

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE NUCLEAR REGULATORY COMMISSION

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In the Matter of	)	
	)	
Southern Nuclear Operating Company, Inc.	)	Docket Nos. 52-025-COL &
	)	52-026-COL
Combined License for Vogtle Electric	)	
Generating Plant Units 3 and 4	)	
_____	)	

**PETITIONERS' MOTION TO STAY THE EFFECTIVENESS  
OF THE COMBINED LICENSE FOR VOGTLE ELECTRIC GENERATING  
PLANT UNITS 3 AND 4 PENDING JUDICIAL REVIEW**

February 16, 2012

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## **I. INTRODUCTION AND SUMMARY**

Pursuant to Section 10(d) of the Administrative Procedure Act, 5 U.S.C. § 705(d), Petitioners, the Southern Alliance for Clean Energy, Blue Ridge Environmental Defense League, Center for a Sustainable Coast, and Georgia Women’s Action for New Directions (who were previously admitted as intervenors to this proceeding), move the U.S. Nuclear Regulatory Commission (“Commission” or “NRC”) to stay the effectiveness of CLI-12-02, the NRC’s February 9, 2012 decision to authorize issuance of a combined license (“COL”) and extended limited work authorization (“LWA”) for Units 3 and 4 of the Vogtle Electric Generating Plant (“Vogtle 3&4”), pending judicial review. Petitioners also request the Commission to stay the issuance of the COL and LWA for Vogtle 3&4, which were issued by the NRC Staff on February 10, 2012.

This Motion is supported by the Declaration of Dr. Arjun Makhijani (Feb. 16, 2012) (“Makhijani Declaration”), which is attached.

As demonstrated below, Petitioners satisfy the four-part test for issuance of a stay of the effectiveness of the COL for Vogtle 3&4. First, they demonstrate a strong likelihood of prevailing on their claim that the NRC violated the National Environmental Policy Act (“NEPA”) by refusing to address the environmental implications of the catastrophic nuclear reactor accident at Fukushima Dai-ichi in a supplemental environmental impact statement (“EIS”) for the licensing of Vogtle 3&4. By adopting the recommendations of its own high-level Fukushima Task Force for improvements to the NRC’s regulatory system<sup>1</sup>, the NRC has established, as a matter of law, that the Fukushima accident and the Task Force’s report regarding its implications for U.S. reactors constitute “new and significant information” that

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<sup>1</sup> Near-Term Report and Recommendations for Agency Actions Following the Events in Japan, (July 12, 2011) (“Task Force Report”).

should have been addressed in a supplemental EIS. Moreover, the NRC's sole rationale for refusing to supplement the EIS – that the likelihood of a Fukushima-like accident in the U.S. is “extremely low” and therefore not worthy of consideration – contradicts the conclusion of the NRC's own high-level Task Force without showing that the NRC has done any technical analysis to back up its disagreement. In fact, no such analysis exists, because the NRC has yet to conduct the technical studies recommended by the Task Force that would give it a basis for disagreeing with the Task Force. In any event, the NRC's determination that the Task Force's conclusions and recommendations are not worthy of consideration in an EIS is completely undermined by its decision to adopt the recommendations of the Fukushima Task Force *in toto*.

In Dr. Makhijani's supporting declaration, Petitioners demonstrate that they will be irreparably harmed if construction of the Vogtle 3&4 reactors is allowed to proceed. Not only is the commitment of resources involved in building Vogtle 3&4 significant, but the impacts of construction activities to air, soil, and water, including the project's carbon footprint, are significant and irreversible. In comparison, the harm of a stay would be minimal to Southern Nuclear Operating Co., because the risks of a delay are borne primarily by the ratepayers.

Finally, Petitioners demonstrate that the public interest would be best served by the issuance of a stay of construction, because the costs of imposing Fukushima-related backfits will be significantly greater if construction is allowed to proceed now and the NRC subsequently requires backfits to the already-built reactors. In addition, if Southern Co. is permitted to proceed with construction now and expensive Fukushima-related backfits are subsequently imposed, it will not be possible to weigh the costs and benefits of foregoing Vogtle 3&4 in favor of more affordable sources of electricity, because a huge economic commitment will have been made already.



Concurrent with this motion, Petitioners have filed a Petition for Review of CLI-02-12 in the United States Court of Appeals for the District of Columbia Circuit. Petitioners, joined by five other organizations<sup>2</sup>, have also asked the Court to review the NRC's rule approving the AP1000 design which underlies the Vogtle COL: Final Rule, AP1000 Design Certification Amendment, 76 Fed. Reg. 82,079 (Dec. 30, 2012).

## **II. STATEMENT OF FACTS**

### **A. Fukushima Accident and Task Force Report**

In March 2011, a catastrophic accident began at the Fukushima Dai-ichi Nuclear Power Station, Units 1-6, in Okuma, Japan. The NRC Commissioners immediately appointed a Task Force, composed of its most qualified and experienced technical staff, to study the regulatory implications of the accident for the United States. The Commission instructed the Task force to provide:

[A] systematic and methodical review of [NRC] processes and regulations to determine whether the agency should make additional improvements to its regulatory system and to make recommendations to the Commission for its policy direction, in light of the accident at the Fukushima Dai-ichi Nuclear Power Plant.

Charter for the Nuclear Regulatory Commission Task Force to Conduct a Near-Term Evaluation of the Need for Agency Actions Following the Events in Japan (March 30, 2011).

On July 12, 2011, the Task Force issued its report, which contained a series of recommendations that “are intended to clarify and strengthen the regulatory framework for protection against natural disasters, mitigation, and emergency preparedness, and to improve the effectiveness of the NRC’s programs.” Task Force Report at viii. The Task Force made twelve overarching recommendations to the NRC for regulatory action in three major areas: risk

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<sup>2</sup> The co-petitioners to the D.C. Circuit are North Carolina Waste Awareness and Reduction Network, Citizens Allied for Safe Energy, Friends of the Earth, Nuclear Information and Resource Service, and Nuclear Watch South (the “AP1000 Oversight Group”).

analysis for earthquakes and floods, equipment upgrades to protect reactor core and spent fuel cooling systems during extended power outages and multi-unit accidents, and emergency planning upgrades for extended power outages and multi-unit accidents. *Id.* at 69-70. The recommendations included orders and rulemakings that were applicable to all new reactors. *Id.* at 71-72. Subsequently, the Commission adopted all of the Task Force recommendations and ordered the NRC Staff to prioritize them and adopt them within the following five years. SRM-SECY-11-0124, Recommended Actions to be Taken Without Delay from the Near-Term Task Force Report (Oct. 18, 2011) (ML11245A127).

**B. Petitioners' Motion to Reopen the Record and Admit Fukushima Contention**

Based on the Task Force Report, in the summer of 2011, Petitioners submitted a motion to re-open the record of the Vogtle COL proceeding, which had closed in June 2010 following the Atomic Safety and Licensing Board's (the "ASLB's") grant of summary disposition of Petitioners' single admitted contention. *See* CLI-12-02, slip op. at 4-5; Motion to Reopen the Record and Admit Contention to Address the Safety and Environmental Implications of the Nuclear Regulatory Commission Task Force Report on the Fukushima Dai-ichi Accident (August 11, 2011).<sup>3</sup> Petitioners' Motion sought admission of a contention that challenged the failure of the EIS prepared in support of the licensing decision to address the environmental implications of the Task Force Report.

Three of the Petitioners also submitted comments on the proposed rule for certification of the AP1000 design, demanding that the NRC consider the environmental implications of the Fukushima accident and Task Force Report in the rulemaking for certification of the AP1000 design. *See* NRC Response to Public Comments, Final Rule: Amendment to AP1000 Design

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<sup>3</sup> On August 11, 2011, one of the petitioners, Blue Ridge Environmental Defense League, independently filed substantially the same motions regarding the Fukushima accident as did the other petitioners.

Certification Rule, 10 CFR Part 52, App. D (Dec. 2011) (ADAMS No. ML113480018).

On September 9, 2011, the Commission issued CLI-11-05, denying an Emergency Petition<sup>4</sup> to which some of the Petitioners had been party. The Emergency Petition, filed shortly after the Fukushima accident began, had asked the Commission to establish a procedure for addressing the safety and environmental implications of the Fukushima accident in licensing proceedings, and to suspend all licensing decisions, as it had after the Three Mile Island accident in 1979, pending resolution of the safety and environmental issues raised by the Fukushima accident. In CLI-11-05, the Commission refused to suspend any licensing decisions or to establish procedures for addressing Fukushima-related issues in licensing proceedings. *Id.*, slip op. at 25. The Commission also concluded that “given the current state of information,” the Fukushima accident had not raised any generic environmental issues that should be addressed in a generic NEPA review. *Id.*, slip op. at 30-31.

On October 18, 2011, the ASLB issued LBP-11-27, rejecting as premature Petitioners’ contentions. The ASLB interpreted CLI-11-05 to preclude admission of the Petitioners’ contentions because “it remains much too early in the process of assessing the Fukushima event in the context of the operation of reactors in the United States to allow any informed conclusion regarding the possible safety or environmental implications of that event regarding such operation.” *Id.* at 13.

Petitioners submitted a petition for review of LBP-11-17 to the Commission on November 2, 2011. The petition is pending before the Commission. CLI-12-02, slip op. at 5.

### **C. AP1000 Rule**

On December 30, 2011, the NRC issued a rule certifying the AP1000 standardized design

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<sup>4</sup> Emergency Petition to Suspend All Pending Licensing Decisions and Related Rulemaking Decisions Pending Investigation of Lessons Learned from Fukushima Daiichi Nuclear Power Plant accident (April 14 -18, 2011).

on which the proposed new Vogtle reactors are based. 76 Fed. Reg. 82,079. The NRC stated that two “actions” that are “related to the [Task Force Report ] have been completed” and that they are documented in NRC Staff memoranda SECY-11-124 and SECY-11-137.<sup>5</sup> *Id.* at 82,081 (citing SECY-11-124, Memorandum from R.W. Borchardt to the Commissioners re: Recommended Actions to be Taken Without Delay From the Near-Term Task Force Report (Sept. 9, 2011) (ML11245A127); SECY-11-137, Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned (Oct. 3, 2011) (ML11269A204)). These memoranda, however, do not refer to any “completed” actions, but rather list actions that have been started and/or prioritized for future action.

The NRC further stated that only three of the Task Force’s recommendations were applicable to the AP1000 design: Recommendation 2 (seismic and flooding protection), Recommendation 4 (mitigation of prolonged station blackout), and Recommendation 7 (enhanced instrumentation and makeup capability for spent fuel pools). *Id.* at 82,081. The NRC did not mention Recommendation 1, the Task Force’s far-reaching recommendation to review the NRC’s regulatory scheme and implement a risk-informed, defense-in-depth regulatory framework.

With respect to Recommendations 2, 4, and 7, the NRC asserted that no changes to the AP1000 design were required to meet these recommendations because “the task force concluded that, by the nature of the passive design and inherent 72-hour coping capability, the AP1000 design has many of the features and attributes necessary to address the Task Force recommendations.” *Id.* In any event, the Commission noted that:

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<sup>5</sup> *Id.* at 82,081 (citing SECY-11-124, Memorandum from R.W. Borchardt to the Commissioners re: Recommended Actions to be Taken Without Delay From the Near-Term Task Force Report (Sept. 9, 2011) (ML11245A127); SECY-11-137, Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned (Oct. 3, 2011) (ML11269A204)).

Even if the Commission concludes at a later time that some additional action is needed for the AP1000, the NRC has ample opportunity and legal authority to modify the AP1000 DCR to implement NRC-required design changes, as well as to take any necessary action to ensure that holders of COLs referencing the AP1000 also make the necessary design changes.

*Id.*

#### **D. CLI-12-02**

On February 9, 2012, the NRC Commissioners issued CLI-12-02. A majority of the Commissioners determined that all safety and environmental issues relevant to the Vogtle 3&4 COL application had been adequately resolved and approved the issuance of a COL for the new reactors. In a separate opinion, Chairman Jaczko dissented on the ground that while the NRC had approved all of the Fukushima Task Force recommendations, it had not made a commitment to implement the recommendations before Vogtle 3&4 began operation. Dissenting Opinion at 1. As the Chairman observed in voting his disapproval of CLI-12-02, the majority was issuing the Vogtle COL “as if Fukushima never happened.” Statement of Chairman Gregory B. Jaczko, Commission Affirmation Session (February 9, 2012).

##### **1. Majority opinion**

The majority of the Commissioners agreed with Chairman Jaczko that “[t]he Fukushima events were significant, warranting enhancements in safety measures.” *Id.*, slip op. 82. The majority also stated that it “share[s] the Chairman’s commitment to implementing Fukushima-related enhancements and to nuclear safety generally.” *Id.* The majority, however, did not state that it had implemented or even fully considered the recommendations of any Task Force recommendation before issuing the Vogtle COL. The decision contains no discussion, for instance, of Recommendation 1 (implementation of risk-informed defense-in-depth regulatory framework), Recommendation 2 (seismic and flood hazard assessments), Recommendation 8

(onsite emergency response training and exercises), or Recommendation 9 (measures for responding to multi-unit events), all of which the Task Force had identified as rulemaking recommendations that are relevant to new reactors. Task Force Report at 71.

The only specific Task Force recommendations discussed in CLI-12-02 are Recommendation 4 (station blackout measures) and Recommendation 7 (spent fuel pool instrumentation). With respect to these all-important recommendations, the majority stated that:

[T]o the extent these recommendations are not already addressed in the AP1000 certified design, we expect that any applicable site-specific requirements arising from these recommendations – whether imposed by order or by rule – will be applied to the Vogtle licenses, *as necessary*, prior to operation.

*Id.*, slip op. at 83 n.363 (emphasis added). Thus, CLI-12-02 contains absolutely no commitment to implement the Task Force recommendations other than as a matter of NRC post-licensing enforcement discretion.

With respect to NEPA, the majority asserted that no supplemental EIS was required because although Fukushima-like accidents in the United States would be “potentially high consequence,” they have “extremely low probability.” *Id.*, slip op. at 74.

## **2. Dissenting opinion of Chairman Jaczko**

In dissenting from the majority opinion, Chairman Jaczko noted that the Fukushima accident had profoundly changed the NRC’s view of the impacts of severe reactor accidents. While prior to the Fukushima accident the NRC Staff may have had an adequate basis for finding reasonable assurance that Vogtle 3&4 would operate safely, the accident “has fundamentally altered our understanding and appreciation of the impacts of a catastrophic natural disaster.” *Id.* at 3-4. But he noted that although the Commission had taken steps to ensure that the lessons of the Fukushima accident are “incorporated as safety enhancements without delay,” the NRC had yet to implement some of the most urgent recommendations applicable to Vogtle, even to the

point that it had not “determined whether implementation will be based on adequate protection.”

*Id.*

Chairman Jaczko also stated that the expectation that newly licensed reactors (such as Vogtle) would incorporate new Fukushima-related safety enhancements was an “implicit underpinning” of the Commission’s decision in CLI-11-05 not to stop new reactor licensing while it reviewed the implications of the Fukushima accident. *Id.* at 6-7. He also noted the practical difficulty of implementing new regulatory measures or design changes after licensing has occurred. *Id.* at 6. Finally, he observed that delaying the licensing of Vogtle 3&4 while Fukushima recommendations were implemented would be consistent with the Commission’s response to the 1979 Three Mile Island accident, when licensing was suspended while the NRC reviewed the regulatory implications of the accident and devised new safety measures.

*Id.* at 11-12.

On February 9, 2012, the Petitioners requested the Commission to issue a brief housekeeping stay in order to allow it to prepare this stay motion. The motion was denied by the Secretary in an order dated February 10, 2012.

### **3. Petitions for review**

Today, February 16, 2012, Petitioners filed petitions for review of CLI-12-02 and the AP1000 rule with the U.S. Court of Appeals for the D.C. Circuit. Petitioners have notified the Court that this Motion for a Stay has been filed and that Petitioners intend to seek a stay from the Court if the NRC denies their motion. In addition, Petitioners have notified the Court that they intend to request expedited consideration of their appeal within the week. Copies of the Petition for Review and cover letter are attached.

### III. ARGUMENT

#### A. Standard for Issuance of a Stay

Under section 10(d) of the Administrative Procedure Act (5 U.S.C. § 705), “[w]hen an agency finds that justice so requires, it may postpone the effective date of action taken by it, pending judicial review.” *See also Long Island Lighting Co.* (Shoreham Nuclear Power Station, Unit 1), CLI-92-4, 35 NRC 69, 80 (1992) (quoting *Washington Metro. Area Transit Comm’n v. Holiday Tours, Inc.*, 559 F.2d 841, 844 (D.C. Cir. 1977) (“tribunals may properly stay their own orders when they have ruled on admittedly difficult legal questions and when the equities of the case suggest that the status quo should be maintained”).

The four criteria for issuance of a stay are set forth in *Petroleum Jobbers Ass’n v. FPC*, 259 F.2d 921, 925 (D.C. Cir. 1958): (1) Has the movant made a strong showing that it is likely to prevail on the merits of its appeal? (2) Has the movant shown that, without such relief, it will be irreparably injured? (3) Would the issuance of a stay substantially harm other parties interested in the proceeding? (4) Where lies the public interest? *Natural Res. Def. Council*, CLI-76-2, 3 NRC 76, 78 (1976); *Cuomo v. NRC*, 772 F.2d 972, 974 (D.C. Circuit 1985).

In considering the four factors, “no single factor is of itself necessarily dispositive; rather, the strength or weakness of the showing by the movant on a particular factor influences principally how strong his showing on the other factors must be in order to justify the sought relief.” *Pub. Serv. Co. of New Hampshire*, (Seabrook Station, Units 1 and 2), ALAB-338, 4 NRC 10, 11 (1976). *See also Int’l Uranium (USA) Corp.* (White Mesa Uranium Mill), LBP-02-9, 55 NRC 227, 232 (2002); *Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant, Units 1 & 2), ALAB-820, 22 NRC 743, 746 n.8 (1985). By this token, the showing of an extremely strong likelihood of success on the merits reduces the strength of the required showing



on the other factors, and vice versa. *Id.* See also *Florida Power & Light Co.* (St. Lucie Nuclear Power Plant, Unit 2), ALAB-404, 5 NRC 1185, 1186-1189 (1977).

Furthermore, the “public interest must be foremost in [the agency’s] consideration.” *Consol. Edison Co. of New York Power Authority of New York* (Indian Point Station, Units 1, 2, and 3), ALAB-357, 4 NRC 542, 549 (1976) (citing *Scenic Hudson Pres. Conference v. FPC*, 354 F.2d 608, 620 (2d Cir. 1965); *Vermont Yankee Nuclear Power Corp.* (Vermont Yankee Nuclear Power Station), ALAB-124, 6 AEC 358, 362 (1973) (agency has a higher duty than to merely “sit back and call ‘balls and strikes’” between the parties).

**B. Petitioners Have a Strong Likelihood of Prevailing on the Merits of their Appeal.**

On judicial review, Petitioners have an extremely strong likelihood of prevailing upon the merits of their claim that the NRC violated NEPA by failing to address the environmental implications of the Fukushima accident in a supplement to the EIS for Vogtle 3&4 before issuing a COL. The NRC’s refusal to supplement the Vogtle 3&4 EIS to address the lessons of the Fukushima accident constitutes clear legal error that is entitled to no discretion by a reviewing court. *Citizens Against Rails-to-Trails v. Surface Trans. Bd.*, 267 F.3d 1144, 1151 (D.C. Cir. 2001) (agency’s conclusion that NEPA does not apply as a matter of law is subject to *de novo* review). See also *San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016, 1028 (9th Cir. 2006), cert. denied, 549 U.S. 1166 (2007) (applying “reasonableness” test to NRC legal determinations under NEPA).

**1. Requirements of NEPA**

NEPA forbids the Commission from issuing a reactor license unless and until it has taken a “hard look” at the environmental impacts of that licensing action. *Baltimore Gas & Electric v. NRDC*, 462 U.S. 87, 97 (1983). See also 10 C.F.R. § 51.20(b)(2) (requiring EIS for

issuance of a COL). This duty to carefully consider information regarding a project's environmental impacts is non-discretionary. *Silva v. Romney*, 473 F.2d 287, 292 (1st Cir. 1973). Federal agencies are held to a "strict standard of compliance" with the Act's requirements. *Calvert Cliff's Coordinating Comm'n v. AEC*, 449 F.2d 1109, 1112 (D.C. Cir. 1971).

Even where the impacts of a proposed licensing action have been studied and reported in an EIS, NEPA requires the agency to supplement that EIS by considering the implications of any new information that could significantly affect the action or its impacts. 10 C.F.R. § 51.92.<sup>6</sup> See also *Marsh v. Oregon Natural Res. Council*, 490 U.S. 360 (1989). This duty to supplement an EIS is not discretionary and is tempered only by a "rule of reason" by which the agency is not required to supplement an EIS when "remote and highly improbably consequences" are alleged. *San Luis Obispo Mothers for Peace v. NRC*, 751 F.2d 1287, 1301 (D.C. Circuit 1984), vacated in part and rehearing en banc on other grounds, 760 F.2d 1320 (D.C. Circuit 1985).

The duty to supplement an EIS is not avoided by a finding of compliance with NRC safety regulations. Even where the NRC has concluded that a proposed reactor operation meets its basic safety requirements, NEPA still requires the NRC to consider cost-effective alternatives for avoiding or mitigating environmental impacts that are reasonably foreseeable and yet not covered by safety regulations. *Limerick Ecology Action v. NRC*, 869 F.2d 730-31 (3rd Cir. 1989) (holding that the NRC could not rely on the sufficiency of a reactor license application under its

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<sup>6</sup> Section 51.92 requires:

(a) If the proposed action has not been taken, the NRC staff will prepare a supplement to a final environmental impact statement for which a notice of availability has been published in the Federal Register as provided in § 51.118, if:

- (1) There are substantial changes in the proposed action that are relevant to environmental concerns; or
- (2) There are new and significant circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

safety regulations to avoid considering the cost-effectiveness of severe accident mitigation alternatives under NEPA).

**2. The NRC violated NEPA by refusing to supplement the EIS for Vogtle 3&4.**

- a. CLI-12-02 establishes as a matter of law that the Fukushima accident and Task Force recommendations constitute new and significant information.

By agreeing with Chairman Jaczko that “[t]he Fukushima events were significant, warranting enhancements in safety measures,” CLI-12-02, slip op. at 82, the Commission effectively concedes that the Fukushima accident and Task Force Report constitute new and significant information warranting the supplementation of the EIS for Vogtle 3&4. The information is “new” because it has not been considered previously in NRC regulations and it is “significant” because consideration of the Task Force’s conclusions and recommendations “could reveal a seriously different picture” of the environmental and safety risks posed by Vogtle 3&4. *Hydro Res., Inc.* (P.O. Box 15910, Rio Rancho, NM 87174), CLI-01-04, 53 NRC 31, 52 (2001) (quoting *Hydro Res., Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), CLI-99-22, 50 NRC 14 (1999) and citing *Sierra Club v. Froelke*, 816 F.2d 205, 201 (5th Cir. 1987)). Thus, as a matter of law, NEPA requires the NRC to consider the environmental implications of the Fukushima accident and the Task Force recommendations in a supplemental EIS for Vogtle 3&4.

Moreover, the NRC must undertake its environmental analysis *before* licensing Vogtle 3&4, not at some unspecified time in the future. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989) (“NEPA ensures that important effects will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast”); *Andrus v. Sierra Club*, 442 U.S. 347, 350 (1979) (“The thrust of [NEPA] is . . . that

environmental concerns be integrated into the very process of decision-making”).

- b. The NRC’s determination that a Fukushima-like accident is “extremely unlikely” is invalid because it fails to address the Task Force’s conclusions.

The NRC offers a single ground for its refusal to prepare a supplemental EIS to address the environmental implications of the Fukushima accident and Task Force Report for Vogtle 3&4: that although Fukushima-like accidents in the United States would be “potentially high consequence,” they need not be considered in a supplemental EIS for Vogtle 3&4 because they have “extremely low probability.” CLI-12-02, slip op. at 74. In other words, the NRC appears to be saying that the likelihood of a Fukushima-like accident is “remote and speculative” and therefore not subject to consideration in an EIS. *See Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), CLI-01-11, 53 NRC 370, 386-87 (2001); *Vermont Yankee Nuclear Power Corp.* (Vermont Yankee Nuclear Power Station), CLI-90-4, 31 NRC 333, 334 (1990); *Vermont Yankee Nuclear Power Corp.* (Vermont Yankee Nuclear Power Station), CLI-90-7, 32 NRC 129, 131 (1990).

But the Commission’s decision is inconsistent with the Task Force Report, which did not use the word “extremely” in describing the low likelihood of Fukushima-like accidents in the U.S. Instead, the Task found that “a sequence of events like those occurring in the Fukushima accident is *unlikely to occur* in the United States and could be mitigated, reducing the likelihood of core damage and radiological releases.” Task Force Report at 18 (emphasis added). Catastrophic environmental impacts with a low likelihood must nevertheless be addressed in an EIS if they are “reasonably foreseeable.” *See* 40 C.F.R. §§ 1502.22(b)(3), (4).<sup>7</sup>

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<sup>7</sup> The EIS must include “a summary of existing credible scientific evidence which is relevant to evaluating the reasonable foreseeable significant adverse impacts on the human environment, and . . . the agency’s evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community.” *Id.* *See also San Luis*

By disregarding the Task Force’s conclusion and substituting its own without any technical basis for doing so, the majority violates NEPA’s “hard look” requirement and CLI-12-02 must be rejected as “fatally deficient.” *Ctr. for Biological Diversity v. United States Forest Serv.*, 349 F.3d 1157 (9th Cir. 2003) (finding an EIS’s failure to disclose and discuss responsible opposing scientific viewpoints violated NEPA and the implementing regulations); *Seattle Audubon Soc’y v. Moseley*, 798 F.Supp. 1473, 1479 (W.D. Wash. 1992), *aff’d sub nom Seattle Audubon Soc’y v. Espy*, 998 F.2d 699 (9th Cir. 1993) (quoting *Friends of the Earth v. Hall*, 693 F.Supp. 904, 934 (W.D. Wash. 1988) (“[a]n EIS that fails to disclose and respond to the opinions held by well respected scientists concerning the hazards of the proposed action . . . is fatally deficient.”)); *W. Watersheds Project v. Kraayenbrink*, 632 F.3d 472, 487 (9th Cir. 2010) (finding that agency failed to take a “hard look” under NEPA when it ignored concerns raised *by its own experts*); *see also Blue Mtns. Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1213 (9th Cir. 1998) (noting that an agency’s failure to discuss and consider an independent scientific report’s recommendations “lends weight to [plaintiff’s] claim that the [agency] did not take the requisite ‘hard look’ at the environmental consequences” of the project).

Here, it would not be possible for the NRC to consider the Task Force’s recommendations in any meaningful way because the NRC has not fulfilled the key recommendations that would allow it to reach an informed conclusion regarding the likelihood of a Fukushima-type accident, *i.e.*, conducting the seismic and flood hazards analyses required by Recommendation 2. In any event, the majority’s decision that the potential for a Fukushima-like accident is too unlikely to warrant consideration is directly contradicted by its own determination in CLI-12-02 that “[t]he Fukushima events were significant, warranting enhancements in safety measures.” CLI-12-02, slip op. at 82. The Commission cannot have it both ways by reassuring

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*Obispo Mothers for Peace v. NRC*, 449 F.3d 1016, 1033 (9<sup>th</sup> Cir. 2006).

the public on the one hand that it takes the lessons of the Fukushima accident seriously and claiming on the other hand that Fukushima-type accidents are too unlikely to warrant consideration in a supplement to the Vogtle 3&4 EIS. *See San Luis Obispo Mothers for Peace*, 449 F.3d at 1031 (disapproving NRC attempt “as a matter of policy, to insist on its preparedness and the seriousness with which it is responding to the post-September 11 terrorist threat, while concluding, as a matter of law, that all terrorist threats are ‘remote and highly speculative’ for NEPA purposes”).

As a matter of law, therefore, the conclusions and recommendations of the Fukushima Task Force satisfy the standard for “new and significant information” under 10 C.F.R. § 51.92(a). The NRC has no legal foundation for its conclusion that the existing EIS for Vogtle 3&4 is sufficient to comply with NEPA and need not be supplemented. Therefore CLI-12-02 must be reversed.

**C. Failure to Issue a Stay Will Cause Irreparable Harm to Petitioners and the Environment.**

As demonstrated in the attached Declaration of Dr. Arjun Makhijani, the failure to issue a stay would cause irreparable harm to Petitioners and the environment by irretrievably committing a large amount of natural resources and generating significant emissions of carbon to the environment. Makhijani Declaration, § 4.1. As Dr. Makhijani attests, the scale of construction to build new reactors is immense, utilizing a vast amount of construction materials. In addition to committing natural resources, construction will also impact air quality. Fabrication of the amount of concrete needed for two AP1000 units – roughly 300,000 metric tons – will result in emissions of large amounts of mercury and other hazardous air pollutants such as hydrochloric acid, hydrocarbons, and fine particulates responsible for increasing the occurrence of respiratory diseases. Similarly, steel production from ore involves considerable

pollution. Further, the use of diesel engines on the construction site will cause particulate, hydrocarbon, and NOx emissions. The transportation of the vast amounts of materials to the site will also cause similar air pollution and indirect water pollution and soil pollution impacts associated with production and refining of petroleum. *Id.*

Finally, the generation of carbon during construction of Vogtle 3&4 is irreversible and significant: on the order of one-and-a-half million metric tons of carbon dioxide, equivalent to that emitted by about 300,000 typical cars in one year. *Id.*

**D. The Issuance of a Stay Will Not Substantially Harm Other Parties Interested In this Proceeding.**

As discussed in Section 4.2 of Dr. Makhijani's declaration, the harm to Southern Co. from a stay of construction is essentially economic; indeed, if changes are ordered after substantial construction is done, Southern Co. will benefit from a stay rather than be harmed. The loss to its workers will be severe in case of late changes, which make an abandonment of the project more likely than early changes, because a sudden halt to construction and abandonment will mean essentially instant unemployment for thousands of workers. This has happened many times before, notably in the 1970s and 1980s when dozens of plants were cancelled due to high costs and declining growth rate of electricity use.

The financial exposure of Southern Co. is likely to be small compared to that of other parties. Southern Co. is exposed to minimal economic risk for the primary reason that Georgia electric ratepayers, not Southern Co., carry the primary financial risk for the Vogtle project. Under Georgia's Construction Work in Progress ("CWIP") law, Southern Co. may recover from the ratepayers all of the costs of construction for which they are responsible, including costs of delays or default, unless the cost is explicitly disapproved by the Public Service Commission for reasons of "fraud, concealment, failure to disclose a material fact, imprudence, or criminal

misconduct.” Ga. Code Ann. § 46-3A-7(d) (2010). Since Southern Co. is being given a green flag both by state regulators and the NRC, it will recover its investment from the ratepayers. *Id.*

Further, the Vogtle 3&4 project has received a conditional commitment for a loan guarantee from the federal government amounting to \$8.3 billion, and the loan will likely come from the Federal Financing Bank. So, in the event Southern Co. abandons the project and defaults on the loan, the United States taxpayer carries the risk. *Id.*

The cost of delaying construction must also be compared to the cost of delaying consideration of the Fukushima Task Force recommendations after a great deal of capital has been invested, all the way to the eve of operation, as proposed by the NRC in CLI-12-02. As Dr. Makhijani states, it is very costly to retrofit a plant after construction is well advanced or nearly completed. This is a cost that Southern Company has previously stated that it wishes to avoid. Southern has posted on its website a statement that the NRC’s current process for issuing combined construction permits and operating licenses is preferable to the previous practice of separately issuing a construction permit before the operating license, because the previous process resulted in “costly redesigns.”

The cost of U.S. nuclear power units built in the 1970s and 80s increased dramatically from original cost estimates. The nuclear industry has taken a number of steps to reduce the risk of capital cost escalations for new plants.

To avoid lengthy licensing processes and cost overruns that occurred during the construction of the current fleet of nuclear plants, the U.S. Nuclear Regulatory Commission has implemented changes to its licensing process that provide for the resolution of all safety and environmental issues before construction begins. The NRC, manufacturers and utilities have worked together to make changes to help prevent price escalations experienced in the 1970s and 80’s.

The prior licensing approach granted an operating license after construction was completed. *During construction, it was common for licensing requirements to change, resulting in costly redesigns.*



### **Licensing Process Today**

Today's design certification process enables plant designers to secure advance NRC approval of standardized plant designs. The early site permit process also enables companies to obtain approval from the NRC for a nuclear power plant site before deciding to build a plant. And today's process provides for issuance of a combined construction permit and operating license before construction begins. Granting a combined construction permit and operating license *signifies resolution of all safety issues associated with the plant.*

"The Plan – Avoiding Time and Cost Overruns,"

<http://www.southerncompany.com/nuclearenergy/plan.aspx> (last visited Feb. 16, 2012)

(emphasis added). Therefore, by Southern Co.'s own logic, the issuance of a stay would be in Southern Co.'s interest. Makhijani Declaration, § 4.2.

### **E. The Issuance of a Stay is in the Public Interest.**

Finally, as discussed in Sections 4.3-4.6 of Dr. Makhijani's declaration, issuance of a stay is in the public interest for three reasons. First, the costs of Fukushima-based retrofits may be significant because the NRC expects to issue orders, and may subsequently issue regulations, imposing new requirements relating to flooding, seismic events and station blackout. *Id.*, § 4.4. The costs of these requirements are likely to be significant, given that protection against flooding, seismic events, and station blackout all involve changes to reactor design rather than mere administrative measures. The costs of backfits for protection against seismic events, flooding and station blackout will be all the more expensive if they are postponed until after significant aspects of construction are complete. *Id.*

Second, if issuance of a stay is denied and Fukushima-related backfits are postponed until after the reactors are built, as proposed by the Commission, ratepayers – and potentially taxpayers – will bear increased costs of delays due to redesign and backfits. *Id.*, § 4.5.

Ratepayers currently finance construction for the Vogtle project via their monthly power bills.

Taxpayers are also at risk because an \$8.33 billion federal loan guarantee will secure the project

if Southern Co. defaults. *Id.*

Finally, issuance of a stay is in the public interest because it would be consistent with past NRC policy regarding the consideration of the implications of the Three Mile Island accident, and because considering safety improvements before construction and operation is, as a matter of policy, the most effective way to ensure that they will be implemented in a timely way. *Id.*, § 4.3 and 4.6.

### **III. CONCLUSION**

For the foregoing reasons, the Commission should grant Petitioners' motion for a stay. In the event that the Commission denies the stay motion, Petitioners request the Commission to issue a brief housekeeping stay to allow them to submit their stay request to the U.S. Court of Appeals. The issuance of a brief housekeeping stay in this case is consistent with NRC customary practice to facilitate orderly Commission and/or judicial review. *Yankee Atomic Electric Co.* (Yankee Nuclear Power Station), CLI-96-5, 43 NRC 53, 60 (1996); *Long Island Lighting Co.* (Shoreham Nuclear Power Station, Unit 1), CLI-91-8, 33 NRC 461, 468 (1991); *Sacramento Mun. Utility District* (Rancho Seco Nuclear Generating Station), CLI-92-2, 35 NRC 47, 61 (1992).

Respectfully submitted,

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February 16, 2012

### **CERTIFICATE OF COUNSEL**

Pursuant to 10 CFR § 2.323(b), I certify that I have consulted with counsel for the NRC, Ann P. Hodgdon, and Southern Nuclear Operating Company, Stan Blanton, regarding this Motion. Ms. Hodgdon opposes the Motion. An attempt was made to consult with Mr. Blanton on February 15, 2012 via electronic mail, but at the time of filing no response has been received.

Dated: February 16, 2012

*(Electronically signed by)*

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UNITED STATES OF AMERICA  
U.S. NUCLEAR REGULATORY COMMISSION  
BEFORE THE COMMISSION

In the Matter of

Southern Nuclear Operating Co.	)	
(Vogtle Electric Generating Plant,	)	Docket Nos. 52-025-COL & 52-026-COL
Units 3 and 4)	)	

**DECLARATION OF DR. ARJUN MAKHIJANI IN SUPPORT OF  
MOTION TO STAY EFFECTIVENESS OF VOGTLE COL APPROVAL**

I, Arjun Makhijani, declare as follows:

**1. Introduction and Statement of Qualifications**

1.1 I am President of the Institute for Energy and Environmental Research (“IEER”) in Takoma Park, Maryland. Under my direction, IEER produces technical studies on a wide range of energy and environmental issues to provide advocacy groups and policy makers with sound scientific information and analyses as applied to environmental and health protection and for the purpose of promoting the understanding and democratization of science. A copy of my curriculum vita is attached.

1.2 I am qualified by training and experience as an expert in the fields of plasma physics, electrical engineering, nuclear engineering, the health effects of radiation, radioactive waste management and disposal (including spent fuel), estimation of source terms from nuclear facilities, risk assessment, energy-related technology and policy issues, and the relative costs and benefits of nuclear energy and other energy sources. I have conducted numerous studies and written extensively regarding investment planning in the electricity sector, the comparative costs of nuclear power plants and other energy sources, and the safety of nuclear power.

1.3 I am the principal author of a report on the 1959 accident at the Sodium Reactor Experiment facility near Simi Valley in California, prepared as an expert report for litigation involving radioactivity emissions from that site. I am also the principal author of a book, *The Nuclear Power Deception: U.S. Nuclear Mythology from Electricity “Too Cheap to Meter” to “Inherently Safe” Reactors*” (Apex Press, New York, 1999, co-author, Scott Saleska), which examines, among other things, the safety of various designs of nuclear reactors. I am also the author of *Securing the Energy Future of the United States: Oil, Nuclear and Electricity Vulnerabilities and a Post-September 11, 2001 Roadmap for Action* (Institute for Energy and Environmental Research, Takoma Park, Maryland, December 2001). In 2004, I wrote “Atomic Myths, Radioactive Realities: Why nuclear power is a poor way to meet energy needs,” *Journal of Land, Resources, & Environmental Law*, v. 24, no. 1 at 61-72 (2004). The article was adapted from an oral presentation given on April 18, 2003, at the Eighth Annual Wallace Stegner Center Symposium entitled, “Nuclear West: Legacy and Future,” held at the University of Utah S.J. Quinney College of Law. In 2008, I prepared a report for the Sustainable Energy & Economic

Development (SEED) Coalition entitled *Assessing Nuclear Plant Capital Costs for the Two Proposed NRG Reactors at the South Texas Project Site*. I am a co-author of a forthcoming report reviewing the official post-Fukushima safety evaluation reports of Electricité de France and AREVA.

1.4 I am generally familiar with the basic design and operation of U.S. nuclear reactors, the safety and environmental risks they pose, and the economic costs of their operation. I am also familiar with 10 CFR 52 Appendix D, which relates to AP1000 design certification, the Environmental Assessments for the revised and original AP1000 designs, and other literature relating to the AP1000 and more generally to pressurized water reactors. In addition, I have examined vulnerabilities relating to the use of zircaloy as a fuel cladding material, hydrogen generation in reactors, spent fuel pool accidents and their consequences, and other matters relating to light water reactor and spent fuel pool accidents.

1.5 I am generally familiar with materials from the press, the Japanese government, the Tokyo Electric Power Company, the French government safety authorities, and the U.S. Nuclear Regulatory Commission (“NRC”) regarding the Fukushima Daiichi (“Fukushima”) accident and its potential implications for the safety and environmental protection of U.S. reactors. I have also read *Recommendations for Enhancing Reactor Safety in the 21<sup>st</sup> Century: The Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident*, July 12, 2011 (the “Task Force Review”),<sup>1</sup> published by the NRC. After the Fukushima accident began on March 11, 2011, I was one of the first experts in the United States to call attention to the dangers and potential consequences of spent fuel accidents. The analysis was written on March 13 and first issued on March 14, 2011.<sup>2</sup>

## **2. Affirmation of Previous Opinions Regarding Environmental Implications of Fukushima Accident**

2.1 In the spring of 2011, I evaluated the environmental significance of the Fukushima accident with respect to the safety of U.S. reactors and new reactor designs for a group of environmental organizations. In mid-April 2011, I completed work on a declaration stating my opinion that although the causes, evolution, and consequences of the Fukushima accident were not yet fully clear a month after the accident began, it was already presenting new and significant information regarding the risks to public health and safety and the environment posed by the operation of nuclear reactors. In my declaration I also stated my conclusion that the integration of new information from the Fukushima accident into the NRC’s licensing process could affect the outcome of safety and environmental analyses for reactor licensing decisions by resulting in the denial of new licenses or existing license extensions or the imposition of new conditions and/or new regulatory requirements. I also expressed the opinion that the new information could also affect the NRC’s evaluation of the fitness of new reactor designs for certification. The environmental organizations submitted my declaration to the NRC in support of a legal petition

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<sup>1</sup> NRC 2011. A bibliography is attached.

<sup>2</sup> Makhijani 2011-03.

to suspend licensing decisions while the NRC investigated the regulatory implications of the Fukushima accident.<sup>3</sup>

2.2 In July 2011, the NRC's Fukushima Task Force issued the above-described Task Force Review. Shortly thereafter, I evaluated the environmental and safety significance of the Task Force Review's conclusions with respect to U.S. reactors and new reactor designs for the same environmental organizations. On August 8, 2011, I prepared a declaration explaining why the Task Force Review provides further support for my opinions that the Fukushima accident presents new and significant information regarding the risks to public health and safety and the environment posed by the operation of nuclear reactors and that the integration of this new information into the NRC's licensing process could affect the outcome of safety and environmental analyses for reactor licensing and relicensing decisions and the NRC's evaluation of the fitness of new reactor designs for certification. My declaration was submitted by environmental organizations who requested hearings on the environmental implications of the Fukushima accident and Task Force Review.<sup>4</sup>

2.3 My opinion is that the Fukushima accident and the Task Force Review present new and significant information regarding the risks to public health and safety and the environment posed by the operation of nuclear reactors. Further, the integration of this new information into the NRC's licensing process could affect the outcome of safety and environmental analyses for reactor licensing decisions and the fitness of new reactor designs for certification has been reinforced by events at Fukushima Daiichi since then. To my knowledge, no one had imagined that a multi-reactor accident could continue for nearly a year. This makes it critical to consider and incorporate the safety lessons of the Fukushima accident before licensing new reactors or certifying their designs. It is reasonable to expect that the implementation of the Fukushima Task Force recommendations will affect the NRC's requirements for the Vogtle 3 and 4 reactors and the underlying AP1000 standardized design, which were both recently approved by the NRC. The new and significant information presented by the Fukushima accident and the Task Force Review should have been considered in a supplemental EIS for Vogtle 3 and 4 before the combined license ("COL") was issued, and that the supplemental environmental review should have included all relevant issues in the Task Force recommendations for the AP1000 design.

### **3. Purpose of Declaration and Summary of Expert Opinion**

3.1 The purpose of this declaration is to support the Motion for a Stay of Construction Pending Judicial Review that has been submitted to the NRC by the Southern Alliance for Clean

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<sup>3</sup> Declaration of Dr. Arjun Makhijani in Support of Emergency Petition to Suspend all Pending Reactor Licensing Decisions and Related Rulemaking Decisions Pending Investigation of Lessons learned from Fukushima Daiichi Nuclear Power Station accident (April 19, 2011), submitted in support of Emergency Petition to Suspend All Pending Reactor Licensing Decisions and Related Rulemaking Decisions Pending Investigation of Lessons learned From Fukushima Daiichi Nuclear Power Station Accident (April 14-18, 2011).

<sup>4</sup> Declaration of Dr. Arjun Makhijani Regarding Safety and Environmental Significance of NRC Task Force Report Regarding Lessons Learned From Fukushima Daiichi Nuclear Power Station Accident (August 8, 2011), submitted in support of Motion to Reopen the Record and Admit Contention to Address the Safety and Environmental Implications of the Nuclear Regulatory Commission Task Force Report on the Fukushima Dai-ichi Accident (August 11, 2011).

Energy, Blue Ridge Environmental Defense League, Center for a Sustainable Coast, and Georgia Women’s Action for New Directions (collectively, “Petitioners”). I will explain why, in my professional opinion, continuing construction of Vogtle 3 and 4 while the D.C. Circuit Court of Appeals reviews the licensing decision and AP1000 design certification would cause irreparable harm to the environment and persons living nearby. This harm could be avoided by issuing a stay of construction.

3.2 I will also explain why the comparative harm to Southern Nuclear Operating Company (“Southern Co.”) caused by the issuance of a stay of construction would be much less than the harm to Petitioners.

3.3 Finally, I will explain why the public interest would be served by halting construction on the new reactors pending completion of a supplemental environmental impact statement (“EIS”) that addresses the environmental implications of the Fukushima accident and the conclusions and recommendations of the Task Force Review.

#### **4. Statement of Professional Opinion**

##### **4.1 Irreparable Harm to Petitioners**

4.1.1 In my professional opinion, the construction activities planned for Vogtle 3 and 4 over the next year will have significant and irreparable adverse environmental impacts by irretrievably committing a large amount of natural resources and generating significant emissions of carbon to the environment.

4.1.2 On February 10, 2012, the NRC issued the COL for Vogtle, which allows it to conduct all aspects of construction and operation. Prior to February 10, Southern Co. had cleared the Vogtle 3 and 4 site.<sup>5</sup> A recent slide presentation to the NRC by Southern Co. shows that it plans to do a substantial amount of construction in 2012, including installation of rebar, laying of the turbine building foundation, and construction of other structures on the site.<sup>6</sup>

4.1.3 The scale of construction required to build new reactors is immense, utilizing a vast amount of construction materials. For example, the following table shows typical materials requirements for each new evolutionary light water reactor designs (AP1000, ABWR, ESBWR, EPR):

Concrete	350,000 cubic meters
Reinforcing steel and embedded parts	46,000 metric tons
Structural steel and miscellaneous steel	25,000 metric tons
Large bore pipe	8,000 meters
Small bore pipe	13,000 meters
Cable tray	67,000 meters
Conduit	370,000 meters

Source: World Nuclear Association 2011

<sup>5</sup> Southern Company 2012 Update, Slides 36 and 37

<sup>6</sup> Southern Company 2012 Update, Slide 13



4.1.4 For the Southern Company Vogtle project, all these estimates must be doubled since two reactors are proposed to be built.

4.1.5 In addition to committing natural resources, construction will also impact air quality. More than one-and-a-half million metric tons of concrete will be needed for two AP1000 units, which in turn will require huge amounts of cement. Cement kilns emit large amounts of mercury and other hazardous air pollutants, like hydrochloric acid, hydrocarbons, and fine particulates responsible for increasing respiratory disease, so much so that the EPA has recently issued rules tightening emissions.<sup>7</sup> Similarly steel production from ore involves considerable pollution. According to the EPA, iron and steel production involves air emissions of carbon monoxide, sulfur oxides, nitrogen oxides, and fine particulates, discharges of contaminants in wastewater, and generation of hazardous and solid wastes.<sup>8</sup>

4.1.6 Further, on-site, the use of the construction equipment involves the use of diesel engines, which cause emissions of particulates, hydrocarbons, and nitrogen oxides. Finally, transportation of these vast amounts of materials to the site will also directly cause similar air pollution and, indirectly, water pollution and soil pollution impacts associated with petroleum production and refining.

4.1.7 The generation of carbon dioxide (CO<sub>2</sub>) during construction of Vogtle 3 and 4 is irreversible and significant. For instance, the construction of two Vogtle units, which will generate on the order of one-and-a-half million metric tons of carbon dioxide,<sup>9</sup> is equivalent to the CO<sub>2</sub> emissions from nearly 300,000 typical cars in one year.<sup>10</sup>

## **4.2 Harm to Southern Co.**

4.2.1 The potential harm to Southern Co. from a stay of construction is essentially economic; indeed, if changes are ordered after substantial construction is done, Southern will benefit from a stay rather than be harmed. This is because costs to all parties involved – Southern Company, workers, ratepayers and taxpayers, will be greater in case of later backfits compared to incorporation of safety changes before licensed construction begins. The loss to its workers will be severe in case of late changes, which make an abandonment of the project more likely than early changes, because a sudden halt to construction and abandonment will mean essentially instant unemployment for thousands of workers. This has happened many times before, in the 1970s and 1980s, when dozens of plants were cancelled due to high costs and declining growth rate of electricity use. But the financial exposure of Southern Co. is likely to be small compared to that of other parties. Southern Co. is exposed to minimal economic risk for the primary reason that Georgia electric ratepayers, not Southern Co., carry the primary financial risk for the Vogtle

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<sup>7</sup> EPA 2011

<sup>8</sup> EPA Steel 2011.

<sup>9</sup> World Nuclear Association 2011. Converted from energy data provided using average US CO<sub>2</sub> emissions per unit of energy use. Estimates of the energy input into construction vary somewhat. The variations are likely due to different assumptions about energy inputs into the materials used and on the on-site energy using during construction. In any case, the CO<sub>2</sub> emissions associated with the construction of nuclear plants are very large.

<sup>10</sup> Rounded to one significant figure.

project. It is my understanding that under Georgia's Construction Work in Progress ("CWIP") law, Southern Co. may recover from the ratepayers all of the costs of construction for which they are responsible, including costs of delays or default, unless the cost is explicitly disapproved by the Public Service Commission for reasons of "fraud, concealment, failure to disclose a material fact, imprudence, or criminal misconduct."<sup>11</sup> This is very high bar for denial of recovery. Southern Co. has been given the go-ahead both by state regulators and the NRC. Therefore, it will very likely be able to recover whatever its own investment may be from the ratepayers even if it abandons the project. In effect, at present, it has, as the popular saying in investment circles goes, little or no "skin in the game" in the sense that it stands to lose little, and maybe none, of stockholders' money in the event of abandonment of the project. It can look forward to construction, believing that all expenses incurred are prudent and recoverable.

4.2.2 Further, the Vogtle 3 and 4 project has received a conditional commitment for a loan guarantee from the federal government amounting to \$8.3 billion, and the loan will likely come from the Federal Financing Bank.<sup>12</sup> So, in the event Southern Co. abandons the project and defaults on the loan, the United States taxpayer carries the risk.

4.2.3 The cost of delaying construction must also be compared to the cost of delaying consideration of the Fukushima Task Force recommendations after a great deal of capital has been invested, all the way to the eve of operation, as proposed by the NRC in CLI-12-02. It is very costly to retrofit a plant after it is nearly completed. This is a cost that Southern Company has previously stated that it wishes to avoid. Southern has posted on its website a statement that the NRC's current process for issuing combined construction permits and operating licenses is preferable to the previous practice of separately issuing a construction permit before the operating license, because the previous process resulted in "costly redesigns:"

The cost of U.S. nuclear power units built in the 1970s and 80s increased dramatically from original cost estimates. The nuclear industry has taken a number of steps to reduce the risk of capital cost escalations for new plants.

To avoid lengthy licensing processes and *cost overruns* that occurred during the construction of the current fleet of nuclear plants, the U.S. Nuclear Regulatory Commission has implemented changes to its licensing process that provide for the resolution of all safety and environmental issues before construction begins. The NRC, manufacturers and utilities have worked together to make changes to help prevent price escalations experienced in the 1970s and 80's.

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<sup>11</sup> Ga. Code Ann. § 46-3A-7(d) (2010).

<sup>12</sup> The official description of the Federal Financing Bank is as follows: "The Federal Financing Bank (FFB) is a *government corporation*, created by Congress in 1973 under the general supervision of the Secretary of the Treasury. The FFB was established to centralize and reduce the cost of federal borrowing, *as well as federally-assisted borrowing from the public*. The FFB was also established to deal with federal budget management issues which occurred when off-budget financing flooded the government securities market with offers of a variety of government-backed securities that were competing with Treasury securities. Today the FFB has statutory authority to purchase any obligation issued, sold, or guaranteed by a federal agency to ensure that fully guaranteed obligations are financed efficiently." Federal Financing Bank 2012. Italics added.

The prior licensing approach granted an operating license after construction was completed. *During construction, it was common for licensing requirements to change, resulting in costly redesigns.*

### **Licensing Process Today**

Today's design certification process enables plant designers to secure advance NRC approval of standardized plant designs. The early site permit process also enables companies to obtain approval from the NRC for a nuclear power plant site before deciding to build a plant. And today's process provides for issuance of a combined construction permit and operating license before construction begins. Granting a combined construction permit and operating license *signifies resolution of all safety issues associated with the plant.*<sup>13</sup>

4.2.4 Therefore, by Southern Company's own logic, the issuance of a stay until resolution of all safety issues would be in its interest.

### **4.3 Public Interest in Issuance of a Stay**

4.3.1 In my professional opinion, the public interest would be served by the issuance of a stay in this case for three reasons. First, the costs of Fukushima-based retrofits may be significant, and if they are considered before construction of Vogtle 3 and 4 begins in a supplemental EIS, the cost-benefit analysis for Vogtle 3 and 4 may change and tip toward other more affordable energy sources. Second, the possibility that backfits would be ordered later in the process has been raised by the NRC itself.<sup>14</sup> If these backfits are postponed until after construction is well advanced ratepayers—and potentially taxpayers—will bear increased costs of delays due to redesign and backfits. Finally, issuance of a stay is in the public interest because it would be consistent with past NRC policy regarding the consideration of the implications of the Three Mile Island accident, and because considering safety improvements before construction and operation is, as a matter of policy, the most effective way to ensure that they will be implemented in a timely way. Indeed, a principal reason for issuing new regulations enabling a single combined construction and operating license, rather than two licenses, one for construction and another for operation, was to avoid the inefficiencies, delays, and high costs that typified the two-step licensing process. This is recognized by Southern Company as illustrated by the quote above. The Nuclear Energy Institute, association of the nuclear industry, has expressed a similar view:

### **Shortcomings of Old Licensing Process**

The federal government licensed most of today's 104 U.S. nuclear power plants during the 1960s and 1970s. Commercial nuclear energy was an emerging technology, and the regulatory process evolved with the new industry. The regulatory agency issued a construction permit for a plant based on a preliminary design. Safety issues were not fully resolved until the plant was essentially

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<sup>13</sup> Southern Company 2012 Plan

<sup>14</sup> NRC Comment Response 2011, p. 16.

complete—a process flaw that had substantial financial implications.

Another shortcoming of the process was that the public did not have access to the details of the design until construction was almost finished.

...

### **Combined Construction and Operating License**

The licensing process for new nuclear power plants provides for issuance of a combined construction permit and operating license (COL). *Granting a COL signifies resolution of all safety issues associated with the plant.*<sup>15</sup>

## **4.4 Potentially significant costs of Fukushima backfits**

4.4.1 The recommendations of the Task Force cover a range of significant regulatory issues related to both the design and operation of nuclear reactors, including new reactors such as Vogtle 3 and 4. As summarized by NRC Chairman Jaczko in his dissent from CLI-12-02:

The Task Force identified twelve overarching recommendations for improving safety of operating and new nuclear reactors. These included measures to ensure protection against earthquakes and flooding, measures to minimize potential hazards from those events and measures to improve emergency preparedness and responses. More broadly, the Task Force recommended strengthening our regulatory framework by making it more logical, systematic and coherent. Taken together, the recommendations were intended to clarify and strengthen our regulatory framework to protect against and mitigate the consequences of natural disaster, enhance emergency preparedness, and improve the effectiveness of our regulatory programs.<sup>16</sup>

4.4.2 As Chairman Jaczko points out in his dissent, “new safety enhancements are under development, some of which I consider necessary for adequate protection...”<sup>17</sup> Those that are necessary for adequate protection cannot be rejected on the basis of their cost. They have not been applied to Vogtle 3 and 4. .

4.4.3 As Chairman Jaczko also points out, the NRC “expect[s] to issue a number of orders imposing new requirements relating to flooding, seismic events and station blackout as well as information requests in March 2012.”<sup>18</sup> And these are “only the initial phase” of the NRC’s post-Fukushima regulatory actions.<sup>19</sup> The recommendations that must be implemented also include rulemakings, which by their very nature have an even broader reach.<sup>20</sup>

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<sup>15</sup> NEI 2012, italics added.

<sup>16</sup> Dissenting Opinion, p, 5 in CLI-12-02 .

<sup>17</sup> *Id.* at 5.

<sup>18</sup> *Id.* at 5.

<sup>19</sup> *Id.* .

<sup>20</sup> NRC SECY-11-0124

4.4.4 The costs of these requirements are likely to be significant, given that protection against flooding, seismic events, and station blackout all involve changes to reactor design rather than mere administrative measures. The costs of backfits for protection against seismic events, flooding, and station blackouts will be all the more expensive if they are postponed until after significant aspects of construction are complete. As recognized in Southern Company's website statement quoted above in par. 4.2.3, as a general rule it is more costly to redesign and backfit a reactor under construction than it is to resolve all issues before beginning reactor construction.

4.4.5 For instance, if the ground acceleration for the design basis earthquake was raised to correspond to more severe earthquakes than were incorporated into the original Vogtle or AP1000 design, the same level of safety would require more robust reactors. Seismic upgrades are likely to be expensive if they are backfitted after construction is advanced or completed. The U.S. Department of Energy's "K-Reactor" at the Savannah River Site in South Carolina, located just across the Savannah River from Vogtle, provides a good example of how changes in a seismic hazard analysis can drastically affect the cost of a nuclear reactor. At 3,415 megawatts-thermal, the AP1000<sup>21</sup> is more than a third larger than the K-reactor, which had a rated thermal power of 2,500 megawatts.<sup>22</sup> The K-reactor was built in the early 1950s; seismic upgrades were made after safety became a very public concern towards the end of the Cold War in the late 1980s, more than two decades prior to the most recent conclusions of elevated hazards in the eastern region. The cost of these upgrades, completed in the early 1990s, was about \$870 million, or about \$1.3 billion in today's dollars for a single reactor that was somewhat smaller than the proposed Vogtle reactors.<sup>23</sup>

4.4.6 A cost comparable to the K-reactor seismic backfit for both Vogtle units could run into billions of dollars, with additional costs for carrying the capital during the delays. Near the end of the construction process, when the two reactors would be nearly complete, Georgia ratepayers and the federal government will have an extremely large amount of capital at risk – up to \$14 billion just before completion, presuming there are no cost overruns before then. At a nominal carrying cost of capital of about 10.6 percent (usual in such calculations<sup>24</sup>), NRC requirements that result in delays due to design and implementation of backfits would be \$20 million to \$29 million *per week* (rounded) if the capital invested at the time the retrofit is ordered is in the \$10 billion to \$14 billion range. The costs of the backfits would be in addition to these costs.

4.4.7 It is important to note that, the possibility of seismic upgrades to reactors in the eastern United States looms larger with the publication of a recent EPRI- DOE-NRC 2012 study. On January 31, a week-and-a-half before issuing the license for Vogtle, the NRC announced the publication of a study on seismic hazards in the Central and Eastern United States.<sup>25</sup> In announcing the study the NRC noted that "[t]he new seismic model will be used by nuclear power plants in the central and eastern United States for these re-evaluations, *in addition to being used for*

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<sup>21</sup> Westinghouse 2003

<sup>22</sup> Bailey, Kalinich, and Chou 1992, p. 1

<sup>23</sup> Wald 1991 and SRS 2011.

<sup>24</sup> This represents 8.6% for the constant dollar weighted cost (mix of equity and bonds) cost of capital and 2% inflation. CEC 2008.

<sup>25</sup> EPRI- DOE-NRC 2012



*licensing of new nuclear facilities.”*<sup>26</sup> But the NRC did not conduct this review for Vogtle 3 and 4 prior to licensing, even though Vogtle lies about 120 miles from the 1886 Charleston earthquake, a major seismic event. Moreover, it is highly important to note that the NRC announcement stated that the results of the study “indicate that estimates of the seismic hazard have increased with respect to some operating nuclear plant sites in the Central and Eastern United States” and that “sample calculations indicate that *the largest predicted ground motions could occur in the vicinity of repeated large magnitude earthquake sources, such as New Madrid, Mo., and Charleston, S.C.*”<sup>27</sup>

4.4.8 If more severe earthquakes than were incorporated into the original design were required for safety, the costs could be significant and increase the attractiveness of alternatives. Protection of the Vogtle reactors against updated flood hazards could also involve significant costs, if the updated evaluations indicate the need for backfits at the Vogtle site.

#### **4.5 Ratepayers and taxpayers will bear the brunt of costs**

4.5.1 Under the Construction Work in Progress (“CWIP”) law cited above, ratepayers currently contribute to the financing of construction for the Vogtle project via their monthly power bills. Taxpayers are also at risk because an \$8.33 billion federal loan guarantee will secure the project if Southern Co. defaults.<sup>28</sup> The loan will likely be provided by the Federal Financing Bank.<sup>29</sup> Retrofits substantially increase costs of the project, increasing the risk of default and eroding the competitive costs of nuclear power compared to alternative forms of energy. Therefore it is in the interest of the ratepayers and taxpayers who are very likely to ultimately bear the costs of the project’s failure, to issue a stay and ensure that all pertinent safety issues are resolved before construction resumes

#### **4.6 Postponing Fukushima safety improvements until after construction severely undermines consideration of alternatives**

4.6.1 If Southern is permitted to go ahead with construction of Vogtle 3 and 4 and Fukushima-related backfits are imposed after a significant amount of construction is complete, it will not be possible to evaluate whether going ahead with construction of the reactors is cost-effective. Not only are the costs of retrofits likely to be greater if they are imposed after construction has been completed – or even substantially completed -- but an up-front accounting of the costs allows a comparison with other alternative energy sources that are more cost-effective. Even the Nuclear Energy Institute has acknowledged (as is clear from the quote above) that the public is deprived of timely information under the old licensing process when regulatory changes happened during construction. (“Another shortcoming of the process *was that the public did not have access to the details of the design until construction was almost finished.*”<sup>30</sup>) One of the needed details is of course, the estimated cost of the project.

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<sup>26</sup> NRC News 2012, italics added.

<sup>27</sup> NRC News 2012, italics added.

<sup>28</sup> DOE 2011

<sup>29</sup> Southern Company 2010

<sup>30</sup> NEI 2012, italics added.

4.6.2 As noted above, if seismic backfits are required at a late stage, the delays could stretch for a year or more, the backfit costs could run into billions; carrying costs of capital would add roughly a billion dollars per year of delay. The cost of power from Vogtle is already high compared to the alternatives. At \$14 billion and 90 percent capacity factor, with 10.6 percent average cost of capital, a 2% inflation rate, and assuming no delays and cost overruns, the levelized cost of power from Vogtle at the busbar of the power plant would be about 9 cents per kWh. When the cost of transmission and distribution is added, the cost of power from the new Vogtle units would be in the range of 13 to 14 cents per kWh. This is greatly in excess of the residential electricity cost of about 10 cents per kWh in Georgia.<sup>31</sup> The cost of natural gas on the spot market today is about \$2.50 per million Btu. At \$5 per million Btu (the approximate cost of natural gas for Georgia power plants in 2010<sup>32</sup>) for a long term contract delivered to the power plant, the levelized cost of power from a combined cycle power plant at the busbar would be about 6 cents per kWh, including a 2% inflation rate in the price of gas (capital and operating costs for combined cycle power plants based on an advanced natural gas combined cycle plant<sup>33</sup>). Hence, the cost to residential customers of this power from combined cycle plants would therefore be about the same as at present, even if there were a two percent per year inflation in natural gas costs. Vogtle is already uneconomical – being about 50 percent more expensive at the busbar than combined cycle power (9 cents per kWh for Vogtle compared to 6 cents for combined cycle natural gas). This is a central reason there is no nuclear renaissance in sight. Significant cost increases are likely to be devastating to the project and reduce the growth rate for electricity.

4.6.3 Finally, to stay construction of Vogtle 3 and 4 is in the public interest because it ensures that Fukushima-related regulatory changes and backfits will be fully and adequately considered. In his dissent, Chairman Jaczko noted “is the difficulty of requiring timely compliance with new safety requirements that are not tied down in the license.”<sup>34</sup> This in essence means that to be assured of implementation, safety changes should be tied to the granting of the license. This was implicitly recognized by the NRC in responding to the Three Mile Island accident, when the NRC suspended all licensing decisions while it studied the regulatory implications of the accident. In explaining his dissent, Chairman Jaczko noted that after the TMI accident there was a “comprehensive assessment” and “licensing pause” to “ensure that “lessons learned from the accident were appropriately accounted for with respect to operating reactors and new reactor applications that were under review.”<sup>35</sup> Yet, no licensing pause has followed the Fukushima accident, even though it was far more serious and severe in every respect than the TMI accident. By suspending reactor licensing while it investigated the implications of the accident and strengthened its regulations, the NRC ensured that safety improvements would be made before operation began.

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<sup>31</sup> EIA 2012, p. 65.

<sup>32</sup> EIA 2012, p. 64. Prices of natural gas have been declining since 2010. The most recent data for prices to electricity producers published by the Energy Information Administration shows a price of \$4.47 in October 2011. (EIA Natural Gas Prices 2012) In contrast, the calculation for natural gas electricity costs here actually assumes that prices will rise at 2% per year.

<sup>33</sup> EIA 2010, Table 1, estimated at 80 percent capacity factor.

<sup>34</sup> Dissenting opinion at 6. in CLI-12-02

<sup>35</sup> *Id.* at 11.

## 5. Conclusion

5.1 The construction of nuclear reactors involves a vast amount of materials like steel and cement. Their production and transport creates considerable amounts of water and air pollution, including emissions of mercury, particulates, and hydrocarbons. In addition, construction causes emissions of huge amounts of CO<sub>2</sub> – equivalent to emissions from about 300,000 typical cars over one year. This environmental harm cannot be remedied or fixed if the new Vogtle reactors are cancelled or significantly altered as a result of Fukushima-related regulatory backfits ordered after construction is well advanced. This irreparable harm should be avoided.

5.2 Moreover, regulatory changes are in the offing as a result of the review of the Fukushima accident by the NRC and the acceptance of all the recommendations of the Task Force by the Commission. These regulatory changes will likely require changes in the reactor design for Vogtle 3 and 4. And, as noted above, such changes are far less expensive to make at the start of the process than after construction is well advanced or nearly complete. Thus, the public interest is served by staying construction while the U.S. District Court of Appeals determines if the Vogtle EIS must be supplemented to account for the lessons learned from Fukushima. The stay is all the more important, because allowing construction to continue, and then requiring backfits at a later date, puts the public's money at risk; based on present approvals, Southern Company faces little or no financial risk. Taxpayers, via a loan guarantee, and ratepayers via payments called "construction work in progress," will bear essentially all of the costs that are incurred if Southern Company walks away from high post-Fukushima retrofit costs after construction is well advanced.

5.3 It is far better and much more prudent, environmentally and economically, to consider the changes that will be required of the Vogtle reactor - before construction continues, not after it is well advanced or nearly complete. Indeed, it appears that the Southern Company's own website indicates agreement with this view as indicated in the quotation in par. 4.2.3 above. So apparently does the nuclear industry, as represented by the Nuclear Energy Institute, which has stated that "[g]ranting a COL signifies resolution of all safety issues associated with the plant."<sup>36</sup> In the case of the Vogtle 3 and 4 project, all safety issues were not resolved prior to the issuance of the combined construction and operating license.

The facts presented above are true and correct to the best of my knowledge, and the opinions expressed therein are based on my best professional judgment.



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Dr. Arjun Makhijani

Date: 16 February 2012

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<sup>36</sup> NEI 2012, italics added.



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## **Curriculum Vita of Arjun Makhijani**

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A recognized authority on energy issues, Dr. Makhijani is the author and co-author of numerous reports and books on energy and environment related issues, including two published by MIT Press. He was the principal author of the first study of the energy efficiency potential of the US economy published in 1971. He is the author of *Carbon-Free and Nuclear-Free: A Roadmap for U.S. Energy Policy* (2007).

In 2007, he was elected Fellow of the American Physical Society. He was named a Ploughshares Hero, by the Ploughshares Fund (2006); was awarded the Jane Bagley Lehman Award of the Tides Foundation in 2008 and the Josephine Butler Nuclear Free Future Award in 2001; and in 1989 he received The John Bartlow Martin Award for Public Interest Magazine Journalism of the Medill School of Journalism, Northwestern University, with Robert Alvarez. He has many published articles in journals and magazines as varied as *The Bulletin of the Atomic Scientists*, *Environment*, *The Physics of Fluids*, *The Journal of the American Medical Association*, and *The Progressive*, as well as in newspapers, including the *Washington Post*.

Dr. Makhijani has testified before Congress, and has appeared on ABC World News Tonight, the CBS Evening News, CBS 60 Minutes, NPR, CNN, and BBC, among others. He has served as a consultant on energy issues to utilities, including the Tennessee Valley Authority, the Edison Electric Institute, the Lawrence Berkeley Laboratory, and several agencies of the United Nations.

### ***Education:***

- Ph.D. University of California, Berkeley, 1972, from the Department of Electrical Engineering. Area of specialization: plasma physics as applied to controlled nuclear fusion. Dissertation topic: multiple mirror confinement of plasmas. Minor fields of doctoral study: statistics and physics.
- M.S. (Electrical Engineering) Washington State University, Pullman, Washington, 1967. Thesis topic: electromagnetic wave propagation in the ionosphere.
- Bachelor of Engineering (Electrical), University of Bombay, Bombay, India, 1965.

### ***Current Employment:***

- 1987-present: President and Senior Engineer, Institute for Energy and Environmental Research, Takoma Park, Maryland. (part-time in 1987).
- February 3, 2004-present, Associate, SC&A, Inc., one of the principal investigators in the audit of the reconstruction of worker radiation doses under the Energy Employees Occupational Illness Compensation Program Act under contract to the Centers for Disease Control and Prevention, U.S. Department of Health and Human Services.

### ***Other Long-term Employment***

- 1984-88: Associate Professor, Capitol College, Laurel, Maryland (part-time in 1988).
- 1983-84: Assistant Professor, Capitol College, Laurel, Maryland.
- 1977-79: Visiting Professor, National Institute of Bank Management, Bombay, India. Principal responsibility: evaluation of the Institute's extensive pilot rural development program.
- 1975-87: Independent consultant (see page 3 for details)
- 1972-74: Project Specialist, Ford Foundation Energy Policy Project. Responsibilities included research and writing on the technical and economic aspects of energy conservation and supply in the U.S.; analysis of Third World rural energy problems; preparation of requests for proposals; evaluation of proposals; and the management of grants made by the Project to other institutions.
- 1969-70: Assistant Electrical Engineer, Kaiser Engineers, Oakland California. Responsibilities included the design and checking of the electrical aspects of mineral industries such as cement plants, and plants for processing mineral ores such as lead and uranium ores. Pioneered the use of the desk-top computer at Kaiser Engineers for performing electrical design calculations.

### ***Professional Societies:***

- Institute of Electrical and Electronics Engineers and its Power Engineering Society
- American Physical Society (Fellow)
- Health Physics Society
- American Association for the Advancement of Science

### ***Awards and Honors:***

- The John Bartlow Martin Award for Public Interest Magazine Journalism of the Medill School of Journalism, Northwestern University, 1989, with Robert Alvarez
- The Josephine Butler Nuclear Free Future Award, 2001
- Ploughshares Hero, Ploughshares Fund, 2006
- Elected a Fellow of the American Physical Society, 2007, "*For his tireless efforts to provide the public with accurate and understandable information on energy and environmental issues*"
- Jane Bagley Lehman Award of the Tides Foundation, 2007/2008



***Committee Member, Radiation Advisory Committee, Science Advisory Board, U.S. Environmental Protection Agency, 1992-1994***

***Invited Faculty Member, Center for Health and the Global Environment, Harvard Medical School:*** Annual Congressional Course, *Environmental Change: The Science and Human Health Impacts*, April 18-19, 2006, Lecture Topic: An Update on Nuclear Power - Is it Safe?

***Consulting Experience, 1975-1987***

Consultant on a wide variety of issues relating to technical and economic analyses of alternative energy sources; electric utility rates and investment planning; energy conservation; analysis of energy use in agriculture; US energy policy; energy policy for the Third World; evaluations of portions of the nuclear fuel cycle.

Partial list of institutions to which I was a consultant in the 1975-87 period:

- Tennessee Valley Authority
- Lower Colorado River Authority
- Federation of Rocky Mountain States
- Environmental Policy Institute
- Lawrence Berkeley Laboratory
- Food and Agriculture Organization of the United Nations
- International Labour Office of the United Nations
- United Nations Environment Programme
- United Nations Center on Transnational Corporations
- The Ford Foundation
- Economic and Social Commission for Asia and the Pacific
- United Nations Development Programme

***Languages:*** English, French, Hindi, Sindhi, and Marathi.

***Reports, Books, and Articles (Partial list)***

(Newsletter, newspaper articles, excerpts from publications reprinted in books and magazines or adapted therein, and other similar publications are not listed below)

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Makhijani, A., and A.J. Lichtenberg, *An Assessment of Energy and Materials Utilization in the U.S.A.*, University of California Electronics Research Laboratory, Berkeley, 1971.

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Makhijani, A., A.J. Lichtenberg, M. Lieberman, and B. Logan, "Plasma Confinement in Multiple Mirror Systems. I. Theory," *Physics of Fluids* 17 (1974): 12911301.

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Makhijani, A., *Experimental Irradiation of Air Force Personnel During Operation Redwing - 1956*, Environmental Policy Institute, Washington, D.C., 1985.

Makhijani, A., and R.S. Browne, "Restructuring the International Monetary System," *World Policy Journal* (Winter 1985-86).

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Makhijani, A., and Brice Smith, *The Role of E.I. du Pont de Nemours and Company (Du Pont) and the General Electric Company in Plutonium Production and the Associated I-131 Emissions from the Hanford Works*, Institute for Energy and Environmental Research, Takoma Park, Maryland, March 30, 2004.

Makhijani, A., Peter Bickel, Aiyu Chen, and Brice Smith, *Cash Crop on the Wind Farm: A New Mexico Case Study of the Cost, Price, and Value of Wind-Generated Electricity*, Institute for Energy and Environmental Research, Takoma Park, Maryland, April 2004.

Makhijani, A., Lois Chalmers, and Brice Smith, *Uranium Enrichment: Just Plain Facts to Fuel an Informed Debate on Nuclear Proliferation and Nuclear Power*, Institute for Energy and Environmental Research, Takoma Park, Maryland, October 15, 2004.

Makhijani, A., and Brice Smith, *Costs and Risks of Management and Disposal of Depleted Uranium from the National Enrichment Facility Proposed to be Built in Lea County New Mexico by LES*, Institute for Energy and Environmental Research, Takoma Park, Maryland, November 24, 2004.

Makhijani, A., project director, *Examen critique du programme de recherche de l'ANDRA pour déterminer l'aptitude du site de Bure au confinement géologique des déchets à haute activité et à vie longue: Rapport final*, prepared for the Comité Local d'Information et de Suivi du Laboratoire de Bure (CLIS); coordinator: Annie Makhijani; authors: Detlef Appel, Jaak Daemen, George Danko, Yuri Dublyansky, Rod Ewing, Gerhard Jentzsch, Horst Letz, Arjun Makhijani, Institute for Energy and Environmental Research, Takoma Park, Maryland, December 2004.

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Makhijani, A., and Brice Smith, *Dangerous Discrepancies: Missing Weapons Plutonium in Los Alamos National Laboratory Waste Accounts*, Institute for Energy and Environmental Research, Takoma Park, Maryland, April 21, 2006.

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CV updated February 16, 2012





February 16, 2012

Mark J. Langer, Clerk  
U.S. Court of Appeals for the District of Columbia Circuit  
333 Constitution Ave. N.W.  
Washington, D.C. 20001-2866

Dear Mr. Langer:

Enclosed for filing please find the original and four copies of two Petitions for Review:

1. Petition for Review of NRC Memorandum and Order CLI-12-02 and
2. Petition for Review of NRC AP1000 Rule.

In addition, I am enclosing a check for \$900 to cover the filing fee for both appeals, as well as the corporate disclosure statements required by Circuit Rule 26.1.

These petitions seek review of decisions by the U.S. Nuclear Regulatory Commission ("NRC") that allow the construction and operation of Units 3 and 4 of the Vogtle nuclear power plant. CLI-12-02 approves the issuance of a combined license ("COL") for the construction and operation of Vogtle 3&4 and the AP1000 Rule approves the underlying design. The NRC issued the license on February 10.

The Petitioners wish to inform the Court that they have applied to the NRC for a stay of CLI-12-02 pending the completion of a merits review by this Court. If the NRC denies the motion, the Petitioners plan to submit a stay motion to the Court.

Within the week, Petitioners also plan to file a motion to consolidate and expedite these appeals. Because the NRC issued a license very quickly after deciding CLI-12-02, Petitioners had to focus their efforts on the stay motion and were unable to prepare their motions to consolidate and expedite the appeals by today.

Sincerely,

A handwritten signature in black ink, appearing to read 'Diane Curran', is written over the printed name.

Diane Curran  
Counsel for Petitioners

UNITED STATES COURT OF APPEALS  
FOR THE DISTRICT OF COLUMBIA CIRCUIT

-----X

BLUE RIDGE ENVIRONMENTAL  
DEFENSE LEAGUE, CENTER FOR A  
SUSTAINABLE COAST, CITIZENS ALLIED  
FOR SAFE ENERGY, FRIENDS OF THE  
EARTH, GEORGIA WOMEN'S ACTION FOR  
NEW DIRECTIONS, NORTH CAROLINA  
WASTE AWARENESS AND REDUCTION  
NETWORK, NUCLEAR INFORMATION  
AND RESOURCE SERVICE, SOUTHERN  
ALLIANCE FOR CLEAN ENERGY,  
and NUCLEAR WATCH SOUTH,

Petitioners

Case No. \_\_\_\_\_

v.

UNITED STATES NUCLEAR  
REGULATORY COMMISSION, and  
UNITED STATES OF AMERICA,

Respondents.

-----X

**PETITION FOR JUDICIAL REVIEW OF  
NRC'S AP1000 RULE**

Pursuant to § 189 of the Atomic Energy Act, 42 U.S.C. § 2239, and 28  
U.S.C. §§ 2341-2344; the Administrative Procedures Act, 5 U.S.C. § 551 et seq.;  
and Rule 15 of the Federal Rules of Appellate Procedure, the petitioners, Blue  
Ridge Environmental Defense League (representing itself and its chapters,  
Bellefonte Efficiency and Sustainability Team, Concerned Citizens of Shell Bluff,



and Mothers Against Tennessee River Radiation), Center for a Sustainable Coast, Citizens Allied for Safe Energy, Friends of the Earth, Georgia Women's Action for New Directions, North Carolina Waste Awareness and Reduction Network, Nuclear Information and Resource Service, Southern Alliance For Clean Energy and Nuclear Watch South, by and through the undersigned counsel, hereby petition this Court for review of the United States Nuclear Regulatory Commission's ("NRC") decision to approve a final rule amending Title 10 of the Code of Federal Regulations, Part 52, Appendix D, "Design Certification Rule for the AP1000 Design," SECY-11-0145, December 22, 2011, and published it in the Federal Register at 76 Fed. Reg. 82,079 on December 30, 2011 ("AP1000 Rule"). A copy of the AP1000 rule is attached to this petition. The NRC acted arbitrarily, abused its discretion, and violated the National Environmental Policy Act (42 U.S.C. § 4321 *et seq.*), the Administrative Procedures Act (5 U.S.C. § 701 *et seq.*), the Atomic Energy Act (42 U.S.C. § 2011 *et seq.*), the Commission's policies and regulations, the Council on Environmental Quality's regulations, and other applicable laws and regulations in certifying the AP1000 reactor design.

The Petitioners are public interest organizations who commented on the proposed AP1000 rule and/or who were intervenors in the NRC licensing proceeding for the Combined License for Vogtle Electric Generating Plant Units 3 and 4 (Docket Nos. 52-025-COL & 52-026-COL) which has adopted the AP1000



reactor design by reference.

This filing is timely because it is made within the 60-day period established by the Hobbs Act for bringing judicial review. Venue is appropriate in the D.C. Circuit pursuant to 28 U.S.C. § 2343.

Therefore, the Petitioners respectfully request that this Court review the AP1000 Rule, vacate it, remand the matter to the NRC for further analysis and the preparation and issuance of a supplemental environmental assessment or environmental impact statement, and grant any other relief that the Court may deem just and appropriate.

Respectfully submitted,



Diane Curran

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*Attorneys for Petitioners*

February 16, 2012





UNITED STATES COURT OF APPEALS  
FOR THE DISTRICT OF COLUMBIA CIRCUIT

-----X  
BLUE RIDGE ENVIRONMENTAL  
DEFENSE LEAGUE, CENTER FOR A  
SUSTAINABLE COAST, GEORGIA WOMEN'S  
ACTION FOR NEW DIRECTIONS, and  
SOUTHERN ALLIANCE FOR CLEAN ENERGY,

Petitioners

Case No. \_\_\_\_\_

v.

UNITED STATES NUCLEAR  
REGULATORY COMMISSION, and  
UNITED STATES OF AMERICA,

Respondents.  
-----X

**PETITION FOR JUDICIAL REVIEW OF  
NRC MEMORANDUM AND ORDER CLI-12-02**

Pursuant to § 189 of the Atomic Energy Act, 42 U.S.C. § 2239, and 28 U.S.C. §§ 2341-2344; the Administrative Procedures Act, 5 U.S.C. § 551 *et seq.*; and Rule 15 of the Federal Rules of Appellate Procedure, the petitioners, Blue Ridge Environmental Defense League, Center for a Sustainable Coast, Georgia Women's Action for New Directions, and Southern Alliance for Clean Energy, by and through the undersigned counsel, hereby petition this Court for review of the United States Nuclear Regulatory Commission's ("NRC") Memorandum and





Order, CLI-12-02 (February 9, 2012), authorizing issuance of a combined license (“COL”) and extended limited work authorization (“LWA”) for Units 3 and 4 of the Vogtle Electric Generating Plant to the Southern Nuclear Operating Company (Attached). Petitioners contend that in authorizing issuance of the COL and LWA, the NRC acted arbitrarily, abused its discretion, and violated the National Environmental Policy Act, the Administrative Procedures Act, the Atomic Energy Act, the Commission’s policies and regulations, the Council on Environmental Quality’s regulations, and other applicable laws and regulations in issuing the COL and LWA.

The Petitioners are public interest organizations who were intervenors in the NRC Docket Nos. 52-025-COL & 52-026-COL for the Combined License for Vogtle Electric Generating Plant Units 3 and 4 and participated throughout the licensing procedure. This filing is within the 60-day period established by the Hobbs Act for bringing judicial review and is therefore timely. 28 U.S.C. § 2324a. Venue is appropriate within the D.C. Circuit pursuant to 28 U.S.C. § 2343.

Therefore, the Petitioners, Blue Ridge Environmental Defense League, Center for a Sustainable Coast, Georgia Women's Action for New Directions, and Southern Alliance for Clean Energy respectfully request that this Court review the NRC’s Memorandum and Order, CLI-12-02, and vacate it, and remand the matter to the NRC for further analysis and the preparation and issuance of a supplemental




environmental impact statement, and grant any other relief that the Court may deem just and appropriate.

Respectfully submitted,



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February 16, 2012



UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
Southern Nuclear Operating Company, Inc.	)	Docket Nos. 52-025-COL &
	)	52-026-COL
Combined License for Vogtle Electric	)	
Generating Plant Units 3 and 4	)	February 16, 2012
	)	

**CERTIFICATE OF SERVICE**

I hereby certify that copies of the foregoing **PETITIONERS' MOTION TO STAY THE EFFECTIVENESS OF THE COMBINED LICENSE FOR VOGTLE ELECTRIC GENERATING PLANT UNITS 3 AND 4 PENDING JUDICIAL REVIEW** were served upon the following persons by Electronic Information Exchange and/or electronic mail.

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Dated: February 16, 2012

/signed (electronically) by/

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