

**UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION**

**BEFORE THE ATOMIC SAFETY AND LICENSING BOARD**

<b>In the Matter Of</b>	)	
	)	
<b>EXELON GENERATION COMPANY, LLC,</b>	)	<b>Docket No. 50-352-LR</b>
	)	<b>Docket No. 50-353-LR</b>
<b>(Limerick Generating Station)</b>	)	
 <b>(License Renewal Application)</b>		

**DECLARATION OF CHRISTOPHER E. PAINE  
OF THE NATURAL RESOURCES DEFENSE COUNCIL**

**INTRODUCTION**

I, Christopher Eliot Paine, declare that the following statements are true and correct to the best of my knowledge:

1. I direct the Nuclear Program of the Natural Resources Defense Council (NRDC), from its office in Washington, D.C., where I have been continuously employed for the past 20 years. In this capacity, I participate in intra-organizational deliberations with NRDC power generation and energy efficiency experts concerning the role of nuclear power in the generation mix, and concerning the cost-effective low-carbon alternatives to the construction of new nuclear power plants. In 2010 I authored the publication: “The Nuclear Fuel Cycle, Global Security, and Climate Change: Weighing the Costs and Benefits of Nuclear Power Expansion,” [*University of Richmond Law Review*, Vol. 44, Number 3, 66 pages, March 2010], and I have given numerous presentations in the United States and abroad on the risks and benefits of nuclear power.
2. Before joining NRDC I worked for five years as a nuclear arms control, nonproliferation, and nuclear energy adviser to former Senator Edward M. Kennedy of Massachusetts, in

which capacity I performed, among other duties, congressional oversight of NRC licensing activities. Before joining Senator Kennedy's office, I was staff consultant for nuclear nonproliferation policy with the House Subcommittee on Energy, Conservation & Power, consultant to Princeton University's Project on Nuclear Policy Alternatives, legislative director for the Physicians for Social Responsibility, and research fellow at the Federation of American Scientists. I am the author or co-author of dozens of journal articles and NRDC reports on topics involving the civil and military applications of nuclear energy. I received my B.A. in Economics from Harvard College in 1974. My curriculum vitae is provided in Attachment A.

3. On June 22, 2011, the Nuclear Regulatory Commission (NRC) received a License Renewal Application for Limerick Generating Station (LGS) Unit 1 and Unit 2 from the licensee, Exelon Generation Company, LLC ("Exelon"). The operating license for Unit 1 currently expires on October 26, 2024, and the operating license for Unit 2 currently expires on June 22, 2029. The two nuclear power plant units at Limerick are General Electric Boiling Water Reactors (BWR) with Mark II containment structures. Exelon seeks to extend the operation of Unit 1 until the year 2044, and Unit 2 until the year 2049.
4. Exelon has submitted an Environmental Report in conjunction with its License Renewal Application that does not adequately consider the environmental consequences of the "No Action" Alternative. Specifically the ER unreasonably misapplies NRC guidance from the 1996 Generic Environmental Impact Statement (GEIS) that limits the set of reasonable alternatives for meeting "a defined generating requirement... to analysis of single, discrete electric generation sources." (GEIS, 1996, cited at ER, 7-2). As a consequence of this misapplication, the ER arbitrarily limits and unfairly conflates

consideration of the No Action alternative with the same set of alternatives that it deems reasonable for analysis as “single discrete electric generation sources.”

5. According to the ER, “Unless replacement generating capacity is provided as part of the no-action alternative, a large amount of base-load generation would no longer be available, and the alternative would not equivalently satisfy the purpose and need for the proposed action. For this reason, the no-action alternative is defined as having two components—replacing the generating capacity of LGS and decommissioning the LGS facility.” (ER, 7-3). But, almost by definition, analysis of the No-Action alternative does not involve consideration of alternatives that would “equivalently satisfy the purpose and need for the proposed action,” and therefore the required NEPA consideration of “No Action” cannot reasonably be equated with “replacing the generating capacity of LGS,” or limited to an analysis of this particular problem.
6. Unlike the Applicant’s selection of individual utility-scale power plant alternatives that it subjectively deems reasonable and appropriate to its own business purpose of generating and selling electricity to replace LGS, the likely evolution of electricity system resources in the areas of PJM Interconnection (“PJM”) served by LGS is an empirical and analytical question that necessarily involves the consideration of multiple socio-economic factors and technological trends – not merely those deemed appropriate to pursuit of the applicant’s specific business interest.
7. Unlike consideration of reasonable alternatives to meet the “defined generating requirement” represented by a particular “baseload” nuclear power plant, mandatory consideration of the environmental impacts of the No Action Alternative – defined as a decision not to relicense LGS Units 1 and 2 -- necessarily involves making an informed

projection of the likely portfolio of PJM electricity system resources available in the region served by LGS beginning 13 years and 18 years hence that could reasonably be expected to supply the energy services currently supplied by LGS. These reasonably foreseeable system resources include all forms of Demand Side Management (DSM), waste heat co-generation, combined heat and power, and distributed renewable energy resources, in addition to the “single, discrete electric generation sources” reviewed by the Applicant as reasonable alternatives to extended operation of Limerick’s base load capacity. The ER’s analysis of the No Action Alternative fails to consider the environmental impacts of this reasonably foreseeable portfolio of PJM system resources, and thus fails to make the required comparison between the environmental impacts of No Action and the continued operation of LGS for an additional 20 years.

8. The Applicant, Exelon Generation Company, LLC, claims that as a merchant generating company with no direct “business connection” with energy consumers, it is not well-positioned to make the integrated projection of system resources, including all forms of DSM, that could plausibly emerge on the PJM system to replace the energy services supplied by LGS. According to Applicant Exelon Generation’s environmental report: “... a private company engaged in generating energy for the wholesale market, such as Exelon Generation, has no business connection to the end users of its electricity and, therefore, no ability to implement DSM. Because a company whose sole business is that of generating electricity and selling energy at wholesale has no ability to implement DSM, the NRC determined that NEPA does not require that an alternative involving electricity demand reduction through DSM be considered when the project purpose is to

authorize a power plant to supply existing and future electricity demand (NRC, 2005).”  
[ER, p. 7-16]

9. While this may be a fair assessment of the capacities of Exelon Generation Company, LLC, it is not a fair characterization of the business and abilities of the parent company, Exelon. Here is the self-description of subsidiary Exelon Energy’s business, from the Exelon website: “As one of the *largest retail energy suppliers* in the country, Exelon Energy delivers traditional *and alternative energy options* to commercial and industrial businesses. Customers have counted on Exelon Energy to provide reliable and cost-effective electricity and natural gas products since 1997. Exelon Energy markets electricity to customers in Illinois and Pennsylvania, and natural gas to customers in Illinois, Michigan, Ohio. Western Pennsylvania customers may choose Exelon Energy as their natural gas supplier. Exelon Energy's locally-based sales representatives have a wealth of experience in energy products and services and bring a depth of knowledge to *the retail energy markets we serve*. They work closely with our customers to develop immediate and long-term energy strategies. Our performance is best proven by our customer loyalty—the vast majority of our customers continue to do business with Exelon Energy year after year.”

[<http://www.exeloncorp.com/energy/marketing/overview.aspx>, emphasis added]. It would appear that parent company Exelon actually does have a “direct business connection” with industrial and commercial electricity customers, and “depth of knowledge” regarding this retail energy market, which, I would note, is ripe with opportunities for demand reduction and, as Exelon Energy itself notes, “alternative energy options.”

10. I further note that the Applicant's citation above, to the NRC's determination that NEPA does not require electricity demand reduction through DSM be considered when *the project purpose is to authorize a power plant*, does not reasonably apply to consideration of the No Action Alternative, which involves no such singular purpose, but rather necessarily involves a broader assessment of the likely evolution of electricity system resources over time in response to an NRC determination not to relicense Limerick.
11. In light of the information presented above, the Licensing Board must determine whether it is reasonable to require the Applicant, given its professed lack of expertise regarding DSM and electricity consumers, to complete the required analysis of the No Action Alternative, or whether the NRC staff should perform this assessment in the course of incorporating the Applicant's ER into a draft and final SEIS. What is clear, however, is that NEPA requires such an assessment, and someone is obliged to do it.
12. Moreover, some policy makers in the region served by Limerick Units 1 and 2, will want to consider as a "No Action Alternative" paying higher costs for replacement power in order to avoid all subsequent risks associated with the entire spectrum of potential future nuclear accidents at Limerick Units 1 and 2, including the potential for a severe accident involving a large source term release with winds blowing in a unfavorable direction. In order to properly weigh the costs and benefits of pursuing this alternative, the ER and EIS should present a spectrum of potential releases and their effects along the lines of the referenced analysis that NRDC performed with respect to the Indian Point nuclear plants [See analysis at [http://www.nrdc.org/nuclear/indianpoint/files/NRDC-1336\\_Indian\\_Point\\_FSR8medium.pdf](http://www.nrdc.org/nuclear/indianpoint/files/NRDC-1336_Indian_Point_FSR8medium.pdf)]

Pursuant to 28 U.S.C. § 1746, I declare that the foregoing is true and correct to the best of my knowledge, information and belief, and that this declaration was executed in Washington, DC on November 22, 2011.

/s/Christopher E. Paine (electronic signature approved)

## **References**

Exelon Generation Company, LLC (Exelon). 2011. Applicant's Environmental Report Operating License Renewal Stage, Limerick Generating Station, Units 1 and 2, Docket Numbers 50-352 and 50-353, License Numbers NPF-39 and NPF-85, June.

Natural Resources Defense Council (NRDC), 2011. Nuclear Accident at Indian Point: Consequences and Costs, appended to his declaration as Attachment A.

U.S.NRC, 1996. Generic Environmental Impact Statement (GEIS) for License Renewal of Nuclear Plants (NUREG-1437 Vol. 1)

## Attachment A: Curriculum Vitae for Christopher E. Paine

### EDUCATION

Harvard University, B.A. Economics, 1974

Certificate of Training, US Department of Energy, Course in Nuclear Nonproliferation, Washington, D.C., and Los Alamos, N.M., September-October, 1990.

### EMPLOYMENT SUMMARY

**8/07/- present:** *Director, Nuclear Program, Natural Resources Defense Council, Washington, D.C.*

**6/91 – 7/07:** *Senior Analyst and Deputy Director, NRDC Nuclear Program*

**2/87 - 5/91:** *Legislative Assistant for Nuclear Energy and Arms Control, Office of Sen. Edward M. Kennedy, United States Senate, Washington, D.C.*

**9/86 - 12/87:** *Visiting Scholar, Defense and Arms Control Program, Center for International Studies, MIT, and MacArthur Writing Fellow-in-residence, Federation of American Scientists, Washington, D.C.*

**10/85 - 12/87:** *Senior Consultant, Project on Nuclear Policy Alternatives, Center for Energy and Environmental Studies (CEES), Princeton University.*

**6/85 - 9/86:** *Staff Consultant for Nuclear Nonproliferation Policy, Subcommittee on Energy Conservation and Power, U.S. House of Representatives.*

**11/83 - 5/85:** *Senior Policy Analyst and Washington Director, Physicians for Social Responsibility; and consultant, "Five Continent Peace Initiative," Parliamentarians Global Action, New York, N.Y.*

**1/81 - 10/83:** *Staff Assistant for Arms Control and Martin Stone Research Fellow, Federation of American Scientists, Washington, D.C.*

**8/79 - 12/80:** *Research Fellow, Council on Economic Priorities, New York, N.Y., and Associate, Center for Investigative Reporting, Oakland, CA.*

**9/76 - 6/79:** *Research Associate and freelance writer in military and foreign affairs, Pacific Studies Center, Palo Alto, CA.*

**12/73 -12/75:** *Staff writer, MIDDLE EAST REPORT, Middle East Research and Information Project, Cambridge, MA., and Washington, D.C.*



## **PUBLICATIONS (List Available Upon Request)**

Over 70 published NRDC reports and articles, many of which appeared in professional journals and general interest magazines such as *Scientific American*, *Science*, *Nature*, *Science and Global Security*, *Bulletin of the Atomic Scientists*, *The Nation*, *Middle East Report*, among others.

## **OTHER PERTINENT DATA**

National Council Member, Federation of American Scientists (elected) 1984-88.

Bulletin of the Atomic Scientists, Contributing Editor, (1985), Columnist (2003-04)

*Foreign Languages:* Spanish (proficient); Russian (rudimentary)

*Clearances Held:* (currently inactive) DoD Top Secret; DOE "Q" (1988-91).

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