from the crash. Areas farther from the accident scene are the least likely to be cleaned up and the most likely to produce longer radiation exposures for the population living there, leading to a high number of latent cancer fatalities miles from the actual crash site.

Recommendations

The accident scenario analyzed here represents a wreck where the cask is cracked, seals are broken and a radioactive cloud of cesium particulates is released downwind from the crash site into the community. This is nowhere near a worst-case analysis where the cask is penetrated by an explosive devise, or where weather conditions create a more concentrated dose of radiation for a greater number of people. Even so, it is apparent from this analysis that hundreds or even thousands of lives are at risk in the event of a serious accident or terrorist attack on a shipment of nuclear waste in a major city.

Economic disruption from such a contamination event would be enormous. Estimates run from 10 to 150 billion in clean-up costs. Predicting costs to the local and regional economy is nearly impossible,

but costs could be astronomical if primary interstate highways or rail lines were disrupted for weeks, months, or even years.

Given these risks, we recommend that the U.S. Senate vote against an override of Nevada Gov. Kenny Guinn's veto of DOE's recommendation to proceed with development of Yucca Mountain as a national nuclear waste repository.

Voting "no" on Yucca Mountain now would not eliminate the possibility of considering Yucca Mountain, or other locations, for use as a repository in the future. Nor would a "no" vote on Yucca Mountain present a waste storage crisis for the nuclear industry or any added risk to the public, according to the Nuclear Regulatory Commission.

A vote in opposition to proceeding with the Nevada repository would allow much needed time to develop a through transportation security plan.

A vote in opposition to proceeding with the Nevada repository would allow much needed time to develop a thorough transportation security plan, as well as full public notification and comment on a repository and its transportation implications, *before* its final selection.

A delay would also provide an opportunity for the public to weigh the implications of a national waste repository in the context of vital state and local concerns about the continued, long-term presence of operating nuclear reactors and the associated long-term, on-site storage of nuclear waste that will be required even if the Yucca Mountain repository is developed.

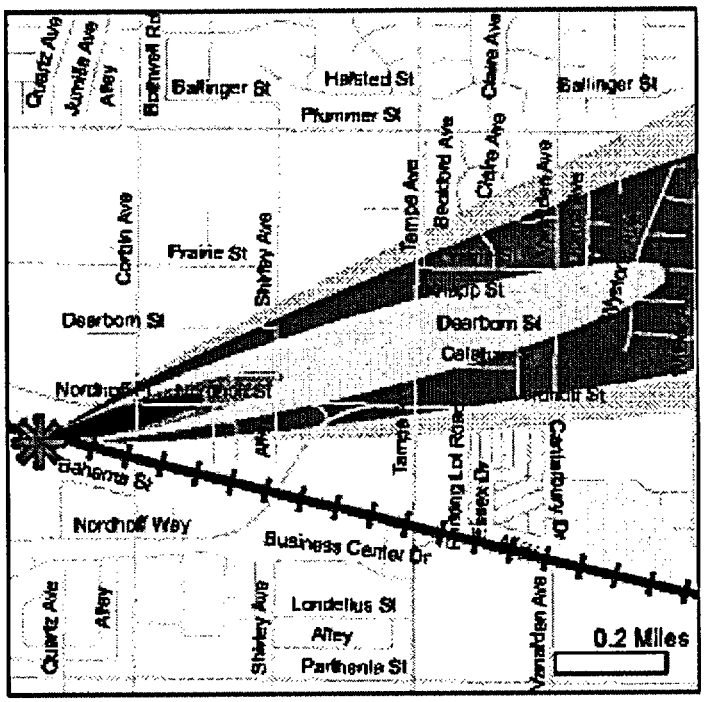
Los Angeles Rail Accident Scenario

SCENARIO PARAMETERS

- Train travelling between 30 and 60 miles per hour;
- A crash into a hard surface causes a fire and leaks in the seals of the cask, releasing cesium. The fire is not hot enough to melt the cask.
- The cask is not penetrated, punctured, or exploded;
- Almost all radiation exposure comes from a cloud of cesium that drifts downwind from the crash.

MAP 1: LARGE SCALE VIEW

- In less than 10 minutes, a radiation plume equal to 100 - 500 x-rays would extend 1 mile from the crash site.



MAP KEY:

- DOE's Proposed Route
- 1 to 10 X-rays
- 10 to 100 X-rays
- 100 to 500 X-rays
- 500 to 1,000 X-rays
- Over 1,000 X-rays

These dosages are based on exposure to a radioactive cesium cloud as it passes through the area.

DOE HOTSPOT AND RISKIND MODEL RESULTS: LOS ANGELES

						Totals
Dose Range (Rems - 1 day)*	10-500	5-10	1-5	[illegible]	0.01-0.1	
Dose Range (x-rays - 1 day)*	1000-50,000	500-1000	100-500	[illegible]	1-10	
Distance to Outer Limit of Range (ft. || mi.)	1608	2362	1.2	[illegible]	27.3	
Area (ft2 || mi2)	247,572	290,628	0.10	[illegible]	34	
Persons Within Area	89	104	1,004	[illegible]	203,854	223,942
Instantaneously Induced Fatal Cancers**	7	1	3	[illegible]	11	32
1-yr. Latent Fatal Cancers***	7†	27	105	[illegible]	392	896

* Dosage contained within the initial particulate cloud

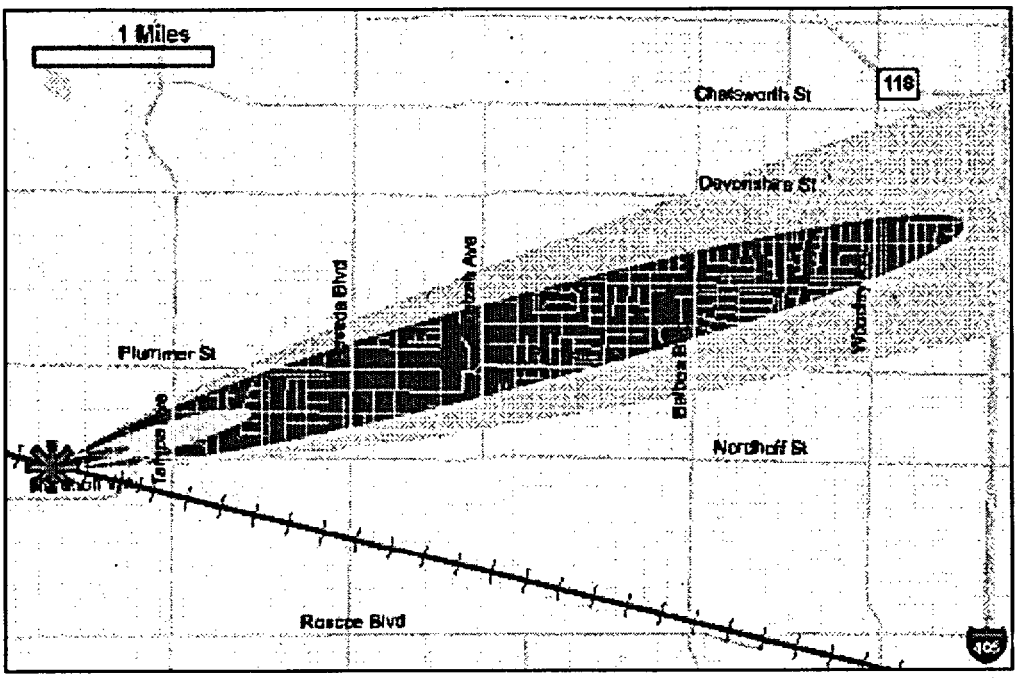
** Latent fatal cancers induced instantaneously by the particulate "cloud"

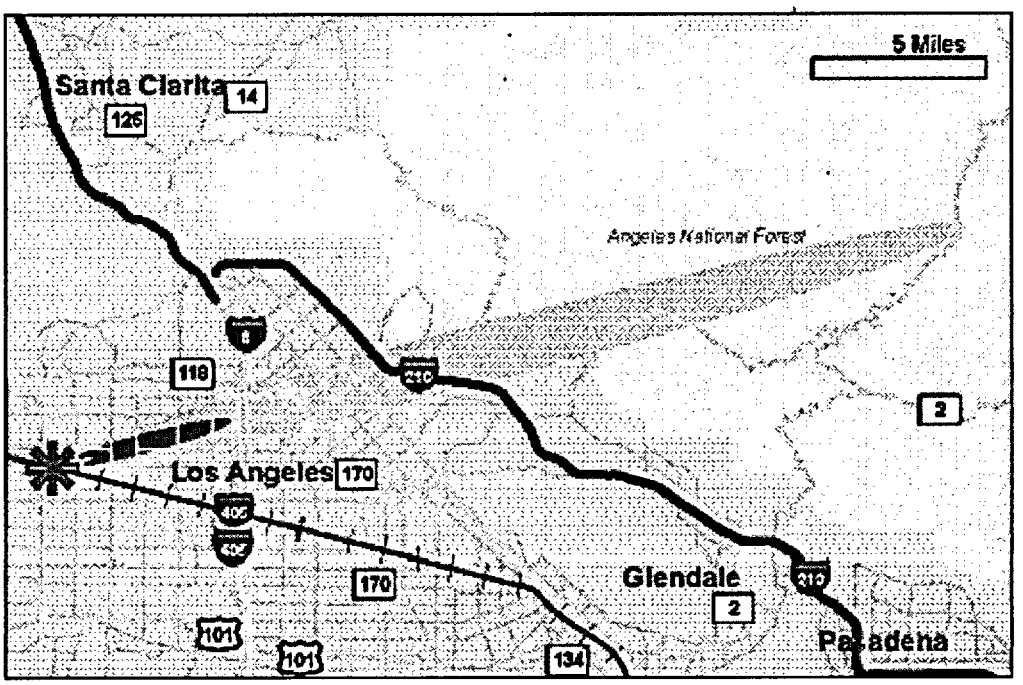
***Latent fatal cancers induced by one year's exposure to residual radioactivity in the contaminated area

† Assumes people in this area are evacuated after one day

MAPS 2 AND 3: MID-RANGE & SMALL SCALE VIEWS

People miles downwind from the accident would face an ele vated risk of radiation-induced cancer .





How fatal cancer s are calculated

- The amount of radiation in the cask and the amount released are based on a DOE model (RISKIND);

- The plume shape, size, and radiation doses are predicted by Department of Energy model (HOTSPOT). It depicts a cloud of cesium gas carried over the community by average winds blowing in the dominant direction during the day.

- Populations exposed are based on people living under the shaded areas from the 2000 census, projected to the year 2020. People working in or traveling through the exposed area are not counted.

- Cancer potency (the amount of radiation needed to cause a fatal cancer), is from the National Academy of Sciences, BEIR V.

- Fatal cancer projections are a function of total radiation delivered to the population exposed. We assume that it takes 1,000 person/rems to cause a fatal cancer.