

Attachment F
Declaration of Diane D'Arrigo in Support of February 6, 2009 Petition
to Intervene

DECLARATION OF DIANE D'ARRIGO
IN SUPPORT of Joint Petitioners
In the matter of Progress Energy Florida, Inc. (PEF)
Levy Nuclear Power Units 1 and 2
Dockets 52-029 and 52-030

I, Ms. Diane D'Arrigo, hereby declare as follows:

1. I am the Radioactive Waste Project Director at Nuclear Information and Resource Service (NIRS) at 6930 Carroll Avenue, Suite 340, Takoma Park, Maryland 20912, and have been at NIRS for 23 years.

2. I am an expert on the policy aspects and general technical characteristics of so-called "low-level" radioactive waste. I hold a Bachelor of Science degree in chemistry with a course concentration in environmental studies and a postgraduate environmental law course. My work experience has been with industry research and development, academic research, laboratory analysis, public interest research, and environmental advocacy. I have closely followed the so-called "low-level" radioactive waste issue since the passage of the 1980 Low Level Radioactive Waste Policy Act and its 1985 Amendments, including efforts to site new waste repositories and to deregulate/declare "below regulatory concern"/release/clear the waste from radioactive regulatory control. I regularly make presentations and occasionally provide testimony to legislators and regulators on related topics. For over twenty five years I have been tracking and participating in policy-making and implementation of policies regarding the generation, disposal, management and deregulation of nuclear waste and materials, primarily from the operation of nuclear power plants and their fuel chain. My work has included research and public education on safety and environmental risks posed by

wastes from the operation of nuclear power plants and the fuel chain and the regulations for disposal. I have spoken publicly and published articles on these topics.

3. I am familiar with the current situation in the United States with regard to “low-level” radioactive waste and with the legislative and regulatory history from the early 1980s up to the present. I am generally familiar with NRC policies and regulations with respect to “low-level” radioactive waste.

4. There is clear public concern about so-called “low-level” radioactive waste especially the highly concentrated, long-lasting, biologically active waste in Classes B, C and Greater-Than-C. The majority of the radioactivity in this waste comes from nuclear power reactors, such as the proposed Levy Nuclear Power 1 and 2 reactors.

5. As of July 1, 2008, the Barnwell, South Carolina disposal site has limiting its access to waste generated within the Atlantic Compact (SC, NJ, CT). The US Ecology-run commercial radioactive waste disposal site at Hanford/Richland Washington already limits access to generators in the Northwest and Rocky Mountain States only. A recently licensed, but legally contested site in Texas can take waste from Texas and Vermont only. For the rest of the country, then, including Florida, generators of Class B and C radioactive waste have no licensed disposal site to which to send their waste. In addition, there is no disposal site for Greater-than-C radioactive wastes which would be generated by the Levy Nuclear Power 1 and 2 reactors if they operate.

6. The nuclear utilities and the NRC are developing guidelines for extended long-term on-site storage of so-called “low level” radioactive waste at nuclear power reactors. This is not a responsible permanent solution for isolation of these long-lasting, highly concentrated radioactive wastes. As with high level radioactive waste, the

outcome could likely be de-facto permanent onsite storage at the reactor site. Rather than assume off-site disposal will become available, Progress Energy Florida should show that the Levy Nuclear Power 1 and 2 site can meet licensing criteria for disposal of the radioactive waste it generates. A likely and completely realistic scenario is that the waste generated by Levy Nuclear Power 1 and 2 reactors will not leave the site.

7. In its application, Progress Energy Florida has failed to address how its Class B, C and Greater-Than-C “low-level” radioactive waste will be disposed according to NRC regulations. Some of the wastes in the “low-level” category will remain radioactively hazardous well beyond the 60 year storage plan described for some of the waste. This could significantly affect the health, safety and security of the site. Serious consideration must be given to meeting the NRC criteria for nuclear waste disposal at 10 CFR 61 or Florida’s compatible Agreement State regulations.

8. Absent any known licensed disposal for Classes B, C and Greater-Than-C radioactive waste to which Progress Energy Florida has access, the applicant must analyze the impacts of alternatives for its “low-level” radioactive waste disposal. The application is incomplete because there is no "realistic" alternative for nuclear waste isolation and disposal proposed. Although onsite storage is discussed, this is not final disposal of Class B, C or Greater-Than-C wastes, which will be generated by Levy Nuclear Power 1 and 2 reactors.

9. Some so-called “low-level” radioactive waste can give high doses of radiation if one is exposed unshielded. According to the Government Accounting Office (GAO/RCED-98-40R Questions on Ward Valley, 5-22-98 pp. 49-52) some so-called

'low-level' radioactive waste can give a lethal dose at one meter, unshielded, in approximately 20 minutes. In addition, so-called 'low-level' radioactive wastes

“contain every radionuclide found in 'high-level' radioactive waste...low-level radioactive wastes constitute a very broad category containing many different types and concentrations of radionuclides, including the same radionuclides that may be found in high-level radioactive wastes.”

These include plutonium-239 (hazardous life 250 to 500 thousand years), iodine-129 (hazardous life 170 to 340 million years), strontium 90 (hazardous life 280-560 years) and cesium-137 (hazardous life 300 to 600 years).

It is imperative that the safety and security issues of permanent on-site storage/de-facto disposal of radioactive waste be addressed in Progress Energy Florida's COL application.

10. The assumption appears to be that there will be a site that accepts the full range of waste generated at Levy Nuclear Power 1 and 2. The Process Control Program, while explaining temporary storage, does not explain how the application will comply with the need for permanent disposal of long-lasting radioactive in the absence of licensed disposal facilities for Classes B, C and Greater-Than-C waste. Even waste sent offsite to vendors, could be returned for storage in the absence of permanent disposal. The unsubstantiated assumption is made that the vendor will render all waste suitable for some offsite disposal site.

11. The special location of the site on water deserves deeper evaluation from the perspective of exorbitant water use, to potential contamination by routine releases and unintended possible radioactive and heat releases from reactor and waste processing, treatment and/or storage operations. The fact that there is another reactor in the same watershed should be factored in.

12. The risk of ever-stronger hurricanes in this location and consequences of dispersal of the large amounts of radioactivity that would accumulate as all the Class B, C and Greater than C waste is stored onsite has not been adequately addressed.

13. There is no justification provided for producing long-lasting, intensely radioactive wastes for which no disposal exists. There is no realistic plan for isolation of the wastes or permanent disposal of the wastes. Considering the long history of failed so-called "low-level" radioactive waste disposal sites in the country, assumptions that new ones will be available are not justified.

I declare under penalty of perjury that the foregoing statements of fact are true and correct to the best of my knowledge and that the opinions expressed herein are based on my best professional judgment.

_____/s/_____
Diane D'Arrigo
Radioactive Waste Project Director
Nuclear Information and Resource Service

Dated: February 5, 2009

Attachment G
Declaration of Diane D'Arrigo in Support of May 14, 2010
Contention 8A

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	
)	
Progress Energy Florida)	Docket Nos. 52-029 and 52-030
)	
(COL Application for Levy County, Units 1 & 2))	May 14, 2010
)	
)	

**DECLARATION OF DIANE D’ARRIGO
IN SUPPORT OF INTERVENERS’ AMENDED CONTENTION 8 ON
SO-CALLED “LOW-LEVEL” RADIOACTIVE WASTE SAFETY ISSUES**

Under penalty of perjury, Diane D’Arrigo does hereby state as follows:

Statement of Qualifications

1. My name is Diane D’Arrigo. I am employed by Nuclear Information and Resource Service as Radioactive Waste Project Director. My business address is 6930 Carroll Ave., Takoma Park, Maryland 20912. I have over 25 years of experience in the technical, policy and economic issues relating to LLRW storage and disposal. I have spoken publicly and published articles on these topics. I have testified as an expert on nuclear waste issues before the NRC. A copy of my curriculum vitae is attached as Exhibit 1.

Purpose of Declaration

2. The purpose of my declaration is to provide factual support for Joint Intervenors’ amended contention on safety issues and adequacy of plans for extended on-site storage of so-called “Low-Level” Radioactive Waste (LLRW) at the proposed Progress Energy Florida Levy County 1 & 2 nuclear site.

Operational Status of LLRW Disposal Sites in the United States

3. Currently, there are only two operating commercial facilities that dispose of Classes A, B, and C LLRW: US Ecology at Hanford, near Richland, Washington; and EnergySolutions in Barnwell, South Carolina. EnergySolutions in Clive, Utah, is licensed to dispose of Class A waste and cannot take Class B or C. The Richland and Barnwell facilities can take LLRW only from the Northwest, Rocky Mountain, and Atlantic compacts. Waste Control Specialists (WCS) has a license to store a limited amount of waste (see below) but can dispose of waste only from the Texas-Vermont Compact when its license is approved and it overcomes other outstanding

hurdles (see below). [There is nowhere to dispose of Greater-Than-C “low-level” radioactive waste.]

Limitations on the Disposal Capacity of Waste Control Specialists (WCS)

4. WCS holds a license (License R04100) which would permit it to dispose of LLRW generated inside the Texas-Vermont LLRW Disposal Compact. The facility is not authorized to accept LLRW from outside the two states that comprise the Compact. The Texas-Vermont Compact Commission is currently considering whether to adopt rules that could allow the importation of additional LLRW from outside the Compact. Proposed Rule for 31 TAC §§ 675.21-675.23, published at 35 Tex. Reg. 1028 on February 12, 2010.

5. WCS is not currently disposing of commercial LLRW, because License R04100 has several conditions which remain unfulfilled. According to the regulator, the Texas Commission on Environmental Quality (TCEQ), “[c]onstruction may not begin until several preconstruction license conditions are completed and approved by the executive director. Once construction is approved and completed, additional conditions of the license must be met prior to commencement of disposal.”¹

6. Several pending lawsuits create uncertainty about when and under what terms the WCS facility may open for disposal of LLRW. See *Sierra Club v. Texas Commission on Environmental Quality*, No. D-1-GN-09-000660 (250th Dist. Ct., Travis County, Texas. March 2, 2009); *Sierra Club v. Texas Commission on Environmental Quality*, No. D-1-GN-09-000894 (98th Dist. Ct., Travis County, Texas. March 19, 2009); *Sierra Club v. Texas Commission on Environmental Quality*, No. D-1-GN-09-003492 (200th Dist. Ct., Travis County, Texas. October 7, 2009); *Sierra Club v. Texas Commission on Environmental Quality*, No. D-1-GN-09-004020 (261st Dist. Ct., Travis County, Texas. November 24, 2009). An Andrews County election for the issuance of a bond to build the WCS facility is also under legal challenge. *Pryor vs. Dolgener*, County Judge of Andrews County, No. 08-09-00284 CV, Texas 8th Court of Appeals from the 109th Judicial District of Andrews County Texas, Cause No. 17,988 is expected to be appealed to the Texas Supreme Court.

Limitations on Storage Capacity of WCS

7. WCS also holds a license for the processing and storage of LLRW (License R04971). The License was due to expire in 2004, but it is still in effect because of WCS’ timely application for renewal. WCS’ renewal application currently is under review by the TCEQ.

8. Even if License R04971 for storage is renewed with the present terms, there are limitations on the quantity of LLRW that can be stored by WCS and the duration for which it can be stored.

¹ From TCEQ website: Waste Control Specialists LLC License Application for Low-Level Radioactive Waste Disposal, Current Status of this Application
http://www.tceq.state.tx.us/permitting/radmat/licensing/wcs_license_app.html#wcs_status

9. For instance, paragraph 23.B of the License requires that within 365 days of arrival at WCS, all LLRW must be placed in interim storage or transferred to an authorized recipient.

10. Paragraphs 7A and 7C of the License also limit LLRW storage at WCS to 2,255,000 curies. Given that WCS is the only offsite facility available for storage of Class B and C waste, that radioactivity limit could be exceeded in just a few years by Class B and C waste that is being generated by facilities without access to disposal. I believe that the storage capacity at WCS could be exceeded well before Levy County Units 1 & 2 begin operation.

11. The operators of Levy County Units 1 & 2 will not be the only nuclear utilities to need storage for Class B and C LLRW. While the Clive, Utah, site can accept Class A LLRW from across the country (outside of the NW and Rocky Mountain Compacts), only the generators in the Northwest, Rocky Mountain and Atlantic Compacts (which have access to the Richland, WA and Barnwell, SC facilities for LLRW disposal) currently have a disposal path for Class B and C waste. If one assumes that a license will be granted to WCS for commercial waste disposal and that WCS will eventually meet all the other conditions and overcome all legal challenges – which is by no means assured – then Texas and Vermont Class B and C waste will also have a disposal path. All of the nuclear power reactor operators in the states without access to Class B and C disposal will be in an increasingly problematic situation. Hence the viability of the applicant's proposal to store waste at WCS must be analyzed in the context of all Class B and C generators in all states outside of the ones with a disposal path. Let us call these 'no-disposal-path' states for convenience in the rest of this declaration.

12. I looked at the amounts of Class B and C LLRW sent for disposal from nuclear generators in the 'no-disposal-path' states. I used past data as posted on the Department of Energy (DOE) Manifest Information Management System (MIMS) website (<http://mims.apps.em.doe.gov/>), which allows computation of data for specific sites, volumes and radioactivity as well as specific compacts and states. All sites except Barnwell have been closed to the 'no-disposal-path' states in recent years. On July 1, 2008, the Barnwell site was closed to these states as well. The total amount of Class B and C waste disposed of at Barnwell by these states over a nine-year period ending on June 30, 2008 was about 4.6 million curies, or about 515,000 curies per year. About 95 percent of this radioactivity came from utilities (spreadsheets attached as Attachment B). At this rate, even if there were no non-utility generators or new reactors, the storage capacity of the WCS site would run out in less than 5 years. If at least some of the recently submitted license applications are approved and result in new operating reactors, the storage capacity would run out sooner, in the absence of a disposal site for the 'no-disposal-path' states.

13. Based on the facts and available data, I conclude that the assumption that offsite storage space will be available for the new reactors for the license period or anything close to it at WCS is unwarranted.

Limitations on the Storage Capacity of Studsvik

14. Studsvik holds Material License R-86011-E17 for the processing of LLRW. The Studsvik License contains provisions that rule out the use of that site for long-term storage. Specifically, Paragraph 17 of the License limits the duration of the storage period to 365 days. Paragraph 24 requires that Studsvik “establish in every contractual obligation relating to radioactive materials the ability to return the radioactive materials, processed or unprocessed, to the prior licensed or exempt processor.” Thus even if Studsvik takes title to the LLRW, it has the right to send it back to the generator and, in any event, may not keep it for more than a year. In view of these limitations, Studsvik is not a plausible option for storage of accumulating Class B and C wastes for existing or new nuclear power reactors.

Delays and Limitations on LLRW Disposal Capacity

15. PEF claims that it has the capacity to store Levy County Units 1 & 2’s LLRW onsite 2 years. But 2 years is not nearly a sufficient period of time to accommodate the potential delay in the availability of offsite LLRW disposal capacity. Currently, there is no LLRW disposal facility that can accept Class B and C radioactive waste from Levy. WCS disposal is not an option that PEF can rely on because WCS is not accepting LLRW from any state at this time and because under its current disposal license it cannot accept LLRW from outside the Texas-Vermont Compact.

16. Even if WCS begins disposing of LLRW and even if it receives permission to accept LLRW from outside the Texas-Vermont Compact, it cannot be relied on for disposal of LLRW beyond the immediate future due to its limited storage and disposal capacity.

17. The licensed disposal capacity of the WCS commercial facility is 2.31 million cubic feet. The Compact States (Texas and Vermont) have estimated their combined need for LLRW disposal under the Compact at 6 million cubic feet: 5 million for Texas and 1 million for Vermont. Adopted Rules, 34 Tex. Reg. 6341 (September 11, 2009); Vermont Health and Safety Code Chapter 403, Sec. 3.04 (11).² The total needed storage capacity of 6,000,000 cubic feet, as estimated by the Compact States, exceeds currently licensed capacity under the Compact. Therefore, the WCS facility does not have the capacity to dispose of LLRW generated at Plant Levy 1 & 2 or at any reactor outside the Texas-Vermont Compact. While WCS could in theory apply for a license modification to allow for more waste disposal, basing a disposal strategy on such an assumption for an-out-of-compact state would be speculative at best, since WCS does not even have an operating license for disposal for a much smaller amount of commercial LLRW within the Texas-Vermont Compact.

² The Vermont Code states: “The shipments of low-level radioactive waste from all nonhost party states shall not exceed 20 percent of the volume estimated to be disposed of by the host state during the 50-years period.” The Proposed Volume Rule states: “Vermont indicated that its needs would probably meet or exceed 1,000,000 cubic feet of capacity based on observed experiences during decommissioning of the Maine Yankee generating facility. There are similar decommissioning requirements in Vermont that indicate the volume could be similar to that generated in the Maine decommissioning process.” 34 Tex. Reg. 4279.

18. Because of the longevity of much of the radioactivity of LLRW and the history of problems at closed LLRW disposal sites, new facilities have been and will continue to be extremely difficult, time-consuming, and expensive. Since the 1980 passage of the Low Level Radioactive Waste Policy Act passed, there have been many siting efforts that have yielded no new full service facilities. According to a 1999 GAO Report: “[s]tates acting alone or within Compacts of two or more, have collectively spent \$600 million over the last 18 years attempting to find and develop about 10 sites for disposing of commercially generated low-level radioactive wastes.” Yet, states’ efforts to license new facilities “have come to a standstill.”³ My own experience has been that localities and states have stopped in the range of 40 proposed “low-level” radioactive waste disposal sites in at least 18 states since the siting effort began with the 1980 Low Level Radioactive Waste Policy Act [Public Law 96-573]. In Texas alone several have been stopped. Although nuclear waste generators may be hopeful that a disposal site will open for them, and remain open, it is by no means a certainty.

Onsite Storage and Processing

19. Referring to guidance documents (such as NUREG-0800 and other NRC and industry guidance) does not substitute for specific plans for onsite storage and management at the Levy County site. PEF fails to provide a realistic plan for its “low-level” radioactive waste. PEF in its response to NRC’s RAI and in referencing the AP 1000 DCD indicates that Levy County Units 1 and 2 can temporarily store “low-level” radioactive waste for “greater than 2 years” or “greater than one year at maximum rate of generation” if offsite disposal is unavailable but fails to specify for how long and which storage and minimization options included in the various guidance documents it will in fact pursue.

20. The applicant must provide greater detail about the amount of waste, its condition, the processes it will undergo, how it will be stored and where, considering the likelihood that extended onsite waste management will be necessary. Will storage be in buildings, and if so what will the structures be? If outside, exposed to the elements, how will safety and security be assured? Where will the storage area or building(s) be located? Will they be within the “protected” area? What treatment options will be carried out onsite and where? Simply referring to generic guidance documents does not substitute for responsible planning for virtually inevitable waste management needs at this specific site. There are important basic plans for management and longer term storage of radioactive waste and the accompanying details that need to be provided, considered and evaluated before the radioactive waste is generated.

21. PEF cannot show that it meets any of the standards without supplying details regarding how the waste will be managed and stored. PEF has not shown that it will meet the provisions of applicable regulations including 10 CFR 20, 10 CFR 30, 10 CFR 50, 10 CFR 10 CFR 61, 10 CFR 71, 40 CFR 190 and 49 CFR 171-180 with regard to the radioactive waste Levy 1 and 2 will produce. Site-specific weather, climatic, social and other conditions will affect the safety and acceptability of the options PEF chooses. These must be identified and evaluated before the waste is permitted to be generated.

³ GAO/RCED 99-238, *Low-Level Radioactive Wastes: States Are Not Developing Disposal Facilities*, page 26.

22. We need to know how much waste will be processed and stored, what processing will be done, the kind of containers that would be used and how they are certified for storage and transport. Without specifying which of the NUREG-0800 and other guidance options PEF intends to use for processing, management and storage compliance cannot be evaluated or assured by the public or the NRC.

23. PEF fails to specify, if waste minimization is to be employed, which processes they expect to implement. Granting a COL for reactor operation does not automatically guarantee that all treatment and long-term storage options are acceptable and will comply with the regulations. We are concerned that some processing such as incineration and accumulated large amounts of radioactive waste could affect safety, environment and exposure rates.

24. If the COL is approved and the reactors operate, a given amount of source term in radioactive waste will be generated, as well as hazardous waste. Synergistic health and physical chemical impacts have not been considered or evaluated.

25. How PEF chooses to distribute that source term generated by Levy County 1 and 2 in terms of waste form, routine releases to air and water, liquid, gaseous and solid radioactive waste affects the ability to meet the regulations. Long-lasting radioactive and hazardous and mixed waste will be generated. PEF has not met necessary requirements for managing or allowing evaluation of management of that waste.

Conclusion

26. There is no offsite disposal available for PEF at present and none is on the horizon. The above analysis shows that PEF does not have a reasonably assured path for long-term offsite storage or disposal. This leaves long-term onsite storage as the only remaining option. PEF is relying on undependable access to non-existent offsite storage and disposal.

27. Storage of Class B and C (and Greater-Than-C) waste generated over decades at a reactor site is without precedent. In view of the unprecedented nature of such storage, it is essential that PEF provide the design of the storage facility and any plans for onsite processing or incineration as part of the COLA and demonstrate the safety and long-term integrity as part of the COLA process.

I declare that the foregoing facts are true and correct to the best of my knowledge and that the statements of opinion are based on my best professional judgment.

_____/s/_____
Diane D'Arrigo

May 14, 2010
Date

Attachment H
Declaration of Dr. Marvin Resnikoff in Support of the Levy County
Intervention, Contentions 7 & 8, September 2009

September 1, 2009 Mandatory Disclosure Attachment C

August 28, 2009

Declaration of Marvin Resnikoff, Ph.D. in Support of Contention 7 and 8 by Nuclear Information and Resource Service, the Green Party of Florida and the Ecology Party of Florida.

After carefully reviewing the petition by NIRS, *et al*, as it concerns Contentions 7 and 8, I adopt and fully support the contentions and their bases, and am prepared to testify in that regard.

I add the following supporting statements. The petition notes that there is no site to which the proposed Levy site reactors can dispose of class B, C and greater than class C low-level waste. Having been involved in every licensing application for proposed low-level facilities in the United States, and also the proposed intermediate level repository in Canada, it is clear that it will be difficult to license new facilities to dispose of low-level waste. This is primarily because closed facilities at Maxey Flats (KY), West Valley (NY) and Sheffield (IL) have leaked and require continual and expensive maintenance and remediation.

Progress Energy Florida has not examined the implications of indefinite storage of low-level waste, as the petition makes clear. This is not a simple operation; some utilities have had difficulty preventing leaks and contamination from occurring. At the now closed Connecticut Yankee reactor, the waste processing system contaminated the underlying aquifer with high concentrations of strontium-90 from the low-level waste processing system. Thus, there is a real possibility that storage would lead to environmental contamination and also an increase in occupational exposures.

Greater than class C waste poses an even more difficult problem. No repository for high-level waste and greater than class C waste is presently available. I have worked for the State of Nevada as a technical consultant since 1986. In my opinion, it is highly unlikely that the proposed Yucca Mountain repository would operate. The national and State political climate does not favor its operation. Therefore, as has occurred at several decommissioned reactors, it is likely that greater than class C waste will be stored in dry storage casks, and similar to spent fuel, will remain so for the indefinite future.

Resume of Marvin Resnikoff, Ph.D.

Dr. Marvin Resnikoff is Senior Associate at Radioactive Waste Management Associates and is an international consultant on radioactive waste management issues. He is Principal Manager at Associates and is Project Director for dose reconstruction and risk assessment studies of radioactive waste facilities and transportation of radioactive materials. Dr. Resnikoff has concentrated exclusively on radioactive waste issues since 1974.

He has conducted dose reconstruction studies of oil pipe cleaners in Mississippi and Louisiana, residents of Canon City, Colorado near a former uranium mill, residents of West Chicago, Illinois near a former thorium processing plant, and residents and former workers at a thorium processing facility in Maywood, New Jersey. He has also served as an expert witness for plaintiffs in Karnes County, Texas, Milan, New Mexico and Uravan, Colorado, who were exposed to radioactivity from uranium mining and milling activities. He is continuing to work on personal injury cases involving former workers and residents at the ITCO and other oil pipe cleaning yards in Louisiana and Texas. He also evaluated radiation exposures and risks in worker compensation cases involving former workers at Maywood Chemical Works thorium processing plant. He also served as an expert witness in a case involving the Port St. Lucie reactors and brain cancer developed by two children and in a case involving clean-up of an abandoned radioactive materials processing facility in Webster, Texas. He is presently working on several land contamination cases in Louisiana, Texas and New York. In June 2000, he was appointed to a Blue Ribbon Panel on Alternatives to Incineration by DOE Secretary Bill Richardson.

In addition to dose reconstruction and land contamination cases, Dr. Resnikoff also works on the risk of transporting radioactive material. Under a contract with the State of Utah, Dr. Resnikoff was a technical consultant to DEQ on the proposed dry cask storage facility for high-level waste at Skull Valley, Utah. He assisted the State on licensing proceedings before the Nuclear Regulatory Commission. He has also prepared studies on transportation risks and consequences for the State of Nevada and the Nevada counties: Clark, White Pine, Lander and Churchill. In addition, at hearings before state commissions and in federal court, he investigated proposed dry storage facilities at the Point Beach (WI), Prairie Island (MN), Palisades (MI), Maine Yankee, Connecticut Yankee and Vermont Yankee reactors. He is presently working for the State of Nevada on Yucca Mountain repository issues before the Nuclear Regulatory Commission (NRC). He is also serving as an expert witness for Earthjustice on a proposed NRC license for a food irradiator at the Honolulu, Hawaii airport.

He has conducted studies on the remediation and closure of the leaking Maxey Flats, Kentucky radioactive landfill for Maxey Flats Concerned Citizens, Inc. and of the leaking uranium basin on the NMI/Starmet site in Concord, Massachusetts under grants from the Environmental Protection Agency. He co-authored a study on the cost of remediating the former West Valley, New York reprocessing plant site. He also conducted studies of the Wayne and Maywood, New Jersey thorium Superfund sites and proposed low-level radioactive waste facilities at Martinsville (Illinois), Boyd County (Nebraska), Wake County (North Carolina), Ward Valley (California) and Hudspeth County (Texas). He investigated phosphogypsum plants in Florida, Texas and Alberta, Canada, and served as an expert witness in a personal injury case involving a Texas phosphogypsum worker. He also served as an expert witness for CRPE, a public interest groups, regarding the proposed expansion of the Buttonwillow, California NORM landfill. He is

presently working for Earthjustice re. the licensing of an irradiation facility near the Honolulu airport in Hawaii.

In Canada, he conducted studies on behalf of the Coalition of Environmental Groups and Northwatch for hearings before the Ontario Environmental Assessment Board on issues involving radioactive waste in the nuclear fuel cycle and Elliot Lake tailings and the Interchurch Uranium Coalition in Environmental Impact Statement hearings before a Federal panel regarding the environmental impact of uranium mining in Northern Saskatchewan. He also worked on behalf of the Morningside Heights Consortium regarding radium-contaminated soil in Malvern and on behalf of Northwatch regarding decommissioning the Elliot Lake tailings area before a FEARO panel. He conducted a study for Concerned Citizens of Manitoba regarding transportation of irradiated fuel to a Canadian high-level waste repository. He is presently working for Greenpeace reviewing the environmental assessment for a proposed intermediate level waste repository under Lake Huron, and for the Provincial Womens Council of Ontario on radioactive waste management costs in a proceeding before the Ontario Energy Board.

In February 1976, assisted by four engineering students at State University of New York at Buffalo, Dr. Resnikoff authored a paper that, according to *Science*, changed the direction of power reactor decommissioning in the United States. His paper showed that power reactors could not be entombed for long enough periods to allow the radioactivity to decay to safe enough levels for unrestricted release. The presence of long-lived radionuclides meant that large volumes of decommissioning waste would still have to go to low-level or high-level waste disposal facilities. He assisted public interest groups on the decommissioning of the Yankee-Rowe, Diablo Canyon, Big Rock Point and Haddam Neck reactors.

He was formerly Research Director of the Radioactive Waste Campaign, a public interest organization conducting research and public education on the radioactive waste issue. His duties with the Campaign included directing the research program on low-level commercial and military waste and irradiated nuclear fuel transportation, writing articles, fact sheets and reports, formulating policy and networking with numerous environmental and public interest organizations and the media. He is author of the Campaign's book on "low-level" waste, *Living Without Landfills*, and co-author of the Campaign's book, *Deadly Defense, A Citizen Guide to Military Landfills*.

Between 1981 and 1983, Dr. Resnikoff was a Project Director at the Council on Economic Priorities, a New York-based non-profit research organization, where he authored the 390-page study, *The Next Nuclear Gamble, Transportation and Storage of Nuclear Waste*. The CEP study details the hazard of transporting irradiated nuclear fuel and outlines safer options.

Dr. Resnikoff is an international expert in nuclear waste management, and has testified often before State Legislatures and the U.S. Congress. He has extensively investigated the safety of the West Valley, New York and Barnwell, South Carolina nuclear fuel reprocessing facilities. His paper on reprocessing economics (Environment, July/August, 1975) was the first to show the marginal economics of recycling plutonium. He completed a more detailed study on the same subject for the Environmental Protection Agency, "Cost/Benefits of U/Pu Recycle," in 1983. His paper on decommissioning nuclear reactors (Environment, December, 1976) was the first to show that reactors would remain radioactive for several hundred thousand years. In March 2004, Dr. Resnikoff was project director and co-author of a study of groundwater contamination at DOE facilities, *Danger Lurks Below*.

Dr. Resnikoff has prepared reports on incineration of radioactive materials, transportation of

irradiated fuel and plutonium, reprocessing, and management of low-level radioactive waste. He has served as an expert witness in state and federal court cases and agency proceedings. He has served as a consultant to the State of Kansas on low-level waste management, to the Town of Wayne, New Jersey, in reviewing the cleanup of a local thorium waste dump, to WARD on disposal of radium wastes in Vernon, New Jersey, to the Southwest Research and Information Center and New Mexico Attorney General on shipments of plutonium-contaminated waste to the WIPP facility in New Mexico and the State of Utah on nuclear fuel transport. He has served as a consultant to the New York Attorney General on air shipments of plutonium through New York's Kennedy Airport, and transport of irradiated fuel through New York City, and to the Illinois Attorney General on the expansion of the spent fuel pools at the Morris Operation and the Zion reactor, to the Idaho Attorney General on the transportation of irradiated submarine fuel to the INEL facility in Idaho and to the Alaska Attorney General on shipments of plutonium through Alaska. He was an invited speaker at the 1976 Canadian meeting of the American Nuclear Society to discuss the risk of transporting plutonium by air. As part of an international team of experts for the State of Lower Saxony, the Gorleben International Review, he reviewed the plans of the nuclear industry to locate a reprocessing and waste disposal operation at Gorleben, West Germany. He presented evidence at the Sizewell B Inquiry on behalf of the Town and Country Planning Association (England) on transporting nuclear fuel through London. In July and August 1989, he was an invited guest of Japanese public interest groups, Fishermen's Cooperatives and the Japanese Congress Against A- and H- Bombs (Gensuikin).

Between 1974 and 1981, he was a lecturer at Rachel Carson College, an undergraduate environmental studies division of the State University of New York at Buffalo, where he taught energy and environmental courses. The years 1975-1977 he also worked for the New York Public Interest Group (NYPIRG).

In 1973, Dr. Resnikoff was a Fulbright lecturer in particle physics at the Universidad de Chile in Santiago, Chile. From 1967 to 1973, he was an Assistant Professor of Physics at the State University of New York at Buffalo. He has written numerous papers in particle physics, under grants from the National Science Foundation. He is a 1965 graduate of the University of Michigan with a Doctor of Philosophy in Theoretical Physics, specializing in group theory and particle physics. Dr. Resnikoff is a member of the American Public Health Association and the Health Physics Society.

Contact Information

Radioactive Waste Management Associates

526 West 26th Street, Room 517

New York, NY 10001

Ph. 212-620-0526

Fax 212-620-0518

radwaste@rwma.com

Dr. Marvin Resnikoff

Radioactive Waste Management Associates
526 West 26th Street, Room 517
New York, NY 10001
(212)620-0526 FAX (212)620-0518

241 W. 109th St, Apt. 2A
New York, NY 10025
(212) 663-7117

EXPERIENCE:

April 1989 - present **Senior Associate**, Radioactive Waste Management Associates, management of consulting firm focused on radioactive waste issues, evaluation of nuclear transportation and military and commercial radioactive waste disposal facilities.

1978 - 1981; 1983 - April 1989 **Research Director**, Radioactive Waste Campaign, directed research program for Campaign, including research for all fact sheets and the two books, *Living Without Landfills*, and *Deadly Defense*. The fact sheets dealt with low-level radioactive waste landfills, incineration of radioactive waste, transportation of high-level waste and decommissioning of nuclear reactors. Responsible for fund-raising, budget preparation and project management.

1981 - 1983 **Project Director**, Council on Economic Priorities, directed project which produced the report *The Next Nuclear Gamble*, on transportation and storage of high-level waste.

1974 - 1981 **Instructor**, Rachel Carson College, State University of New York at Buffalo, taught classes on energy and the environment, and conducted research into the economics of recycling of plutonium from irradiated fuel under a grant from the Environmental Protection Agency.

1975 - 1976 **Project Coordinator**, SUNY at Buffalo, New York Public Interest Research Group, assisted students on research projects, including project on waste from decommissioning nuclear reactor.

1973 **Fulbright Fellowship** at the Universidad de Chile, conducting research in elementary particle physics.

1967 - 1972 **Assistant Professor of Physics**, SUNY at Buffalo, conducted research in elementary particle physics and taught range of graduate and undergraduate physics courses.

1965 - 1967 **Research Associate**, Department of Physics, University of Maryland, conducted research into elementary particle physics.

EDUCATION

University of Michigan
Ann Arbor, Michigan

PhD in Physics, June 1965
M.S. in Physics, Jan 1962
B.A. in Physics/Math, June 1959