TESTIMONY OF ALEX MATTHIESSEN

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U.S. Congressional Subcommittee Hearing on *Emerging Threats: Assessing Public Safety and Security Measures at Nuclear Power Facilities*

Rep. Christopher Shays, Connecticut
Subcommittee Chairman

Subcommittee on National Security, Emerging Threats, and International Relations of the Government Reform Committee

Scheduled for Monday, March 10th at 2:00 p.m.

Room 2154 Rayburn House Office Building.

Washington, DC

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Mr. Chairman and members of the committee:

Thank you for the opportunity to provide testimony on this crucial public health and safety issue affecting millions of people living and working in the populated region surrounding the Indian Point nuclear power plant.

I am Alex Matthiessen, executive director for Riverkeeper, Inc, a non-profit public interest organization with 5,000 members. Riverkeeper's mission is to protect the environmental, recreational, and commercial integrity of the Hudson River, and to safeguard New York City's and Westchester County's drinking water supply. Riverkeeper and its predecessor, the Hudson River Fishermen's Association, Inc., has over 35 years of experience with Hudson River issues, and is a leader in the pursuit of economically viable and ecologically sound power plants.

Riverkeeper is not and has never been an anti-nuclear organization. Our focus is solely on the Indian Point nuclear power plant and the federal policies that affect Indian Point and the communities surrounding the facility. Therefore, our testimony here today will be geared strictly to Indian Point security and emergency planning preparedness and those federal policies that apply to this nuclear power plant.

INTRODUCTION

The Indian Point nuclear power plant, located in Buchanan, NY, on the Hudson River, 35 miles north of Times Square in New York City, is situated in the midst of the densest population surrounding any U.S. commercial reactor site. Approximately, twenty million people live within a 50-mile radius of Indian Point. Due to its proximity to the nation's major population nucleus, financial center and transportation hub, Indian Point is a unique case that deserves special attention.

In 1979, in the wake of the Three Mile Island meltdown, NRC's Director of the Office of State Programs, Robert Ryan stated that:

> "I think it is insane to have a three-unit reactor on the Hudson River in Westchester County, 40 miles from Time Square, 20 miles from the Bronx. And if you describe that 50-mile circle, as I said before, you've got 21 million people. And that's crazy. I'm sorry. I just don't think that that's the right place to put a nuclear facility."

If the location of Indian Point was called into question two decades ago, then post September 11th we really need to question Indian Point's proximity to such a densely populated area. Clearly, today, we would not site Indian Point this close to the New York City metropolitan area.

The bottom line for this public health and safety issue is that the risks associated with Indian Point far outweigh the benefits. There is no question that the risks are significant and the consequences catastrophic.

Since the attacks of September 11th, legitimate concerns have been raised by the public and elected officials regarding security lapses and poor security defenses at Indian Point. Valid concerns have also been raised about the inability of the emergency preparedness plan to protect the public in the event of a radioactive release from Indian Point.

Concerns about Indian Point being a potential terrorist target and deficiencies within the plant's emergency plan have garnered further legitimacy especially with the recent release of the draft report by James Lee Witt Associates on emergency planning for Indian Point and the paper issued by the National Research Council which devotes a chapter to nuclear plant security.

Back in July of 2002, the National Research Council released a report[1] stating "nuclear power plants may present a tempting high-visibility target for terrorist attack and the potential for a September 11-type surprise attack in the near term using U.S. assets such as airplanes appears to be high." The report explains that "such attacks could potentially have severe consequences if the attack were large enough."

And now, the findings of the Governor Pataki commissioned Witt Report have reignited concerns about the inability of Indian Point's emergency plan to protect the public from a radioactive release. The long-awaited Witt Report's conclusions are decisive, irrefutable and inescapable. With regard to the "problems" associated with the emergency plan, Witt Associates states that,

> "...it is our conclusion that the current radiological response system and capabilities are not adequate to overcome their combined weight and protect the people from an unacceptable dose of radiation in the event of a release from Indian Point, especially if the release is faster or larger than the design basis release."

The report criticized virtually every aspect of the regional evacuation plans, including the planning process, monitoring equipment, the plans' underlying premises, the ability to handle modern terrorist scenarios, communications between local agencies, and the size of the area that would be affected by a successful terrorist attack.

[1] The National Research Council's July 2002 report is titled "Making The Nation Safer: The Role Of Science And Technology In Countering Terrorism" and it can be viewed at the following website: http://books.nap.edu/html/stct/index.html

I. RADIOLOGICAL EMERGENCY PLANNING

Critique of FEMA's Approach to Terrorist Threat

The Federal Emergency Management Agency has buried its head in the sand with respect to the threat of terrorism at nuclear power plants. This is best illustrated with the unique and unprecedented situation unfolding with respect to the Indian Point nuclear power plant.

FEMA's Decision on Indian Point's Evacuation Plan

On February 21, 2003 FEMA refused to certify the Indian Point radiological emergency plans, saying it cannot give "reasonable assurance" that the plans can protect the public from a radioactive release from Indian Point.[2] This first-time event was triggered by yet another unprecedented decision: On January 30, 2003, New York State refused to certify to federal officials that emergency plans for the four counties around Indian Point are up-to-date. The decision by the State Emergency Management Agency to withhold its annual certification now forces the Federal Emergency Management Agency to determine if the Indian Point emergency plans are still effective. The state's decision was prompted by the refusal of the four counties within the EPZ to certify their respective plans to the state. The heightened scrutiny of emergency plans came about when the Governor Pataki-commissioned Witt Associates report was released on January 10, 2003.

From initial reports, it appears that FEMA has established a series of very low hurdles -- delivering signed bus contracts, providing more information on school evacuation, improving systems for information dissemination -- for the state to overcome so that the federal agency can certify the plan for the NRC in May. What seems to be missing from that list is addressing the insurmountable flaws in the plan such as local population densities, fast-breaking radiological emergency scenarios, congested road networks, and the effect of shadow evacuation in areas outside the 10-mile evacuation zone.

Instead of initiating a 120 day period to address the problems in the emergency plan, FEMA gave the state and the counties 75 days to submit to them the requested documents. FEMA's 75-day extension is, clearly, a delay tactic and is jeopardizing the public. It is alarming that FEMA continues to stall in reaching the ultimate and obvious conclusion -- that the plan is inadequate and unfixable. The law is clear: without reasonable assurance that the plan is adequate, the plant must not be allowed to operate. Millions of New York City metropolitan residents are at risk while federal agencies continue to duck the issue.

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[2] FEMA's regional administrator, Joseph Picciano, in testimony at a March 3, 2003 Congressional forum in Tarrytown, NY hosted by Rep. Nita Lowey, reiterated that FEMA could not provide "reasonable assurance" without having in hand key documents from New York State and the four counties within the emergency planning zone (EPZ).

FEMA report fails to take into consideration:

- The distinction between accident and terrorist triggered emergency scenarios
- An emergency scenario involving a spent fuel pool disaster
- The ability of a radioactive plume to travel well beyond the 10-mile EPZ
- The population density of the region
- The public's distrust of the emergency plan, FEMA and the NRC
- The human behavior component
    - the shadow evacuation effect
    - the spontaneous evacuation within the 10-mile EPZ
- The lack of faith that first responders have in the effectives of the plan
- The nature of the region's road system
- The inability to protect the public in the event of a rapid release

I will elaborate on each deficiency:

FEMA and the NRC fail to acknowledge that the current Indian Point emergency plans do not take into consideration **the distinction between accident and terrorist triggered emergency scenarios**

Clearly, an emergency response to a terrorist attack would be unique and would impede first responders. Contrary to the NRC, FEMA and Entergy's unfounded claims, there is an important distinction between the consequences of spontaneous accidents and those of terrorist attacks. Aware of this distinction, the independent report issued by former FEMA director James Lee Witt concluded that "the plans do not consider the possible additional ramifications of a terrorist caused release" and "that the current radiological response system and capabilities are not adequate to ... protect the people from an unacceptable dose of radiation in the event of a release from Indian Point, especially if the release is faster or larger than the design basis release."

Although nuclear plant emergency plans are based on a spectrum of possible emergency scenarios, they are heavily weighted toward those in which the containment building or irradiated "spent" fuel pool remains intact and radiation releases occur slowly. Such plans would be ineffective if terrorists breached the containment building or "spent" fuel pool walls with explosives, causing an enormous release before most nearby residents could be evacuated. A well-financed and planned terrorist attack will utilize nuclear engineers who are fully cognizant of the vulnerabilities of a nuclear facility. Reactor shutdown – in conjunction with 1) the reconfiguration of the fuel assemblies so they are less densely packed and 2) the fortification of the high level radioactive waste storage facilities and dry casks – which house the deadly irradiated fuel – will significantly reduce the threat now facing the public.

In addition, a terrorist attack may involve several targets in the region. The current emergency plan does not include a comprehensive response to multiple attacks in the region, which may impair the efficient evacuation of the area. Examples of such attacks include destruction or blockage of the Tappan Zee Bridge, loss of power to passenger railroads, and other events, which deny use of necessary infrastructure. A coordinated

attack designed to effectively send the region into chaos will preliminarily target the communication and transportation infrastructures. This will ensure (A) the region is reduced to mass confusion; (B) residents have vastly reduced means of evacuating; and (C) law enforcement and other first responders are impeded from gaining access to the site. In a coordinated attack scenario, public officials will be uncertain as to where to direct responsive action and first responders will be dispatched to numerous sites, thereby reducing the number available to rapidly reach the Buchanan area.

Also, the current plan fails to adequately address an emergency scenario involving a "multiplier" effect in which a radiological or biological weapon is discharged in the vicinity of Indian Point, interfering with the actions that plant employees could take to prevent a catastrophic release of radiation. Furthermore, during a terrorist attack some on-site plant personnel could be killed and the control room damaged. This would hinder on-site personnel from preventing a situation from evolving into a faster breaking scenario. On-site personnel are key players during a response to a radiological emergency. During a terrorist attack involving biochemical weapons, personnel could be immediately eliminated or rendered immobile.

Furthermore, it is quite possible that the primary and secondary sources of meteorological data could be rendered useless in the event of a terrorist attack. The draft Witt report explains the vital role meteorological data plays during a radiological emergency: "the primary hazard is radiation and the dosage received by people is very dependent on meteorological conditions." According to the draft Witt report: "The primary source of meteorological data at Indian Point is a 400-foot tower located on the top of the containment building for the number 1 reactor. This tower has three instrument packages that measure temperature, dew point, wind speed, and wind direction. Precipitation is also measured near ground level. Data are logged at the tower and transmitted by an auto feed to the Emergency Operations Facility by way of landlines and optical fibers for storage on a mainframe computer. The data logger computes atmospheric stability and finds 15-minute averages for use in selecting the appropriate overlay for the accident impact analysis. A backup source of meteorological data is a tower located approximately 1,200 feet northeast of the primary tower, about halfway between the two power reactors. This tower measures wind speed, wind direction and the variability in the wind direction. The instruments are similar to those on the main tower. A third set of meteorological instruments is located on the top of the Emergency Operations Facility building. (Page 31 of draft Witt report) [Emphasis Added]

Finally, in the event of a fast breaking radiological disaster event, local emergency officials have publicly stated that they may order area residents to shelter in their homes. But, sheltering is not practical in many circumstances and will not adequately protect the public from exposure to radiation. In fact, FEMA recognizes this concern in their February 21, 2003 report on emergency preparedness at Indian Point. On page 6 of Attachment B of the report, FEMA states:

> NUREG-0654, Appendix 1 provides guidance on the application of evacuation and sheltering as protective measures for a radiological event.

> Information Notice 83-28 was issued on May 4, 1983 to provide additional clarification of the guidance. Following the EPA updated guidance on protective action guidelines and protective actions for nuclear incidents, and more than ten years of drill and exercise experience the guidance was further enhanced and clarified. In 1996, the NRC published Supplement 3 to NUREG-0654.FEMA-REP-1, "Criteria for Protective Action Recommendations for Severe Accidents" Draft Report for Interim Use and Comment. This report states "Since the publication of the original guidance in NUREG-0654, extensive studies of severe reactor accidents have been performed. These studies clearly indicate that for all but a very limited set of conditions, prompt evacuation of the area near the plant is much more effective in reducing the risk of early health effects than sheltering the population in the event of severe accidents. In addition, studies have shown that except for very limited conditions, evacuation in a plume is still more effective in reducing health risks than prolonged sheltering near the plant. Therefore, the NRC and FEMA recommend that the population near the plant should be evacuated if possible for actual or projected severe core damage accidents." [Emphasis Added]

If the emergency plan cannot protect people – in the event of a fast-breaking scenario at Indian Point – through sheltering or evacuating, then FEMA and the NRC are faced with a problem that cannot ever be fixed.

FEMA and the NRC fail to acknowledge that the current Indian Point emergency plans do not take into consideration **a scenario involving a spent fuel pool disaster**

The draft Witt report, which did not assess a scenario involving a terrorist attack on a spent fuel pool, did note that Indian Point's radiation monitors "would not directly measure an incident involving spent fuel rods, so another means of determining the release amount would be needed if an accident occurred at one of the spent fuel pools."[3]

This is rather disturbing given the fact that the structures that house the spent fuel pools at Indian Point are substantially less protected than the containment domes are. Furthermore, the irradiated "spent" fuel pools at Indian Point 2 and 3 – which house 600 and 800 tons, respectively – pose an even greater threat due to the quantity of high level radioactive waste stored in each building. A February 2001 NRC report (NUREG 1738) reveals that the loss of life and illnesses from a spent fuel pool release would be significant and long-term health effects would be felt hundreds of miles away.

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

[3] Page 28 of the Draft Report by James Lee Witt Associates released on January 10, 2003 by New York State Governor George Pataki.

a pool's cesium 137 would be released into the environment in the event of a spent fuel fire.

In comparison, the 1986 Chernobyl accident released about 40 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.

According to the Institute for Resource and Security Studies, the offsite consequences of a pool fire at Indian Point Unit 2 could render uninhabitable a land area of about 95,000 square kilometers, and a pool fire at Unit 3 could render uninhabitable a land area of about 75,000 square kilometers. For comparison, the area of New York State is 127,000 square kilometers.

In June 2001, the NRC staff reported that terrorist threats against spent fuel pools are credible and cannot be ruled out. "Until recently, the staff believed that the [design basis threat] of radiological sabotage could not cause a zirconium fire. However, [NRC's safety policy for spent fuel storage] does not support the assertion of a lesser hazard to the public health and safety, given the possible consequences of sabotage." In other words, the NRC recognizes the significant risk posed to the public by a spent fuel zirconium fire triggered by sabotage.

FEMA and the NRC fail to acknowledge that the current Indian Point emergency plans do not take into consideration **the ability of a radioactive plume to travel well beyond the 10-mile EPZ**

Numerous federal reports produced and commissioned by the NRC, federal legislation, and real-life events suggest that radiation released from a nuclear power plant can travel well beyond the 10-mile EPZ.

Evidence:

- The Chernobyl accident suggests that impacts extend tens to hundreds of miles beyond the 10-mile radius. In fact, there were more thyroid cancers in children from a thirty mile radius around Chernobyl than those closer to the plant.
- A February 2001 Nuclear Regulatory Commission (NRC) report, *Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants*, (NUREG-1738) states in Appendix 4, that a release from a spent fuel fire could cause tens of thousands of long-term cancer fatalities within the 50-mile radius of a nuclear power plant.
- In fact, federal regulations already require an ingestion zone[4] within a 50-mile radius of a nuclear power plant.
- The 1982 CRAC-2 report released by a U.S. House of Representatives subcommittee, stated that "increasing the evacuation distance [from 10]

[4] The Ingestion Zone is the area within which people could be at risk if they eat or drink contaminated food or water.

to 25 miles could substantially reduce the peak consequences, but the feasibility of a timely evacuation from so large an area is highly questionable."

- A 1997 Brookhaven National Lab Report ("A Safety and Regulatory Assessment of Generic BWR and PWR Permanently Shutdown Nuclear Power Plants") claims that a disaster from a spent fuel pool could cause anywhere from 1,500 to 143,000 cancer deaths and $800 million to $566 billion in damage, and could make an area of 1 to 2,790 square miles around the plant uninhabitable. The dramatic range is due to several factors, such as weather conditions, differences in population and the age of the spent fuel. [The Chernobyl accident, which rendered about a thousand square miles uninhabitable (about 100 square miles permanently), released to the environment only a fraction of the radioactive material currently stored at Indian Point. Thus, it is entirely conceivable that a significant radiological release from Indian Point could render a large portion of the New York metropolitan area uninhabitable.]
- Federal legislation, recently passed and signed into law, calls for the distribution of Potassium Tablets within a 20-mile radius of nuclear power plants. This suggests that the area of impact could be beyond the 10-mile EPZ and argues strongly for an extension of the EPZ to at least 20 miles, if not 50 miles.
- Recommendations made by the American Thyroid Association regarding distribution of Potassium Iodide suggests that the area of impact could be beyond the 10-mile Emergency Planning Zone. The American Thyroid Association (http://lwpes.org/PS/ki.htm) recommends that:
  - Potassium iodide should be made available to populations living within ***200*** miles of a nuclear power plant
  - Potassium iodide should be "pre-distributed" to households within 50 miles of a plant

FEMA and the NRC fail to acknowledge that the current Indian Point emergency plans do not take into consideration **the population density of the region**

The Indian Point nuclear power plant has the densest population within a 10-mile and 50-mile radius of any of the nation's 70 commercial reactors sites (home to 103 operating reactors). Approximately 300,000 and 20 million people reside, respectively, within a 10-mile and 50-mile radius of Indian Point. NRC and FEMA don't appear to have any explanation for how to overcome this fundamental problem.

FEMA and the NRC fail to acknowledge that the current Indian Point emergency plans do not take into consideration **the public's distrust of the emergency plan, FEMA and the NRC**

The controversy surrounding the certification of the emergency plan has spotlighted the finger-pointing taking place between our local, state, and federal agencies. This will only cast further doubt on the beleaguered FEMA and NRC. The public's faith in Indian

Point's emergency plan is extremely low. Add to this the doubt the public has in the ability of FEMA and the NRC to protect public health and safety.

FEMA and the NRC fail to acknowledge that the current Indian Point emergency plans do not take into consideration **the human behavior component**

A radiological emergency is unique, and the public's fear of radiation and the fact that it poses an intangible threat will lead to mass panic. In the wake of the September 11th terror attacks, residents in the area are on edge and this would affect their response to a radiological emergency in ways that the emergency plan could not predict or address. Public panic will be substantially heightened in another terrorism attack.

a) Shadow Evacuation Effect

The logic behind a radiological emergency plan for a 10-mile EPZ is contradicted by both academic research and the experience at Three Mile Island, which demonstrates there will be significant self-evacuation, or shadow evacuation, outside of the 10-mile zone. Shadow evacuation will impede the evacuation of people within the affected areas of the EPZ.

b) Spontaneous Evacuation within the 10-mile EPZ

The draft Witt report notes in the executive summary, "The likelihood of significant spontaneous evacuation within and beyond the ten-mile zone is indisputable, and has serious public safety implications. Planning at all levels of government must reflect this reality." One of the report's major findings is that "The plans do not consider the reality and impacts of spontaneous evacuation." Spontaneous evacuation would impede the evacuation of people within the affected areas of the EPZ

FEMA and the NRC fail to acknowledge that the current Indian Point emergency plans do not take into consideration **the lack of faith that first responders have in the effectives of the plan**

Numerous first responders within and outside of the emergency planning zone have expressed doubt in the emergency plan, in particular with respect to not having the proper protective gear and not being able to reach areas in need of their assistance due to spontaneous evacuation, shadow evacuation and the nature of the road system. Many have admitted, in the event of a radiological emergency at Indian Point, they will seek to protect their own families rather than fulfilling their emergency duties.

FEMA and the NRC fail to acknowledge that the current Indian Point emergency plans do not take into consideration **the nature of the region's road system**

The unique nature of the road system within and outside of the emergency planning zone would complicate the timely evacuation of area residents. Importantly, this is not a problem that can be fixed.

FEMA and the NRC fail to acknowledge that the current Indian Point emergency plans do not take into consideration **the inability to protect the public in the event of a rapid release**

Sheltering in the event of a rapid release will not be an effective measure in protecting the public from exposure to radiation. In the event of a fast breaking radiological disaster event, local emergency officials have publicly stated that they may order area residents to shelter in their homes. But, sheltering is not practical in many circumstances and will not adequately protect the public from exposure to radiation. In fact, FEMA recognizes this concern in their February 21, 2003 report on emergency preparedness at Indian Point. On page 6 of Attachment B of the report, FEMA states:

> NUREG-0654, Appendix 1 provides guidance on the application of evacuation and sheltering as protective measures for a radiological event. Information Notice 83-28 was issued on May 4, 1983 to provide additional clarification of the guidance. Following the EPA updated guidance on protective action guidelines and protective actions for nuclear incidents, and more than ten years of drill and exercise experience the guidance was further enhanced and clarified. In 1996, the NRC published Supplement 3 to NUREG-0654.FEMA-REP-1, "Criteria for Protective Action Recommendations for Severe Accidents" Draft Report for Interim Use and Comment. This report states "Since the publication of the original guidance in NUREG-0654, extensive studies of severe reactor accidents have been performed. These studies clearly indicate that for all but a very limited set of conditions, prompt evacuation of the area near the plant is much more effective in reducing the risk of early health effects than sheltering the population in the event of severe accidents. In addition, studies have shown that except for very limited conditions, evacuation in a plume is still more effective in reducing health risks than prolonged sheltering near the plant. Therefore, the NRC and FEMA recommend that the population near the plant should be evacuated if possible for actual or projected severe core damage accidents." [Emphasis Added]

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II. NUCLEAR PLANT SECURITY

Critique of NRC's Approach to Terrorist Threat

When the Nuclear Regulatory Commission ruled in December 2002 that the threat of terrorism cannot be considered when licensing reactors because the risk is too speculative, and that discussing the issue in licensing hearings would give too much information to terrorists and "unduly alarm the public," it was frighteningly reminiscent of equally Orwellian pronouncements issued previously by federal regulators.

The NRC's latest exercise in bureaucracy concerns a reprocessing facility that Duke Energy and other companies are seeking to build in South Carolina to turn weapons plutonium into mixed oxide (MOX) reactor fuel; two existing Duke reactor plants that would use the MOX fuel; a temporary waste-storage project in Utah; and a project to expand fuel storage at the Millstone reactors in Waterford, Connecticut.

In the past, design features at nuclear plants proposed to ensure environmental safety have been available for public scrutiny. But the commission now says that security preparations and characteristics of plants that would bear on the success of a terrorist attack must remain secret, and ruled that terrorism could not be considered under the National Environmental Policy Act, the law that requires the government to issue an Environmental Impact Statement when it takes a major action.

The NRC's December 2002 ruling took note of the attacks of Sept. 11, 2001, but said the proper approach would be to improve security at nuclear sites, on airplanes and around the country generally, rather than to try to determine the environmental effects of "a third-party attack" on a site.

Could it be that the NRC's ruling was partly based on a judgment they may have shared with the National Research Council which, in their July 2002 report[5], stated that a successful terrorist attack on a nuclear power plant could be a major setback to the civilian nuclear industry? The July 2002 report stated that a terrorist attack "could potentially have severe consequences if the attack were large enough and, were such an attack successfully carried out, could do great harm to the nation's near-term energy security and **civilian nuclear power as a long-term energy option."** [Emphasis Added]

Clearly, the threat to nuclear power plants is real and Indian Point is arguably one of the more attractive targets in the New York City metropolitan area.

Please consider the following:

- On January 29, 2002, **President Bush** in his State of the Union stated "We have found diagrams of American nuclear power plants [in al Qaeda camps]...."

[5] The National Research Council's July 2002 report is titled "Making The Nation Safer: The Role Of Science And Technology In Countering Terrorism" and it can be viewed at the following website: http://books.nap.edu/html/stct/index.html

- Then, on September 8, 2002, Britain's Sunday Times quoted two leading members of Osama bin Laden's al-Qaida network as saying the initial plan for the Sept. 11 hijackers had been to crash planes into nuclear power plants in the United States. This had been rejected for fear "it would get out of control," but future nuclear targets were not ruled out. The newspaper was quoting from a documentary by Yosri Fouda, chief investigative reporter for the Arab television station Al-Jazeera, who interviewed Ramzi Binalshibh and Khalid Shaikh Mohammad in Pakistan's port city of Karachi. The date of the interview was not given. The AP picked up this story. ("Masterminds of 9/11 reveal terror secrets," September 8, 2002, Britain's Sunday Times)

- With the recent arrest of Khalid Sheikh Mohammed, a U.S. intelligence report stated that Mohammed "is actively involved in Al Qaeda planning in [the U.S.]...and he has directed operatives to target bridges, gas stations and **power plants** in a number of locations, including New York City." [Emphasis Added] In a March 3, 2003 New York Times article ("Qaeda Suspect Sound Asleep at Trails End Offers No Resistance to Arrest in Pakistan"), it was reported that "intelligence officials said they had penetrated his circle deeply enough in recent weeks to conclude that Mr. Mohammed was actively planning for terror operations inside the United States in the 'near term' as one official described it." The article went on to report: "One target was again New York City, the officials said, possibly involving the ***revival*** of a discarded plan that was first discussed in the months before the World Trade Center attacks on September 11, 2001. Mr. Mohammed had then considered attacks on the city's gas stations, bridges, hotels, and **power plants**, the officials said confirming a report in this week's issue of Newsweek." [Emphasis Added] The New York Times recently reported that New York City remains on orange alert.

- The **National Governors Association**, in a September 19, 2002 report states "U.S. nuclear power plants are potential targets for terrorist attacks.... A terrorist attack on a nuclear facility should be viewed like a terrorist attack using a dirty bomb, but possibly more catastrophic due to the volume of nuclear material available for dispersion. ...The effects of a release over the long term could be dramatic unless the area was adequately decontaminated. For instance, the Chernobyl disaster saw an alarming increase in the number of cancer-related illnesses for children 10 years after the release."

The NRC's ruling outraged many nuclear-safety experts, including former commissioner Victor Gilinsky, who complained that at a time when the commission forbids considering terrorism at the Duke MOX plant, "(Attorney General) Ashcroft is changing the Bill of Rights because it is imminent."

Peter A. Bradford, another former NRC member, compared the commission's attitude to its view on hydrogen explosions. Before the 1979 accident at Three Mile Island (which regulators called "a normal aberration" and a "plant transient" rather than use the word

"accident") such explosions were considered impossible. After the one at Three Mile Island, he said, the commission still considered them impossible, "because now that we had had one, we would be too vigilant for another to occur."

"The bottom line is that events that have occurred but that can't be dealt with must still be considered impossible, first because they haven't yet occurred, then because they have," Bradford said.

The commission has historically declined to speculate about terrorist threats against reactors. In the late 80's and early 90's, it fought off arguments that stronger defenses against truck bombs were needed, despite truck bomb attacks around the world. It argued that in the United States no bomb could be assembled without attracting the notice of the police. But in early 1993, terrorists exploded a truck bomb in an underground garage at the World Trade Center, and a man with a history of mental problems drove his station wagon through a gate and into the turbine building at Three Mile Island. The man, who was not armed, then hid inside the plant for hours.

The commission soon revised its rules to cover bombs in small vehicles. But it has yet to institute any rules changes related to the Sept. 11 attacks. Dr. Edwin Lyman, president of the Nuclear Control Institute, a non-proliferation group in Washington, says the commission's reasoning is contradictory. The commission believes it need not consider terrorism, Dr. Lyman points out, because terrorism is "entirely independent of the facility." But he adds that "ignores the fact that the terrorist threat to a facility is surely dependent on where that facilities is sited, i.e. in a remote or densely populated area." And as we all know, of the nation's 103 reactors at approximately 70 sites, Indian Point is situated in the midst of the densest population, 20 million people within a 50-mile radius.

"One of the main threats we face today in the U.S. is that many potentially hazardous facilities are located near heavily populated areas," Dr. Lyman recently told the New York Times. "This situation is tolerated because severe accidents are considered highly improbable. But surely in the future, it makes sense to consider the possibility of terrorist acts that could intentionally cause large releases when making decisions about the location and design features of hazardous facilities."

But the NRC, stuck in mindset based on wishful thinking and still employing a language of euphemism and distortion, disagrees. Saying that it defines risk as a product of the probability of an event multiplied by its consequences, the NRC maintains that when it comes to terrorism and nuclear safety, "we have no way to calculate the probability portion of the equation, except in such general terms as to be nearly meaningless."

With our federal regulators still dedicated more to marketing their nuclear technology to the American public than to protecting the American people from it, their continued reliance on information-management techniques is not surprising. Historically, nuclear regulators have confused hopes with reality, presented expectations and assumptions as facts, covered up damaging information and failed to learn from their mistakes. The implications and consequences for Indian Point are dire.

Add to these concerns, the key finding by a recent survey of 1,525 NRC employees about the "safety culture" within the agency – commissioned by the NRC's internal watchdog, the Office of Inspector General – that NRC employees are worried that the NRC "is becoming influenced by private industry, and its power to regulate is diminishing." The survey, which became public in early January 2003, also found that while there had been substantial improvements since the last poll in 1998, there are still major areas of concern. They include:

- Only about half of the agency's employees - 53 percent - feel it is "safe to speak up in the NRC."
- A growing number of employees - 24 percent, compared with 19 percent in 1998 - don't believe that "the NRC's commitment to public safety is apparent in what we do on a day-to-day basis."
- Less than half of the agency's staff - 48 percent - think that NRC bosses trust their judgment.
- Only 43 percent feel the NRC is highly regarded by the public.

Coupled with another report from the NRC's Office of Inspector General that also became public in early January 2003 showing that Nuclear Regulatory Commission staffers didn't think they had the authority to shut down the Davis-Besse nuclear plant in late 2001 for safety concerns, the findings raise troubling questions about the agency's self-confidence and its decision-making climate.

One of the main conclusions in the highly critical review conducted by the OIG of Davis-Besse was that the NRC had enough evidence to justify shutting down the Davis-Besse nuclear plant in late 2001 for safety concerns, but the agency let the reactor keep running largely because it didn't want to hurt owner FirstEnergy Corp. financially.

According to former NRC Commissioner Victor Gilinsky: "You wouldn't know it from the bland pronouncements of the Nuclear Regulatory Commission (NRC), but the U.S. nuclear industry just had its closest brush with disaster since the 1979 Three Mile Island accident. The Davis-Besse nuclear power plant, located about 30 miles east of Toledo, Ohio, was operating with a rust hole in the top of its reactor pressure vessel -- a hole wide and deep enough to put your fist into. All that was left to contain the reactor's highly pressurized supply of cooling water around the reactor core was a three-eighths inch liner of stainless steel, and the liner had started to bulge ominously. If the liner had burst, it would have drained cooling water vital for safety and also threatened the reactor's emergency shutdown system."

Weak Security Measures at Indian Point

Currently, security measures at Indian Point are not capable of withstanding a coordinated attack of the kind that occurred on September 11th. Entergy will not and cannot guarantee the plant's security against an attack the magnitude of that on September 11th. And what has become obvious over the last year and half is that no single agency is

ultimately responsible for protecting the plant from a terrorist attack. It is unclear just who is ultimately responsible for defending a nuclear plant in an emergency. The Nuclear Regulatory Commission. Entergy. The Department of Defense. The Department of Homeland Security. The Federal Aviation Administration. The Coast Guard. C.I.A. F.B.I. New York State Police. Just who is responsible, depends on the type of attack.

Security at Indian Point nuclear plant continues to be disturbingly lax despite information that Al Qaeda terrorists originally had planned to target a nuclear power plant and that terrorists have not ruled out striking a U.S. nuclear facility in future attacks.

Prior to Indian Point-3 security officer Foster Zeh going public in December 2002 with his concerns about inadequate security at the nuclear facility, there were a number of security lapses that occurred over the course of that year, starting in January 2002:

- In January, three would-be turkey hunters stumbled unwittingly and undetected into a low-security section of the plant. The hunters, all in their early 20s, were charged with trespassing.
- In March, it was reported that one of the security guards pulled his gun on a colleague at Indian Point 2 in an apparent joke. His supervisor did not report the incident until several hours later. Both men were later fired.
- In June, a local fireman gained access to the plant and drove around the grounds unfettered for several minutes. It was later discovered that the plant did not have surveillance cameras at the gate through which the fireman entered.
- On September 11, Entergy reported that a semi-automatic handgun belonging to the Wackenhut security company was missing from the IP-2 unit. Months later, the gun remains missing and the investigation continues.
- In September, Riverkeeper's patrol boat captain spoke with two unarmed naval militiamen in an 18-foot whaler who had been assigned to protect the plant from a water attack. The poorly-maintained 18-foot whaler with the unarmed guards broke down on the way back to the plant after checking the identification of the patrol boat captain.
- A potential act of sabotage occurred at Indian Point 3 on December 12, 2002. Officials at Indian Point 3 and the Nuclear Regulatory Commission initiated an investigation into how a pump used to provide the nuclear reactor's coolant was manually turned off. The FBI was called in to conduct an investigation. Referring to the pump, Michael Kansler, chief operating officer of Entergy Nuclear Northeast, stated: "We found it in a position it is not supposed to be in, and we are doing our investigation. We are trying to determine why it was mispositioned and why it is not the way it is supposed to be. One possibility is that someone did it deliberately..."
- On January 30th and 31st, 2003, ABC Eyewitness News ran a two-part series called "Dangerous Lapses: Whistleblowers Speak Out about Indian Point Nuclear Plant." The special report, by The Investigator's Jim Hoffer, featured interviews with a plant security officers and supervisors about their concerns including excessive overtime, poor training, improperly maintained equipment, harassment,

and the improper storage of hazardous materials. Those interviewed conveyed that Entergy's priority appears to be profit-making rather than safety and security.

Security Guards Speak Out

According to dozens of security guards at Indian Point, Entergy and Wackenhut have done little to substantially improve security since September 11, 2001. With few exceptions, the problems noted in an internal January 2002 Entergy report still exist today.

The January 2002 internal Entergy report is all the more alarming because it directly contradicts past proclamations – issued by Entergy, the U.S. Nuclear Regulatory Commission, and the State Office of Public Security – that Indian Point is secure. One can only wonder what Mr. Kallstrom was thinking about on Dec. 13, 2001 when he declared Indian Point to be the best defended facility in the nation and brazenly taunted terrorists to attempt an assault on the plant. His statement, troubling then, is more disturbing now given that the next month a security consultant for Entergy delivered his report documenting that only 19 percent of the guard force believed they could successfully defend the plant against a terrorist attack. Indian Point's own security guards have confirmed that Mr. Kallstrom's "expert" assessment was based on a two-hour tour of the facility and assurances from Entergy that security was robust. Worse yet is the attitude of the Nuclear Regulatory Commission, which still has not upgraded its regulations for defending nuclear plants or resumed its exercises for testing guards against mock terrorists.

Foster Zeh, a security officer at Indian Point 3 who has gone public with his concerns regarding weak security, participated in a planned security drill at Indian Point 2 in mid August of this year. During the drill, he was able to gain access to the spent fuel pool building within 60 seconds. In earlier drills, the mock assault team was also able to gain quick access to the spent fuel building – on one occasion, in 36 seconds – and simulate placing explosives throughout the building. Had the mock assault been real, the damage would have been catastrophic. (A February 2001 NRC report - NUREG 1738, reveals that the loss of life and illnesses from a spent fuel pool release would be significant and health impacts would be felt hundreds of miles away.) Regrettably, the NRC did not penalize Entergy or Wackenhut for this poor showing. In fact, the NRC passed Indian Point 2 security with high marks.

In light of the vulnerability of the spent fuel storage buildings, which house much of the high level radioactive material on site, one would expect the highest level of security. However, according to Officer Zeh, these buildings are lacking proper security and are extremely vulnerable to terrorist attack. The radioactive material present in the spent fuel storage buildings pose a clear and present danger to public health and safety and these facilities must be better protected. But, Officer Zeh has explained that no structural upgrades or fortifications have been made to the spent fuel storage buildings at the Indian Point nuclear power station, nor are there any plans to add additional structural fortifications to the spent fuel storage buildings.

Provided below is a summary of the major security lapses and work environment problems at Indian Point identified by an internal Entergy report and by security officers interviewed by reporters and by Riverkeeper:

- Most security guards believe they can ***not*** defend the plant against a terrorist attack for the following reasons:
  - Guards believe that they are not properly armed with weapons to defeat attackers
  - Guards admit that they are under-qualified and under-trained with respect to gun handling qualifications, physical fitness tests, and training exercises
    - Guards are being hired with very little experience; in some cases guards are hired who meet just the minimum requirement of possessing a pistol permit
    - Guards reported that qualifying exams for carrying weapons had been rigged, in some cases, to ensure guards could pass
  - Guards say that security drills are carefully staged to ensure that mock attackers would be repelled
  - Guards forced to work overtime (i.e. forced to work 6 or 7 straight days involving 12 hour to 16 hour shifts, even when ill)
  - Guards suffer from a high fatigue level
  - Guards have little confidence in their management in correcting past problems
  - Guards suffer from low morale, and do not feel obligated to stand their post in the event of an attack; guards admit that if an attack occurred, they would flee

- The facilities that house the highly dangerous irradiated or "spent" fuel at Indian Point are vulnerable to attack. (A catastrophic release of radioactivity from these facilities would cause thousands of prompt fatalities and injuries.) In a recent exercise at the main reactor campus, one security guard was able to penetrate security on five occasions and was able to carry a mock satchel charge of explosives into the highly radioactive spent fuel pool three times – without being challenged by security

- The Code of Federal Regulations pertaining to safeguards information has been violated numerous times.

- Security guards are being suspended and terminated by Wackenhut and Entergy without proper representation and cause due to the fact that they are bringing serious security concerns to the attention of management

- A "chilled" environment exists at the plant and security guards do not feel safe speaking with management about their concerns

- Entergy Nuclear management have asked security personnel to alter incident reports so that an incident becomes a less serious offense and non-reportable

- Company officials sugarcoat and cover up real problems regarding the missing handgun incident, forging documents, giving guards a third chance to pass re-qualifying tests, watering down mock attack drills

- Numerous recommendations made by guards to improve security have not been implemented resulting in the same problems resurfacing time and again.

- Many demoralizing incidents involving sexism, racism, homophobia and anti-Semitism.

Fortifying the Storage of Irradiated "Spent" Fuel

Riverkeeper recognizes the vulnerability of Indian Point's current method of storing irradiated ("spent" or "used") fuel[6] to terrorist attack. Therefore, Riverkeeper calls for the "hardening" of the wet and dry storage for all of Indian Point's irradiated fuel and other radioactive waste at Indian Point to the maximum extent possible. These structures must immediately be hardened to repel entry or penetration into building via air or ground attack. All irradiated fuel older than five years must be moved out of the wet storage (e.g. cooling pools) and into hardened dry cask storage. Stored in hardened on-site storage, the irradiated spent fuel is less vulnerable to a spent fuel fire triggered by accident, sabotage or terrorist attack.

As recommended by industry experts, the remaining spent fuel assemblies in the pool must be reconfigured so that there is more space in between each assembly. The current spacing between fuel assemblies is dangerously close which increases the likelihood of a spent fuel pool fire consuming more fuel and releasing greater amounts of radioactivity. The dry cask storage system must involve the spacing of casks at an adequate distance from one another and the concealing of these casks through the use of berms and other protective measures. Riverkeeper advocates that the irradiated fuel be stored safely on site until an environmentally sound method is developed and suitable storage site determined. The proposed Yucca Mountain storage site is years away from opening and faces numerous legal challenges and scientific hurdles.

[6] Currently, the total estimated 1500 tons of irradiated fuel is kept in cooling pools in three separate non-reinforced storage buildings (IP-3's pool holds approx. 600 tons; IP-2's pool holds approx. 800 tons; and IP-1's pool holds less than 100 tons).

III. PUBLIC BEARS LIABILITY AND BURDEN OF RADIOACTIVE CONTAMINATION

Entergy would not be held fully responsible in the event of an accident or terrorist-triggered radioactive release from Indian Point. Currently, Entergy's liability is limited by the Price-Anderson Act. Under Price-Anderson, commercial nuclear operators are required to carry only $200 million in primary insurance. A second level of retrospective premiums in the event of an accident is capped at approximately $88 million per reactor, for an industry-wide total of approximately $9.4 billion.

Yet according to a 1982 study, a worst case scenario accident at a U.S. nuclear reactor would result in $24.8 billion - $590.4 billion in damages in today's dollars. A 1997 Brookhaven National Lab Report ("A Safety and Regulatory Assessment of Generic BWR and PWR Permanently Shutdown Nuclear Power Plants") claims that a disaster from a spent fuel pool could cause up to $566 billion in damage. In addition, the CRAC-2 Report reveals that in the event of a worst case scenario, a meltdown at the Indian Point Unit 2 or 3 reactors could cause $274 billion (1982 dollars) in property damage, and $314 billion (1982 dollars) in property damage, respectively. In terms of 2000 dollars, property damage from a Unit 2 meltdown would be estimated conservatively at $500.5 billion, and property damage from a Unit 3 meltdown would be estimated conservatively at $573.5 billion -- figures based solely on inflation without factoring the substantial rise in metropolitan area real estate values.

The sizable discrepancy between the coverage available under Price-Anderson and the calculated consequences of severe nuclear incidents leaves the public unprotected and the industry unaccountable in the event of a serious accident. Furthermore, by artificially limiting the liability of nuclear operators, the Price-Anderson Act serves as a subsidy to the nuclear industry in terms of foregone insurance premiums. In addition, all homeowner insurance policies exclude nuclear accidents from coverage, leaving homeowners to bear the risk of Indian Point's operations. In other words, no homeowners policy will cover the loss from contamination which results from a radioactive release from Indian Point triggered by an accident or terrorist attack. Outrageously, residents would still have to pay their mortgages even if their homes are contaminated. No other energy source benefits from this level of subsidy.

Clearly, the Price Anderson Act is central to the survival of the commercial nuclear power industry and is a major subsidy to nuclear plant operators. If the nuclear industry was truly confident in its safety and security, then it would forego the Price Anderson Act. But, that seems unlikely. According to a October 1998 U.S. Nuclear Regulatory Commission report – *The Price-Anderson Act - Crossing the Bridge to the Next Century: A Report to Congress* – "Many nuclear suppliers express the view that without Price-Anderson coverage, they would not participate in the nuclear industry."

Even with the limited liability, commercial nuclear power corporations - like Entergy, Exelon and Dominion - may not have the fiscal fortitude to withstand a catastrophic accident at one of their plants. In the case of catastrophic nuclear accident, anywhere in

the United States, Entergy, by virtue of assuming ownership of several reactors, would be required to put up over $1 billion as part of a national self-insurance program under the Price-Anderson Act. A significant accident occurring at one of Entergy's 10 reactors could jeopardize the safe operation of Indian Point. In a recent prospectus from the Exelon Corporation the following statement can be found: "We may incur substantial cost and liabilities due to our ownership and operation of nuclear facilities...The consequences of an accident can be severe and include loss of life and property damage. Any resulting liability from a nuclear accident could exceed our resources, including insurance coverages."

IV. CONCLUSION

In conclusion, I would like to offer the following recommendations:

Regarding Radiological Emergency Planning:

- Demand that FEMA stop delaying and immediately withdraw certification for the Indian Point emergency plans in light of the overwhelming evidence that the major deficiencies in the plans cannot be repaired.

- Demand that the NRC recognize that Indian Point is a unique case – given its proximity to a dense population and to New York City, which remains a terrorist target – and order the immediate closure of Indian Point and its safe and orderly decommissioning.

Regarding nuclear plant security:

- Introduce legislation that would require the "hardening" of on-site storage facilities and casks for irradiated "spent" fuel. Cost of fortifying the storage of irradiated fuel must be born by nuclear plant operators and not by the public.

- Introduce legislation that would require the federalization of military forces at Indian Point, and perhaps the nation's other nuclear facilities. The cost of this security upgrade needs to be borne solely by the nuclear plant companies, not by the public.

- Demanding that the force-on-force (OSRE) drill that will be conducted at Indian Point later this year test the ability of Indian Point's security force to repel a *9/11 type* of terrorist attack – i.e., 20 suicidal terrorists launching a coordinated assault on the plant from multiple directions armed with an array of weapons, working in conjunction with an "active" insider; moreover, Entergy should not be given any more than 72 hours notice that the mock assault is coming.

Regarding Financial Fitness of Commercial Nuclear Power Corporations like Entergy:

- Parent corporations should be required to guarantee that plant-owning subsidiaries and affiliates will be provided whatever funds are needed to safely operate and decommission their nuclear power plants.

- Parent corporations should be held fully responsible for the unmet liabilities incurred by both direct and indirect nuclear power plant owning subsidiaries.

- Congress should adopt legislation to assure that costs related to (1) safety and security (2) decommissioning assets and (3) Price-Anderson nuclear accident responsibilities receive priority in bankruptcy proceedings.

- Reactor owners should be required to guarantee payment of their nuclear accident insurance responsibilities under the Price-Anderson Act through surety bonds, letters of credit, sinking funds, or other comparable financial instruments that will be bankruptcy remote. This will assure that public liability claims will be paid up to the limits of the Price-Anderson Act without concern about the financial condition of the industry and without requiring a taxpayer bailout.

- The Nuclear Regulatory Commission should not eliminate the current legal requirement that non-utility corporations must disclose their financial qualifications when applying to re-license nuclear power plants, as the agency has proposed in a recent rulemaking. Instead, the NRC should bolster its disclosure requirements concerning the character of the legal relationships between a parent corporation and its subsidiaries in the event of a bankruptcy, business failure or accident.

Federal Grant Disclosure

Pursuant to House rules, Riverkeeper wishes to disclose that the only federal grant Riverkeeper received during the current fiscal year is from the U.S. Environmental Protection Agency under their program Water Quality Cooperative Agreements under Clean Water Act (CWA) section 104(b)(3). The grant was for $90,000. It was administered in July 2001.

Curriculum Vitae of Alex Matthiessen

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Professional Experience

HUDSON RIVERKEEPER, INC.

Garrison, NY (2000-present)

Hudson Riverkeeper & Executive Director As Hudson Riverkeeper, serve as public's chief advocate for protection of the Hudson River, its tributaries, and the New York City drinking water supply. Riverkeeper investigates potential threats to the watershed, combining hard-hitting litigation, science and public education, to safeguard the rights of Hudson Valley citizens to clean water and healthy communities. Identified the key issue, human health impacts of PCB contamination, in the coalition effort to bring about expeditious and thorough clean up of the General Electric PCB Superfund site and launched a citizen-based coalition to shut down the Indian Point nuclear power plant. As Executive Director, supervise and oversee the fundraising and outreach operations of a rapidly growing organization currently comprised of 21 staff. In addition to serving on the Riverkeeper Board of Directors, also serve on the boards of the Waterkeeper Alliance and the Hudson River Improvement Fund.

U.S. DEPARTMENT OF THE INTERIOR, Office of the Secretary
Washington, DC (1997-2000)

Special Assistant Appointed to work with the Deputy Secretary on matters of special importance to the Secretary. Primarily responsible for managing a task force of federal agency representatives seeking to reform the Federal Energy Regulatory Commission's (FERC's) hydropower licensing process. Serve as a member of the task force's steering committee and chair several work groups formed to develop recommendations in five substantive policy areas. Also selected to chair Interior's internal hydropower committee which involves overseeing a Department-wide effort to improve and coordinate bureau hydropower relicensing activities across the country. Conceived and developed an initiative titled Green Energy Parks, a joint program of the National Park Service and the Department of Energy to promote the use of efficient and renewable energy technologies throughout the national park system. In past, assisted the Assistant Secretary in the Department's budget development process, in the formulation of the Land and Water Conservation Fund project list for FY'98 and in the oversight of the Department's Brown Tree Snake Control Program. Also coordinated the Department's activities related to the White House Climate Change Initiative which included conducting research and writing a speech on climate change for the Secretary.

HARVARD INSTITUTE FOR INTERNATIONAL DEVELOPMENT

Jakarta, Indonesia (1995-96)

Macroeconomic Policy Analyst Analyzed macroeconomic policy issues (exchange rates, monetary and fiscal policy, trade policy, sector analysis, inflation, and debt) and assisted in the development of policy recommendations for Indonesian Ministry of Finance. Was responsible for writing the interest rate and exchange rate sections of the monthly and quarterly reports. Wrote and edited speeches for Indonesia's economic and finance ministers. Authored President Suharto's resignation speech.

THE WHITE HOUSE, Council on Environmental Quality
Washington, DC (Summer, 1994)

Assistant to the Associate Director for Natural Resources (Internship) Conducted research and prepared policy briefs for the Director (and for the Vice-President on behalf of the Director), and coordinated inter-agency activities.

INDEPENDENT ENVIRONMENTAL CONSULTANT
Washington, DC (1993)

Conservation International Authored policy papers and memoranda analyzing the potential social and environmental impacts of liberalizing international trade (i.e., vis-a-vis GATT and NAFTA).
Bank Information Center Wrote grant proposals which were awarded $100,000.
World Wildlife Fund Organized a two-day congressional staff retreat on toxics policy.

RAINFOREST ACTION NETWORK
San Francisco, CA (1990–93)

Grassroots Program Director Developed and managed international grassroots network of 150 affiliate groups. Created small-grants program to support developing country NGOs. Wrote and edited affiliate network's bi-monthly newsletter and all other program materials. Organized international conferences. Coordinated media campaigns. Hired and managed staff, interns, and volunteers. Co-chaired, with Executive Director, organization's strategic planning committee which was comprised of board and staff.

Other Related Work Experience

INTERNATIONAL DEVELOPMENT EXCHANGE
San Francisco, CA (1992-93)

Overseas Project Representative (Volunteer) Evaluated and assisted in the design of community-based development projects based in West Africa.

EARTH DAY 1990
Palo Alto, CA (1990)

National Field Coordinator Managed the northeast region of a national grassroots network of local field organizations and programs participating in the 20th anniversary of Earth Day.

NEW YORK ZOOLOGICAL SOCIETY
Epulu, Zaire (1989)

Research Assistant Conducted biological research on the 'okapi,' an ungulate species indigenous to the Ituri rainforest of northeastern Zaire, and helped manage a team of approximately 25 pygmy and Bantu project staff.

SAVE OUR SHORES
Santa Cruz, CA (1988)

Intern Reviewed EIAs, wrote testimony on behalf of state legislators, and attended public hearings.

Education

HARVARD UNIVERSITY, JOHN F. KENNEDY SCHOOL OF GOVERNMENT

Master in Public Administration, *Natural Resource and Development Economics*, 1995
Additional areas of study included: international finance, project appraisal, dispute resolution, non-profit financial management, international trade, and statistics.
Teaching Assistant in finance, accounting
Co-chair, International Development Professional Interest Council (1993-94)

UNIVERSITY OF CALIFORNIA, SANTA CRUZ

Bachelor of Arts, *Biology* and *Environmental Studies,* 1988
Honors Thesis: "A Citizen's Guide to Energy Efficiency & Renewable Energy"

Additional Background

Professional strengths: Management, program development, consensus-building, dispute resolution, writing and editing, advocacy, strategic planning
Computer: PC and Macintosh: QuattroPro, Excel, Word, WordPerfect, FoxPro, Filemaker
Languages: French (proficient); Indonesian (conversant)