Proposed Changes to Environmental Impact Assessments for License Renewal

Ralph Andersen

Perspective

- The license renewal process has proven thorough, well-reasoned and effective
- 1996 GEIS has improved the efficiency of the license renewal process
- Focus the GEIS updating on what is needed to enhance efficiency, transparency and practicality

Proposed Changes

- New issues are being added; some existing issues are being combined
- Some issues do not include a clearly articulated legal and regulatory basis
- A meaningful opportunity to comment requires that an agency fully disclose its basis for the action/proposal.

Proposed Rule

- Recommend reclassification of four issues from Category 2 to Category 1 and removal of two issues
- Proposed combining of issues resulted in unintended reclassification of some issues
- Opportunity to enhance leveraging on issues that are regulated by state and other federal regulatory agencies

Draft Regulatory Guide

- Assure consistency between the final rule and regulatory guide
- Descriptions and discussion in the environmental report for Category 1 issues should be limited to new and significant information only
- Guidance should employ a graded approach in regard to the level of detail

Implementation Timing

- Final rule should allow at least 18 months from the date of the publication of the final rule for implementation of new format

- NEI will sponsor a workshop on the changes once adopted to enhance consistent and efficient implementation

TENNESSEE VALLEY AUTHORITY (TVA) SEQUOYAH NUCLEAR PLANT LICENSE RENEWAL ENVIRONMENTAL REPORT

January 11, 2012

Jack Bailey, Vice President

Nuclear Generation Development

TVA License Renewal

- TVA plans to submit a License Renewal Application for its Sequoyah Nuclear Plant to the Nuclear Regulatory Commission (NRC) in the first quarter of 2013
- TVA performed a National Environmental Policy Act (NEPA) Review for Sequoyah License Renewal and completed a Supplemental Environmental Impact Statement in July 2011
- TVA is currently developing the Environmental Report to be included as Appendix E to the Sequoyah License Renewal Application

Presentation Topics

- Ensure the Sequoyah License Renewal Application adequately addresses both current and proposed draft Generic Environmental Impact Statement (GEIS) issues
- Use TVA's timeline for development and review of the SQN Environmental Report for License Renewal to illustrate lead time recommendation.

Crosswalk - Purpose

- To ensure all content and issues from the current 1996 GEIS as well as the proposed draft GEIS are addressed
- New issues and expanded issues are clearly identified
- Deal with any uncertainty on current versus new requirements

Crosswalk – Example Using Partial

License Renewal Environmental Issues:

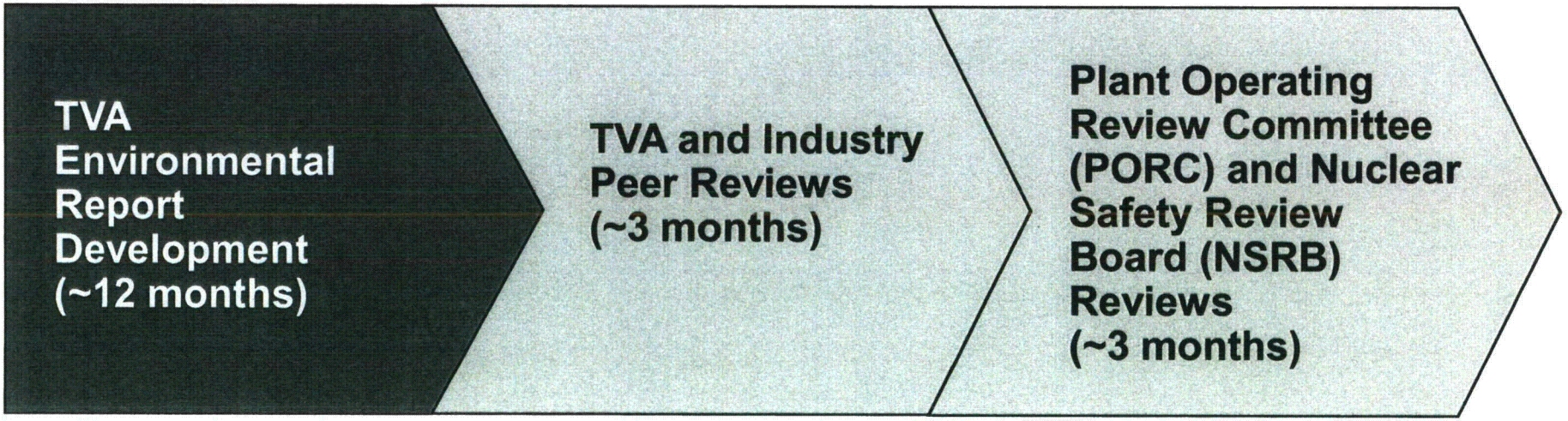
Current 1996 GEIS / Proposed 2009 GEIS Crosswalk

(2009 issue expansions in blue font; new 2009 issues shaded yellow)

1996 GEIS Issue	2009 GEIS Issue	1996 Category	2009 Category	Applicable to SQN Y/N	Where Considered
Surface Water Quality, Hydrology, and Use					
Impacts of refurbishment on surface water quality	Surface water use and quality (both continuing operations and refurbishment)	1	1	1996: N 2009: Y	ER Section 3.3
Impacts of refurbishment on surface water use		1		1996: N 2009: Y	ER Section 3.3
Altered salinity gradients	Altered salinity gradients	1	1	N	ER Section 4.0 and Table 4.0 - 1
Not specifically identified as a separate category issue - addressed elsewhere.	Effects of dredging on water quality	No category	1	Y	ER Section 2.2, 2.5, and 3.2

LR Environmental Report Timeline

Today



TVA Conclusions & Recommendations

- Proposed changes to the NRC's regulations and regulatory guidance are expected to be manageable, but major changes to the draft could be problematic
- Finalize new requirements as soon as possible to reduce uncertainty
- Sufficient lead time is required to produce an Environmental Report, so the rule should have a reasonable effective date

RIVERKEEPER

January 11, 2012

NRC Commission Meeting to Discuss Proposed Revisions to 10 CFR Part 51, Update to GEIS for License Renewal

Summary of Comments

1. **Inadequate Assessment of Inadvertent Radioactive Releases to the Environment**
   a. **New Cat. 2 Assessment only addresses groundwater contamination**
   b. **New Cat. 1 Assessment – Exposure of Aquatic Organisms to Radionuclides is improperly limited to *normal operations.***
   c. **Expansion of Cat. 2 Assessment of Threatened or Endangered Species to include "essential fish habitats" should specifically include impacts from radiological releases, both routine and inadvertent.**
   d. **Cumulative impacts of routine and inadvertent releases must be assessed.**
   e. **Recommendation: NRC must require a comprehensive, site specific (Cat. 2) analysis of the impacts of inadvertent/accidental radiological releases on all relevant environmental media – aquatic species, water quality, soil/sediments, terrestrial species, and endangered/threatened species and related habitat, as well as available mitigation measures to avoid or remediate such impacts.**

2. **New Cat. 2 Assessment of non – radiological contamination of groundwater and soil fails to include specific requirement for licensees to publicly disclose all information of historic leaks, spills and other industrial releases that contributed or may have contributed to contamination of the plant site. GEIS, 4-45, 4-46.**

3. **Failure to require site-specific (Cat. 2) assessment of emergency preparedness effectively precludes meaningful public participation in the license renewal process and violates NEPA.**

4. **Failure to require consideration of spent fuel pool accidents under the NEPA SAMA analysis does not comply with the NEPA requirement that all reasonably foreseeable impacts of license renewal be assessed.**

5. **Category 1 Classification of nuclear waste storage impacts does not comply with NEPA, because it fails to assess or integrate new and significant information that has arisen since the GEIS update was issued in 2009, including the federal government's official abandonment of the Yucca Mountain repository and the nuclear disaster at the Fukushima Daichi nuclear power plant in Japan in March 2011.**

RIVERKEEPER

VIA E-MAIL AND FIRST-CLASS MAIL

January 12, 2010

Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
ATTN: Rulemakings and Adjudications Staff
Rulemaking.Comments@nrc.gov

Re: Riverkeeper, Inc.'s Comments on the U.S. Nuclear Regulatory Commission's Proposed Revisions to NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants

Dear Rulemakings and Adjudications Staff:

Riverkeeper, Inc. ("Riverkeeper") hereby respectfully submits the following comments in response to the U.S. Nuclear Regulatory Commission's ("NRC") Proposed Rule, "Revisions to Environmental Review for Renewal of Nuclear Power Plant Operating Licenses," 74 Fed. Reg. 38,117, 10 C.F.R. Part 51, RIN 3150-AI42, NRC-2008-0608 (July 31, 2009) (hereinafter "Proposed Rule"), and associated draft documents, including:

- NUREG-1437, Volume 1, Revision 1, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report," Draft Report for Comment (June/July 2009) (hereinafter "Revised GEIS");

- NUREG-1437, Volume 2, Revision 1, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Appendices," Draft Report for Comment (June/July 2009) (hereinafter "Revised GEIS Appendices");

- NUREG-1555, Supplement 1, Revision 1, "Standard Review Plans for Environmental Reviews of Nuclear Power Plants, Supplement 1: Operating License Renewal," Draft Report for Comment (July 2009), (hereinafter "Draft Revised SRP");

- Draft Regulatory Guide DG-4015, "Preparation of Environmental Reports for Nuclear Power Plant License Renewal Applications," Revision 1 (July 2009) ("hereinafter Draft Reg. Guide 4015").

For the reasons set forth below, the proposed regulatory revisions fail to adequately address numerous fundamental deficiencies with the current environmental review process for nuclear

power plant license renewal. Riverkeeper, therefore, urges the NRC to fully address the concerns identified herein prior to finalizing the proposed changes.

I. RIVERKEEPER'S INTEREST

Riverkeeper is a member-supported, not-for-profit organization dedicated to protecting the Hudson River and its tributaries.[1] Since its inception in 1966, Riverkeeper has used litigation, science, advocacy, and public education to raise and address concerns relating to the Indian Point nuclear power plant, located on the eastern bank of the Hudson River in Buchanan, NY. Riverkeeper is headquartered in Tarrytown, New York, approximately twenty-two (22) miles from the Indian Point facility, and has numerous members that reside within at least fifty (50) miles of the plant.[2]

Riverkeeper has been actively involved in the Indian Point license renewal proceeding due to the serious concerns relating to the continued operation of the facility, including the environmental damage caused by its antiquated once-through cooling system and leaking spent fuel pools, the vulnerability of the plant's spent fuel pools to terrorist attacks and serious accidents, and the failure of any long-term solution for permanent nuclear waste disposal. Riverkeeper filed a successful petition to intervene in Indian Point's relicensing proceeding, raising various environmental and safety concerns, and is currently litigating three contentions which have been admitted for an adjudicatory hearing.[3]

Riverkeeper has consistently raised concerns with the adequacy of the environmental review process the NRC is currently still undertaking in the Indian Point relicensing case. Riverkeeper submitted extensive environmental scoping comments, as well as comments on the supplemental site-specific environmental impact statement prepared in relation to the Indian Point relicensing proceeding, both times heavily criticizing the NRC's improper reliance on the outdated 1996 Generic Environmental Impact Statement for License Renewal of Nuclear Plants (hereinafter "1996 GEIS").[4] The NRC's use of the 1996 GEIS has done a great disservice to the Indian Point license renewal process, by failing to ensure sufficient analysis of all relevant concerns. The

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[1] *See generally,* Riverkeeper.org, Our Story, http://www.riverkeeper.org/ourstory_index.php (last visited Jan. 12, 2010).

[2] *See* Riverkeeper.org, Contact Us, http://www.riverkeeper.org/contact/ (last visited Jan. 12, 2010).

[3] *See* Riverkeeper, Inc.'s Request for Hearing and Petition to Intervene in Indian Point License Renewal Proceeding, November 30, 2007 (hereinafter "Riverkeeper Petition for Hearing"), ADAMS Accession No. ML073410093. Riverkeeper's Petition for Hearing raised many concerns relevant to the issues discussed in the Revised GEIS, and Riverkeeper provides this petition in further support of the comments made herein, for your consideration, as Exhibit B.

[4] Many of the concerns articulated in Riverkeeper's Indian Point license renewal environmental scoping comments and supplemental site-specific environmental impact statement comments would remain unresolved by the NRC's Revised GEIS, and Riverkeeper provides them as exhibits in further support of the comments made herein, for your consideration in the instant rulemaking proceeding: Riverkeeper Comments on Environmental Scoping for the Indian Point License Renewal Proceeding, Docket Nos. 50-247, 50-286 (Oct. 12, 2007), ADAMS Accession No. ML072960455 (hereinafter "Riverkeeper's Scoping Comments), are attached hereto as Exhibit C; Riverkeeper Comments on Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 38, Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3, Draft Report for Comment (March 18, 2009), ADAMS Accession No. ML090860983 (hereinafter "Riverkeeper's IP DSEIS Comments"), are provided herewith as Exhibit D.

NRC's attempt to now belatedly revise the 1996 GEIS continues to fall short of guaranteeing a comprehensive environmental review process in license renewal proceedings. Riverkeeper now offers the following comments to highlight our ongoing concerns, in order to ensure that the NRC carries out adequate environmental reviews in the future.

II. IMPROPER FOCUS ON "STREAMLINING"

The Proposed Rule repeatedly emphasizes that the changes made by the Revised GEIS will "simplify and streamline the NRC review process.[5] Understanding the efficacy of having generic EISs pursuant to the National Environmental Policy Act of 1969 ("NEPA"), i.e., to avoid unnecessary repetition of review, a reading of the Proposed Rule leads one to surmise that the NRC's *primary* concern was how to further streamline the process. Indeed, the NRC proudly touts that "[t]he 1996 GEIS has been effective in focusing NRC resources on important environmental issues and increased efficiency of the environmental review process. Currently, 51 nuclear units at 29 plant sites have received renewed licenses."[6]

Yet, the focus of the NRC should be on performing an objective, NEPA-compliant, comprehensive review and not to efficiently get reviews done at breakneck speed. This misplaced emphasis has manifested itself throughout the Revised GEIS, in the failure of the NRC to provide for adequate review of various environmental issues, as discussed forthwith.

III. INADEQUATE ASSESSMENT OF INADVERTENT RADIOACTIVE RELEASES TO THE ENVIRONMENT

The Revised GEIS acknowledges the problem encountered at various nuclear power plants across the country over the past several years of unplanned releases of radionuclides to the environment. Given this ongoing issue, it is critical that the license renewal environmental review process address all relevant concerns posed by such releases. Unfortunately, the NRC's proposed revisions to the 1996 GEIS do not go far enough toward ensuring that the environmental impacts of such releases will be analyzed in a comprehensive manner.

A History of Inadvertent Radioactive Releases to the Environment

Unplanned releases of radionuclides to the environment have become ubiquitous at nuclear power plants across the United States. To date, leaks from varying plant systems have occurred at 29 plants in the United States, nearly a third of the United States' operating fleet. Riverkeeper has compiled documentation related to these leaks, attached hereto as Exhibit A, for your consideration in this rulemaking proceeding.

It is imperative that the update to the 1996 GEIS fully address any and all relevant concerns. Unfortunately, as discussed below, the Revised GEIS as proposed would not ensure a comprehensive review of this issue.

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[5] *See, e.g.*, Proposed Rule at 38,123, 38,124, 38,126, 38,128.
[6] *Id.* at 38,119.

Revised Assessment of Groundwater Resources

The NRC proposes to add a new Category 2 issue to address radionuclides released to groundwater.[7] It is in this portion of the Revised GEIS that the NRC recognizes the reality of inadvertent releases of radionuclides: "There is a growing concern about radionuclides detected in groundwater at nuclear power plants. These releases have occurred as leaks in at least 14 plants."[8] However, as discussed in more detail below, it is apparent that the Revised GEIS would not require consideration of the environmental impacts of such releases in relation to other "resources areas," i.e. aquatic ecology, terrestrial resources, and threatened/endangered species. Providing for such a narrow assessment related only to impacts to groundwater would lead to a narrow and incomplete analysis of the impacts of such releases to the environment. As discussed below, the NRC must require a comprehensive site-specific analysis of the impacts of accidental releases on all relevant environmental media. This is the only way to ensure a thorough assessment and accurate conclusions as to significance of such inadvertent contamination.

The newly proposed Category 2 issue to address radionuclide releases to groundwater is problematic for other reasons as well. While the Proposed Rule implies a focus on an assessment of public health impacts, the Revised GEIS and associated guidance documents notably fail to provide concrete direction to ensure adequate analysis related to such impacts. Instead, the Draft Revised SRP and Draft Reg. Guide 4015 provide vague directives, mostly emphasizing assessment of groundwater monitoring systems.[9] The Revised GEIS even appears to largely dismiss public health concerns, stating that "[t]he NRC does not consider these tritium releases to be a health risk to the public or onsite workers in any of these [previously reported] cases because the tritiated groundwater is expected to remain onsite."[10] The NRC should provide more specific guidance to ensure that licensees and the NRC accurately assess all reasonably foreseeable impacts to public health at particular plants.

For example, at Indian Point, licensee/license renewal applicant, Entergy Nuclear Operations, Inc., (hereinafter "Entergy") acknowledges groundwater contamination that is slowly leaching through the underlying bedrock to the Hudson River,[11] contrary to the NRC's blanket conclusion stating that groundwater contamination has remained onsite. Currently, there is proposed project that would site a desalination plant in Rockland County, New York, across and slightly downstream from Indian Point, which would withdraw Hudson River water for drinking water.[12] Far from speculative, this proposal is currently in the planning, environmental review, and permitting stages.[13] Accordingly, an appropriate assessment of the impacts of radionuclide releases from the Indian Point facility should include impacts to the public from use of contaminated drinking water. Unfortunately, in the Indian Point relicensing proceeding, the

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[7] *See* Revised GEIS at 4-46 to 4-47; Revised GEIS Appendices at B-12.
[8] *See* Revised GEIS at 4-46; see also Proposed Rule, 74 Fed. Reg. at 38,122.
[9] *See* Draft Revised SRP at 4.4.6-1 to 4.4.6-3; Draft Reg. Guide 4015 at 31-32.
[10] Revised GEIS at 4-47.
[11] *See* Groundwater Investigation Executive Summary (Indian Point Energy Center, Buchanan, N.Y., Jan. 2008), at 2-4, *available at* http://jic.scmo.state.ny.us/Resources/ExecutiveSummary%20GW%20final.pdf.
[12] *See generally* Riverkeeper's IP DSEIS Comments at 22-25.
[13] *See generally id.*

NRC Staff's site-specific Draft Supplemental Environmental Impact Statement[14] was completely devoid of assessment of the impacts of license renewal on drinking water quality in regards to the use of the Hudson River as a source of drinking water via the desalination plant.[15] Thus, in the instant rulemaking, the NRC must provide clear direction so that any reasonably foreseeable radionuclide exposure to the public, such as through anticipated drinking water sources, will be assessed.

Revised Assessment of Aquatic Resources

The NRC proposes to add a new issue to address "Exposure of Aquatic Organisms to Radionuclides."[16] While analysis of such impacts is important and necessary, unfortunately, the NRC has misguidedly chosen to label this a Category 1 issue, making a generic determination that such impacts will always be small.[17]

This is problematic because the NRC's consideration of this issue is limited to the impact of radionuclides on aquatic organisms from *normal operations*.[18] Normal operations, by definition, do not include accidental releases of radionuclides from a facility. As such, the NRC's analysis here on its face excludes consideration of the impacts to aquatic biota from inadvertent releases, despite the earlier recognition that this has been a problem.[19] Instead, the NRC relies on past Radiological Environmental Monitoring Program reports of 15 nuclear power plants to conclude that "*normal operations* of these facilities would not result in negative effects on aquatic biota."[20]

With the noted history of accidental releases at the nation's nuclear power plants, it is absolutely necessary to specifically consider such releases when evaluating impacts to aquatic resources. Given the nature of this ongoing problem, and the likelihood of future unplanned releases, this is simply not an issue that is appropriate for one generic determination at this time. Instead, the NRC should make this a Category 2 issue and require licensees and NRC Staff to specifically consider the impacts of any known inadvertent releases to the environment on aquatic biota at the time of license renewal. This would ensure a full assessment of any impacts to aquatic resources, including nearby critical ecosystems, which are not otherwise specifically encompassed by the Revised GEIS's generic analysis.

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[14] Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 38, Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3, Draft Report for Comment, Main Report (U.S. Nuclear Regulatory Commission December 2008) ("Indian Point Draft Supplemental EIS"), *available at*, http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/supplement38/ (last visited Jan. 12, 2010).

[15] *See* Indian Point Draft Supplemental EIS at §§ 2.2.7, 4.3.

[16] Revised GEIS at 4-98 to 4-100; Revised GEIS Appendices at B-22.

[17] Revised GEIS at 4-98 to 4-100; Revised GEIS Appendices at B-22.

[18] *See* Revised GEIS at 4-98 ("The potential impacts of radionuclides on aquatic organisms from *normal operations* of a nuclear power plant during the license renewal term were not identified as an issue in the 1996 GEIS") (emphasis added); *id.* at 4-99 ("Thus, it is anticipated that *normal operations* of these facilities would not result in negative effects on aquatic biota") (emphasis added).

[19] Revised GEIS at 4-46 ("There is a growing concern about radionuclides detected in groundwater at nuclear power plants. These releases have occurred as leaks in at least 14 plants.")

[20] *Id.* at 4-99.

For example, the Indian Point nuclear power plant is adjacent to the ecologically critical area of Haverstraw Bay. Haverstraw Bay is a New York State designated Essential Fish Habitat and Significant Coastal Fish and Wildlife Habitat.[21] Despite the considerable amount of inadvertent radionuclide releases from Indian Point over the past few decades, Entergy and the NRC Staff have consistently refused to assess the impacts to the Hudson River ecosystem in the Indian Point license renewal proceeding.[22] Under the proposed changes to the 1996 GEIS, site-specific impacts of unplanned radionuclide releases on aquatic biota would continue to evade assessment. This is utterly illogical, and completely inconsistent with the NRC's recognition that inadvertent releases are an ongoing issue.

Revised Assessment of Terrestrial Resources

The NRC also proposes a new Category 1 issue to address "Exposure of Terrestrial Organisms to Radionuclides."[23] While the intention of this new issue is admirable, it suffers from the same problems articulated above. In particular, this issue, once again, only applies to radioactive releases from *normal operations*.[24] Based on this assumption, the NRC made a generic determination that impacts to terrestrial resources are small.[25]

However, it is necessary for the NRC to require consideration of radioactive releases that are not part of the normal course of operation.[26] This would be the only way ensure an accurate and complete assessment of impacts to terrestrial biota. Accordingly, the NRC should make this a Category 2 issue and require licensees and the NRC Staff to look at radionuclide impact to terrestrial resources on a site-specific basis.

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[21] *See* Coastal Fish & Wildlife Habitat Rating Form, http://www.nyswaterfronts.com/downloads/pdfs/sig_hab/hudsonriver/Haverstraw_Bay.pdf (last accessed Jan. 12, 2010).

[22] *See* Entergy, Inc., License Renewal Application, Appendix E: Applicant's Environmental Report, Operating License Renewal Stage, Indian Point Energy Center (ER), *available at*, http://www.nrc.gov/reactors/operating/licensing/renewal/applications/indian-point.html; Indian Point Draft Supplemental EIS at §§ 2.2.7, 4.3.

[23] *See* Revised GEIS at 4-55 to 4-58; Revised GEIS Appendices at B-12.

[24] *See* Revised GEIS at 4-55 ("Releases into terrestrial environments often result from deposition of small amounts of radionuclide particulates released from power plant vents during *normal operations*") (emphasis added); *id.* at 4-58 ("[T]he NRC concludes that the impact of *routine radionuclide releases* from past and current operations on terrestrial biota would be small at all nuclear power plants and would not be expected to appreciably change during the renewal period") (emphasis added).

[25] *See* Revised GEIS at 4-58; Revised GEIS Appendices at B-12.

[26] For example, Indian Point has a noted history of unplanned radiological releases which have the potential to affect the surrounding terrestrial environment; in addition to the extensive releases from underground piping and the plants spent fuel pools, which the NRC and Entergy have both acknowledged, the most recent example involved a release of radioactive steam resulting from an unplanned shutdown at the plant. *See* Abby Luby, *Nuclear Steam Leak Intentional: Response to Indian Point Plant Shutdown*, New York Daily News (Jan. 8, 2010), http://www.nydailynews.com/ny_local/2010/01/08/2010-01-08_nuclear_steam_leak_intentional_response_to_indian_point_plant_shutdown.html (last visited Jan. 12, 2010).

Revised Assessment of Threatened/Endangered Species

The Revised GEIS would expand the scope of a existing Category 2 issue related to threatened or endangered species to include "essential fish habitats."[27] Riverkeeper believes this addition is an improvement to this assessment. Riverkeeper further commends the NRC for recognizing that releases of radionuclides to the environment have the potential to impact threatened, endangered, and protected aquatic species, and essential fish habitats. In particular, the Revised GEIS acknowledges that terrestrial and aquatic threatened, endangered, and protected species, and essential fish habitats could be affected by, *inter alia*, "exposure to radionuclides."[28]

While this explicit recognition is a departure from the 1996 GEIS, Riverkeeper remains apprehensive that licensees and the NRC Staff would continue to fail to fully address the impacts of inadvertent radioactive releases to the environment on threatened, endangered, and protected species, and essential fish habitats, since there is no explicit requirement that such impacts be evaluated. For example, the Draft Revised SRP simply requires that site-specific supplemental environmental impact statements present a "list of adverse impacts to listed and proposed threatened or endangered species or critical habitats from continued operations during the renewal term and refurbishment."[29] Given the discussion in the Revised GEIS recognizing potential impacts from radionuclides, license renewal applicants and NRC Staff assessments of this issue should ostensibly include adverse impacts caused by radionuclide contamination, both from normal operations as well as inadvertent releases. However, with the noted history of accidental radioactive contamination at nuclear power plants, and the tendency to evade full review of this issue, as evidenced from the discussion above, a more explicit requirement is preferable.[30]

Failure to specifically require this analysis will lead to inadequate environmental reviews of this issue. For example, in the Indian Point license renewal proceeding, Entergy's Environmental Report and the NRC Staff's Indian Point Draft Supplemental EIS lack any assessment of the potential effects on threatened or endangered species caused by groundwater contamination at the facility. Despite leakage of extensive amounts of highly toxic radionuclides from the IP1 and IP2 spent fuel pools, including strontium-90 and tritium, into the groundwater around the plant, the environmental review documents completed by the license renewal applicant and the NRC Staff at no point assesses the effects of such contamination on the Hudson River's federally listed shortnose sturgeon, or candidate species, Atlantic sturgeon.[31] This is particularly concerning due to the known dangers of exposure to these radioactive substances: strontium-90 imitates calcium by concentrating in fish bones and shells of clams and blue crab; clams are a major part of the diet of sturgeon found in the Hudson River. Therefore, concern that Hudson

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[27] *See* Revised GEIS at 4-71 to 4-77; Revised GEIS Appendices at B-24.

[28] Revised GEIS at 3-73, 4-111, 4-112.

[29] Draft Revised SRP at 4.5.5-5.

[30] In the newly required essential fish habitat assessment under the Magnuson-Stevens Fishery Conservation and Management Act, "adverse impact" is defined as including "direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH." Draft Revised SRP at 4.5.5-2. This would ostensibly cover accidental radionuclide contamination, but once again, an overt requirement in light of the ongoing problem is preferable.

[31] *See* Indian Point Draft Supplemental EIS at 4-49 to 4-53

River sturgeon are being exposed to elevated levels of such dangerous substances, is wholly warranted. It is, therefore clear that the environmental review in the Indian Point relicensing case was lacking in this regard. The NRC must, therefore, explicitly require consideration of radionuclide contamination to avoid such deficient assessments in the future.

Assessment of Decommissioning Impacts

The Revised GEIS proposes to make a generic Category 1 determination as to impacts of relicensing on decommissioning.[32] However, this appears to be inconsistent with the NRC's recognition of the problem of radioactive contamination. Based on the discussion above, past, current, and future inadvertent releases will undoubtedly have an impact on water quality, ecological resources, and aquatic resources at the time of decommissioning. Accordingly, it is necessary to require site-specific analysis of the impacts of any unplanned leaks in regards to this issue as well.

Need for a Comprehensive Framework to Assess Inadvertent Radionuclide Releases

As discerned from the discussion above, it is evident that the Revised GEIS will not ensure a complete evaluation of the environmental impacts of inadvertent radionuclide releases from nuclear power plant facilities. NRC must implement a comprehensive framework to ensure that all aspects of such contamination are properly assessed. At a minimum, NRC must ensure that the impacts of unintended radionuclide releases on groundwater, aquatic ecology, terrestrial resources, and threatened, endangered, and protected species, and essential fish habitats, are all Category 2 issues, with specific requirements for appropriate assessment, as indicated above.

However, preferably, the NRC should put all of these issues under one umbrella issue, to ensure that an all-inclusive review occurs. Indeed, separating all of the individual environmental effects of accidental radioactive contamination does a disservice to the environmental review process by disallowing a look at the overall, collective impacts of this issue.

Notably, the NRC's proposed method of analyzing radionuclide contamination as articulated throughout the Revised GEIS would lead to inconsistencies in the review process. For example, the NRC would apparently require a Category 2 site-specific assessment of radionuclide impact to threatened, endangered, and protected species, and essential fish habitats, however, makes a generic Category 1 determination with respect to the impacts of radionuclides on aquatic organisms. Thus, for example, while the impacts of radioactive contamination to certain federally listed fish species would require extra analysis, the impacts to the majority of fish species would be categorically dismissed as small. This makes no sense, and, in fact, only serves to prove that Category 2 analysis is warranted in relation to effects on aquatic resources from inadvertent radioactive contamination.

Furthermore, instead of a comprehensive review, the NRC's Revised GEIS envisions a narrow assessment of inadvertent releases that would essentially focus on impacts to groundwater and associated public exposure pathways. To the contrary, NEPA requires a broader evaluation of

[32] *See* Proposed Rule at 38,128; Revised GEIS Appendices at B-40.

environmental impacts beyond mere public health concerns.[33] The significance of any radiological release is governed by the CEQ regulation defining "significantly"; this definition requires consideration of the context of the action and intensity or severity of the impacts.[34] Accordingly, in order to accurately evaluate the significance of inadvertent radiological release, license renewal applicants and the NRC Staff must fully assess all of the impacts to the surrounding natural environment. Thus, the need for a comprehensive site-specific review of impacts to all relevant environmental media is apparent.

For example, in the Indian Point license renewal proceeding, Entergy and the NRC Staff's environmental analysis of the leaks from the Indian Point spent fuel pools was seriously deficient. In that proceeding, the relevant environmental analyses focused solely on radiological doses to humans from the proclaimed "only" exposure pathway, i.e., consumption of aquatic foods.[35] By determining that the leaks did not exceed public radiation dose limits via consumption of aquatic foods, the NRC Staff concluded that the leaks did not have a significant impact on "plant workers, the public, *or the environment.*"[36] In their reviews, Entergy and the NRC Staff did not perform *any* analysis of the impacts of the contamination to the Hudson River ecosystem. In particular, Entergy's Environmental Report and the NRC Staff's Indian Point Draft Supplemental EIS failed to determine if toxic radionuclides including strontium-90 and cesium-137 are bioaccumulating in the environment; there was no analysis of the contamination to Hudson River fish or shellfish despite sampling showing elevated levels of such radionuclides in fish; there was no assessment of the effects of the contamination to the nearby essential fish habitat and ecologically critical area of Haverstraw Bay; and, as discussed above, there was no assessment of the potential effects of the leaking on the Hudson River's federally listed endangered species, including the short-nosed sturgeon.[37]

If the Revised GEIS is implemented as proposed, such an inadequate review would continue to be acceptable, since no site-specific review of impacts of radionuclides on terrestrial/aquatic/endangered, etc resources would be required. It is, thus, clear that the Revised GEIS must be adjusted to provide for a comprehensive review of impacts of radionuclide releases on all relevant resources.

Moreover, any complete assessment of inadvertent radioactive releases to the environment must specifically include an analysis of the *cumulative impact* of such contamination. For example, in the Indian Point relicensing proceeding, neither Entergy nor the NRC Staff performed any evaluation of the cumulative long-term effects of the contaminated groundwater plumes at Indian Point. The NRC Staff cited Entergy's removal of spent fuel from the IP1 pool as evidence that impacts from the contamination would be minimized.[38] Entergy made further claims that leaking is no longer active at the facility, a claim that is dubious at best, as explained in Riverkeeper's

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[33] *See Marsh v. Oregon Natural Resources Counsel*, 490 U.S. 360, 374 (1989).
[34] *See* 40 C.F.R. § 1508.27 (requiring analysis of ten different factors).
[35] Indian Point Draft Supplemental EIS § 2.2.7, at 2-107 to 2-108; § 4.3, § 4.5, § 4.7. In addition to incorrectly relying on dose limits as a sole measurement of the impacts from the leaks, the NRC Staff's assessment of dose limits was also fundamentally flawed since it did not take into consideration the proposed desalination plant, discussed above, that is likely to result in a direct drinking water pathway.
[36] Indian Point Draft Supplemental EIS §§ 4.3, 4.5, 4.7 (emphasis added).
[37] *See generally id.*
[38] *Id.* § 4.3, at 4-36.

Petition for Hearing. However, the extensive leakage that has emanated from the Indian Point spent fuel pools to date is still in the groundwater and will continue to slowly leach into the Hudson River.[39] Whether leaking is active or not, it is undisputed that there has never been an assessment of the environmental impacts of this contamination. Current and future accidental radioactive releases from the plant will only add to the existing plumes. For example, an underground pipe leak at the facility in February 2009 resulted in over 100,000 gallons of tritiated water being released directly into the waterway.[40] It is, therefore, imperative that the NRC specifically require an evaluation of the cumulative environmental impacts of inadvertent radioactive releases at nuclear power plant sites.

In contrast, the Revised GEIS's new Category 2 issue requiring analysis of cumulative impacts[41] would not necessarily require such an assessment. The Revised GEIS explains that an "analysis of cumulative impacts focuses on the resources that could be affected by the incremental impacts from continued operations of the nuclear plant" and that "[p]ast and present actions include all actions up to and including the time of the license renewal application."[42] And yet, despite the fact that repeated inadvertent releases of radionuclides can have an incremental impact on the surrounding environment, this new Category 2 issue does not explicitly require consideration of this issue. Other than stating that the cumulative impacts on terrestrial and aquatic resources would include habitat degradation,[43] the Revised GEIS does not provide any specific guidance that would ensure consideration of the cumulative impact of radioactive contamination. This failure precisely highlights the problem with breaking down this issue into various sections of the Revised GEIS.

Only with an all-inclusive review of the environmental impacts of unplanned radioactive contamination will the NRC ever be able to come to an accurate conclusion as to the degree of the overall impact. Accordingly, the NRC must require site-specific assessment of accidental releases on all pertinent environmental media, including terrestrial animals and plants, soils, river sediments, aquatic biota, and endangered/threatened/protected resources, as well as the cumulative impacts thereto.

In light of the foregoing, it is also clear that the range of impacts, when taking into account all of the potential environmental consequences of inadvertent radiological release, could be anywhere from SMALL to *LARGE*.[44] Given the long history of widespread contamination at nuclear power plant sites across the country, along with the fact that license renewal proceedings involve continually aging facilities, it is reasonably foreseeable that additional tritium leakage will occur

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[39] For example, in the months leading up to the completion of draining of the pool at Indian Point Unit 1, Entergy reported it was leaking around 70 gallons per day, contributing thousands and thousands of additional gallons of polluted water into the groundwater and eventually the Hudson River.

[40] *See* Annie Correal, *Indian Pt. Broken Pipe Spurs Safety Worries*, THE NEW YORK TIMES (Feb. 27, 2009).

[41] *See* Revised GEIS at 4-220 to 4-227.

[42] *See id.* at 4-220, 4-221.

[43] *See id.* at 4-223, 4-224.

[44] Thus, the NRC's proposed range of impacts in relation to the new Category 2 issue related to radionuclide release to groundwater, of "small to moderate," is unfounded, (*see* Revised GEIS at 2-9; Revised GEIS Appendices at B-12), and the conclusion of "small" impact in relation to the two Category 1 issues related to radionuclide impact on terrestrial and aquatic resources, is also unsupported (*see* Revised GEIS at 2-9, 2-11; Revised GEIS Appendices at B-12, B-22).

at aging, relicensed plants during their twenty year term of extended operation, and that such leakage could result in "LARGE" impacts to the environment. Indeed, the NRC has offered no support for its assertion that current and future impacts will only be SMALL or MODERATE, beyond simply relying on its belief that the incidences of tritium leakage that have occurred thus far have had no health impacts and minimal environmental impacts, at least according to the NRC's assessment. Riverkeeper strongly disagrees with this assertion, as evidenced by the arguments put forth in our intervention petition, environmental scoping comments, and comments to the Draft Supplemental EIS in the Indian Point relicensing proceeding.[45] Therefore, the NRC should find that impacts on all media, as explained above, from inadvertent radiological releases to groundwater could be "SMALL, MODERATE OR LARGE."

IV. NON-RADIOLOGICAL CONTAMINATION THE ENVIRONMENT

The Revised GEIS would create a new Category 2 issue requiring assessment of non-radiological groundwater and soil contamination resulting from general industrial practices.[46] Riverkeeper supports inclusion of this new issue, however, urges the NRC to specifically require that in the course of the assessment of this issue, licensees provide detailed, publicly available inventories of any and all spills, leaks, and other releases that contributed to any such soil and groundwater contamination. Such a requirement would ensure a more complete evaluation of such contamination.

V. FAILURE TO REQUIRE AN ASSESSMENT OF EMERGENCY PREPAREDNESS

A fundamental flaw with the Revised GEIS is the NRC's continued narrow scope of the environmental review which, *inter alia*, precludes assessment of emergency preparedness at nuclear power plants.[47] The NRC rationalizes that "[b]efore a plant is licensed to operate, the NRC must have 'reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.'"[48] The Revised GEIS further explains how NRC's finding of reasonable assurance is founded upon compliance with NRC regulations and guidance, which require that nuclear power plant licensees routinely demonstrate effectiveness of their emergency plans.[49]

However, this reasoning is flawed since NRC's emergency preparedness regulatory scheme is inherently deficient, and, as such, reliance upon those regulations is misguided. Indeed, due to the purely procedural nature of the emergency planning standards found in 10 C.F.R. § 50.47(b), which fail to set actual benchmarks for determining what constitutes a workable emergency plan, there is no guarantee that a particular plan would actually be effective in light of site-specific concerns.[50]

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[45] *See* Riverkeeper Exhibits B, C, D.
[46] *See* Revised GEIS at 4-45 to 4-46.
[47] *See id.* at 1-10, 1-11 ("The NRC will not make a decision or any recommendations on the basis of information presented in this GEIS regarding emergency preparedness at nuclear power plants.")
[48] *See id.* at 1-11.
[49] *See id.* 1-11.
[50] Riverkeeper explained at length the deficiencies of the emergency preparedness regulatory scheme in recent comments on a recent proposed update to the emergency planning regulations. *See* Riverkeeper's Comments on NRC's Proposed Enhancements to Emergency Preparedness Regulations (Oct. 19, 2009), ADAMS Accession No.

This is starkly apparent when examining the situation at Indian Point. Of the nations commercial reactor sites, Indian Point, located just 24 miles north of New York City, (35 miles north of Times Square) tops the list as the nuclear power plant with the greatest population density within a 10-mile radius (at least 300,000) and 50-mile radius (approximately 20 million people).[51] This represents nearly a doubling of the population since Indian Point's initial licensing. This high population density, coupled with the nature of the region's infrastructure (prone to severe congestion), present serious impediments to effective emergency evacuation. Indeed, a 2003 traffic study performed for Entergy by KLD Associates determined that evacuation times for the Emergency Planning Zone around Indian Point had doubled since 1994. The original estimate was 2.5 hours for people to proceed with evacuation, with a total of 5.5 hours for complete evacuation. KLD's 2003 estimates increased mobilization time to 4 hours, while complete evacuation of the region in good weather conditions could take up to 9.5 hours and in snow conditions up to 12 hours.[52] Shadow evacuation, which is not adequately addressed by NRC emergency planning regulations and guidance, would further increase this time. Based on these evacuation time estimates, which apply only to the narrow 10-mile Emergency Planning Zone, it is clear that many residents could not be evacuated in time to avoid exposure to high doses of radiation under a traditional release scenario, much less a fast-breaking release.

According to an independent analysis of Indian Point's emergency plan commissioned by former New York Governor George Pataki in 2003 and authored by former FEMA director James Lee Witt, the radiological emergency plan for Indian Point is badly flawed, unworkable and key components are unfixable. Witt found that ". . . the current radiological response system and capabilities are not adequate to . . . protect the people from an unacceptable dose of radiation in the event of a release from Indian Point . . . ."[53]. Even the NRC has voiced concerns associated with the location of Indian Point: in 1979, Robert Ryan, the NRC's Director of the Office of State programs, stated "I think it is insane to have a three-unit reactor on the Hudson River in Westchester County, 40 miles from Times Square, 20 miles from the Bronx . . . [Indian Point is] one of the most inappropriate sites in existence."[54]

And yet, due to the lack of enforceable standards, NRC consistently finds the requisite "reasonable assurance," in the Indian Point emergency plan, despite the glaring problems that would hinder effective evacuation at the facility.

ML093100527 (hereinafter "Riverkeeper EP Comments"). Riverkeeper provides these comments in further support of the comments made herein, for your consideration in the instant rulemaking proceeding, as Exhibit E.

[51] *See, e.g.,* James Lee Witt Associates, LLC, Review of Emergency Preparedness of Areas Adjacent to Indian Point and Millstone (2003) (hereinafter "Witt Report") at 4, 81-82. The NRC has previously acknowledged that Indian Point has the "highest population within 10, 30 and 50 miles of any nuclear power plant in the U.S. At 50 miles, it population is more than double any other plant site." *See* U.S. Nuclear Regulatory Commission, Consolidated Edison Company of New York: Indian Point, Units 2 and 3, Memorandum and Order, January 8, 1981, at 6; *see also* Indian Point Draft Supplemental EIS" at Table 2-1.

[52] Indian Point Energy Center Evacuation Time Estimate, Tbl. 1-1, p. 1-12, KLD Associates, Inc., 2003.

[53] Witt Report at viii.

[54] Report of the Office of the Chief Counsel on Emergency Preparedness to the President's Commission on the Accident at Three Mile Island, October 31, 1979, p. 5.

The NRC's emergency preparedness regulations are further deficient because they fail to fully consider the effects of accidents or intentional attacks involving onsite nuclear waste. The likelihood for such a scenario is not insignificant given the vulnerabilities of such facilities, for example, those at Indian Point: the spent fuel pools at Indian Point are not housed under containment, but rather in non-reinforced cinderblock industrial buildings which are admittedly penetrable by aircraft; the dry casks in the Indian Point ISFSI are stored on an outdoor concrete pad, lined up in rows that are easily visible from the air and the Hudson River. Moreover, numerous reports indicate that nuclear power plants remain likely targets of terrorist attacks.[55] The results of such an occurrence could potentially be catastrophic. For example, at Indian Point, an attack on the densely packed IP2 or IP3 spent fuel pools would result in contamination of a significant portion of the 10-mile emergency planning zone and the 50-mile ingestion pathway zone. A 2006 National Academy of Sciences Study concluded that storage pools are susceptible to fire and radiological release from intentional attacks.[56] The environmental impacts of a fire in a spent fuel pool may be severe, extending over a geographic area larger than a state's legal boundaries and continuing for decades.[57] Federal government reports note that a radioactive release could begin in less than an hour.

And yet, NRC's emergency preparedness scheme, including the pending proposed update, fails to adequately require that nuclear power plant licensees are capable of dealing with such severe radiological consequences.[58] This simply further demonstrates how emergency plans may not provide the needed "reasonable assurance" that the public would be protected in the event of an emergency.

Therefore, it is clear that compliance with existing emergency preparedness regulations and guidance does not necessarily guarantee adequate emergency preparedness at nuclear power plants in light of all relevant factors. Indeed, the Revised GEIS's statement that "[t]hrough its standards and required exercises, the Commission reviews existing emergency preparedness plans throughout the life of any facility, keeping up with changing demographics and other site-related factors,"[59] is utterly belied by the foregoing. The need to address emergency preparedness during the license renewal environmental review process, thus, quickly becomes apparent.

This becomes even clearer when examining nuclear power plant siting regulations: were Entergy applying for a license to build a new nuclear power plant where Indian Point is now located, it is unlikely they would be allowed to do so, based on its proximity to such a highly populated

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[55] For example, a 2006 study by the National Academy of Sciences on security risks posed by the storage of spent fuel at nuclear plant sites, confirmed that attacks by civilian aircrafts remain a plausible threat. Nat'l Acad. of Sciences., *Safety and Security of Commercial Spent Nuclear Fuel Storage: Public Report* (2006) (hereinafter "2006 NAS Study"). The study found that attacks on spent fuel pools are attractive targets since they are less protected structurally than reactor cores and typically contain much greater inventories of medium and long-lived radionuclides than reactor cores. *Id.*

[56] *See* 2006 NAS Study at 49, 57.

[57] *See generally* Gordon R. Thompson, "Risk Related Impacts from Continued Operation of the Indian Point Nuclear Power Plants" (Institute for Resource and Security Studies) (November 28, 2007) (hereinafter "Thompson Report"). Riverkeeper provides this report in further support of the comments made herein, for your consideration in the instant rulemaking proceeding, as Exhibit F.

[58] *See generally* Riverkeeper EP Comments.

[59] *See* Revised GEIS at 1-11.

area.[60] The regulations for reactors built *after* 1997 require that every site must have an exclusion area and a low population zone.[61] These regulations define low population zone as "the area immediately surrounding the exclusion area which contains residents, the total number and density of which are such that there is a reasonable probability that appropriate protective measures could be taken on their behalf in the event of a serious accident."[62] The regulations do not specify a permissible population density or total population within this zone because the situation may vary from case to case.[63] The regulations go on to say whether a specific number of people can, for example, be evacuated from a specific area, or instructed to take shelter, on a timely basis will depend on many factors such as location, number and size of highways, scope and extent of advance planning, and actual distribution of residents within the area.[64] As far as Indian Point is concerned, there is no low population zone, therefore if Entergy were applying to build a new nuclear power plant as opposed to a relicensing it would likely not be permitted.

Therefore, if held to the same standard as a new nuclear power plant, an evaluation of emergency preparedness would likely preclude license approval. It defies logic to then exclude consideration of this issue in a license renewal review, given significant changes to the baseline environment upon which initial evaluations were made. The NRC cannot continue to hide behind a set of deficient regulations. The NRC should, thus, include emergency preparedness as a site-specific Category 2 issue for review, and require an assessment of all relevant concerns, including population changes, transportation/traffic issues, varying radiological consequences, etc.

VI. INADEQUATE ASSESSMENT OF THE ENVIRONMENTAL CONSEQUENCES OF SEVERE ACCIDENTS

Inadequate Consideration of Spent Fuel Pool Accidents

The Revised GEIS recognizes that severe accident analyses in the 1996 GEIS "were limited to consideration of reactor accidents caused by internal events."[65] Proclaiming an understanding that accident risk has naturally evolved since issuance of the 1996 GEIS, the Revised GEIS identifies new sources of postulated severe accidents, including an explicit recognition of spent fuel pool accidents.[66]

However, while this recognition is commendable, the Revised GEIS goes on to draw erroneous conclusions about the potential consequences of spent fuel pool accidents. After weighing new information said to decrease estimated environmental impact against new information (including spent fuel pool accidents) said to increase estimated impacts, the Revised GEIS concludes "that the reduction in environmental impacts from the use of new information outweighs any increases

[60] *See* 10 C.F.R. Pts. 100.3, 100.10(b), 100.11, & 100.21(h).
[61] 10 C.F.R. § 100.21(h).
[62] 10 C.F.R. § 50.2.
[63] *Id.*
[64] *Id.*
[65] Revised GEIS at 4-153.
[66] *See id.* at 4-153 to 4-154; Revised GEIS Appendices at E-32 ("The 1996 GEIS did not include an explicit assessment of the environmental impacts of accidents at the spent fuel pools (SFPs) located at each reactor site.").

resulting from new considerations. As a result, the findings in the 1996 GEIS remain valid."[67] In particular regard to spent fuel pool accidents, the Revised GEIS concludes that "the environmental impacts from accidents at spent fuel pools . . . can be comparable to those from reactor accidents at full power . . . Subsequent analyses performed, and mitigative measures employed since 2001 have further lowered the risk of this class of accidents."[68] Accordingly, the NRC continues to exclude spent fuel pool accidents from site-specific analysis, including Severe Accident Mitigation Alternatives (SAMAs) related to spent fuel pool accidents.[69]

The NRC's revised assessment here continues to ignore relevant information about the risk of spent fuel pool accidents, which undermines the NRC's continued conclusion that the impact of releases to the environment from severe accidents will always be "small."[70]

While initially, it was assumed that stored spent fuel generally did not pose significant risks, with the introduction of high-density, closed-form storage racks into spent fuel pools beginning in the 1970s, this understanding is no longer valid.[71] The closed-form configuration of the high density racks can create a major problem if water is lost from a spent fuel pool, including disastrous pool fires.[72] Studies conducted after the issuance of the 1996 License Renewal GEIS contradict previous studies that had asserted that complete drainage of spent fuel pools was the most severe case and that aged fuel would not burn.[73] These later studies establish that if the water level in a fuel storage pool dropped to the point where the tops of the fuel assemblies are uncovered, the fuel would burn regardless of its age, and resulting fires can be catastrophic.[74]

Furthermore, the Revised GEIS acknowledges that mitigative measures have been taken to reduce the risk of spent fuel pool fires. However, the existence of such measures at particular nuclear power plant sites completely contradicts the NRC's end conclusion that spent fuel pool accidents do not warrant site-specific consideration.[75]

Accordingly, the NRC conclusion that that all consequences from severe accidents, including those involving spent fuel pools, are "small for all plants," is without proper foundation. The

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[67] Revised GEIS at 4-154.
[68] *Id.* at 4-156.
[69] *See id.* at 4-154 ("[T]he impacts from reactor accidents at full power (including internal and external events) should continue to be considered in assessing Sever Accident Mitigation Alternatives (SAMAs). The impacts of *all other new information* do not contribute sufficiently to the environmental impacts to warrant their inclusion in the SAMA analysis, since the likelihood of finding cost-effective plant improvements is small.") (emphasis added).
[70] *See* Revised GEIS Appendices at B-33.
[71] *See* Thompson Report at 18-27.
[72] *Id.*
[73] *See* Waste Confidence Rule, 55 Fed. Reg. 38,474, 38,481 (Sept. 18, 1990).
[74] NUREG-1738, *Final Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants* (January 2001); 2006 NAS Study at 53-54. The Revised GEIS improperly attempts to underplay the findings of NUREG-1738 at various turns. *See, e.g.*, Revised GEIS Appendices at E-34 ("the impact analysis contained in NUREG-1738 is considered conservative"); *id.* at E-35 ("low ruthenium source term is . . . viewed as the more accurate representation. Therefore, the risk and environmental impact from fires in SFPs as analyzed in NUREG-1738 are expected to be comparable to or lower than those from reactor accidents and are bounded by the 1996 GEIS."); *id* at E-36 ("Based on the more rigorous accident progression analyses, the recent mitigation enhancements, and NRC site evaluations of every SFP in the United States, the risk of an SFP zirconium fire initiation is expected to be less than reported in NUREG-1738").
[75] *See generally* Riverkeeper's IP DSEIS Comments at 26-33.

impacts of severe accidents from spent fuel pool accidents should be addressed in a site-specific manner, with the appropriate potential range of impact being SMALL to LARGE.

In any event, it is crucial that NRC require consideration of spent fuel pool accidents in licensee and NRC Staff SAMA analyses. Failure to do so will lead to highly inaccurate results.[76] For example, in the Indian Point relicensing proceeding, in the first step of the SAMA analysis (establishing the baseline of severe accidents) neither Entergy nor the NRC Staff considered the contribution to severe accident costs by fire in either of the spent fuel pools at IP2 or IP3.[77] No SAMAs that would avoid or mitigate such costs were identified.[78] However, if the costs of pool fires were considered, the value of SAMAs would be significant. Even using unrealistically low probability estimates in NUREG-1353, *Regulatory Analysis for the Resolution of Generic Issue 82, Beyond Design Basis Accidents in Spent Fuel Pools* (1982), the offsite cost risk of a pool fire is substantially higher than the offsite cost risk of an Early High release from a core-damage accident.[79] The present value of cost risk for a conventional pool accident at Indian Point (i.e., an accident not caused by intentional attack), using the unrealistically low probability assumptions in NUREG-1353, is $27.7 million, a significant sum.[80] If more realistic assumptions about the likelihood of a pool fire were used, the cost would be considerably higher.[81] Moreover, the present value of cost risks ("PVCR") for a spent fuel pool fire would increase substantially (i.e., from $27.7 million to $38.7 million) if the discount rate were changed from 7% to 3%, a more appropriate rate for an analysis of the benefits of measures to prevent or mitigate radiological accidents that Entergy used to test the sensitivity of its SAMA analysis.[82] If the discount rate were dropped to zero, a rate that is justified in light of the catastrophic nature of the consequences involved, the PVCR for a spent fuel pool fire would be even higher -- $51.5 million.[83]

Given the potential costs involved, it is essential that such risks are assessed in licensee SAMA analyses.

Continued Failure to Specifically Address the Risk of Intentional Acts of Sabotage

The Revised GEIS maintains that "the risk of a successful terrorist attack (i.e., one that results in a zirconium fire) is very low."[84] Notably, the NRC continues to rely upon Sandia National Lab studies that are classified as "sensitive security related" and, thus, not available to the public, to support its conclusion that environmental consequence of a terrorist attack would be adequately mitigated.[85] Accordingly, NRC folds this issue into its generic determination that the impact of severe accidents is "small," and would continue to not require any site specific analysis, including SAMAs related to terrorist attacks.

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[76] *See generally* Thompson Report.
[77] *See* Indian Point Draft Supplemental EIS § 5.2; Entergy's Environmental Report at § 4.21.
[78] Indian Point Draft Supplemental EIS § 5.2
[79] Thompson Report at 28
[80] *Id.* at 49 and Table 7-7.
[81] *Id.* at 51.
[82] *Id.* at 51-52.
[83] *Id.* at 52.
[84] Revised GEIS Appendices at E-35.
[85] *See id.* at E-36.

However, ample evidence undermines the NRC's conclusions here. Firstly, the Revised GEIS downplays the potential risk of terrorist attack on nuclear power plants. Numerous reports indicate that nuclear power plants remain likely targets of terrorist attacks. The 9/11 Commission Report revealed that the mastermind of the 9/11 attacks had originally planned to hijack additional aircrafts to crash into targets, including nuclear power plants, but wrongly believed the plants were heavily defended.[86] This report indicates that the terrorists were considering attacking a specific nuclear facility in New York which one of the pilots had seen during a familiarization flight near New York.[87] This was likely Indian Point, especially given the fact that almost 20 million people live within 50 miles of the facility.[88] In the years since the 9/11 attacks, the federal government, including the NRC, has repeatedly recognized that there is a credible threat of intentional attacks on nuclear power plants.[89] Notably, existing nuclear power plants in the United States were built between the 1950s and the 1980s and were not intended to be able to withstand the impact of aircraft crashes or explosive forces, thus, making success of a potential terrorist attack a credible possibility.[90]

Furthermore, as discussed above, the Revised GEIS continues to underplay the severity of consequences of spent fuel pool fires that could result from an intentional attack. For example, at Indian Point, the impacts of terrorist attack would be far ranging. Such impacts are explained in a report prepared on behalf of Riverkeeper in connection with Riverkeeper's Petition for Hearing in the Indian Point relicensing proceeding by Edwin Lyman, entitled, *Chernobyl on the Hudson? The Health & Economic Impacts of a Terrorist Attack at the Indian Point Nuclear Power Plant.* This report is attached hereto in support of the comments made herein, for your consideration in the instant rulemaking proceeding, as Exhibit G.

Once again, the existence of mitigation measures which have been implemented to reduce the risk of intentional attack only highlight the fact that a comprehensive site-specific assessment as part of the NEPA process has never been performed, and is greatly needed here.[91] The inadequate assessment of intentional attack on nuclear power plants, thus, further erodes the

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[86] Nat'l Comm'n on Terrorist Attacks Upon the U.S., *The 9/11 Commission Report* (2004), at 154 ("9/11 Commission Report").

[87] 9/11 Commission Report at 245.

[88] *See, e.g.*, Witt Report at 4, 81-82.

[89] *See, e.g.*,; *Wide-Ranging New Terror Alerts*, CBS News.com (May 26, 2002), *available at*, http://cbsnews.com/stories/2002/05/24/attack/main510054.shtml (discussing heightened alert of the U.S.'s nuclear power plants as a result of information gained by the intelligence community); *FBI Warns of Nuke Plant Danger*, CBS News.com (May 1, 2003), *available at*, http://www.cbsnews.com/stories/2003/09/04/attack/main571556.shtml (discussing FBI warning to nuclear plant operators to remain vigilant about suspicious activity that could signal a potential terrorist attack); General Accounting Office, *Nuclear Regulatory Commission: Oversight of Security at Commercial Nuclear Power Plants Needs to be Strengthened*, GAO-03-752 (2003) (noting that U.S. nuclear power plants are possible terrorist target, and criticizing the NRC's oversight of plant security); *FBI's 4th Warning*, CBS News.com (July 2, 2004) (discussing FBI warning of recent intelligence showing Al-Qaeda interest in attacking nuclear plants).

[90] *In re All Nuclear Power Reactor Licensees*, DD-02-04 (Nov. 1, 2002), *available at* http://www.nrc.gov/reading-rm/doc-collections/petitions-2-206/directors-decision/2002/ml022890031.pdf; *NRC: Nuclear Power Plants Not Protected Against Air Crashes*, Associated Press (Mar. 28, 2002).

[91] *See generally* Riverkeeper's IP DSEIS Comments at 26-33.

NRC's basis for concluding that the consequences from severe accidents are categorically "small for all plants."

Additionally, it is crucial that NRC require consideration of intentional attack in licensee and NRC Staff SAMA analyses. Failure to do so will once again lead to highly inaccurate results.[92] For example, in the Indian Point relicensing proceeding, in the first step the SAMA analysis (i.e., establishing the baseline of severe accidents), Entergy and the NRC Staff did not consider the contribution to severe accident costs made by such intentional attacks at Indian Point.[93] The present value of cost risks for an attack at an Indian Point reactor and its pool exceeds half a billion dollars, which would warrant significant expenditures on SAMAs.[94] The present value of cost risks for an attack on a reactor alone are also significant -- $62 million to $73 million.[95] However, relevant SAMAs with a value of this magnitude were not considered.

It is, thus, clear that the failure to consider the risk of intentional attack renders the required SAMA analysis highly inaccurate.

VII. INADEQUATE ASSESSMENT OF NUCLEAR WASTE STORAGE IMPACTS

Low-Level Waste Storage and Disposal

The Revised GEIS recognizes that the Barnwell disposal facility in South Carolina has stopped accepting waste from States that are not part of the Atlantic compact as of July 2008.[96] The Revised GEIS further acknowledges the difficulty this poses to the 36 States who now have limited options for disposal of low-level waste. And yet, the NRC proposes to once again generically dispose of this as Category 1 issue. However, in light of the closure of the aforementioned disposal facility, it should be incumbent on licensees to perform a site-specific assessment of the environmental impacts of the accumulating volumes of low-level waste, which may now have to remain onsite on a long-term basis. Accordingly this should be re-categorized as a Category 2 issue.

Onsite Storage of Spent Nuclear Fuel

The Revised GEIS continues to hide behind the generic determination of no significant environmental impact in 10 C.F.R. § 51.23(b), stemming from the NRC's Waste Confidence Decision, to avoid requiring site-specific review of onsite nuclear waste storage impacts.[97] This is highly problematic for numerous reasons.

To begin with, a pending proposal, which the Revised GEIS acknowledges, to update the NRC's Waste Confidence Decision, if finalized, would extend the finding of no significant impact an additional 30 years.[98] A concomitant proposed rule change, would omit any reference to how

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[92] *See generally* Thompson Report.
[93] Indian Point Draft Supplemental EIS § 5.2; Entergy's Environmental Report at § 4.21.
[94] *See* Thompson Report at 45-46, Table 7-7, Section 9.
[95] *Id.* at 49.
[96] Revised GEIS at 4-165.
[97] *See id.* at 1-9 to 1-10, 4-165 to 4-168.
[98] Waste Confidence Decision Update, 73 Fed. Reg 59,551, 59551, 59563-59569 (Oct. 9, 2008) ("WCD Update").

long spent fuel can safely be stored in "temporary" on- or off-site facilities, and simply state that such waste can be so temporarily stored without significant impact "until a disposal facility can reasonably be expected to be available."[99] Given the status of the Yucca Mountain proposal and lack of a clear long-term disposal solution, it is reasonably foreseeable that spent nuclear fuel and high level waste will have to remain onsite indefinitely. If the proposed rule changes are implemented, the NRC's generic finding of no significant impact would essentially be extended to some indefinable point in the future. Foregoing any analysis of impacts of decades and decades of spent nuclear waste storage because of the NRC's "waste confidence" is, thus, improper.

The NRC's reasonable assurance of safe interim storage, first instituted over a quarter of a century ago and never supported by an environmental assessment or environmental impact statement under NEPA,[100] simply does not hold up given current knowledge and circumstances. Most blatantly, the NRC's generic assurance of benign spent fuel pool storage is completely undermined by the evidence of leaks at reactors across the United States.[101] For example, at Indian Point, the Unit 1 pool began leaking as early as the 1990s, and the leaks from Unit 2 were discovered in 2005.[102] With spent fuel pool degradation already at nuclear plants, it is patently absurd to rely on the generic no impact finding to project the long-term integrity of the pools for decades into the future. Given this circumstance, a generic finding about the impacts of pool storage is simply not appropriate, and a site-specific review should be performed at the license renewal juncture.

The NRC's Waste Confidence Decision also fosters unbridled assurance in the safety of dry cask storage, yet this is also questionable. It is far from clear what environmental impacts will result if dry casks remain loaded with spent fuel beyond their design life.[103] In light of the fact that these casks will remain on the banks of the Hudson River indefinitely into the future, the NRC Staff must perform a site specific assessment of impacts of such long-term storage.

The NRC's generic finding of no significant impact also flies in the face of new information about the risks of accidents at on-site nuclear waste storage facilities. Numerous reports and studies show that fuel storage pools are potentially susceptible to fire and radiological release from natural phenomena.[104] As discussed above, the environmental impacts of a fire in a spent

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[99] Proposed Rule on the Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation, 73 Fed. Reg. 59,547, 59551 (Oct. 9, 2008).

[100] Final Waste Confidence Decision, 49 Fed. Reg. 34658 ("[T]he Commission finds that NEPA does not require an EIS to support the [temporary storage] finding"); *see also* 40 C.F.R. § 1508.9 (explaining that environmental assessments under NEPA should provide sufficient evidence and analysis for determining whether to prepare an EIS or a FONSI).

[101] *See Liquid Radioactive Release Lessons Learned Task Force Final Report*, U.S. Nuclear Regulatory Commission, at 5-6 (September 1, 2006) (hereinafter "Radioactive Release Task Force Report").

[102] *See* Entergy's Environmental Report, at 5-4; Groundwater Investigation Executive Summary (Indian Point Energy Center, Buchanan, N.Y., Jan. 2008), *available at* http://iic.semo.state.ny.us/Resources/ExecutiveSummary%20GW%20final.pdf; *see also* Riverkeeper's Exhibit A.

[103] *See* Riverkeeper's Scoping Comments at 9-10.

[104] *See, e.g.*, NUREG-1738, Final Technical Study of 1 Spent Fuel Pool Accident Risk and Decommissioning Nuclear Power Plants (NRC: January 2001); National Academy of Sciences Committee on the Safety and Security of Commercial Spent Nuclear Fuel Storage, Safety and Security of Commercial Spent Nuclear Fuel Storage (The National Academies Press: 2006); Gordon Thompson, Risks and Risk-Reducing Options Associated with Pool

fuel pool may be severe, extending over a geographic area larger than a state's legal boundaries and continuing for decades.[105]

Despite such ominous potential consequences, the Revised GEIS would continue to completely ignore the vulnerability of stored spent fuel to natural phenomenon, such as earthquakes. For example, recent new information from seismologists at Columbia University's Lamont-Doherty Earth Observatory, who published a study in August 2008 on earthquakes in the greater New York City Area, indicates that Indian Point sits on a previously unidentified intersection of two *active* seismic zones.[106] Indeed, several recent earthquakes in New Jersey right near the Ramapo fault, which runs directly underneath Indian Point, starkly demonstrate the active nature of the seismic areas around the facility.[107] The Columbia study further found that historic activity of earthquakes of a magnitude more than 5 has been higher in southeastern New York than in many other areas of the central and eastern United States, and that the fault lengths and stresses suggest magnitude 6 or 7 quakes (which would be 10 and 100 times bigger than magnitude 5, respectively) are "quite possible.[108]

Yet, due to the categorical exclusion of nuclear waste storage impacts, the Revised GEIS would not require consideration of such information. This is notwithstanding the new issue in the Revised GEIS related to new seismological information,[109] which would ostensibly not extend to impacts to nuclear waste in light of NRC's reliance on the Waste Confidence Rule. There is no certainty whatsoever that the dry casks or spent fuel pools at plants like Indian Point are designed so as to be able to withstand such natural occurrences in light of the new seismic information. The existence of such new information highlights why a generic determination of environmental safety for long-term on-site storage of spent fuel is totally inappropriate.

The NRC Staff also relies upon the NRC's generic safety determination to further justify its refusal to consider the risks to spent fuel storage from intentional acts of sabotage.[110] However, the likelihood and seriousness of such risks necessitates a thorough review of the impacts of long-term storage of spent fuel at Indian Point. As discussed above, future terrorist attacks at Indian Point remain reasonably foreseeable, and such risks must be fully assessed in the relicensing proceeding.

Based on the foregoing, it is clear that the NRC's generic determination can not form the basis for continued exclusion of this issue in all future license renewal proceedings. Based on the

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Storage of Spent Nuclear Fuel at the Pilgrim and Vermont Yankee Nuclear Power Plants (May 25, 2006); Jan Beyea, Report to the Massachusetts Attorney General on the Potential Consequences of a Spent-fuel Pool Fire at the Pilgrim or Vermont Yankee Nuclear Plant (May 25, 2006).

[105] *See generally*, Thompson Report.

[106] *See* Lynn R. Sykes, John G. Armbruster, Won-Young Kim, & Leonardo Seeber, *Observations and Tectonic Setting of Historic and Instrumentally Located Earthquakes in the Greater New York City-Philadelphia Area*, Bulletin of the Seismological Society of America, Vol. 98, No. 4, pp. 1696-1719 (August 2008) ("2008 Columbia Earthquake Study").

[107] *See, e.g.*, Lawrence Ragonese, *Morris County Shows Signs of Stress: Four Quakes*, The Star-Ledger (Feb. 18, 2009), *available at*, http://www.nj.com/news/index.ssf/2009/02/morris_county_shows_sign_of_st.html.

[108] 2008 Columbia Study; *see also* Robert Roy Britt, *Large Earthquakes Could Strike New York City* (Aug. 21, 2008), *available at* http://www.livescience.com/environment/080821-new-york-earthquakes.html.

[109] *See* Revised GEIS at 3-49 to 3-50.

[110] *See* Waste Confidence Decision Update, 73 Fed. Reg. 59,551.

changed landscape, NRC must make this a Category 2 issue and require site-specific analysis of the impacts of long-term on-site storage.

Offsite Radiological Impacts of Spent Nuclear Fuel and High-Level Waste Disposal

The Revised GEIS continues to review the offsite radiological impacts from spent nuclear fuel and high level waste disposal in relation to the use of Yucca Mountain as the future long-term geologic repository. This flies in the face of recent indications that Yucca is no longer a viable option. Indeed, there is no dispute that the current Administration has brought the axe down on the Yucca project. Most recent accounts indicate that the U.S. Department of Energy intends to stop pursuing a license for the Yucca repository by this December.[111] Even the NRC Commissioner's have acknowledged the current plan to eliminate the Yucca Mountain Project.[112]

It is, thus, curious, that a document that will serve as a generic environmental impact statement for decades to come would continue to rely upon this eventuality. Indeed, the Revised GEIS explicitly relies upon dose limits from documents filed in connection with the Department of Energy's Yucca Application.[113] In addition to misguidedly relying upon a pending application, such information was developed specifically in relation to Yucca, and is therefore essentially unusable in light of the aforementioned circumstances.

Given the uncertainly of long-term disposal of nuclear waste, and the likelihood of essentially indefinite on-site storage, it makes far more sense to perform a site specific review to discern the offsite impacts of this waste at particular plants. While the NRC will undoubtedly claim that they are relying in good faith on the Department of Energy's pending application which has not been withdrawn yet, the NRC must not "shut . . . [their] ears to the din of current debate" as Commissioner Svinicki has articulated.[114]

VIII. CONCLUSION

For the foregoing reasons, Riverkeeper respectfully submits that the Revised GEIS for license renewal of nuclear power plants is inadequate and incomplete. The environmental review based on the Revised GEIS would fail to provide for a comprehensive review which is necessary to comply with NEPA.

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[111] *See, e.g.*, Keith Rogers, *Yucca Mountain: Memo casts doubt on license for Yucca repository*, LAS VEGAS REVIEW-JOURNAL (Nov. 10, 2009), http://www.lvrj.com/news/memo-casts-doubt-on-license-for-yucca-repository-69639342.html (last visited Jan. 12, 2009).

[112] *See* Notation Vote of Commissioner Klein, SECY-09-0090 – Final Update of the Commission's Waste Confidence Decision (September 16, 2009), *available at*, http://www.nrc.gov/reading-rm/doc-collections/commission/cvr/2009/2009-0090vtr-dek.pdf; Notation Vote of Commissioner Svinicki, SECY-09-0090 – Final Update of the Commission's Waste Confidence Decision (September 24, 2009), *available at*, http://www.nrc.gov/reading-rm/doc-collections/commission/cvr/2009/2009-0090vtr-kls.pdf ("Svinicki Vote on WCD").

[113] *See* Proposed Rule at 38,127.

[114] Svinicki Vote on WCD at 3.

Thank you for your consideration.

Sincerely,

s/

Phillip Musegaas, Esq.
Hudson River Program Director

s/

Deborah Brancato
Staff Attorney

LIST OF EXHIBITS

Exhibit A – compiled documentation related to nuclear power plant leaks across the United States.

Exhibit B – Riverkeeper, Inc.'s Request for Hearing and Petition to Intervene in Indian Point License Renewal Proceeding, November 30, 2007

Exhibit C – Riverkeeper Comments on Environmental Scoping for the Indian Point License Renewal Proceeding, Docket Nos. 50-247, 50-286 (Oct. 12, 2007)

Exhibit D – Riverkeeper Comments on Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 38, Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3, Draft Report for Comment (March 18, 2009)

Exhibit E – Riverkeeper's Comments on NRC's Proposed Enhancements to Emergency Preparedness Regulations (Oct. 19, 2009)

Exhibit F – Gordon R. Thompson, "Risk Related Impacts from Continued Operation of the Indian Point Nuclear Power Plants" (Institute for Resource and Security Studies) (November 28, 2007)

Exhibit G – Edwin S. Lyman, *Chernobyl on the Hudson? The Health & Economic Impacts of a Terrorist Attack at the Indian Point Nuclear Power Plant* (Union of Concerned Scientists, September 2004)

PROPOSED RULE TO REVISE GENERIC ENVIRONMENTAL IMPACT STATEMENT FOR LICENSE RENEWAL OF NUCLEAR POWER PLANTS

COMMENTS OF ROBERT SNOOK ASSISTANT ATTORNEY GENERAL OF CONNECTICUT

SUMMARY

The Nuclear Regulatory Commission's ("NRC") proposed revisions to the generic environmental impact statement for license renewal of nuclear power plants released July 31, 2009 ("Revised GEIS" or "Statement"), while containing important changes such as recognizing the importance of evaluating groundwater impacts, remains inadequate. The Revised GEIS is required by law to identify and evaluate all reasonably foreseeable potential environmental impacts resulting from the proposed license renewals, but it fails to do so.

Three significant environmental impacts of relicensing nuclear power plants must be further evaluated: 1) the continued and increased storage of spent nuclear fuel onsite because the federal government no longer has any plan or proposal for the permanent storage of high level reactor waste; 2) the threat of terrorist attacks on nuclear facilities; and 3) emergency response and evacuation of the facilities and surrounding areas.

The Revised GEIS severely underestimates the consequences of a fire, accident or attack on any relicensed facility, and especially on stored spent nuclear fuel on-site ("SNF"), as those risks will be profoundly increased by the continued operation of nuclear power stations and the permanent termination of the Yucca Mountain waste storage project. The Revised GEIS ignores the environmental impact of a successful attack at a relicensed nuclear power station. The Revised GEIS similarly ignores the

environmental consequences of realistic and effective evacuation plans. Further, the Revised GEIS has clearly not taken into account at all the example of the disaster at the Fukushima nuclear power plant and its clear implications for this nation's nuclear infrastructure. The Revised GEIS gives no look, and surely not the required "hard look," at critical aspects of license renewal of nuclear power stations.

State and local governments will bear the full burden of responding to the human and natural resources impacts caused by an accident or attack on a nuclear power station. Until all relevant data is presented and thoroughly reevaluated, NRC's environmental impact statement will be legally inadequate, because it will fail to effectuate the safeguards required by the National Environmental Policy Act, 42 U.S.C § 4321, *et seq.* ("NEPA") .

BACKGROUND

The Atomic Energy Act of 1954 ("AEA") authorizes the NRC to issue commercial nuclear power stations operating licenses for a period of up to 40 years and permits renewals upon expiration. NRC regulations, in turn, authorize renewals for a period of up to 20 years.

As described in detail below, the National Environmental Policy Act mandates that federal agencies proposing actions that could result in significant environmental impacts provide a detailed study of these impacts for public review and comment. Pursuant to NRC regulations, 10 CFR Part 51, renewal of a nuclear power station operating license requires the preparation of an environmental impact statement ("EIS").

In 1996, NRC released a Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants ("GEIS") NUREG-1437. This document was designed

to assess environmental impacts associated with continued operation of power plants as a result of a decision by NRC to permit relicensing. The GEIS was intended to address generic issues that apply to all license renewal applications. Plant specific supplemental EISs would be required for each license renewal application to address those issues not covered in the GEIS.

NRC released the Revised GEIS for License Renewals for Nuclear Plants in July, 2009. The 2009 revised GEIS is specifically intended "to incorporate lessons learned and knowledge gained" since 1996. Revised GEIS p. S-2.

Interests of the State of Connecticut

As chief legal officer of the State of Connecticut, the Attorney General has long supported efforts to protect human health and safety and the environment from improper use of radioactive materials. Connecticut is a densely populated state containing several operating or decommissioned nuclear power sites. In addition, the Attorney General is currently involved as an interested governmental body in the relicensing proceedings for the Indian Point nuclear power plant. *See* In the Matter of Entergy Nuclear Operations, Inc., ASLBP No. 07-858-03-LR-BD01, Memorandum and Order (July 31, 2008). Indian Point is located in New York, close to the border with Connecticut, and fully one-third of Connecticut's citizens reside within the 50-mile ingestion pathway zone for Indian Point. Relicensing of nuclear power plants will directly affect the citizens of the State of Connecticut. In fact, that much of the burden associated with relicensing devolves onto State government and its citizens. In the event of an accident or attack, the primary responders will inevitably be state and local law enforcement, fire fighters and medical personnel. State officials, and budgets, will be required to deal with evacuations or other

related issues. It is clear, therefore, that the State of Connecticut has a strong interest in ensuring the safety of nuclear power plants near or within its borders.

The Atomic Energy Act and NEPA

Section 161(b) of the Atomic Energy Act empowers the Nuclear Regulatory Commission to "establish rule[s], regulation[s], or order[s]" to "protect health or to minimize danger to life or property."[1] The NRC's authority to protect the public

> ...cannot be read simply to permit the Commission to provide adequate protection; another section of the Act "requires" the Commission to do that much. We therefore must view section 161 as a grant of authority to the Commission to provide a measure of safety above and beyond what is "adequate." The exercise of this authority is entirely discretionary. If the Commission wishes to do so, it may order power plants already satisfying the standard of adequate protection to take additional safety precautions.[2]

The AEA prohibits the NRC from issuing a license to operate a nuclear power plant if it would be "inimical to the common defense and security or to the health and safety of the public." 42 U.S.C. § 2133(d). Public safety is "the first, last, and a permanent consideration in any decision on the issuance of a construction permit or a license to operate a nuclear facility. "Petition for Emergency and Remedial Action, 7 NRC at 404, *citing Power Reactor Development Corp. v. International Union of Electrical Radio and Machine Workers*, 367 U.S. 396, 402 (1961) ("*Power Reactor Development Corp.*").

The National Environmental Policy Act, 42 U.S.C § 4321, *et seq.*, mandates that federal agencies involved in activities that may have a significant impact on the environment complete a detailed statement of the environmental impacts and project

[1] 42 U.S.C. § 2201(b), (i).

[2] *Union of Concerned Scientists v. NRC*, 824 F.2d 108, 110 (D.C. Cir. 1987).

alternatives. NEPA directs that federal agencies, such as the NRC, must study certain issues and that the reviewing agency must take a "hard look" at these issues, but does not direct what result an agency must reach. Federal appellate courts have been very clear that NEPA is an important federal law and compliance is mandatory. "NEPA was created to ensure that agencies will base decisions on detailed information regarding significant environmental impacts and that information will be available to a wide variety of concerned public and private actors. *Morongo Band of Mission Indians v. Federal Aviation Administration,* 161 F.3d 569, 575 (9th Cir. 1998)" (quoted in *Mississippi River Basin Alliance v. Westphal,* 230 F.3d 170, 175 (5th Cir. 2000)).

Thus, the fundamental goal of an evaluation under NEPA is to require responsible government agencies involved with a given project to undertake a careful and thorough analysis of the need for that project and its impacts before committing to proceed with the project. As the Tenth Circuit has held:

> The purpose of NEPA is to require agencies to consider environmentally significant aspects of a proposed action, and, in so doing, let the public know that the agency's decisionmaking process includes environmental concerns. *Baltimore Gas & Elec. Co. v. Natural Resources Defense Council,* 462 U.S. 87, 97, 76 L. Ed. 2d 437, 103 S. Ct. 2246 (1983); *Sierra Club v. United States Dep't of Energy*, 287 F.3d 1256, 1262 (10th Cir. 2002).

Utahns For Better Transportation v. United States Dept. of Transp., 305 F.3d 1152, 1162 (10th Cir. 2002).

It is not only the government decision-makers who are to be served by an EIS, but the citizens of this nation as well. As one court noted: "The purpose of an EIS is to 'compel the decision-maker to give serious weight to environmental factors' in making choices, *and to enable the public to* 'understand and consider meaningfully the factors

involved.' *County of Suffolk [v. Secretary of Interior]*, 562 F.2d at 1375 (*citing Sierra Club v. Morton*, 510 F.2d 813, 819 (5th Cir. 1975))." *Town of Huntington v. Marsh*, 859 F.2d 1134, 1141 (2d Cir. 1988)(emphasis added).

Spent Nuclear Fuel

The NRC has acknowledged that severe accident analyses in the 1996 GEIS "were limited to consideration of reactor accidents caused by internal events."[3] The Revised GEIS identifies additional types of potential severe accidents, including an explicit recognition of spent fuel pool accidents. The statement asserts that such accidents would have the same consequences for all plants and that therefore such accidents constitute a generic Category 1 issue for the Revised GEIS, instead of a site-specific or Category 2 issue for a separate site-specific environmental impact statement.[4]

The Revised GEIS goes on to draw incorrect conclusions about the likely consequences of spent fuel pool accidents. Specifically, it concludes "that the reduction in environmental impacts from the use of new information outweighs any increases resulting from new consideration. As a result, the findings in the 1996 GEIS remain valid."[5] With respect to fuel pool accidents, the Revised GEIS concludes that "the environmental impacts from accidents at spent fuel pools . . . can be comparable to those from reactor accidents at full power . . . Subsequent analyses performed, and mitigative measures employed since 2001 have further lowered the risk of this class of accidents."[6]

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[3] Revised GEIS at 4-153.
[4] *See id.* At 4-153 to 4-154; Revised GEIS Appendices at E-32 ("the 1996 GEIS did not include an explicit assessment of the environmental impacts of accidents at the spent fuel pools (SFPs) located at each reactor site."). *See* Revised GEIS Appendices at B-33.
[5] Revised GEIS at 4-154.
[6] *Id.* At 4-156

The NRC thus places spent fuel pools as a Category 1 issue to be considered in the Revised GEIS, and then inexplicably discounts the risks as "small."[7]

The NRC's revised assessment of risk related to spent pools is not supported by the facts, and this failure undermines the NRC's conclusion that the impact of releases to the environment from severe accidents will be small. For example, particularly since the introduction of high-density storage racks into spent fuel pools forty years ago, it can no longer be assumed that spent fuel pools pose no major risk.[8] The dense packing of fuel rods can create gravely dangerous situations if water drains from a spent fuel pool, including disastrous pool fires.[9] While early studies suggested that old fuel will not burn and full drainage of a pool was necessary to create any risk, newer studies have changed the picture.[10] These recent studies show that if the water level drops so that only the tops of the fuel assemblies are uncovered, the fuel could burn and resulting fires could be catastrophic.[11] Numerous reports and studies show that fuel storage pools are potentially susceptible to fire and subsequent radiological release from earthquakes and other natural events.[12] These studies do not take into account emerging data from Fukushima.

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[7] *See* Revised GEIS Appendices at B-33.
[8] *See* Thompson Report at 18-27.
[9] *Id.*
[10] *See* Waste Confidence Rule, 55 Fed. Reg. 38,474, 38,481 (Sept. 18, 1990).
[11] NUREG-1738, *Final Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants* (January 2001); 2006 NAS Study at 53-54. The revised GEIS improperly attempts to underplay the findings of NUREG-1738 at various turns. *See*, e.g., Revised GEIS Appendices at E-34 ("the impact analysis contained in NUREG-1738 is considered conservative"); *id.* at E-35 ("low ruthenium source term is . . . viewed as the more accurate representation. Therefore, the risk and environmental impact from fires in SFPs as analyzed in NUREG-1738 are expected to be comparable to or lower than those from reactor accidents and are bounded by the 1996 GEIS."); *id* at E-36 ("Based on the more rigorous accident progression analyses, the recent mitigation enhancements, and NRC site evaluations of every SFP in the United States, the risk of an SFP zirconium fire initiation is expected to be less that reported in NUREG-1738").
[12] *See, e.g.*, NUREG-1738, Final Technical Study of 1 Spent Fuel Pool Accident Risk and Decommissioning Nuclear Power Plants (NRC: January 2001): National Academy of Sciences Committee on the Safety and Security of Commercial Spent Nuclear Fuel Storage, Safety and Security of Commercial spent Nuclear Fuel Storage (The National Academies Press: 2006); Gordon Thompson, Risks and Risk-Reducing Options Associated with Pool Storage of Spent Nuclear Fuel at the Pilgrim and Vermont Yankee

Accordingly, the NRC conclusion that all consequences from severe accidents, including those involving spent fuel pools, are "small" for all plants is without proper support.[13]

It is particularly disturbing is that the Revised GEIS shows no indication of having been modified to reflect the lessons learned and to be learned from the destruction of three nuclear reactors, and damage to spent fuel pools, at Fukushima, Japan, in March 2011. Obviously, it will take time to fully evaluate all that happened at Fukushima and significant effort will be needed to understand and characterize these events fully. It is already clear, however, that many of the assumptions that went into safeguarding that plant were incorrect. Risks were underestimated and the consequences of that failure were, and are, severe. In particular, Fukushima shows that spent fuel pool buildings can and did suffer damage.

Because there is no national waste repository, the spent nuclear fuel at civilian reactors is kept in water-filled storage pools located next to nuclear reactors, but almost always *outside* the reactors' protective containment domes. The danger created by these high-density storage pools in the event of an accident or terrorist attack is obvious. The two operating reactors at the Indian Point nuclear power station, for example, are located in one of the most densely populated areas of the country, an area which includes not only New York City and much of southern New York and northern New Jersey, but also much of the State of Connecticut, within its potential exposure zone.

Nuclear Power Plants (May 25, 2006); Jan Beyea, Report to the Massachusetts Attorney General on the Potential Consequences of a Spent-fuel Pool Fire at the Pilgrim or Vermont Yankee Nuclear Plant (May 25, 2006).

[13] The Revised GEIS notes that mitigation efforts reduce the risk of fuel pool fires. However, these efforts are site-specific which flatly contradicts the NRC's contention that spent fuel pool accidents do not warrant site-specific consideration and thus support a conclusion that spent fuel pools should be Category 2.

The facts, as developed over the last several decades, clearly contradict NRC's assumption that SNF storage is safe. In fact, an accident or attack on a SNF pool could result in a loss of coolant and subsequent fire releasing deadly amounts of radiological material and toxic fumes. An NRC report published in February, 2001, described in detail what can occur if there is a loss of coolant in a fuel pool:

> This reaction of zirconium and air, or zirconium and steam is exothermic (i.e., produces heat). The energy released from the reaction, combined with the fuel's decay energy, can cause the reaction to become self-sustaining and ignite the zirconium. The increase in heat from the oxidation reaction can also raise the temperature in adjacent fuel assemblies and propagate the oxidation reaction. The zirconium fire would result in a significant release of the spent fuel fission products which would be dispersed from the reactor site in the thermal plume from the zirconium fire. Consequence assessments have shown that a zirconium fire could have significant latent health effects and resulted (sic) in numbers of early fatalities.[14]

A Department of Energy report indicates that such a fire would release considerable amounts of cesium-137, an isotope that accounted for most of the offsite radiation exposure from the 1986 Chernobyl accident.[15] Another report, authored by NRC, concludes that, in the event of a pool fire, approximately 100 percent of the pool's inventory of cesium would be released to the atmosphere.[16] The radioactive fallout from this type of release could also render tens of thousands of acres of land uninhabitable.

The Revised GEIS inexplicably and insupportably asserts that high density fuel storage pools pose no significant environmental risk. *See*, Revised GEIS, p. S-17. This claim is completely refuted by the reports prepared by the National Academy of Sciences,

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[14] NRC Report February, 2001 at 3-1 (internal citation omitted). (NUREG 1738)

[15] *See* US Department of Energy, Health and Environmental Consequences of the Chernobyl Nuclear Power Plant Accident, DOE/ER-0332 (Washington, DC: DOE. June 1987).

[16] *See* V L Sailor et al, Severe Accidents in Spent Fuel Pools in Support of Generic Safety Issue 82, NUREG/CR-4982 (Washington, DC: NRC, July 1987).

the NRC itself, and independent experts.[17] The February, 2001 NUREG 1738 report referred to above showed that fuel storage pools are susceptible to fire and radiological release from a wide range of conditions, including natural phenomena, operator error, equipment failure, or intentional attack. The environmental impacts of a fire in a spent fuel pool may be severe, extending over a geographic area larger than one state's boundaries and continuing for decades.

In the February, 2001 Report, the NRC admitted that:

> "the risk analysis in this study did not evaluate the potential consequences of a sabotage event that could directly cause off-site fission product dispersion, for example, a vehicle bomb driven into or otherwise significantly damaging the SFP [Spent Fuel Pool]. . . ."[18]

There are, therefore, clear and foreseeable risks associated with the continued massive buildup of spent fuel. Consequently, the Revised GEIS is flawed in assuming, in the face of material evidence to the contrary, that the risk from spent fuel pools is small. The failure of the Revised GEIS to acknowledge the potentially catastrophic consequences to human health and safety and the environment from an accident or attack on the accumulated stored fuel is made worse by the fact that the document is based upon a fundamental error – a continuing assumption that there will be a national repository for off-site disposal of spent fuel.

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[17] NUREG-1738, Final Technical Study of 1 Spent Fuel Pool Accident Risk and Decommissioning Nuclear Power Plants (February 2001); National Academy of Sciences Committee on the Safety and Security of Commercial Spent Nuclear Fuel Storage, Safety and Security of Commercial spent Nuclear Fuel Storage (The National Academies Press: 2006); Gordon Thompson, Risks and Risk-Reducing Options Associated with Pool Storage of Spent Nuclear Fuel at the Pilgrim and Vermont Yankee Nuclear Power Plants (May 25, 2006); Jan Beyea, Report to the Massachusetts Attorney General on the Potential Consequences of a Spent-fuel Pool Fire at the Pilgrim or Vermont Yankee Nuclear Plant (May 25, 2006).

[18] NRC Report February, 2001, NUREG -1738, at 4-15.

Section 1.7.2 of the Revised GEIS expressly states that NRC "will not make a decision or any recommendation on the basis of the information presented in this GEIS regarding the disposition of" SNF. This section continues that the agency's rules "leave[] the onsite storage of spent nuclear fuel during the term of plant operation as the only option at the time of license renewal." *Id.* While acknowledging that the NWPA mandates that the federal government is responsible for high level nuclear waste, the Revised GEIS only states that the "NRC is confident that there will eventually be a licensed high-level waste repository." *Id.* The Revised GEIS thus concludes that SNF "will be safely stored either onsite or at offsite interim storage facilities." *Id.* This sort of wishful thinking without analysis is virtually the opposite of the "hard look" required by NEPA. The purpose of an environmental review is to allow decision makers to know and understand the full range of potential impacts to public health and safety and the environment from a proposed action.

The assumptions regarding the eventual disposal of spent nuclear fuel in both the 1996 GEIS and the Revised GEIS were based on the 1984 Waste Confidence Decision. Originally the Rule stated that there was reasonable assurance that one or more mined geologic repositories for commercial SNF would be available by the years 2007-2009, and that sufficient repository capacity would be available within 30 years beyond the expiration of any reactor operating license to dispose of existing commercial SNF originating in such reactor and generated up to that time.

There have been amendments to the Waste Confidence Rule over the years and NRC revised the waste-confidence decision and the temporary-storage rule again in 2010 to provide that (1) a common repository will be available "when necessary," and

(2) spent fuel can be stored in a combination of spent-fuel pools and dry casks for sixty years beyond the expiration of a reactor's license safely and without environmental impacts. The revised rule states:

> [I]f necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 60 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor in a combination of storage in its spent fuel storage basin and at either onsite or offsite independent spent fuel storage installations. Further, the Commission believes there is reasonable assurance that sufficient mined geologic repository capacity will be available to dispose of the commercial high-level radioactive waste and spent fuel generated in any reactor when necessary.

10 C.F.R. § 51.23(a). Based on those determinations, the rule provides that the site-specific EIS that is prepared when a plant's license is renewed is not required to discuss "any environmental impact of spent fuel storage in reactor facility storage pools" for "the period following the term of the reactor operating license or amendment." *Id.* § 51.23(b); *see also id.* § 51.30(b).

However, after spending approximately $14 billion over the last 20 years to study and develop the proposed repository at Yucca Mountain, the Department of Energy has withdrawn with prejudice its application for a nuclear fuel repository. The NRC's fundamental SNF premise underlying all assumptions in the Revised GEIS is now demonstrably false. Accordingly, the GEIS must be drastically revised to conform to the obvious facts.

Failure to Evaluate Terrorist Attacks

The Revised GEIS states that "the risk of a successful terrorist attack (i.e., one that results in a zirconium fire) is very low,"[19] and that the impact of severe accidents is "small." Section 1.7.4 of the Revised GEIS then states that "Security issues . . . are not tied to a license renewal action . . . ." *Id.* Because security is deemed by the NRC to be independent of license renewal, "decisions and recommendations concerning safeguards and security at nuclear power stations are ongoing and outside the regulatory scope of this GEIS." *Id.*

The conclusion that the risk of an attack is very low is not supported in the record and is flatly contradicted by essentially every other federal agency and the decision not to discuss the consequences of an attack is illogical and inconsistent with NEPA. The purpose of an environmental review is to allow decision makers to know and understand the full range of potential impacts to public health and safety and the environment from a proposed action. Ignoring major impacts, such as the environmental consequences of a terrorist attack, is a flat violation of federal law. While the plans and procedures to safeguard nuclear power stations are properly classified and not part of this proceeding, it makes little difference to human health and safety and the environment what caused a major release of radioactive material. A major release, whether accidental or the result of sabotage, can have a major environmental impact and to assume that there is no real risk of an attack is to ignore reality.

Clearly, since September 11, 2001, there has been a heightened awareness that nuclear facilities are at risk of terrorist attacks. Such an attack might target the reactor

[19] Revised GEIS Appendices at E-35.

containment building of a nuclear generating facility, but it might also target potentially more vulnerable targets, such as the spent fuel pools, that have considerably less structural protection. As noted in a Princeton University study, a successful terrorist attack on a spent fuel storage pool at a large nuclear reactor could have consequences "significantly worse that Chernobyl."[20]

Nuclear power plants plainly remain potential targets of terrorist attack. The 9/11 Commission Report revealed that Al Qaida had intended to hijack additional aircraft to crash into other targets, including nuclear power plants.[21] The federal government has repeatedly recognized that there remains a threat of attacks on nuclear power stations.[22] As President Obama has said: "We are at war."[23]

NRC cannot maintain that a terrorist attack on a nuclear power station is not a foreseeable risk. In fact, NRC itself has long recognized that nuclear power stations are

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[20] Reducing the Hazards from Stored Spent Power-Rector Fuel in the United States, Science and Global Security, 11:1-51, 2003, p. 2

[21] Nat'l Comm'n on Terrorist Attacks Upon the U.S., the 9/11 Commission Report (2004), at 154 ("9/11 Commission Report"). The report stated that the terrorists were considering attacking a specific nuclear facility in New York which one of the pilots had seen during a familiarization flight near New York, nmost probably Indian Point. *Id.* At 245.

[22] Obama Details New Policies in Response to Terror Threat, New York Times, Jan. 8, 2010. //www.nytimes.com/2010/01/08/us/politics/08terror.html?hp See, e.g.; *Wide-Ranging New Terror Alerts*, CBSNews.com (May 26, 2002), http://cbsnews.com/stories/2002/05/24/attack/main510054.shtml (discussing heightened alert of the U.S.'s nuclear power plants as a result of information gained by the intelligence community); *FBI Warns of Nuke Plant Danger*, CBSNews.com (May 1, 2003), *available at*, http://www.cbsnews.com/stories/2003/09/04/attack/main571556.shtml (discussing FBI warning to nuclear plant operators to remain vigilant about suspicious activity that could signal a potential terrorist attack); General Accounting Office, *Nuclear Regulatory Commission: Oversight of Security at Commercial Nuclear Power Plants Needs to be Strengthened*, GAO-03-752 (2003) (noting that U.S. nuclear power plants are possible terrorist target, and criticizing the NRC's oversight of plant security); *FBI's 4th Warning*, CBSNews.com (July 2, 2004) (discussing FBI warning of recent intelligence showing Al-Qaeda interest in attacking nuclear plants).

[23] Obama: "We are at war." New York Times, Jan. 7, 2010. http://thecaucus.blogs.nytimes.com/2010/01/07/obama-review-revealed-significant-national-security-shortcomings/

potentially vulnerable to attack. As early as 1977, the agency's published design basis threat ("DBT") regulation explicitly acknowledged the possibility of attack. Final Rule, Requirements for the Physical Protection of Nuclear Power Reactors, 42 Fed. Reg. 10,836 (Feb. 24, 1977).[24] In 1994, the DBT rule was amended to include vehicle based bomb threats. Final Rule, Protection Against Malevolent Use of Vehicles at Nuclear Power Plants, 59 Fed. Reg. 38,889 (Aug. 1, 1994). Further, in 2002, the NRC itself ordered nuclear plant operators "to develop specific guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities using existing or readily available resources (equipment or personnel) that could be effectively implemented under the circumstances associated with loss of large areas of the plant due to explosions or fire, including those that an aircraft impact might create." Letter from J. Boska, NRC, to M. Balduzzi, Entergy Operations (July 11, 2007).[25] In fact, one emergency drill at the Indian Point facility assumed that it was attacked by terrorists using a hijacked 737 airplane.[26] Clearly, NRC cannot maintain that a terrorist attack is not foreseeable when the agency itself has foreseen it.

In 2005, the National Academy of Sciences released a report from a study it conducted at the request of Congress, with the sponsorship of the NRC and the Department of Homeland Security, of the security risks posed by the storage of spent fuel at nuclear plant sites. See Nat'l Acad. of Scis., Safety and Security of Commercial Spent Nuclear Fuel Storage: Public Report (2006) [hereinafter NAS Study]. Based upon

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[24] Similarly, the NRC's 1979 environmental impact statement included a section dealing with possible sabotage attacks.

[25] ML071920023.

[26] Final Exercise Report Indian Point, Oct. 24, 2004 (ML 050190165) Appendix 4.

information provided by the NRC, the National Academy of Sciences judged that "attacks with civilian aircraft remain a credible threat." *Id.* at 30 It noted that terrorists might choose to attack spent fuel pools because they are "less well protected structurally than reactor cores" and "typically contain inventories of medium- and long-lived radionuclides that are several times greater than those contained in individual reactor cores." *Id.* at 36. The National Academy of Sciences concluded that the storage pools are susceptible to fire and radiological release from a wide range of conditions, including intentional attacks with large civilian aircraft. *Id.* at 49, 57. According to a report prepared for Congress by the Government Accountability Office, the nation's nuclear power plants remain vulnerable to a terrorist attack.[27]

The threat of attack or sabotage to the nation's nuclear power stations is real and present. Terrorists are still attempting to create a "dirty bomb" or otherwise cause a deliberate release of radioactive material. On October 28, 2008, Dr. Mohamed ElBaradei, Director General of the International Atomic Energy Agency (IAEA), addressed the United Nations General Assembly and warned the world about nuclear terror: "The possibility of terrorists obtaining nuclear or other radioactive material remains a grave threat."[28] Dr. ElBaradei also warned of "the potential of terrorists targeting nuclear facilities."[29] He stated that the "safety and security of nuclear material is a legitimate concern of all States" and that "[t]he willingness of terrorists to commit

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[27] Nuclear Power Plants Efforts Made to Upgrade Security, but the Nuclear Regulatory Commission's Design Basis Threat Process Should Be Improved, March 2006, GAO-06-388.

[28] World At Risk – The Report of the Commission on the Prevention of WMD Proliferation and Terrorism, Graham & Talent (December 2008), http://www.preventwmd.gov, at 43.

[29] International Atomic Energy Agency, *Calculating the New Global Nuclear Terrorism Threat* (November 1, 2001) *available at* www.iaea.org/worldatom/Press/P_release/2001/nt_Pressrelease.shtml.

suicide to achieve their evil makes the nuclear terrorism threat far more likely than it was before September 11."[30] It is clear that the threat of terrorism is very real and the possibility of an attack or sabotage needs to be considered in any NEPA analysis.

Terrorism is clearly a foreseeable threat to the nation's nuclear power facilities and related infrastructure. NEPA mandates a full analysis of foreseeable impacts. While the security plans and similar issues are properly classified and not part of this discussion, the environmental impacts of an attack on a nuclear power station are both foreseeable and properly part of an environmental impact statement. Some of the impacts associated with a terrorist attack are likely to be Category 2 impacts and therefore evaluated in a site-specific environmental analysis, but other potential impacts would be essentially the same at all plants and could be discussed in a generic study. In either event, the Revised GEIS fails to contain any analysis regarding the results of an attack. Therefore, important data is lacking in this GEIS and, until it is made available, this environmental impact document is incomplete.

Emergency Evacuation Impacts Not Considered

The Revised GEIS clearly and unequivocally states that "NRC will not make a decision or any recommendation on the basis of information presented in this GEIS regarding emergency preparedness at nuclear power plants." Revised GEIS, Section 1.7.3. The Revised GEIS states that existing emergency plans "cover preparations for evacuation, sheltering, and other actions to protect residents. . . ." *Id.* The Revised GEIS concludes that the Federal Emergency Management Agency ("FEMA") "has the lead in overseeing offsite planning and response. . . ." *Id.*

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[30] *Id.*

Under NEPA, a reviewing agency is required to consider the impact on the environment resulting from the total effects of the contemplated action and other past, present, and "reasonably foreseeable" future actions. See 40 C.F.R. 1508.7 (1990). Furthermore, NEPA mandates that federal agencies contemplating "major federal actions significantly affecting the quality of the human environment," 42 U.S.C. § 4332(2)(C), are obligated to include in the recommendation or report on the anticipated action an environmental impact statement ("EIS"), as "evidence that an agency has considered the reasonably foreseeable environmental effects of a proposed major action before making a decision to take the action." *Town of Orangetown v. Gorsuch*, 718 F.2d 29, 34 (2d Cir. 1983), *cert. denied*, 465 U.S. 1099 (1984). Nothing in NEPA says that if some other agency has the lead on an aspect of a project, the NEPA reviewing agency can ignore that aspect, but that is what NRC is attempting to do.

To meet the mandates of NEPA, the Revised GEIS must identify and discuss all anticipated adverse impacts in a clear and comprehensive fashion, including any adverse unavoidable environmental effects resulting from the implementation, alternatives to the proposed action, the relationship between short-term uses and the long-term maintenance of the environment, and any irretrievable commitments of resources involved in the proposed action. Such a detailed statement "insures the integrity of the agency process by forcing it to face those stubborn, difficult-to-answer objections without ignoring them or sweeping them under the rug" and serves as an "environmental full disclosure law so that the public can weigh a project's benefits against its environmental costs." *Sierra Club v. United States Army Corps of Eng'rs* (Sierra Club

II), 772 F.2d 1043, 1049 (2d Cir. 1985); *see also Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989).

This Revised GEIS does not evaluate the environmental impacts associated with a major evacuation, an evacuation that is demonstrably foreseeable in that NRC mandates that all power stations have evacuation plans and test them. Further, an evacuation is a foreseeable consequence of any and all the potential accidents or attacks that NRC has already concluded are properly considered in the Revised GEIS. It is irrelevant what caused the incident at a power station for purposes of evaluating the environmental impacts associated with an evacuation and displacement of hundreds of thousands, if not millions, of people. What is relevant is that the Revised GEIS accepts that any number of events could trigger a release of a substantial amount of radioactive material. Once that occurs, it is beyond dispute that evacuation may be necessary as the Fukushima disaster has powerfully demonstrated. As noted above, a full evaluation of the events at Fukushima is not available. However, Fukushima shows that evacuation plans need to reevaluated to consider their effectiveness and that evacuations have collateral environmental consequences. Moving significant numbers of people, and resettling them for the short or longer term, will affect natural resources in the host areas. One need look no further that the experiences in the United States from Hurricanes Katrina and Rita in 2005 to see that regional disasters result in complex resettlement impacts which in turn burden local communities and local natural resources.

This issue is particularly important because an accident or attack at a nuclear power facility would cause not only a potential catastrophe for the local population, but

also far reaching downwind damage.[31] As was demonstrated by the 1986 disaster at the Chernobyl nuclear power station in the Ukraine, not only are people in the immediate vicinity affected by a major release of radioisotopes, but vast areas at great distances may be contaminated, creating disastrous public health and environmental consequences for communities many miles from the actual site. Further, these adverse impacts can continue for many years after the event. Consequently, NRC must evaluate the impacts to human health and safety and the environment of an immediate accident or attack on the entire potentially impacted downwind environment, as well as the collateral impacts of the long-term relocation of large numbers of displaced citizens who live in the immediate vicinity of an affected plant, as well as the potential millions more who live within the 50-mile radius, in the event of major downwind contamination.[32]

NEPA requires a consideration of all potential impacts from a proposed government project. The emergency evacuation plan is a central and critical element of the NRC's reactor permit and regulatory program and is an aspect of great importance to state officials. There is no federal fire department or federal paramedic organization. State and local officials will be the ones to respond in an emergency and the full burden of an evacuation and resettlement of displaced persons will fall on state and local shoulders.

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[31] Emergency planning for Indian Point, for example, includes plans covering both a 10-mile radius emergency planning zone ("EPZ") and a separate 50-mile radius ingestion pathway zone. The 50-mile radius zone includes substantial portions of the State of Connecticut, including its largest city, Bridgeport, and its most populous county, Fairfield. The immediate consequences of an evacuation order would affect approximately one-third of the population of Connecticut. In 2003, James Lee Witt, the former director of the Federal Emergency Management Agency issued a report detailing the deficiencies in the emergency evacuation plan for the Indian Point. Mr. Witt concluded that safe evacuation of the area surrounding Indian Point is highly unlikely, if not impossible. James Lee Witt Associates, Review of Emergency Preparedness of Areas Adjacent to Indian Point and Millstone (2003).

[32] Indian Point Independent Safety Evaluation, July 31, 2008, p.5.

It is true that emergency response and evacuation plans will differ from one plant to another based on local conditions and these are properly part of a site-specific environmental impact statement. But many elements can and should be standardized in order to provide uniform and consistent national standards. For example, protocols for notifying state and local officials and the public can and should be standardized. Similarly, computer modeling of evacuation and emergency training and response procedures should be common to all power stations.[33] Thus, the NRC's NEPA review of the potential impacts resulting from operation of nuclear reactors, and the spent fuel pools and dry cask storage facilities, for an additional 20 years must include an analysis of the impacts of standardized elements of emergency response and evacuation for nuclear power stations.

[33] As an example, the Final Exercise Report, Oct. 24, 2004, (ML 050190165) regarding an emergency exercise at Indian Point noted that the evacuation order was given in English to Spanish-speaking residents near the power plant, Section 1.3, that inaccurate information was given to the public, Section 2.1, that government officials failed to communicate with each other, Section 2.3.1 and that, in one case, an automated telephone system was incomplete and radiation dose assessment personnel were not notified of the staged "accident." Section 2.4.1 These kinds of systemic errors and mistakes could happen at any facility across the country and the environmental consequences need to be evaluated and addressed.

CONCLUSION

The NRC has failed to provide a thorough and accurate analysis of all relevant potential impacts and has failed to take a "hard look" at the adverse impacts of this project. Foremost among the critical risks are the problems resulting from an additional 20 years accumulation of spent nuclear fuel without any prospects for a federal repository, the need to ensure practical and workable evacuation plans, and the failure to address the environmental consequences of a terrorist attack. The Revised GEIS is incomplete. The NRC must provide the missing analyses regarding impacts to natural resources and evaluate the long-term impact to these resources from these identifiable risks.

Dated: January 11, 2012

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

10 CFR Part 51 License Renewal (GEIS) Rulemaking

Office of Nuclear Reactor Regulation

January 11, 2012

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Overview and Introduction

Bill Borchardt

Executive Director for Operations

January 11, 2012

Agenda

- Overview – Bill Borchardt
- License Renewal Rule – Eric Leeds
- Rulemaking & GEIS Revision – Melanie Galloway
- Summary of Changes – Andrew Imboden

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Origins of 10 CFR Part 51 License Renewal Rule

Eric Leeds, Director

Office of Nuclear Reactor Regulation

January 11, 2012

License Renewal Rule

- License renewal environmental review regulations and GEIS (NUREG-1437) published in 1996
- License renewal a successful program
- Proposed revisions incorporate lessons learned and knowledge gained from completed reviews (71 units)

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

10 CFR Part 51 License Renewal (GEIS) Rulemaking

Melanie Galloway, Acting Director

Office of Nuclear Reactor Regulation

Division of License Renewal

January 11, 2012

Topics

- Purpose of License Renewal GEIS
- Rulemaking Objectives
- Overview of the Rulemaking
- Summary of Public Interest
- Major Issues – In Scope
- Major Issues – Out of Scope

Purpose of License Renewal GEIS

- Evaluate environmental impacts of renewing nuclear power plant operating licenses
- Identify and assess impacts that are expected to be generic (the same or similar) at all nuclear plants
- Define the number and scope of issues that need to be addressed in plant-specific EISs

Rulemaking Objectives

- Incorporate lessons learned and knowledge gained from completed plant-specific environmental reviews
- Identify changes to laws, executive orders, and other government-wide environmental practices since 1996
- Reorganize environmental issues and the GEIS for clarity

Overview of the Rulemaking

- Basis for Update:
  - Table B–1 in Appendix B to Subpart A of Part 51
    - 10-year cycle to review of Appendix B, GEIS is the technical basis
- Proposed rule and Draft GEIS issued for public comment in July 2009

Overview of the Rulemaking (Cont.)

- Significant public outreach
  - Six public comment meetings on the revised GEIS and proposed rule
    - One meeting in Regions I, II, and III and two meetings in Region IV
    - One Webinar meeting at HQ
  - One rule implementation meeting at HQ
  - All meetings had open phone lines

Overview of the Rulemaking (Cont.)

- Response to public outreach
  - Public comment period was extended from 75 days to 165 days ending in January 2010
  - Large volume of comments received from industry, environmental public interest groups, and State agencies

Overview of the Rulemaking (Cont.)

- EPA gave the GEIS revision its highest rating "LO" – Lack of Objections
  - EPA's review did not identify any potential environmental impacts requiring substantive changes.
- Rulemaking is consistent with Commission's SRM on the cumulative effects of regulation

Summary of Public Interest

- Hundreds of comments were received from various interest groups including, but not limited to, the following:
  - Riverkeeper, San Luis Obispo Mothers for Peace, Pilgrim Watch, Alliance for Nuclear Responsibility
  - Nuclear Energy Institute
  - New York and Connecticut Attorneys General
  - California Energy Commission

Selected Major Issues – In Scope

- Radionuclides in groundwater
- Human health impacts
- Postulated accidents

Selected Major Issues – Out of Scope

- Seismicity
- Emergency preparedness and security
- Spent nuclear fuel and waste disposal
- Fukushima event

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Summary of Changes to Part 51 and the Revised GEIS

Andrew Imboden, Chief

Environmental Review and Guidance Update Branch, Office of Nuclear Reactor Regulation

Division of License Renewal

January 11, 2012

Topics

- Key Concepts
- Summary of Changes
- New Issues
- Implementation
- Summary

Key Concepts

- The NRC Staff's Compliance with Environmental Laws
- Environmental regulations – Part 51 and Table B-1
- How environmental issues are organized
- Categorization of issues

Summary of Changes

- Reorganization and consolidation of issues
  - 78 environmental issues (was 92)
  - 17 requiring plant-specific reviews (was 22)

Selected New Issues

- Category 1
  - Exposure of terrestrial and aquatic organisms to radionuclides
  - Geology and soils
- Category 2
  - Radionuclides released to groundwater
  - Environmental justice

Selected Re-Categorized Issues

- Air quality
- Groundwater and soil contamination
- Housing
- Public services
- Offsite land use

Implementation

- Final rule package to the Commission due May 1, 2012
  - Final guidance documents will be provided to the Commission with the final rule
  - Guidance will be effective when final rule is published
  - Guidance documents incorporate input received from public comments

Summary

- Complex rulemaking
- Benefits of revision
- Significant public involvement

Acronyms

- CFR – Code of Federal Regulations
- EPA – Environmental Protection Agency
- GEIS – Generic Environmental Impact Statement
- HQ – headquarters
- LO – lack of objections