

**IndianPointEIS - RE Ammended FUSE October 12 Comments on EIS Scoping**

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October 24, 2007

Dr. Pao-Tsin Kuo, Program Director  
 License Renewal and Environmental Impacts Division  
 Chief, Rules and Directives Branch,  
 Division of Administrative Services  
 Office of Administration, MailstopT-6D59,  
 U.S. Nuclear Regulatory Commission  
 Washington, DC, 20555-0001

**Re:** Federal Register 45076, Vol. 72, No. 154, August 10, 2007/Notices

**Subject:** Comments on Scope of Environmental Impact Statement and Scoping Process Indian Point Energy Center Unit 2 and Unit 3

Dr. Pao-Tsin Kuo,

On October 12, 2007 Friends United for Sustainable Energy USA, Inc. (FUSE) submitted Comments in accordance with the above notice as well as the federal rules promulgated under 10 C.F.R. §51.26 , and §51.28, and reserved the right to amend the attached comments.

Attached is an amended, revised version of FUSE's comments, for clarification, as permitted by 10CFR 51.45.

The entire document and attachments are being sent electronically by email to the address cited in the above reference Federal Registry notice.

Regards,

Susan Shapiro  
 President of FUSE USA, and lead counsel

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FUSE submits for inclusion in the GEIS Scoping process the following concerns, and accident pathways which can lead to potentially significant off site Environmental Costs. FUSE requests that certain GEIS scoping issues, classified as Category 1, be included in a Site Specific EIS, as Category 2 issue.

The current operating licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3 expire on September 9, 2013, and December 12, 2015, respectively. The application for renewal, dated April 23, 2007, as supplemented by letters dated May 3, 2007, and June 21, 2007, was submitted pursuant to Title 10 of the Code of Federal Regulations (10 CFR) Part 54. A notice of receipt and availability of the application, which included Entergy's Environmental Report (ER), was published in the Federal Register on May 11, 2007 (72 FR 26850). A notice of acceptance for docketing of the application for renewal of the facility operating license was published in the Federal Register on August 1, 2007 (72 FR 42134).

Entergy submitted an Environmental Report (ER) allegedly prepared in accordance with the requirements of Title 10, Part 51, of the Code of Federal Regulations (10 CFR Part 51) identified as Appendix E to the LRA

for IP2 LLC and IP3 LLC. 10 CFR51 contains the NRC requirements for implementing the National Environmental Policy Act (NEPA) of 1969 and the implementing regulations promulgated by the Council on Environmental Quality (CEQ). Section 51.53 of 10 CFR Part 51 outlines the requirements to be met in the preparation and submittal of ERs to the NRC.

Section 51.53(c)(3) is based upon the findings documented in NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants, (GEIS). The GEIS, in which the staff identified and evaluated the Environmental Costs and Impacts associated with license renewal, was first issued as a draft for public comment. The NRC received limited input from Federal and State agencies, public organizations, and private citizens before developing the final document.

As a result of the assessments in the GEIS, a number of Impacts were determined to be generic to all nuclear power plants. These were designated as Category 1 impacts. An applicant for license renewal may adopt the conclusions contained in the GEIS for Category 1 impacts, absent new and significant information that may cause the conclusions to fall outside those of the GEIS. Category 2 impacts are those impacts that have been

determined to be plant-specific and are required to be evaluated in the applicant's ER.

In addition, the Commission determined that the NRC does not have a role in energy-planning decision making for existing plants; decisions for existing plants should be left to State regulators and utility officials. Therefore, an applicant for license renewal need not provide an analysis of the need for power or the economic costs and economic benefits of the proposed action.

Additionally, the Commission determined that the ER need not discuss any aspect of storage of spent fuel for the facility that is within the scope of the generic determination in 10 CFR 51.23(a) and in accordance with 10 CFR 51.23(b), however FUSE submits that the use of the site for indefinite storage of spent fuel is significant new information that must be considered within scope in the EIS.

As outlined by NEPA, the NRC initiated the scoping process with the issuance of the Federal Register Notice on August 10, 2007. The NRC invited the applicant; Federal, State, and local government agencies; local

organizations; and individuals to participate in the scoping process by providing oral comments at the scheduled public meetings and/or by submitting written suggestions and comments no later than October 12, 2007.

The scoping process is the singular opportunity for the public to participate in identifying issues that Stakeholders request the NRC to address in the plant-specific supplement to the GEIS. The Intent, as 10 CFR and NUREG guidance lays out, of the Scoping Process should include the following objectives:

- Define the proposed action, which, to date, has not been adequately done by the NRC,
- Determine the scope of the supplement to the GEIS and identify significant issues to be analyzed in depth, including (a) category 1 issues that have changed significantly in the aftermath of September 11, 2001. (b) the determination that Yucca Mountain, or any other long term storage facility, has not to date been approved, and (c) the specific on-site underground leaks which to date have not been

identified or remediated, and are factual proof that zero-emissions are not being maintained.

- Identify and eliminate peripheral issues, or where necessary bring into the process peripheral issues that are site specific to IP2 LLC and IP3 LLC,

- Identify any Environmental Impact Cost assessments and other environmental impact statements being prepared that are related to the supplement to the GEIS, including those necessary for other licenses and/or permits required to operate the Indian Point Plants in a lawful manner,

- Identify other environmental review and consultation requirements and ways in which we, the public, can be actively involved in these processes,

- Indicate the schedule for preparation of the supplement to the GEIS, and, in a timely fashion at the beginning of the scoping process, provide the host community Stakeholders with a list of all items NRC



staff will not include in the process, with their specific reasoning and justifications for said decision,

- Identify any cooperating agencies, and
- Describe how the supplement to the GEIS will be prepared, and what steps will be taken to assure adequate public inclusion from the onset of the EIS scoping.

FUSE points out that many component parts and systems reviewed in the technical review, in the weighing of the adequacy of Entergy's Aging Management Plans, do carry Environmental Impacts and Costs if those component parts and systems or the Aging Management plans fail. A NEPA review is not concerned with these specific component parts and systems, but instead focuses specifically on Environmental Costs should they fail. In submitting our comments on the Scope of the site specific supplement to the GEIS, FUSE will include numerous component parts and systems that are within Scope in the dual technical track that is a part of the LRA process, and should be placed within Scope in the EIS.

With regard to what the scope of the site specific supplement to the GEIS should be, FUSE does not present a position as to the adequacy or lack thereof, IP2 LLC or IP3 LLC's Aging Management Plans, or the ability of specific parts or systems to perform as intended. Instead, FUSE points out that industry guidance and lessons learned show that these items can fail, and when they do, there is a potential for off site Environmental Costs to occur which must be included in the Environmental Scoping process and in the final draft of the Site Specific Supplemental ER.

NRC Staff must address these concerns in the Draft ER. Federal case law underscores the duty of the NRC Staff to fully discuss, at the earliest point in the process, information brought to its attention regarding the potential environmental impacts of its proposed actions.

The Fifth Circuit underscored the important role that the NEPA process plays in allowing a meaningful exchange of information between the agency and the public:

This case arises under the network of NEPA, a statute drafted to ensure that federal agencies "carefully consider detailed information concerning significant environmental impacts," and at the same time "guarantee that the relevant information will be made available to the larger audience that may also play a role in both the decision making process and the implementation of that decision." *Robertson v. Methow Valley*

Citizens Council, 490 U.S. 332, 109 S.Ct. 1835, 1845, 104 L.Ed.2d 351 (1989); accord *North Buckhead Civic Ass'n v. Skinner* 903 F.2d 1533, 1540 (11th Cir.1990). This procedural statute was promulgated to insure that the decision to go forward with a federal project which significantly affects the environment be an environmentally conscious one.

The President's Council on Environmental Quality (CEQ) governing implementation of NEPA are binding on all federal agencies (40 CFR Section 1500.3) and entitled to substantial deference (*Robertson v. Methow Valley Citizens Council*, 490 U.S. at 355-56, 109 S.Ct. at 1849), underscoring the importance of an agency addressing new, site specific information. “c) Agencies...1. Shall prepare supplements to either draft or final environmental impact statements if: (ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts...”

Therefore the NRC under administrative law has a fiduciary obligation to include significant new circumstances or information and must guarantee that the affected public's concerns are included within scope.

## **ISSUES TO BE INCLUDED IN EIS SCOPE**

FUSE requests that certain GEIS scoping issues classified as Category 1, be included in the Site Specific EIS as Category 2 issues. FUSE submits for inclusion in the GEIS Scoping process the following concerns, and accident pathways which can lead to potentially significant off site Environmental Costs: :

**ISSUE 1. The Draft EIS is Generic, not Site Specific**

**ISSUE 2. Impacts of Refurbishment**

**ISSUE 3. NRC's Regulations, including Title 10, Part 50, Appendix A<sup>1</sup> include the following that presently appear to be in non-compliance**

**ISSUE 4: Non-Compliance with NYS DEC Law – Closed Cycle Cooling “Best Technology Available” Surface Water Quality, Hydrology and Use (for all plants)**

**ISSUE 5. Fish Return Pipeline (*Issue 98*)**

**ISSUE 6. Exemptions, Exceptions and Deviations of the Design Basis or Current Licensing Basis of Indian Point 1, 2 or 3.**

**ISSUE 7: Aquatic Ecology (for all plants with once-through and cooling pond heat dissipation systems)**

**ISSUE 8. Exemptions, Exceptions and Deviations of the Design Basis or Current Licensing Basis of Indian Point 1, 2 or 3.**

**ISSUE 9. Mixed Radioactive Waste Contamination of the Site**

**ISSUE 10. Long Term on-site radioactive waste storage**

**ISSUE 11. Dry Cask Storage**

**ISSUE 12. Closure of Barnwell**

**ISSUE 13: Decommissioning Trust Funds**

**ISSUE 14. Leaks -Ground-water Use and Quality**

**ISSUE 15 Omitted**

**ISSUE 16: Human Health**

**ISSUE 17. Population Considerations**

**ISSUE 18 United Water Hudson River Water  
Desalination for Rockland County Drinking Water**

**ISSUE 19. FAA recent decision to increase commercial air traffic over Rockland County**

**ISSUE 20. Air Traffic Risk:**

**ISSUE 21. Global Warming**

**ISSUE 22. Emergency Planning**

**ISSUE 23. Reasonable Assurance of Adequate Protection of  
Public Health and Safety**

**ISSUE 24. Terrorism**

**ISSUE 25. Propaganda:**

**ISSUE 26: Environmental Justice – Fair Trade**

**ISSUE 27: Environmental justice - Sustenance Fishermen**

**ISSUE 28. Microbial Stainless Steel Corrosion of Roller bearings on Traveling Water Screens**

**ISSUE 29. Fire Protection**

**ISSUE 30. Impingement or significant damage to water intake**

**ISSUE 31. Accidents involving the breakdown of certain in-scope parts, components and systems**

**ISSUE 32 Thermal Shock:**

**ISSUE 33. Transporation:**

**ISSUE 34. Missile projectile damage to reactor coolant and steam piping systems;**

**ISSUE 35. Internal reactor chemistry corrosion induced incidents.**

**ISSUE 36. Pipe bursts from fatigue, corrosion, and other aging related failure scenarios.**

**ISSUE 37. Pipe burst and leaks caused by plugs, and vibration redistribution.**

**ISSUE 38 Crack and rust propagation**

**ISSUE 39 New Superceding License**

## **ISSUE 1. The Draft EIS is Generic, not Site Specific**

FUSE asserts that Entergy's site specific environmental analysis is not site specific, and is actually word for word identical in content to other Entergy plants regardless of the distinct site specific characteristics.

- A.** For example, the final SEIS report for Vermont Yankee and Pilgrim and preliminary SEIS for Indian Point are confirmed identical. In fact, a brief examination of seven plants contained word for word precisely the same language, as cited below.
- B.** Equally troubling is that in each case, no changes were made from preliminary SEIS to final SEIS. The regulatory authorities apparently were satisfied with the generic versions for what was supposed to be a site specific SEIS for each site as submitted.

In each SEIS, Entergy's arguments turn on there being no refurbishment issues. The argument collapses on a fact analysis alone. Refurbishment issues are predicted, and in fact required, for many active components and the consequences of rationalizing not performing them are immediately obvious.

For example, at Entergy Vermont Yankee, there was an environmental intervention by the Stakeholders to include the cooling towers as within scope because the cooling towers needed refurbishment. The ALSB ruled against the Stakeholders, and did not include the cooling towers within the EIS. Recently the cooling towers in question collapsed.

QuickTime™ and a  
TIFF (LZW) decompressor  
are needed to see this picture.

Closer examination reveals more disturbing activities that appear to deliberately circumvent refurbishment of equipment during the renewal



period, by upgrading or refurbishing the equipment prior to the renewal period.

Entergy's assertion in the Indian Point EIS that no refurbishment issues exist, or are expected during the period of license renewal is a misrepresentation. Examples of refurbishment plans are provided below including the refurbishment plans for both Indian Point Plant reactor vessel heads scheduled for 2011 and 2012 and the refurbishment of equipment during power uprate initiatives. Substantial historical events and problematic issues will not simply disappear over the extended operation.

. It is pointed out here, that Entergy as a Fleet Operator has claimed NO REFURISHMENT ISSUES EXIST for any of their reactor sites. As example, from Entergy's Arkansas One Plant (ANO-1) ER:

In addition, an evaluation of structures and components as required by 10 CFR 54.21, did not identify any major plant refurbishment activities or modifications necessary to support the continued operation of ANO-1 during the license renewal term. Therefore, evaluation of refurbishment issues was not considered.

A cursory review of other License Renewal Applications and their Environmental Reports shows a very disturbing trend. Despite the self admitted fact that all 104 reactors in the American Fleet are aging and have some known and serious issues that will need to be addressed through

refurbishment during the license renewal period, both the NRC and their licensees have been side stepping this significant Category issue by simply claiming there ARE NO REFURBISHMENT ISSUES, and they thus do not need to be discussed in the Supplemental Report. As example, we quote from the Wolf Creek (WCGS) Environmental Report:

WCGS has stated that its evaluation of structures and components, as required by 10 CFR 54.21, did not identify any major plant refurbishment activities or modifications as necessary to support the continued operation of WCGS for the license renewal period. In addition, any replacement of components or additional inspection activities are within the bounds of normal plant operation, and are not expected to affect the environment outside of the bounds of the plant operations evaluated in the U.S. Nuclear Regulatory Commission's 1982 *Final Environmental Statement Related to Operation of Wolf Creek Generating Station, Unit No. 1*.

Even more disturbing, is the almost identical cut and paste preparation of site specific reports that is taking place. Below is a passage from Vermont Yankee's (VYNPS) Environmental Report, and the similarity between it, and the Wolf Creek Passage above is startling.

Entergy has stated that its evaluation of structures and components, as required by 10 CFR 54.21, did not identify any major plant refurbishment activities or modifications as necessary to support the continued operation of VYNPS for the license renewal period. In

addition, any replacement of components or additional inspection activities are within the bounds of normal plant operation and are not expected to affect the environment outside of the bounds of the plant operations evaluated in the U.S. Atomic Energy Commission's 1972 *Final Environmental Statement*.

Again, if we look at the Environmental Report for Pilgrim (PNPS), we again find the same identical cut and paste.

PNPS has stated that its evaluation of structures and components, as required by 10 CFR 54.21, did not identify any major plant refurbishment activities or modifications as necessary to support the continued operation of PNPS for the license renewal period. In addition, any replacement of components or additional inspection activities are within the bounds of normal plant operation, and are not expected to affect the environment outside of the bounds of the plant operations evaluated in the U.S. Atomic Energy Commission's 1972 *Final Environmental Statement Related to Operation of PNPS*.

This startling cut and paste is INDUSTRY WIDE, as is further witnessed by the same comment lifted from Nine Mile Point's (NMPN) Environmental Report:

NMPNS has stated that its evaluation of structures and components, as required by 10 CFR 54.21, did not identify any major plant refurbishment activities or modifications as necessary to support the

continued operation of NMP, for the license renewal period. In addition, any replacement of components | or additional inspection activities are within the bounds of normal plant operation, and are not expected to affect the environment outside of the bounds of the plant operations evaluated in the U.S. Atomic Energy Commission's 1972 *Final Environmental Statement Related to Operation of Nine Mile Point Nuclear Station*.

The integrity of the entire EIS Scoping process is further questioned when we look at the Environmental Report for Brunswick (BSEP), and find again almost word for word cut and pasting going on throughout.

CP&L has stated that its evaluation of structures and components, as required by 10 CFR 54.21, did not identify any major plant refurbishment activities or modifications as being necessary to support the continued operation of BSEP for the license renewal term. In addition, any replacement of components or additional inspection activities that are within the bounds of normal plant operation are not expected to affect the environment outside the bounds of the plant operations evaluated in the *Final Environmental Statement Related to Operation of Brunswick Nuclear Steam Electric Plant Units 1 and 2*, issued by the U.S. Atomic Energy Commission in 1974.

It's breathtaking to realize that the biggest Category 2 issue in the license renewal Environmental Scoping process, Refurbishment, is side stepped by the industry by claim after claim that there are no Refurbishment issues anticipated for 104 aging, embrittled reactors with known Boric Acid Corrosion Issues as relates to reactor vessel heads and spray nozzles. This claim by the industry is even more disturbing in light of the NRC's attempts to LOWER SAFETY MARGINS for Reactor Vessel Heads and Fire Safety, No PWR's can meet those standards during the period of extended operation. Couple that with the fact that Entergy has already placed orders for replacement reactor vessel heads for both IP2 LLC and IP3 LLC, negating their claim that no refurbishment is anticipated, is a planned misrepresentation, and an attempted deception of both the NRC and the public.

## **ISSUE 2. Impacts of Refurbishment**

Entergy alleges in their EIS Statement, marked as Appendix E to the LRA, that there are no refurbishment issues anticipated in the period of license renewal, and therefore no Environmental Costs need be considered. This statement on the part of the licensees (IP2 LLC and IP3 LLC) is the equivalent of the owner of a Chevy Vega or Ford Pinto

claiming their vehicles were going to require no significant repairs in the next 20 years, even though it is being driven 60 miles a day.

FUSE USA has uncovered the fact that Entergy has made commitments to purchase and install new reactor vessel heads at both IP2 and IP3. According to experts in the specific area of reactor vessel head replacement and repair, the installation of a reactor vessel head is highly complex, and comes with a host of potentially significant issues, including the possibility of cutting a hole in the containment if said head will not fit otherwise.

To skew and limit the scope of the EIS Supplemental ER, Entergy has deliberately omitted any and all refurbishment issues planned in anticipation of, or during, the period of license renewal. It is pointed out that numerous Generic Letters issued by the NRC anticipate numerous refurbishment issues during the period of license renewal for a nuclear reactor.

Each of these refurbishment issues, and specifically the reactor vessel head replacement, will have potentially SIGNIFICANT impacts on environment that must be investigated in the GEIS Supplemental ER process.

In Appendix E of the EIS Statement Entergy falsely states that there are no refurbishment issues in sections A through J:

**A. Refurbishment impacts on terrestrial resources [10 CFR 51.53(c)(3)(ii)(E)]**

**NONE.** *No refurbishment activities have been identified.*

Consideration of mitigation is not required.

**B. Threatened or Endangered Species (for all plants)**

**Threatened or endangered species [10 CFR 51.53(c)(3)(ii)(E)]**

**SMALL.** No refurbishment activities have been identified. No adverse impacts to threatened or endangered species were expected due to continued operations of IP2 and IP3. Further consideration of mitigation measures is not warranted.

Refurbishment issues could disturb known PCB's at the site, which in turn could threaten (as one example) American Bald Eagles.

Entergy's ER states that the impact to is a generic issue at all plants, and that the significance is It also states that :

**C. Air Quality Air quality during refurbishment [10 CFR 51.53(c)(3)(ii)(F)]**

**NONE.** *No refurbishment activities have been identified.*

Consideration of mitigation is not required.

Entergy's ER claims that there is no impact on air quality, because "no refurbishment activities have been identified. Consideration of mitigation is not required."

As has been stated, FUSE USA has uncovered the fact that Entergy has made commitments to purchase and install new reactor vessel heads at both IP2 and IP3. According to experts in the specific area of reactor vessel head replacement and repair, the installation of a reactor vessel head is highly complex, and comes with a host of potentially significant issues, including the possibility of cutting a hole in the containment if said head will not fit otherwise.

To skew and limit the scope of the EIS Supplemental ER, Entergy has deliberately omitted any and all refurbishment issues planned in anticipation of, or during the period of license renewal. It is pointed out, that numerous Generic Letters issued by the NRC anticipate numerous refurbishment issues during the period of license renewal for a nuclear reactor.



Each of these refurbishment issues, and specific reactor vessel head replacement will have potentially SIGNIFICANT impacts on air quality that must be investigated in the GEIS Supplemental ER process.

**D. Socioeconomics Housing impacts [10 CFR  
51.53(c)(3)(ii)(I)]**

**SMALL. *No refurbishment activities have been identified.***

Entergy does not anticipate an increase in employment during the period of extended operation. Therefore, no additional impacts to housing are expected due to continued operations of IP2 and IP3. Further consideration of mitigation measures is not warranted.

Entergy wrongfully assumes that a stable work force at the plant with numbers neither going up nor going down is the only potential effect on housing in the period of continued operation of IP2 and IP3. IP1 LLC, IP2 LLC and IP3 LLC are all aging industrial facilities with known radiological leaks and contaminant flows. Its current operation has suppressed, and will continue to suppress, the property values of those communities closest to the plant, specifically Buchanan and Peekskill. It is expected that this suppression of real estate prices will worsen during the period of license

renewal as the media coverage of an increasing number of incidents caused by aging and poor management increase.

Further, Entergy fails to spell out what the effects would be on housing should a significant fire, radiological accident and/or terrorist event occur at the Indian Point facility during the period of license renewal.

## **E. Unavoidable Adverse Impacts**

### **6.3.1 Requirement [10 CFR 51.45(b)(2)]**

The applicant's report shall discuss any adverse environmental effects which cannot be avoided upon implementation of the proposed project. Public utilities: public water supply availability [10 CFR 51.53(c)(3)(ii)(I)]

**SMALL.** *No refurbishment activities have been identified* and no additional workers anticipated during the period of extended operation. PWS's near IP2 and IP3 currently have adequate system capacity to meet demand of residential and industrial customers in the area. Further consideration of mitigation measures is not warranted.

There are numerous issues that will have unavoidable adverse impacts on public water supply, primary among them the lack of an off site repository for Indian Point's radiological and mixed waste streams that are currently leaking into the groundwater.

First and foremost, Entergy fails to adequately address the public's use of the Hudson River as both a primary and secondary source of water supply. As one example, we reference United Water's announcement in the Journal News of their plans to build a new desalination water processing plant for Rockland County drinking and tap water down the Hudson River directly across from Indian Point, in either Stony Point or Haverstraw. Further, Indian Point fails to identify effects of ongoing leaks and of allowed releases at the plant on both the potable and public waters of our community, both from the individual and the cumulative perspective.

**F. Education impacts from refurbishment [10 CFR 51.53(c)(3)(ii)(I)]**

**NONE.** *No refurbishment activities have been identified.*

Consideration of mitigation is not required. Offsite land use (effects of refurbishment activities) [10 CFR 51.53(c)(3)(ii)(I)]

**G. Local transportation impacts 10 CFR 51.53(c)(3)(ii)(J)]**

**SMALL.** The area around IP2 and IP3 has pre-established land patterns of development and has public services and regulatory controls in place to support and guide development. No additional workers are anticipated during the period of extended operation. Further consideration of mitigation measures is not warranted. Local transportation impacts 10 CFR 51.53(c)(3)(ii)(J)]

Industry best standards and experience have shown that the additional inspection requirements in the period of license renewal is likely to add up to 60 people to the staff of each licensed reactor facility. Further, continued transport of materials into and out of Indian Point, as well as potential refurbishment issues, will create local transportation impacts. Additionally, any significant incident at Indian Point will create transportation impacts. Entergy's own words are that all negative impacts, no matter how small, must be evaluated and mitigation alternatives reviewed. Entergy, however, attempts to remain mute on these issues by claiming they simply do not exist.

#### **H. Historic and archaeological properties [10 CFR**

##### **51.53(c)(3)(ii)(K)]**

**SMALL.** *No refurbishment activities have been identified* and no increases in total number of employees during the period of extended operation are expected. Further consideration of mitigation measures is not warranted. Historic and archaeological properties [10 CFR 51.53(c)(3)(ii)(K)]

#### **I. Offsite land use (effects of license renewal) [10 CFR**

##### **51.53(c)(3)(ii)(I)]**

**NONE. *No refurbishment activities have been identified.***

Consideration of mitigation is not required. Offsite land use (effects of license renewal) [10 CFR 51.53(c)(3)(ii)(I)]

There are numerous issues that will affect land use, primary among them, lack of an off site repository for Indian Point's radiological and mixed waste streams.

**J. Postulated Accidents: *Severe accident mitigation alternatives***  
***[10 CFR 51.53(c)(3)(ii)(L)]***

**SMALL.** No impact from continued operation. Potentially cost effective SAMAs are not related to adequately managing the effects of aging during period of extended operation. Further consideration of mitigation measures is not warranted.

There are a host of accident scenarios that must be evaluated, with various mitigation alternatives explored. Has Entergy already forgotten about the 2000 Tube Rupture at Indian Point 2, or are they simply hoping the surrounding communities have forgotten about it? Over 350,000 gallons of contaminated water have been leaked by Indian Point into the environment. The NRC allowed an emergency dump of radiological contaminants into the air. Additionally, there is no no-fly zone over Indian Point yet the GEIS does not address accidental aerial bombardment from falling aircrafts. Each

of these accidents has a LARGE significant Impact on the Environment and must be considered a Category 2, non-generic issue in the EIS.

FUSE asserts that changes to the facility under 10CFR50.59 did not aggregate environmental impact analysis and Entergy did not provide a necessary comprehensive EIS, as required under section 102(C) of the NEPA.

From 10 CFR 50.59:

2) A licensee shall obtain a license amendment pursuant to Sec. 50.90 prior to implementing a proposed change, test, or experiment if the change, test, or experiment would:

(i) Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the final safety analysis report (as updated);

(ii) Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety previously evaluated in the final safety analysis report (as updated);

(iii) Result in more than a minimal increase in the consequences of an accident previously evaluated in the final safety analysis report (as updated);

(iv) Result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the final safety analysis report (as updated);

(v) Create a possibility for an accident of a different type than any previously evaluated in the final safety analysis report (as updated);

(vi) Create a possibility for a malfunction of an SSC important to safety with a different result than any previously evaluated in the final safety analysis report (as updated);

(vii) Result in a design basis limit for a fission product barrier as described in the FSAR (as updated) being exceeded or altered; or

(viii) Result in a departure from a method of evaluation described in the FSAR (as updated) used in establishing the design bases or in the safety analyses.

Entergy's site specific environmental analysis is not site specific, and is actually word for word identical in content to other Entergy plants regardless of the distinct site specific characteristics.

As stated above, the final SEIS report for Vermont Yankee and Pilgrim and preliminary SEIS for Indian Point are confirmed identical. In fact a brief examination of seven plants contained word for word precisely the same language.

Equally troubling is that in each case, no changes were made from preliminary SEIS to final SEIS. The regulatory authorities apparently were satisfied with the generic versions what was supposed to be a site specific SEIS for each site as submitted.

These statements are gross misrepresentations due to the fact that Entergy already has committed to the purchase new reactor vessel heads for both IP2 LLC and IP3 LLC, with delivery and installment tentatively scheduled for 2011 and 2012 respectively. Even if installation were to occur before the period of license renewal were to begin, said major refurbishment is being contemplated, or planned in expectation of license renewal. Additionally such refurbishment effects many other systems and components whose failure will have significant Environmental Impacts and Costs.



Therefore, Refurbishment of the reactor vessel head must be included in the EIS, as site specific Category 2 issues, that have significant Environmental Impacts and Costs on, terrestrial resources, Threatened or Endangered Species, Air Quality Air quality during refurbishment, Socioeconomics Housing impacts, Unavoidable Adverse impacts, Education impacts. Local transportation impacts, historic and archaeological properties, and Offsite land use.

**ISSUE 3. NRC's Regulations, including Title 10, Part 50, Appendix A<sup>2</sup> include the following that presently appear to be in non-compliance.**

All the below outlines issues appear to be in non-compliance, which is a new circumstance, and therefore should be considered in the EIS as Category 2 issues with MODERATE to LARGE significance.

**Criterion 60--Control of releases of radioactive materials to the environment.** The nuclear power unit design shall include means to control suitably the release of radioactive materials in gaseous and liquid effluents and to handle radioactive solid wastes produced during normal reactor operation, including anticipated operational

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<sup>2</sup> Note that under petition for leave to intervene, hearing and contentions, the actual design criteria the plant is legally required to comply with was found to be in of itself in apparent non-compliance. See Contentions 1-5 of this petition.

occurrences. Sufficient holdup capacity shall be provided for retention of gaseous and liquid effluents containing radioactive materials, particularly where unfavorable site environmental conditions can be expected to impose unusual operational limitations upon the release of such effluents to the environment.

**Criterion 64--Monitoring radioactivity releases.** Means shall be provided for monitoring the reactor containment atmosphere, spaces containing components for recirculation of loss-of-coolant accident fluids, effluent discharge paths, and the plant environs for radioactivity that may be released from normal operations, including anticipated operational occurrences, and from postulated accidents.

**§ 50.36a Technical specifications on effluents from nuclear power reactors.**

(a) In order to keep releases of radioactive materials to unrestricted areas during normal conditions, including expected occurrences, as low as is reasonably achievable, each licensee of a nuclear power reactor will include technical specifications that, in addition to requiring compliance with applicable provisions of § 20.1301 of this chapter, require that:

(1) Operating procedures developed pursuant to § 50.34a(c) for the control of effluents be established and followed and that the radioactive waste system, pursuant to § 50.34a, be maintained and used. The licensee shall retain the operating procedures in effect as a

record until the Commission terminates the license and shall retain each superseded revision of the procedures for 3 years from the date it was superseded.

(2) Each licensee shall submit a report to the Commission annually that specifies the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in gaseous effluents during the previous 12 months, including any other information as may be required by the Commission to estimate maximum potential annual radiation doses to the public resulting from effluent releases.

#### **§ 20.1301 Dose limits for individual members of the public.**

(a) Each licensee shall conduct operations so that —

(1) The total effective dose equivalent to individual members of the public from the licensed operation does not exceed 0.1 rem (1 mSv) in a year, exclusive of the dose contributions from background radiation, from any administration the individual has received, from exposure to individuals administered radioactive material and released under § 35.75, from voluntary participation in medical research programs, and from the licensee's disposal of radioactive material into sanitary sewerage in accordance with § 20.2003 NRC's Regulations.

#### **§ 20.1302 Compliance with dose limits for individual members of the public.**

(a) The licensee shall make or cause to be made, as appropriate, surveys of radiation levels in unrestricted and controlled areas and radioactive materials in effluents released to unrestricted and controlled areas to demonstrate compliance with the dose limits for individual members of the public in § 20.1301.NRC's Regulations.

**Appendix B to Part 20--Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage**

The columns in Table 2 of this appendix captioned "Effluents," "Air," and "Water," are applicable to the assessment and control of dose to the public, particularly in the implementation of the provisions of § 20.1302. The concentration values given in Columns 1 and 2 of Table 2 are equivalent to the radionuclide concentrations which, if inhaled or ingested continuously over the course of a year, would produce a total effective dose equivalent of 0.05 rem (50 millirem or 0.5 millisieverts).

To comply with NRC's regulations on doses to the public, one must monitor all releases of radioactive material to the air and water.

Any unmonitored release, no matter its size, violates the

regulations. FUSE therefore concludes that the applicant must first address the present non-compliant issues and the environmental issues associated with each before a meaningful SEIS can be made for a new superceding license.

**ISSUE 4: Non-Compliance with NYS DEC Law – Closed Cycle Cooling “Best Technology Available” Surface Water Quality, Hydrology and Use (for all plants)**

State Permits and Licenses from State agencies, specifically [DEC SPDES permits](#), are required to discharge thermal pollution into the state owned discharge channel, and required fish return pipe lines. See [Exhibit 1](#).

Easements from New York State are required for the issuance of a new superceding license for a 20 year period. These required permits must be included in the EIS scoping, as they directly relate to the Environmental Costs of thermal pollution and to potable water quality as required by State law.

Further, the cumulative effects of ALL discharges from IP2 LLC and IP3 LLC must be weighed, and their Environmental Impacts and Costs considered in the EIS Scoping process. It is impossible to know the Environmental Impacts and Costs associated with Indian Point Discharges

without looking at the whole, as well as its singular year effluents totals.

The EIS Supplement states:

Water use conflicts (plants with cooling ponds or cooling towers using make-up water from a small river with low flow) [10 CFR 51.53(c)(3)(ii)(A)]

IP2 and IP3 are equipped with once-through cooling systems that utilize make-up water from an estuary on the Hudson River. IP2 and IP3 do not have or use cooling ponds or cooling towers. Consideration of mitigation is not required.

The way Entergy presents Surface Water Quality, Hydrology and Use (for all plants) would seem upon its face to be true, and to close this environmental issue. Here's the problem the licensee is misrepresenting the issue by omission, and deliberately obfuscating the facts of this issue. In the original Environmental Impact Study for IP2 LLC and IP3 LLC, both plants made a COMMITMENT to go to a closed cooling system. There are current and significant (unresolved) issues as relates to this very issue. Until a final decision is made on Indian Point's original commitments to go to a closed cooling system, Entergy's comments here are, at best, misleading.

As a part of the EIS Supplement, all environmental Impacts and Costs associated with a Closed versus a Once-through cooling system should be completely investigated and resolved to the satisfaction of all parties.

Additionally, regardless of which cooling system is employed at Indian Point, the thermal discharge effects on the environment, on plant and aquatic life, and on Global Warming must be evaluated.

The population that is affected by this omission is the People of the State of New York, as they are the true owners and users of the Hudson River, which is affected by the thermal pollution in violation of the Clean Water Act.

The thermal pollution significantly and adversely affects the larvae and fish populations of the Hudson River. Entergy not using the “best available” technology with regard to closed cycle cooling is an issue of LARGE significance. Indian Point takes in a billion gallons of Hudson River water a day and super heats it 15 to 25 degrees before discharging it back into the Hudson, dramatically affecting the flora and fauna of the river.

Entergy also fails to present a complete analysis of compliance, and falsely submits in the ER on page 9-2 that

Compliance with the SPDES Permits over previous years has been excellent. For example, there has never even been an exceedance relative to thermal discharge limits as identified in the Station's SPDES permit"

Entergy's misrepresentation and omission regarding its status of compliance with required permits is not a Category 1 issue, but rather a Category 2 issue with regard to Indian Point's operation which is not in compliance with Environmental Protection Agency, Clean Water Act, and NYS DEC requirements to use the "best technology available", to prevent thermal pollution.

#### **ISSUE 5. Fish Return Pipeline (*Issue 98*)**

Since 1986 Indian Point was required to build a fish return pipeline by the DEC, and since that time received multiple construction permits pending issuance of a new easement. However the fish return pipeline was not constructed and therefore a final easement has not been issued.

Therefore, Indian Point is in violation of New York State law, which



affects all the residents of New York State who own the Hudson River, the aquatic life in the river and the environment of the Hudson Valley.

The significance of the effect of this failure to build the fish return pipeline is MODERATE as its environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resources. However, granting of a license renewal for 20 more years of operation could see the cumulative effects of this non-action and elevate this issue to high.

The requirement of the FISH RETURN PIPELINE is site specific, and is not part of the GEIS. Warranted mitigation measures would be for the NRC to require that the Fish Return Pipeline be constructed prior to approval the LRA. A comprehensive analysis as to why Entergy has not built the required FISH RETURN PIPELINE must be included in the EIS.

**Issue 7: Aquatic Ecology (for all plants with once-through and cooling pond heat dissipation systems)**

Entergy in the ER states that the environmental impact of entrainment of fish and shellfish [10 CFR 51.53(c)(3)(ii)(B)] is **SMALL**. Historic and

current studies have shown no negative trend in overall aquatic river species populations related to plant operations. Current mitigation measures implemented through the HRSA and fourth amended Consent Order, and the ongoing SPDES permitting process will ensure impacts remain SMALL. Further consideration of mitigation measures is not warranted. Impingement of fish and shellfish [10 CFR 51.53(c)(3)(ii)(B)]

Mitigation alternatives cannot be considered unless adverse effects are specifically identified, regardless of how SMALL THE ADVERSE IMPACT.

Though Entergy, painting with a broad brush, may claim there is no negative trend in OVERALL Aquatic and Plant river species that is not the question in the ER. Rather, the question is what the negative trend is for EACH SPECIFIC SPECIES. It is therefore imperative that each plant, animal and aquatic species be A) identified, B) inventoried, and C) the potential negative effects be measured in species specific studies. If a particular species is being negatively impacted, the impact and mitigation alternative must be specifically addressed.

This is speculative on the part of the Licensee. Further, NRC needs to take specific notice of the use of the phrase “OVERALL AQUATIC RIVER SPECIES”. The real question avoided in this presentation, is what effects to **SPECIFIC RIVER SPECIES**. Licensee must not be allowed to mitigate significant environmental impacts and costs to very SPECIFIC SPECIES by painting with a broad brush through the use of terms like OVERALL liberally used in their Environmental Report. We refer the NRC to Entergy’s own words in 6.2.2 of Appendix E of their application:

#### 6.2.2 Entergy Response

As discussed in Supplement 1 to Regulatory Guide 4.2, “Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses,” when adverse environmental effects are identified, 10 CFR 51.45(c) requires consideration of alternatives available to reduce or avoid these adverse effects. Furthermore, Supplement 1 states, "**Mitigation alternatives are to be considered no matter how small the adverse impact;** (emphasis added) however, the extent of the consideration should be proportional to the significance of the impact."

Based on the licensees own words as found in its own EIS ER, they admit that when adverse effects are identified, 10 CFR 51.45 (c) requires consideration of alternatives available to reduce or avoid these adverse

effects. No such alternatives are listed and evaluated. The license goes on further to state, “Furthermore, Supplement 1 states, ‘Mitigation alternatives are to be considered NO MATTER HOW SMALL THE ADVERSE IMPACT’”.

It is pointed out here, that this STANDARD must be applied to each and every ENVIRONMENTAL issue that has an associated cost.

The EIS must include fully independent, plant-specific, comprehensive studies of groundwater, including but not limited to, testing for radio nuclides including strontium 90, as well as strontium 89, which has a shorter half life, tritium, cesium 137, and trace levels of plutonium and PCB’s. Such testing must include samples from wells, riverbeds, silts, all discharge points and river water, at high and low tides. In addition testing of wildlife, including but not limited to, captured fish, oyster beds, turtles, frogs, nesting birds and egg shells must be fully monitored for a complete growth cycle from spring to fall. Water quality of the groundwater and river has a direct effect on Environmental Costs and therefore such

comprehensive site specific analysis must be included as Category 2 issues of the EIS.

**ISSUE 8. Exemptions, Exceptions and Deviations of the Design Basis or Current Licensing Basis of Indian Point 1, 2 or 3.**

Any and all exemptions, exceptions and deviations of the Design Basis or Current Licensing Basis of Indian Point 1, 2, or 3 have potentially significant Environmental Impacts and Costs and must be included in the EIS. In September ,2007 the NRC staff informed Sherwood Martinelli, Vice President of FUSE, that such a list does not exist, even though it is required in the relicensing regulations. Therefore, such new information and circumstances must be evaluated comprehensively with regard to Environmental Impacts and Costs as a Category 2 issue.

**ISSUE 9. Mixed Radioactive Waste Contamination of the Site:**

Co-mingling of radioactive waste streams is prohibited by NRC regulations, however Entergy plans to co-mingle the waste streams of Indian Point 1, 2, and 3 during the new superceding license.

In order to transfer spent fuel assemblies to dry cask storage, the spent fuel assemblies from Indian Point 3 and Indian Point 1 must be transferred using a special crane to Spent Fuel Pool 2, thereby co-mingling the radioactive waste. To make matters worse, Spent Fuel Pool 2 is leaking radioactive effluent.

The entire population and environment surrounding the plant are adversely affected by this total disregard of regulations that were promulgated in order to protect public health and safety. The significance of this co-mingling of radioactive waste streams is MODERATE to LARGE, depending on the unknown chemical reactions between different waste streams, and complex physics.

The ER nor the GEIS include an evaluation of co-mingling of radioactive waste streams. Therefore this must be considered a Category 2 issue that is comprehensively investigated in the EIS.

Pre-existing and known radiological and mixed waste contamination of the site is not being adequately addressed and remediated, thus causing an on-going harm to the environment, both on and off site, and it must be fully addressed in the EIS. The areas of environmental concern and resultant

Environmental Costs with regard to mixed radioactive waste contamination of Indian Point, include but are not limited to, the following:

- a. During construction, and brief operation, IP1 buried mixed wastes in various, and in some cases unknown locations, on the IP site. Further, it is known that some mixed wastes that have not be adequately accounted for or disposed of in a safe manner, are currently in the reactor core area.
- b. Various known and unknown leaks throughout the IP1 LLC, IP2 LLC and IP3 LLC site(s) are leaking radiological contaminants into the ground water and the Hudson River, including but not limited to strontium 90, tritium and cesium 137, yet the leaks remain unidentified, stopped or remediated.
- c. Various low level radioactive waste streams are stored in buildings in violation of LLRW (Low Level Radioactive Waste) storage facility guidelines. Currently steel buildings housing radioactively contaminated waste for both Indian Point 2 and Indian Point 3 have failed turbines and are not air tight, thus allowing radiological decay chains to be released into the air and to subsequently migrate off site without adequate

monitoring. The above issues of mixed radioactive waste contamination of the site must be addressed in the EIS.

**ISSUE 10. Long Term on-site radioactive waste storage:**

NRC staff admitted in public documents that it is very likely that these contaminated materials will need to be stored onsite at Indian Point for periods in excess of 100 years. The Spent Fuel pools currently hold 18,000 tons of high level radioactive waste and the currently proposed 20 year new superseding license another 24,000 plus tons of high level radioactive waste will be produced. The storage areas/facilities onsite must meet the same safety and public health criteria established for license of LLRW Disposal/Storage Facilities, such as Envirocare in Utah. The DOE and NRC do not have workable long term plans that are adequate to address the offsite (offsite or onsite?) disposal of radioactive waste streams produced at Indian Point, as required by Federal Law (cite law).

The Environmental Costs and Impacts associated with the storage of these waste streams, and of bringing onsite storage facilities into compliance with NRC rules and regulations promulgated for LLRW storage facilities, must



be included within the scope of the EIS for Entergy's LRA for IP2 LLC and IP3 LLC.

The NRC and the DOE must fulfill their legal responsibilities and obligations to safely dispose of radioactive wastes, however presently the only plan is to store the radioactive waste produced by Indian Point **indefinitely** on the site of Indian Point 2 and Indian Point 3. Therefore, such indefinite, long term, *permanent* storage must comply with the same standards as a licensed radioactive waste storage/disposal site. Since there is no safe disposal of radioactive waste currently available off site, and none are expected before the year 2110, such information must be comprehensively considered, evaluated and included in the EIS for relicensing of IP2 and IP3. The costs of such indefinite, long term storage, as of enormous quantities of radioactive waste at Indian Point, must be fully considered in the EIS, as it has significantly **LARGE** Environmental Impacts and Costs.

#### **ISSUE 11. Dry Cask Storage (Issue 83)**

The use of the Indian Point site for Dry Cask Storage is a new use of the land, and was never contemplated when the site was first approved.

Therefore the use of the land on the banks of the Hudson for so-called interim spent fuel storage is not included in the GEIS.

The dry cask storage pad design, and proposed configuration of the Spent fuel casks, is considered Category 1 in 10 CFR51 Appendix A subpart B, however, given the multiple emergent issues, it should be included in the SEIS as a Category 2 issue..

Facts supporting this include: (1) long term permanent storage remains unresolved, (2) multiple spent fuel pool leakage issue requiring design load changes to the pad and cask storage changes, (3) closing of Barnwell storage facility, (4) fissures in the pad that were unanticipated, (5) potential mixing of fuels from different units including Unit 1, (6) NRC and industry own research into leaving waste sitting where it now resides for periods in excess of 100 years, and finally (7) the extent of contaminated soil requiring remediation, as well as new seismology studies are each relevant to the EIS for the renewal license itself and probable consequences

Dry Cask Storage must be considered as new information with

potential LARGE adverse affect on human health and the environment, as there is no current functional or realistic plan to ever remove the waste from the site. Therefore, it must be included clearly in the EIS that the plan for “interim spent fuel storage,” dry cask storage, is actually a plan for indefinite long term, and potentially infinite high level radioactive waste storage, on the banks of the Hudson River, affecting the surrounding communities for generations and the entire Hudson Valley region.

The Independent Spent Fuel Storage Installation (ISFSI), also known as Dry Cask Storage, estimates capacity of 75 Holtec 100 High Holtec Storm Casks, 18ft high x 14 ft in diameter, 2.5 feet apart. Each cask or canister will hold 32 PDR fuel assemblies, with a total of 2,400 fuel assemblies. The casks will not be bolted down to the pad, even though ISFSI is situated on top of the Ramapo Fault line. The concrete pad on a .5 acre pad with a 100 meter buffer of controlled land, uses approximately 40 acres of 239 acres site in Buchanan.

The casks are 3 ft thick made of carbon steel inside concrete, which is highly corrosive.

It is estimated that each plant will require one cask per year, during the new superceding license period, assuming there is no need to change fuel assemblies because of power uprate or other problems.

The Capacity amount of spent fuel in pools is Unit 2 1374, which is currently almost full, and IP3 Unit 3 1345 fuel assemblies. [See exhibit 5](#)

IP 1 needs approximately 5 MPC (casks) and must be emptied immediately due to the strontium leaking from it into the groundwater and the Hudson River. In the event the LRA of IP2 is approved in 2010 by the NRC it will be in operation for an additional 23 continuous years, and In the event the LRA of IP3 is approved by the NRC it will be in operation for 25 continuous years. IP2 would require 23 casks and IP3 25 casks, a total of 48 casks. This leaves only 21 additional casks. However, due to the inability of Entergy to find the leaks at IP2 spent fuel pool, there is a very real possibility that the only way to find the leaks is to empty the pools. It requires 43 casks to empty Indian Point 2, and 42 casks to empty Indian Point 3.

Therefore using simple math, in the event the IP2 and or IP3 spent fuel pools must be emptied, due to structural damage as evidenced by the current leaks, the dry cask pad may not be large enough to adequately store the high level radioactive waste generated during the 20 year new superceding license period.

Further it must be considered that in the event an additional dry cask storage pad is needed, there may not be adequate area on the site once the required closed-cycle cooling systems are installed. This issue must be fully evaluated as part of EIS scoping as a Category 2, site-specific issue.

The possible need to place even more high level radioactive waste in Holtec casks that do not meet the required seismic standards of 5.5, must be transparently and comprehensively reviewed in the EIS.

The plan for “interim spent fuel storage”, dry cask storage, is actually a plan for indefinite long term, and potentially infinite high level radioactive waste storage on the banks of the Hudson River, affecting the surrounding communities for generations and the entire Hudson Valley region.

The potential significant adverse impact on human health and the environment is LARGE, as there is no current functional or realistic plan to ever remove the waste from the site.

Although the issue of spent fuel storage is an industry wide problem, the limited space of the Indian Point site causes a full plant-specific mitigation measure to be comprehensively reviewed at Indian Point to prevent turning “interim spent fuel storage” into permanent high level radioactive waste storage.

Permanent high level radioactive waste storage is not considered in the GEIS and is not a Category 1 issue, therefore it must be a Category 2 issue that requires full plant-specific analysis for Indian Point in the EIS.

## **ISSUE 12. Closure of Barnwell**

It was recently announced that the only radioactive waste disposal site in the United States that is currently operating and accessible for all classes A, B, and C (and greater than C on a case-by-case basis) of “low-level” radioactive waste generated by all nuclear power plants is the EnergySolutions-operated site at Barnwell South Carolina. It will be closed

for use by states other than New Jersey, Connecticut and South Carolina after June 2008. and will not accept low-level radioactive waste from Indian Point. The GEIS does not address disposal of low-level radioactive waste on-site, which will turn Indian Point into a low-level waste disposal site.

Some less concentrated of the so-called “low-level” radioactive waste (Class A) could still go to the Class A-only waste site that EnergySolutions owns and runs in Clive, Utah, but Classes B and C will not have a place to go after June 2008. Currently the Department of Energy (DOE) is doing an EIS on the disposal of greater than Class C waste.

While the low level waste disposal capacity at Indian Point is relatively small, Indian Point is not permitted to increase the low level waste disposal capacity. However, due to the closure of Barnwell, Indian Point 2 must start storing low-level waste on the site, which will have a MODERATE impact on the Environmental Costs and Impacts, and long term affects on the population and environment of the surrounding communities for generations.

In a letter from the NRC to all licenses dated August 1, 1985 U.S. Nuclear Regulatory Commission Commercial Storage at Power Plant Sites

of Radioactive waste Not Generated by the Utility HPPOS-092 PDR-

9111210185, W.J. Dircks states that:

NRC is opposed to any activity at a reactor site that is not supportive of authorized activities. Interim storage of low-level radioactive waste matter of policy, NRC is opposed to any activity at a nuclear reactor site which may divert attention of licensee management from its primary task of safe operation or construction of the power reactor.

The operator must demonstrate that the increased use of the low level waste facility do not involve a safety or environmental question, and that safe operation of the reactor will not be affected.

The licensee must consider:

1. Direct impacts of commercial storage activities on reactor operations during normal and accident conditions.
2. Diversion of utility management and personnel attention from safe reactor operation.
3. Combined effects of onsite and offsite dose during normal and accident conditions.



4. Influence on effectiveness of both reactor emergency plans and reactor security plans.

5. Financial liability provisions, including impact on indemnity coverage.

6. Environmental impact of the storage facility, including potential interaction with the generating station.

In addition, the following issues must be considered:

1. Safety of the commercial storage operation.

2. Environmental impact of the storage operation in sufficient detail for NRC to establish the need for an Environmental Impact Statement.

3. Financial assurance to provide for commercial storage operation and decommissioning including any necessary repackaging, transportation and disposal of the waste.

Therefore, if Entergy is proposing to use the Indian Point site for a new “low-level” waste storage facility for disposal of Class B and C radioactive waste, then a fully independent application and review of such a

change must be commenced for public and regulatory comment and consideration.

Specifically, with regard to the known radioactive leaks and planned refurbishment of the reactor vessel heads, the EIS must include a comprehensive review of the disposal plan of the old, highly irradiated and contaminated reactor vessel heads. Once again this is new information, which Entergy has failed to include in Environmental Supplement E, and it must be included as a Category 2 issue that must be comprehensively reviewed in the EIS.

### **ISSUE 13: Decommissioning Trust Funds**

The GEIS has taken the position that the environmental impact of on-site spent fuel storage at generic reactor sites does not require any further environmental analysis because it has already been generically determined that such impacts will be SMALL. However, that position can no longer be sustained because, as per well-established law, there is new and significant information suggesting that the basis for the original GEIS conclusion is no longer valid, and specifically related to Indian Point, that conclusion is invalid because of known serious structural issues (known leaks), which greatly change and impact the costs of decommissioning. Such new

information regarding additional costs has not been incorporated into the GEIS.

As an example, neither Entergy's ER (Appendix E), nor the GEIS, address, much less provide a reasoned analysis of, the new and significant information (leaks) and its impact on the original GEIS findings with regard to the Decommissioning trust funds.

The GEIS evaluates the impacts associated with onsite land use as Category 1, SMALL. The basis for this assessment is the assumption that the land used for storage of nuclear wastes at the generic reactor site will not exceed 30 years after the end of the license term and is based on a zero leak assumption. That flawed assumption, invalidated by the fact that the plant is already leaking unmonitored radioactive effluent into the bedrock, groundwater and Hudson River, relies upon the misdirected assumption that the decommissioning of Indian Point will be generic decommissioning, however the leaks into the bedrock will dramatically increase decommissioning costs at this site, thereby causing the impacts to be LARGE and therefore Decommissioning must be a Category 2, site specific

issue based on new information, in the EIS.

Entergy's decommissioning trust fund balances are inadequate and insufficient to properly decommission the site, as required by 10CFR 54.3 to properly restore the site including, but not limited to, removal of underground radioactive contamination in the bedrock under the plant. Per NRC Section PART 50 Sec. 50.75: Reporting and recordkeeping for decommissioning plan, Indian Point's decommissioning funds are inadequate to clean up the bedrock site from the ongoing underground leaks. The costs for complete decommissioning and cleanup of the site must be adjusted to reflect significant changes in circumstances in the contamination streams, including the large underground radioactive leaks. The EIS must include a comprehensive evaluation of actual decommissioning funds required to decontaminate the site in light of ongoing massive underground radioactive effluent and leaks. In addition, such funds must be placed into the decommissioning fund to protect the public health and safety, as well as the environment prior to acceptance of Entergy's LRA.

The Indian Point 2 decommissioning trust fund has not been adjusted to take into consideration the enormous, underground radioactive

contamination accidentally discovered in 2005. The current decommissioning plan for aging management of the plant is inadequate to clean up the bedrock site and is not addressed in the Applicant's LRA, and must be adjusted to reflect the large underground radioactive leaks, as required by:

Section PART 50 Sec. 50.75 (2) (e)(1)(v); any modifications occurring to a licensee's current method of providing financial assurance since the last submitted report; and any material changes to trust agreements.... or where conditions have changed such as: (iii) The current situation with regard to disposal of high-level and low-level radioactive waste; (iv) Residual radioactivity criteria; (v) Other site-specific factors which could affect decommissioning planning and cost; (1) Records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site. These records may be limited to instances when significant contamination remains after any cleanup procedures or when there is reasonable likelihood that contaminants may have spread to inaccessible areas as in the case of possible seepage into porous materials such as concrete. These records must include any known information on identification of involved nuclides, quantities, forms, and concentrations., or certification is used.

It has been acknowledged by the NRC that numerous systems, structures and components can experience undetected radioactive leaks over a prolonged period of time and that relatively large volumes of contamination above the decommissioning release limits can result in notable increases in remediation time and costs in the sums of hundreds of millions of present value dollars. (NRC's Liquid Radiation Release Lessons Learned Task Force Final Report, ML062650312 2006-09-013.4.3) The past and present leaks at Indian Point 2 provide indicia of continued and future leaks. In 2006 Don Mayer, Director of Special Projects for Entergy said that "The underground area of the Indian Point site has contaminated water that is 50 to 60 feet deep, ...and there is also another area, or underground plume, that is about 30 feet wide by 350 feet long."

In the Matter of Power Authority of the State of New York and Entergy Nuclear Fitzpatrick LLC, Entergy Nuclear Indian Point 3 LLC, and Entergy Nuclear Operations, Inc. (James A. FitzPatrick Nuclear Power Plant and Indian Point Nuclear Generating Unit No. 3) Docket Nos. 50-333-LT and 50-286-LT regarding the license transfer to Entergy, the Nuclear Regulatory Commission held that decommissioning shortfall did not fall within the scope of this license transfer proceeding, as Entergy Indian Point

was not seeking in its application to renew or extend the Indian Point 3 operating license, nor does its pending application assume such a request.

The Commission further states, that regarding decommissioning Stakeholders have the right to seek intervenor status in any application for license renewal or license extension that Entergy Indian Point may file. Therefore, based on the Commission's own decision, the issue of whether there are adequate decommissioning funds is within scope of the licensing renewal proceedings, specifically included in the EIS.

Additionally, Energy's violation of the terms of the SAFESTOR for Indian Point 1, must be comprehensively evaluated in the EIS, as it is a Category 2 issue, due to the new information regarding the leaks of strontium 90 and cesium 137 from Indian Point 1 which have LARGE significant impacts to the environment and costs of decommissioning.

The method of cost analysis of adequate decommissioning funds must be clearly stated. Entergy's application and Environmental Supplement E does not outline an adequate decommissioning and clean up plan for the large amounts of underground radioactive waste, for which the source has

not yet been identified. Therefore the extent of the contamination remains unknown.

Entergy initiated actions to pump out the Unit 1 Containment Spray Sump through a filter/demineralizer system, designed to remove Strontium 90, and to investigate the source and means of the Strontium 90 groundwater contamination.

When Entergy began removing the underground leaks by pumping the radioactive contamination out of the ground, it caused more radioactive material to be released. Therefore, the NRC ordered Entergy to discontinue removal of the radioactive effluent from ground, and to monitor it while the issue was further investigated.

The NRC has ordered that the contaminated materials remain under the plant in the bedrock, until some date uncertain when Applicant figures out a method to find, stop and remediate the Radiation Leaks. Until that time radioactivity will continue to leach into the groundwater and the Hudson River. At a recent annual assessment NRC meeting in Croton, NY, NRC officials stated that since they can't dig the radioactive contamination out,



and can't blast it out, therefore they will have to chisel out the tritium, cesium and strontium from the bedrock. If such remediation work is required to bring the reactor site into compliance with NRC guidelines and PART 50.7 it will require additional protective actions during the remediation work to keep radioactive contaminants from migrating off site, and exposing both humans, workers and the public, as well as the environment, to unnecessary additional exposure risks and pathways.

In the NRC's Liquid Radiation Release Lessons Learned Task Force Final Report, ML062650312 2006-09-013.4.3, it was concluded and recommended that, in some cases, such as Indian Point, the relatively large volumes of contamination above the decommissioning release limits resulted in notable increases in remediation time and costs. The NRC staff estimates the increased cost to be in the tens of millions of dollars, although specific actual cost data is not available to the staff.

The decommissioning reports for Indian Point 2 from 2002 to 2006 indicate that the Urban Inflation rate has been 2.9% per year, yet the adjustment of the decommissioning funds for IP2 has been only 1% per year. However, the decommissioning reports falsely state the escalation rate is

3.0%. The decommissioning funds for Indian Point have a substantial shortfall, as they are not even keeping up with the rate of inflation, as evidenced in the March 29, 2005 Report BVY-05-033/NL-05-039/JNP-05-005/Entergy Nuclear Operations Ltr.2.05.023 and the March 29, 2007 Report Entergy Nuclear Operations C-07-00007.

The newly proposed onsite storage of an additional 20 years of waste, either in the spent fuel pools or in dry cask storage, increases the risk to human health and safety far beyond the original Design Basis for this site. Additionally, the NRC has been discussing plans to store both LLRW and HLRW onsite at reactor facilities for a period in excess of 100 years, while failing to provide the public with the protection standards and additional decommissioning funds that are required for a long term LLRW or HLRW storage facility.

The lack of protection and additional decommissioning costs associated with forced onsite storage of radioactive waste streams must be addressed in the license renewal process. Spent fuel pools are not designed to meet the basic minimum requirements for structural stability and integrity, as is outlined in the citing criteria for new reactors in place at the

time the NRC granted the original license. It thus becomes imperative that the structural degradation indicated by the leaks of both Spent Fuel Pools 1 and 2 be addressed and remediated before the license renewal application is allowed to move forward.

Moreover, the dry cask storage facility at Indian Point presents additional hazards, higher decommissioning costs, and greater risk to New York (and other Northeastern states) that will very possibly continue for centuries. The costs of assuming these burdens cannot be placed on the taxpayers, but should be assumed by the Applicant which profits from the operation. These additional costs must be added to the decommissioning fund. Even the Nuclear Energy Institute (NEI) recommends that although NRC regulations do not require the inclusion of used-fuel storage costs in decommissioning funds, companies should include such costs in their estimates, because no federal repository or interim storage facility is available.

The adequacy of decommissioning trust funds are not addressed in the GEIS Due to the site specific nature of the decommissioning funds, the collective off-site radiological impacts and the

need to determine site specific mitigation measure, decommissioning is not a Category 1 issue. This must be considered a Category 2 issue which has significantly LARGE impacts to the environment and public health and safety and therefore, must be comprehensively evaluated in the EIS.

#### **ISSUE 14. Leaks -Ground-water Use and Quality**

Section 5.1. of the Environmental Report contains Entergy's ground contamination analysis at Indian Point. Entergy classifies Groundwater Contamination as "new information, but not necessarily significant". The significance of the Groundwater Contamination has not yet been determined, in fact, new studies and maps of the groundwater contamination are due to be delivered by Entergy later this fall.

Only after all reports, including, but not limited to, Entergy's reports due in the fall of 2007, and the NYDEC independent studies based on captured aquatic life and other tests regarding Essential Fish Habitat or Significant Coastal Fish and Wildlife Habitat, specifically of the Haverstraw

Bay, regarding the groundwater contamination are complete and fully reviewed by the residents surrounding Indian Point and the elected officials, can a determination be made as to the level of significance of the Groundwater Contamination.

Clearly, the issue of Groundwater Contamination is a plant-specific issue, and therefore not a Category 1 issue, but a Category 2 issue.

Entergy's misrepresentation stating that Indian Point Groundwater Contamination is NOT NECESSARILY SIGNIFICANT or SMALL is based on conjecture, rather than facts. Therefore, the significance of the Groundwater Contamination cannot be determined until all the relevant studies are complete and submitted.

Therefore the ER is incomplete and the issue must be considered a Category 2 issue that must be fully analyzed in the EIS.

Various and assorted leaks of unknown origin and undiscovered specific locations are indicative of deteriorating stability and tensile strength of plant infrastructure and systems. Many of the underground

pipes and all the spent fuel pools on the Indian Point site are leaking radiological contaminants into the ground under the Indian Point site, and thus contaminating various potable water supplies in violation of both State and Federal laws.

Further, said radiological contaminants are migrating towards the Hudson River. It is only a matter of a few years, if not months, before the underground plumes migrate off site, and reach the Hudson River, thus creating a serious risk of contaminating the river, a key fresh water resource.

The current status of the leaks is that the NRC and Entergy have been investigating them since 2005 and still have not found the source(s). Recently it was decided not to remove the radioactive effluent from the ground. This decision was reached when siphoning began and caused more radioactive materials to be released. Doing nothing is not an answer. In fact it just proves the lack of knowledge and ability of both Entergy and the NRC to properly manage radioactive pollution

- a. These leaks unchecked and un-repaired will further increase the contaminant levels in potable water sources and the Hudson River.

b. The risk of wall collapse in one of the spent fuel pools is greatly increased, as winter temperature shifts coupled with the leaks creates a much higher risk of damage caused from ground heave.

c. The radiological and chemical contaminants associated with these known, yet non-specifically identified leaks hold the potential to increase the rates of corrosion in the underground pipes and other structures at the Indian Point site. This is significantly worrisome, as these unreachable pipes and systems cannot be tested with any certainty as it is. To strengthen this contention, it is pointed out that reactor coolant chemistry is considered a key issue of concern in Flow Accelerated Corrosion (FAC). If water chemistry inside of the pipes of the reactor is a concern, then it follows that over 250,000 gallons of radioactively contaminated water under the site should be a corrosion concern as relates to the outside of the pipes.

If the NRC allows this high level radioactive effluent to remain unchecked in the ground during the 20 year new superseding license they are granting permission to Entergy to release unmonitored radioactive waste into the groundwater and the Hudson River, through off-site

migration, gravity, tidal pull and capillary action. Until all the leaks are identified, located, repaired and fully remediated, significant Environmental Costs and risks continue to increase. Therefore, a comprehensive study of all aspects of the leaks at Indian Point 1,2, and 3 must be included in the EIS.

Additionally the NRC must require Entergy to make all plume maps and leak reports available to elected officials and the public, even though Entergy has claimed such materials to be proprietary, as the information contained in the plume maps and leak reports directly impact Environmental Costs which must be included in the EIS. (Plume Maps have not been released to Public because Entergy has claimed them as proprietary)

Specifically, any unmonitored releases are in violation of NRC regulations § 20.1301 Dose limits for individual members of the public.

(a) Each licensee shall conduct operations so that —

(1) The total effective dose equivalent to individual members of the public from the licensed operation does not exceed 0.1 rem (1 mSv) in a year, exclusive of the dose contributions from background radiation, from any administration the individual has received, from exposure to



individuals administered radioactive material and released under § 35.75, from voluntary participation in medical research programs, and from the licensee's disposal of radioactive material into sanitary sewerage in accordance with § 20.2003 NRC's Regulations.

§ 20.1302 Compliance with dose limits for individual members of the public.

(a) The licensee shall make or cause to be made, as appropriate, surveys of radiation levels in unrestricted and controlled areas and radioactive materials in effluents released to unrestricted and controlled areas to demonstrate compliance with the dose limits for individual members of the public in § 20.1301.

Large releases of radioactive particulates and or contaminants into the air or water, must be considered new circumstances. In the past, and present, there have been more than one incident at Indian Point in which such releases have occurred, including but not limited to the current leaks and the steam generator spill in 2000 of hundreds of gallons of radioactive waste. Large releases of radioactive particulates are a key accident pathway that results in significant off site release of radiological contaminants into the air, water and ground that must be investigated. These releases result in

associated significant LARGE Environmental costs and impact that must be included in the EIS as Category 2 issues.

### **ISSUE 16: Human Health**

The ER states that there are no adverse health affects and the impact of Indian Point on public health in “SMALL”. FUSE asserts that the impacts and environmental costs are “LARGE” and the health effects are not generic Category 1 issues, but rather must be investigated and evaluated on a plant-specific basis. Continued operation of Indian Point raises the risk of radioactivity exposure in two ways. First, the reactor cores would maintain high levels of radioactivity in the core and add waste to the approximately 18,000 tons already at the site, worsening the consequences of a large-scale release after a mechanical failure or an act of sabotage. Many thousands would be stricken with thorough acute radiation poisoning or cancer.

The potential health and environmental consequences of 20 additional years of dumping radionuclides into the Hudson River, combined with an analysis of the synergistic interaction of such radionuclides with other known Hudson River pollutants like PCBs, endocrine disruptors (including dioxins) and mercury;

The potential health and environmental consequences of 20 additional years of additional releases of radiation and other chemical toxins into the atmosphere, combined with an analysis of the synergistic interaction of such elements with other known pollutants such as mercury;

The potential health and environmental consequences of 20 additional years of additional releases of radiation and other chemical toxins released by Indian Point into the environment (especially toxic metals like cadmium) upon populations most susceptible to radiation and toxic chemicals, such as women, adolescents, children, babies, breast-fed infants and the embryo/fetus would be significant.

Reactors routinely release radioactivity and persons living near Indian Point would be exposed to more of these radioactive chemicals. Historically, Indian Point has a checkered record of contaminating the local environment.

- It released the 5<sup>th</sup> most airborne radioactivity of 103 U.S. nuclear plants.

- Radioactivity levels in the Hudson River are over 10 times greater than in Albany.
- Levels of Strontium-90 in local baby teeth are the highest of any area near seven U.S. nuclear plants, and rose 38% since the late 1980s.

This record of contamination raises health concerns, which are heightened when considering that since 2000, in the four counties closest to Indian Point,

- Childhood cancer incidence is 22% above the U.S. rate
- Thyroid cancer incidence is 70% above the U.S. rate
- Cancer incidence in the six towns within five miles of Indian Point is 20% greater than the rest of Rockland and Westchester Counties.

Closure of Indian Point will result in decreases in cancer mortality, as it did near the closed Rancho Seco plant in California. In the event the NRC does not approve Entergy's LRA and the plants close in 2013 and 2015, respectively, 5000 fewer cancer deaths would occur in the next 20 years in Westchester, Rockland, Orange, and Putnam Counties. While many factors contribute to cancer risk, evidence suggests that more detailed study on

Indian Point is warranted, and that the public be informed of any health risks.

Estimated Deaths/Cases of Acute Radiation Poisoning and Cancer Deaths Near Indian Point, Following a Core Meltdown

<u>Type of Effect</u>	<u>Indian Point 2</u>	<u>Indian Point 3</u>
Deaths, Acute Radiation Poisoning	46,000	50,000
Cases, Acute Radiation Poisoning	141,000	167,000
Cancer Deaths	13,000	14,000

The National Academy of Sciences BEIR VII report<sup>3</sup> concludes that women are significantly more vulnerable to radiation than are men and that the cancer mortality risks for solid tumors are almost 50% greater for women (though for leukemia, the risk estimates are higher for men). The BEIR VII panel was also in accord with the European Commission on Radiation Risk, in determining that the risk differential for children – especially babies and very young children – is even more dramatic. For instance, the cancer risk for male infants up to age one is 3 - 4 times that for males in the age range of 20 - 50 exposed to the same amount of radiation. Female babies and children are even more vulnerable than males. Moreover,

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<sup>3</sup> The National Academies of Science (NAS) report, *Health Risks from Exposure to Low Levels of Ionizing Radiation*, known as BEIR VII (Biological Effects of Ionizing Radiation) to be a landmark study. It was released in June 2005 and updated in 2006.

infants are vulnerable to the transference of isotopes like strontium-90 which can be fed to a newborn during breastfeeding.

It is also well established that radiation is most potent to the rapidly dividing cells of babies in utero. (Gamma rays can pass through the fetus. Alpha and beta particles can be transmitted via the placenta.) Radiation interferes to a high degree with cell proliferation and such rates exist throughout prenatal development. The central nervous system may be at especially high risk. Central nervous system development starts during the first weeks of embryonic development and continues through the early postnatal period. This system is accordingly quite vulnerable for a very long period. The constellation of effects from injury to the developing central nervous system includes: mental retardation, autism spectrum disorders, learning disabilities, and ADD.

Tissues that are particularly susceptible if exposed during normal periods of rapid growth (i.e., prenatal, early childhood and puberty) are the brain, thyroid, bone and breast.

Notably, a Radiation and Public Health Project study published in the February 2003 issue of the Archives of Environmental Health examined rates of cancer of children living near operating U.S. nuclear reactors. The study found that cancer incidence for children under age 10 living within 30 miles of each of the 14 nuclear plants in the eastern U.S. exceeded the national average. Incidence was particularly elevated for leukemia. Of the 14 power plant regions studied, the childhood cancer rates in Rockland and Westchester Counties near the Indian Point plant was 4th highest (17.4% above the U.S. average). While such findings are not determinative, they are highly suggestive of the possibility that Indian Point is posing a consequential risk to its surrounding population.

Notwithstanding their special vulnerability, women, children, babies and the embryo/fetus are not given corresponding consideration in the regulatory framework which governs nuclear power plant emissions. The current outmoded standards do not incorporate the medical knowledge that has been attained during the past 20 years and continues to be based on “Reference Man” which is defined as a young adult Caucasian male. (The term actually derives from the standards created to protect the young, white, male scientists working in nuclear labs during the early post-Manhattan

Project era.) The regulatory paradigm is also narrowly oriented to genetic effects and cancer, thereby ignoring the wide panoply of other extensively reported conditions that can result from exposure to ionizing radiation.

Compliance with standards does not mean that the health of the public is not compromised, as radioactive exposure is cumulative, and therefore must be evaluated over the period of 60 years, rather than 40 years as a Category 2 issue in the EIS,

Additionally, comprehensive health studies and associated Environmental Costs and Impacts must be included as Category 2 issues in the EIS as part of the relicensing application for Indian Point 2 and Indian Point 3.

### **ISSUE 17. Population Considerations**

Locating reactors away from densely populated centers is part of the NRC's defense-in-depth philosophy and facilitates emergency planning and preparedness, as well as reducing potential doses and property damage in the event of a severe accident. 10 CFR Part 100,



The nearest distance to the boundary of a densely populated center containing more than about 25,000 residents must be at least one and one-third times the distance from the reactor to the outer boundary of the LPZ “low population zone”. An "exclusion area" is the area surrounding the reactor in which the reactor licensee has the authority to determine all activities, including exclusion or removal of personnel and property, and a "low population zone" (LPZ), which immediately surrounds the exclusion area.

In 2006 the immediately surrounding area had substantially more than 25, 000 residents, in fact the communities directly adjacent to Indian Point had 84,848 residents: Peekskill 24,601, Buchanan 2, 269,. Croton-on-Hudson 7,899, Stony Point 14,975 and Haverstraw 35,104.

Reactor sites should be located away from very densely populated centers. Areas of low population density are generally preferred. The projected Population increase during the new superseding 20 year license period distinguishes Indian Point from any other plant in the nation. The population surrounding Indian Point has exponentially increased since 1970 by 32%. The population in the surrounding Counties are continuing to

grow rapidly. In fact, Orange County, is the fastest growing county in New York State. Based on census studies from 1970, 1990, 2000 and updates in 2002 and 2006, the projected average annual rate of population increase has been 1.23%. Using the same rate of increase, the projected population in the counties surrounding Indian Point will be 2, 250,619 or a 63% increase. Census Study 1970-2006), or at a more modest rate of 50%, 1,958,575. See Census study Exhibit 2

This dramatic increase in population and population density has LARGE and significant adverse impact on public health and safety. Public health and safety cannot be grandfathered in, especially in light of such substantial changes in population.

Population increases directly affects the ability to evacuate the areas and protect public health and safety and has not been included in the GEIS. This enormous population is specific to the New York Metropolitan area, specifically in the communities surrounding Indian Point.

At the time the plant was built the area was primarily farmland, and the plant owners could have mitigated the rapidly increasing population by

purchasing vast acreage to maintain the required low population density.

Today only unrealistic mitigation measures exists as the surrounding region is densely populated with homes, apartments and businesses.

The high dense and numerous population surrounding Indian Point is plant-specific and is not a Category issue. Therefore a full comprehensive study of population and population increases in the surrounding counties,

Westchester, Rockland, Orange and Putnam is a Category 2 issue that must be included in the EIS.

### **ISSUE 18   United Water Hudson River Water Desalination for Rockland County Drinking Water**

A proposal for a desalinization plant along the Hudson in a location not yet disclosed, although it is anticipated to be in Stony Point or Haverstraw due to the salinity of the water in those locations, has been submitted for review by United

Water of New York (UWNY). As the proposed facility is anticipated to be in use by UWNY within the proposed 20 year superseding license period of Indian Point 2 & 3, it must be fully evaluated and considered in Entergy's environmental impact study. Given the leakage of strontium 90, cesium 137, and tritium into the Hudson it would be unreasonable to not consider the full environmental impact of the desalinization plant and the other River intake sites of water for human

consumption such as the Croton Station, which is New York City's emergency water source. This will have a LARGE impact on human health and the environment. Due to the radioactive releases from Indian Point, the costs and impacts of removal of radioactive nuclides from the water for human consumption must be included as a Category 2 issue in the EIS, as new information and circumstances.

**ISSUE 19. FAA recent decision to increase commercial air traffic over Rockland County:**

The residents in the Hudson Valley have recently been advised of the FAA's decision to increase air traffic in the region. Entergy's Environmental review reports that no foreseeable related Federal projects were identified. As the FAA Redesign Project is a Federal project that has been considered since 1999, we ask what effect increased air traffic on increasing crash risks, and the background noise of increased air traffic might have on the efficacy of the emergency alert system. Specifically, was the emergency siren system designed to be heard above the increased noise coming from the increased noise levels projected for Rockland County? The current new installed alarm system cannot be heard inside a house or even in a parked car.

### **[“2.13 Related Federal Project Activities**

During the preparation of this report, Entergy did not identify any known or reasonably foreseeable federal projects or other activities that could contribute to the cumulative environmental impacts of license renewal at the site.”

[http://www.nrc.gov/reactors/operating/licensing/renewal/applications/indian-point/1-ipeclra-appendix-e\\_1-2.pdf](http://www.nrc.gov/reactors/operating/licensing/renewal/applications/indian-point/1-ipeclra-appendix-e_1-2.pdf), pg 113 of 156)]

In Entergy’s Environmental Report it’s LRA failed to identify this significant change by another federal agency with regard to the residents in an area within 50 miles of Indian Point, despite the fact that the FAA has posted such increases in the Federal Registry. Therefore by regulation, and because of the potential significant MODERATE Environmental Impacts and Costs, such increased air traffic is new information that must be considered as new information and circumstances, on a plant-specific basis as a Category 2 issue in the EIS.

#### **ISSUE 20. Air Traffic Risk:**

Air traffic, including but not limited to, helicopters, as well as airplanes (private planes, private jets, large commercial planes) fly over Indian Point, as there is no no-fly zone. This presents a clear and significant danger with serious Environmental Costs, impacts and risk. There are 6 major airports within the 50 miles of Indian Point, including Westchester Airport, Stewart Airport, JFK International Airport, La Guardia Airport,

Newark International Airport and Bradley Airport, as well as numerous private airports. An inadvertent crash will have serious Environmental Impacts and Costs which must be considered in the EIS.

Recent accidents in New York area highlight the necessity of a comprehensive study of the air traffic within the 50 miles of Indian Point to be included in the EIS. Two recent examples are set forth below:

a) **NEW YORK** (CNN) Yankees pitcher Cory Lidle and his flight instructor were killed Wednesday when the 34-year-old ballplayer's plane crashed into a high-rise apartment building in New York, city baseball team officials said. Include a date

b) **American Airlines Flight 587 on November 12, 2001**  
crashed into the Belle Harbor neighborhood of Queens in New York City shortly after takeoff from John F. Kennedy International Airport. This was the second deadliest U.S. aviation accident to date.

On January 1, 2006 The National Transportation Safety Board said 44 aviation accidents took place in New Jersey in the past year, double the number in 2004 and the most in more than 10 years.

The Star-Ledger reported that eight fatal accidents killed 13 people, and half of those accidents involved home-built aircrafts. Curious, could a TERRORIST build a homemade plane?

The impact of potential aviation accident(s) such as those described above, will have a direct impact and will impinge on critical infrastructure at Indian Point, resulting in significant Environmental impacts and costs, and therefore must be included in the EIS.

### **ISSUE 21. Global Warming:**

Weather related accidents, such as floods, tornados, hurricanes can cause various accidents which impact, compromise and prevent the reactors' ability to conduct and maintain safe shutdown. In light of Global Warming which will significantly change weather patterns throughout the world, perhaps leading to rising river waters and warming rivers which may not be adequate to cool the "hot" components and fuel during the 20 year new superseding license period.

Indian Point's function and ability to safely shutdown will be significantly compromised by projected global warming during the 20 years of the new superseding license. These are key accident pathways that would

result in the potential for significant off site release of radiological contaminants into the air, water and ground affecting the environment and the surrounding population of 20 million people.

The magnitude of the impact will be LARGE, as written on August 23, 2007 when the Union of Concerned Scientists wrote,. “As global warming pushes temperatures upward, scientists project increased heat waves and drought in the United States, Europe and elsewhere. Such conditions spell trouble for nuclear power plants. The water they rely on from lakes and rivers to cool reactors during the summer are either drying up or [are] too warm to use.”

On August 16, the Tennessee Valley Authority (TVA) had to shut down one of the three units at its Browns Ferry nuclear power plant because the Tennessee River water it uses to cool the reactor was too hot, exceeding a 90-degree average over 24 hours. The two other reactors at the plant had to run at reduced capacity. The same day, demand for TVA power set a record, presumably due in large part to the increased use of air conditioning. The average high temperature for five of the largest cities in TVA's service area, including Memphis and Nashville, was 105 degrees. There were similar incidents in the summer of 2006. In August, for example, Exelon had



to cut power at its Quad Cities, Illinois, nuclear power plant after a heat wave warmed the Mississippi River. Other plants in Illinois, and some in Minnesota, had to cut power due to drought.

An extended heat wave last summer in Europe also intensified drought conditions, lowering water levels in the lakes and rivers that nuclear plants rely on for their water supply. French, Spanish and German utility companies had to shut down some of their plants and reduce power at others. Several Western European governments exempted nuclear plants from regulations against discharging overheated water into waterways. The situation in Europe was even worse during the summer of 2003. An unprecedented heat wave forced France to shut down a quarter of its 58 nuclear power plants.

The results of Global warming will apply in some manner to all plants that use river water for cooling, however the mitigation measures taken at different plants may be significantly different depending on the geography and climate of the plant. "Nuclear plants as they're designed now will produce less power in a warming world," said Dave Lochbaum, the Union of Concerned Scientists' nuclear safety project director. "The industry can't use

global warming as a justification for building more plants without papering over the fact that they don't do well in extremely hot weather."

Nuclear power plants split atoms to produce heat to boil water, Lochbaum explained. The resulting steam spins turbines that produce electricity. After the steam exits the turbine, a large amount of water drawn from a nearby lake or river is used to cool it down so it can be recycled to make steam again. The plants discharge the water from the lake or river back into the same water body, but the process warms it as much as 30 degrees higher than it was originally. Hotter weather disrupts this cycle. When river or lake water temperatures rise from 70 degrees to 90 degrees, for example, a nuclear power plant's electrical output is reduced nearly 5 percent. Higher water temperatures can impair the ability to cool down the steam to a point where a reactor must be shut down.

Meanwhile, electricity demand spikes when temperatures rise, putting more strain on the grid. Safety equipment also can be compromised when temperatures go up. A reactor at the Donald C. Cook nuclear plant in Michigan, for example, was forced to shut down in July 2006 because of temperature-related safety concerns. "If average global temperatures

continue to rise, as climate scientists predict, the nuclear industry will literally be in hot water," Lochbaum said. "It really makes no sense to spend billions of federal dollars to build new nuclear power plants until we solve the climate crisis. That means we should be betting on conservation, energy efficiency, and solar and wind power, none of which rely on water."

August 23, 2007 Union of Concerned Scientists Backgrounder Rising Temperatures Undermine Nuclear Power's Promise

The environmental effects of Global warming on Indian Point will be MODERATE to LARGE. As the climate changes and the water becomes hotter, the impact will become LARGER and the environmental effect will alter noticeably, at first without destabilizing important attributes, but in a short time important attributes for public health and safe operation of Indian will be destabilized.

New York and the Hudson River have unique geography which make it extremely vulnerable to storm surge hurricanes. This could suddenly raise water levels with the pressure of a tsunami. Scientists predict that by 2050 the sea level will be 15 -19 inches higher, therefore the impacts of Global

warming on Indian Point located on the banks of the Hudson River is a plant-specific issue.

The issue of Global warming is not considered in the GEIS, A comprehensive study of possible mitigation of the effects of global warming must be included in an EIS for Indian Point, including the true carbon footprint of Indian Point and including, but not limited to, construction, mining, fuel processing, transportation, waste fuel storage, decommissioning and thermal pollution. Therefore, Global warming is not a Category 1 issue, but rather a Category 2 issue which must be comprehensively considered and analyzed in the EIS.

## **ISSUE 22. Emergency Planning**

The purpose of the EIS, as originally spelled out in the NEPA laws, is that the Scoping process should be used to ascertain ALL potential environmental costs of a particular federal action. The Environmental Costs associated with the issuance of a new 20 year superseding license by the NRC with regard to a potential significant radiological event with the current emergency plan, which has been deemed inadequate to provide reasonable assurance of public health and safety by the local and state authorities for the

past five years, must be considered in the EIS. The NRC acknowledges this in the following statement:

For operating power reactors, 10 CFR 50.54(s)(2)(ii) requires that "If ... the NRC finds that the state of emergency preparedness does not provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency ... the Commission will determine whether the reactor shall be shut down until such deficiencies are remedied or whether other enforcement action is appropriate."

Adequate Emergency Plan is a requirement and an important part of the issuance of a new nuclear plant operating license.

In § 50.47, "Emergency Plans," of 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," paragraph (a)(1) states that no initial operating license for a nuclear power reactor will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

To be clear, FUSE is not requesting that the entire adequacy of the evacuation plan be placed within scope of the EIS, however FUSE asserts that any and all resulting Environmental Impacts and Costs of such accident pathway caused by failure of the Emergency Plans must be included in the EIS.

A comprehensive evaluation of any and all the environmental costs and impacts that could occur in the event that Indian Point's Emergency Plan fails during a radiological release must be included in the EIS.

FUSE asserts that all costs of a failed Emergency Plan do rightfully belong in the EIS Scoping process, with a full complete record of those potential costs as set forth in various scientific studies including, but not limited to, the Witt Report and must be included in the Final Environmental Impact Statement to be issued as a contributing document to the LRA.

The NRC acknowledged that shutdown risk associated with shutdown and refueling (however remote) can occur:

In January 1992, the Nuclear Utilities Management and Resource Council (NUMARC) issued Revision 2 of NUMARC/NESP-007, "Methodology for Development for Emergency Action Levels,"<sup>2</sup> which contained guidance on EAL development that accounted for lessons learned from ten years of using the NUREG-0654 guidance. The NRC stated in Revision 3 of Regulatory Guide 1.101 (August 1992), that Revision 2 of NUMARC/NESP-007 was considered to be an acceptable alternative to the

guidance provided in NUREG-0654 for development of EALs to comply with 10 CFR 50.47 and Appendix E to 10 CFR Part 50.

In addition, the NRC stated in Revision 3 of Regulatory Guide 1.101 that there is a likelihood that the results of ongoing risk studies related to shutdown may necessitate revision of both the NRC EAL guidance (NUREG-0654) and the NUMARC EAL guidance (NUMARC/NESP-007). Appendix E to 10 CFR Part 50 specifies that EALs are to be used as criteria for determining the need for taking emergency response actions (e.g., notification of emergency response organizations). The need for emergency response actions depends on the degree of degradation of plant safety during an event. The shutdown risk studies have demonstrated that events warranting emergency classification and response (although very unlikely) can occur in the shutdown and refueling mode of plant operation.

The above passages are from, “**Regulatory Guide 1.101 - Emergency Planning and Preparedness for Nuclear Power Reactors**”. Here the NRC admits there are events that can occur that would require implementation of the Emergency Plan.

In the event the Emergency Plan is implemented, there is also the possibility of failure of the plan to perform adequately in the intended

activation scenario. The environmental costs of said Emergency Plan's failure, without specifically discussing the adequacy of the plan itself, must be addressed in the EIS.

Reactor core components are designed and built to function in a fashion meant to avoid core damage and/or meltdown, yet due to the possibility of failure of the reactor core components, it is nonetheless, included within the scope of the EIS.

Therefore, by applying the same standards, the Emergency Plan is designed to adequately protect public health and safety, yet due to the possibility of failure of the Emergency plan it too must be included within the scope of the EIS.

If, and when, the necessity comes where the Emergency Plan has to be implemented, we are talking a very serious life and death situation. Therefore, the potential Environmental Costs and Impacts of such failure must be transparently evaluated and considered in the EIS to ensure that adequate protective measures can be taken to protect members of the public in the event of an emergency. The characteristics of the site should not preclude development of such plans. 10 CFR Part 100, "Reactor Site Criteria," requires that:



Site characteristics must be such that adequate plans to take protective actions for members of the public in the event of emergency can be developed.

10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," requires:

Reasonable assurance that adequate protection can and will be taken in the event of a radiological emergency. Emergency planning zones (EPZ) consisting of the plume exposure pathway EPZ with an area about 16 km (10 mi) in radius, and the ingestion pathway EPZ with an area about 80 km (50 mi) in radius.

NUREG-0654/FEMA-REP-1, Rev.1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" (November 1980), 2 provides guidance on performing an ETE.

It is important to note that NRC does not have a clearly defined definition of “reasonable assurance” or of “adequate protection”.

The Counties surrounding Indian Point and retired FEMA director James Lee Witt, who was hired by the State of New York to evaluate the Emergency Planning for Indian Point, have determined that the current evacuation plan is inadequate and unfixable, due to the limited road infrastructure and the enormous population density surrounding Indian Point.

f. Security Plans

To prevent plant damage and possible radiological consequences to the public as a result of acts of sabotage, the characteristics of the site should not preclude development of adequate security plans.

10 CFR 100.21(f) states that site characteristics must be such that adequate security plans and measures can be developed.

10 CFR Part 73, "Physical Protection of Plants and Materials," prescribes requirements for establishment and maintenance of a physical protection system for the protection of special nuclear materials at fixed sites and of plants in which special nuclear material is used.

g. Hydrology and .g1 Flooding

Precipitation, wind, or seismically induced flooding (e.g., resulting from dam failure, from river blockage or diversion, or from distantly

and locally generated sea waves) can affect the safety of a nuclear power station. 10 CFR 100.23, "Geologic and Seismic Siting Criteria"; Regulatory Guide 1.59, "Design Basis Floods for Nuclear Power Plants"; Regulatory Guide 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants" (Section 2.4); 10 CFR Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants;" Criterion 2, "Design Bases for Protection Against Natural Phenomena".

#### h. Water Quality

Contamination of ground water and surface water by radioactive materials discharged from nuclear stations could cause public health hazards. 10 CFR Part 20, "Standards for Protection Against Radiation"; 10 CFR Part 50, "Licensing of Production and Utilization Facilities".

The current ground water contamination at Indian Point must be fully evaluated and remediated to protect the public against radiation, prior to the issuance of a new license for 20 years.

#### i. Industrial, Military, and Transportation Facilities:

Accidents at present or projected nearby industrial, military, and transportation facilities may affect the safety of the nuclear power station. 10 CFR 100.21, "Non-seismic Siting Criteria"; 10 CFR Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants," Criterion 4, "Environmental and Dynamic Effects Design Bases"; Regulatory Guide 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear

Power Plants," Section 2.21 (lists types of facilities and potential accidents); Regulatory Guide 1.78, "Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release".

It should be noted that the West Point Military Academy is less than 8 miles from Indian Point and Fort Smith is less than 3 miles from Indian Point.

Public health and safety cannot, and must not, be grandfathered in for an additional 20 year period of licensed operation without properly evaluating the siting of the plant under NRC regulations. In the event of acceptance of Entergy's LRA, the NRC will issue a 20 year new superceding license, hence retiring the current license. Therefore all the regulatory Environment citing criteria for a new license must be reviewed as a Category 2 issue in the EIS.;

### **ISSUE 23. Reasonable Assurance of Adequate Protection of Public Health and Safety**

On June 12, 2006, Richard S, Barkley, of the NRC wrote that the NRC's definition of REASONABLE ASSURANCE OF ADEQUATE PROTECTION OF PUBLIC HEALTH AND SAFETY was stated in the

Director's Decision, in the matter of Docket No. 50-346 (License No. NPF-3) FIRSTENERGY NUCLEAR OPERATING COMPANY (Davis-Besse Nuclear Power Station, Unit 1, April 22, 2004, 59 NRC 215), and NRC case law, to be, "as a general matter, defined by the Commission's health and safety regulations themselves.... There is reasonable assurance of adequate protection of public health and safety when the applicant or licensee demonstrates compliance with the Commission's regulations. The regulations were established using defense-in-depth principles and conservation practice.

Since the NRC cannot take enforcement actions solely on the basis of whether licensees fulfill commitment, a failure to meet a commitment in itself does not constitute a violation of a legally binding requirement. However, when failure to meet a commitment results in violation of the Commission's health and safety regulations, the Staff will take the appropriate enforcement actions. Due to the fact that the NRC has granted seemingly endless exemptions, exceptions and deviations from its regulations, and the fact that Indian Point was built to industry guidance, instead of NRC regulations, the standard of REASONABLE ASSURANCE

OF ADEQUATE PROTECTION OF PUBLIC HEALTH AND SAFETY is meaningless at Indian Point.

Therefore the entire population, of 20 million residents, 8% of the United State population, living within the 10 mile emergency evacuation zone, 17.5 mile peak injury zone, and the 50 miles ingestion zone are all affected by the NRC's inability to maintain an enforceable standard of REASONABLE ASSURANCE OF ADEQUATE PROTECTION OF PUBLIC HEALTH AND SAFETY.

The magnitude of the impact on the effected population is LARGE, as the impact of the NRC not enforcing its own required standard regulations has a significant adverse affect on the population. This is evidenced by the fact that the State and County government surrounding the plant have found the emergency evacuation plans to be wholly inadequate. Robert Stephan, Homeland Security's Assistant Secretary for Infrastructure Protection reported in the Journal News, March 23, 2006 that, "The Nuclear Regulatory Commission has ranked Indian Point 'in terms of potential human consequences as the No. 1 site in the nation.'"

The issues surrounding Indian Point are unique, and the GEIS does not adequately address the site specific and unique issues of Indian Point to give REASONABLE ASSURANCE OF ADEQUATE PROTECTION OF PUBLIC HEALTH AND SAFETY including but not limited to the following:

A. The population mass within a 50 mile radius of Indian Point far exceeds 20 million citizens, 8% of the U.S. population, and is located in the most densely populated area surrounding a nuclear facility in the nation.

B. New York City, located 25 miles from the plant, is the hub of America's Financial institutions. A significant nuclear incident (accident) or terrorist attack on the facility that led to off site migration of radiological contaminants would be catastrophic in nature to not only the surrounding region, but to the entire nation, as it could quickly lead to Environmental Costs in excess of half a trillion dollars and could bankrupt America.

C. West Point Military Academy, the training

ground for America's future leaders, and a vital American brain trust, which includes a U.S. mint, it located less than 8 miles away.

D. Indian Point is the only reactor site that is leaking radioactive strontium 90 into the ground, groundwater and Hudson River.

E. Indian Point is located on an active fault line, the Ramapo fault.

F. On 9/11 at least one of the hijacked planes flew directly over Indian Point 2 and 3 before it destroyed the World Trade Center.

G. Since 9/11 Indian Point is considered one of the most attractive and vulnerable terrorist targets in the nation.

2. In addition, the Indian Point site already has numerous non-compliance issues that place it in violation of NRC Rules and Regulations, with said issues that are already contaminating the environment, and increasing the risk to the general public. These risks include, but are not limited to:



A. Numerous members of Congress, and a majority of the elected officials and local communities, question whether Indian Point is safe, and have repeatedly called for, and asked the NRC for an Independent Safety Assessment (ISA).

B. Despite various extensions granted by the NRC, Entergy has yet to come into compliance with NRC regulations as relates to having a working siren system. FEMA recently failed the system, and a full review of Entergy's own documents shows that the system ordered and installed FAILS to meet the Design Basis Criteria. Further, the old system, as NRC records show, also fails to come close to being in compliance with 10 CFR Rules and Regulations.

C. The State and County governments within the 10 mile Emergency Evacuation Zone have stated it is there own belief that the Evacuation Plan is fundamentally flawed, and the Witt Report supports their conclusions.

It is pointed out here, that the Emergency Plans tells us, "When you hear the sirens... go inside and follow instructions." However FEMA has admitted the Siren level is inadequate and therefore the sirens cannot be heard.

D. Significant spent fuel pool leaks at IP1, IP2 and IP3, are leaking strontium 90, cesium 137 and tritium. All the spent fuel pools at Indian show clear evidence of serious aged related degradation. Yet, since 2005 Entergy has been unable to locate, identify, stop and remediate said leaks.

E. A recently discovered leak at IP2, that was incorrectly categorized as a conduit leak, was in fact a leak in the fuel transfer tube.

F. Entergy has been unable to locate and identify the leaks associated with reactor cooling systems which were only accidentally discovered when workers saw steam rising through the black top.

G, There are known Tritium, Strontium 90 and Cesium 137 plumes under the entire reactor site that are rapidly migrating towards the Hudson River. Said leaks represent a minimum of 250,000 gallons of radiological contaminants that are polluting the potable water resources of New York State, in violation of New York State Law. Such leaks have been, and continue to be, unmonitored in violation of the NRC own regulations.

H. Both reactors are suffering severe BAC (Boric Acid Corrosion) of the reactor vessel heads...in fact, the corrosion issues are significant enough that Entergy has a standing order for new reactor vessel heads for IP2 and IP3 with delivery slated for 2011 and 2012 respectively. In order to install these vessel heads, it is probable that containment will have to be breeched.

I. IP2 is one of the few reactors in America to have suffered a significant Tube Rupture. This occurred back in 2000. Further, a recent Industry study has shown that tube fouling becomes a significant safety issue in pipes adjoining plugged pipes. Indian

Point 2 and Indian Point 3 together have literally hundreds of plugged pipes in the reactor cooling system.

J. The series 400 stainless steel roller bearings on the traveling water screens for IP3 have huge holes, which is believed to be caused by corrosive microbes or lack of maintenance, This condition has existed since 1991, yet remains un-remediated.

K. One of the steel containment plates at Indian Point is failing.

L. Indian Point cannot meet the Fire regulations of 10 CFR, and, in fact, Entergy has just requested the NRC further lower the SAFETY MARGINS although they were already granted exemption from the rules and regulations

M. Due to the closure of Barnwell, the “low-level” radioactive waste site, Entergy is planning to turn Indian Point into a low level radioactive site, without proper application and review.

N. Due to the failure of approval of Yucca Mountain, the spent fuel produced by Indian Point, which by regulation is only to be stored on site on an interim, temporary basis, will now become indefinite and potentially permanent.

O. The Decommissioning Trust Funds for IP1, IP2 and IP3, are insufficient to restore the site, especially in light of the multiple leaks first noticed in 2005.

Mitigation measures with regard to REASONABLE ASSURANCE OF PUBLIC HEALTH AND SAFETY would be warranted for impacts that would have the same significance level for all plants. However, due to the unique facts and issues at Indian Point, such mitigation must be site specific. Therefore, the criteria of Category 1 cannot be met and additional plant-specific review is required of the environmental impacts as a Category 2 issue, due to the unenforceable nature of the definition of REASONABLE ASSURANCE OF ADEQUATE PROTECTION TO PUBLIC HEALTH AND SAFETY at Indian Point, which is the underlying organizing purpose of the NRC.

## **ISSUE 24. Terrorism**

On 9/11 at least one of the hijacked planes flew directly over Indian Point 2 and 3 before it slammed into the World Trade Center. Since 9/11 Indian Point is considered one of the most attractive and vulnerable terrorist targets in the nation. Additionally, over 9,438 terrorist events have occurred around the world since September 11, 2001. The risk of a terrorist attack on a nuclear reactor site is a very real possibility.

The environment and the entire population within 50 miles Indian Point, approximately 20 million residents, 8% of the United States population, will be affected in the event a successful terrorist attack occurs at Indian Point.

The aftermath and significant impacts on the environment as a result of a successful terrorist attack at the Indian Point Energy Facility located in Buchanan, New York would have LARGE adverse environmental consequences, including but not limited to, unmonitored radioactive releases into the air, water and ground from breaks in components, and pipes, a spent fuel fire causing a radioactive steam cloud, the inability for the plant to maintain safe shut down, or a total core melt down. All of these result in

significant LARGE adverse effect on public health and safety of the surrounding population and environment, and are sufficient to destabilize important attributes of the resource and of the environment.

Indian Point is distinguished from all other nuclear facilities in that the terrorists flew directly over the plant and the Hudson River on 9/11, and the terrorists considered attacking Indian Point on 9/11 and those plans may still be on the table. There is no no-fly zone over Indian Point.

In addition, Indian Point is unique because:

A. It is located 25 miles from NYC. The population mass within a 50 mile radius of Indian Point far exceeds 20 Million citizens, 8% of the U.S. Population, and is located in the most densely populated area surrounding a nuclear facility in the nation.

B. New York City is the hub of America's Financial institutions. A significant nuclear incident (accident) or terrorist attack on the facility that led to off site migration of radiological contaminants would be catastrophic in nature to not only the surrounding region, but would

cause the entire nation to go into bankruptcy, as it could quickly lead to Environmental Costs in excess of half a trillion dollars.

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C. The West Point Military Academy, the training ground for America's future leaders, and a vital American brain trust, which includes a U.S. mint, it located less than 8 miles away.

The GEIS Category I standards do not apply an analysis of terrorist effects at Indian Point, nor does it consider mitigation measures warranted for Environmental impacts and costs of a terrorist attack on Indian Point, nor is a terrorist attack an issue of single significance, nor have mitigation of adverse impacts associated with the issue of a terrorist attack been considered in the analysis. Therefore the issue of Terrorism is a Category 2 issue and requires additional plant-specific review in the EIS.

NEPA's intent and purpose is not in weighing the odds of an event occurring, but instead is intended to measure the risks and costs to the environment should such an event occur. In *San Luis Obispo Mothers of Peace v. NRC*, 449 F.3d 1016, 1028 (9th Cir. 2006) the courts Memorandum and Order in part states: NRC's "categorical refusal to



consider the environmental effects of a terrorist attack” in this licensing proceeding was unreasonable under the National Environmental Policy Act (NEPA). It is abundantly clear in the Ninth District Court’s ruling that the odds of a given event are not at issue, but instead the issue is the effects that such a postulated event or events would have on the environment. The Ninth Circuit Court Order made it abundantly clear that the NRC must take into consideration the environmental effects of a successful terrorist attack.

NEPA requires the NRC and the licensee to answer what are the environmental costs of a successful attack of a terrorist attack on a Nuclear Reactor site. Such postulated events should include, but not be limited to, evaluation of the risks associated with attacking various components of the facility independently and jointly, including, for instance, the reactor itself, the control room, the spent fuel pools, and the water intake and/or discharge channel. The attack scenarios should include the attacking force of 9/11, which means scenarios and their aftermaths should include an attacking force of no less than 18 terrorists and the potential use of up to four large commercial airplanes.

The real threat of Terrorism, as confirmed by the Department of Homeland Security, the State Department, the Pentagon, and other agencies of the United States government, including the Executive and Legislative Branches, must be comprehensively studied and evacuated for the 20 year period of the proposed new superceding licenses as a Category 2 issue, which has a LARGE impact on the public and the region within 50 miles of the plant,

#### **ISSUE 25. Propaganda**

The NRC and other governmental agencies plan to change public sentiment regarding radioactive waste, rather than deal with the radioactive waste streams generated through the production of nuclear energy which directly impacts the Environmental Costs and Impacts to the Stakeholder community, and thus must be included in the EIS, as is witnessed in excerpts from a governmental task force report:

#### **U.S. Nuclear Regulatory Commission Implementation Plan for the Radiation Source Protection and Security Task Force Report**

**Task:** The Task Force recommends that there be a coordinated **public education campaign (Federal, State, and industry) to reduce fears of radioactivity**, diminish the impact of a radiological attack if one were to occur, and provide a deterrent to attackers considering the use of radiological materials.

Report Context: Another important aspect of response training is public education. Proactively educating the public about the radiation risks of an RDD may **reduce the public's anxiety and ameliorate the psychological impacts in the event of RDD attack and thereby mitigate some of the physical and social disruption consequences caused by fear and panic.**

Agencies should coordinate this effort to avoid duplication of effort and ensure the consistency of the intended message.

Therefore, the Task Force recommends that there be a coordinated interagency (Federal and State) campaign, which would work with industry groups, to educate the public on the effects of and response to an RDD event.

It is the intent of the nuclear industry, NEI and the NRC to change public perception of risk in order to make reactor sites unlicensed high and low level radioactive waste disposal sites, with waste streams created from Nuclear Energy stored at these sites for periods far in excess of 100 years.

There is no solution as to how to dispose of radioactive waste. It amounts to criminal deception for the benefit of the nuclear industry, the

NRC and the DOE. By perpetuating a fraudulent propaganda campaign on members of the general public, and by failing to fulfill their legal responsibilities and obligations to safely dispose of radioactive wastes OFF SITE, the responsible agencies, the NRC and DOE, are in violation of their organizing mandates to “protect public health and safety”.

The responsible agencies, the NRC and DOE, as well as Entergy and the NEI, must disclose any and all costs, funds incentives and contributions used in this propaganda campaign, including, but not limited to, donations to community groups, paid and unpaid advertisements for Indian Point and/or the nuclear renaissance and proliferation, as part of the EIS scoping.

The proposed propaganda campaign regarding radioactive waste, and the long term storage of radioactive waste at Indian Point, must be included in the EIS, as Category 2 issues, because it creates public deception with regard to significant Environmental Impact and Costs.

## **ISSUE 26: Environmental Justice – Fair Trade**

*( issue 92)*

The nuclear industry enjoys financial incentives far beyond what is available to other more environmental friendly renewable energy sources.

Between 1947 and 1999, the nuclear industry was given more than \$115 billion in direct taxpayer subsidies, compared to a mere \$5.7 billion for wind and solar over the same period. The Energy Policy Act of 2005, was filled with nuclear industry largesse with an additional \$3 billion dollar subsidy to the mature nuclear industry that already has received the lion's share of federal energy funds over the past 50 years. These ongoing subsidies to the nuclear industry have resulted in a violation of Fair Trade doctrine.

Ratepayers and taxpayers are the victims of this violation of fair trade. Specifically, New York State taxpayers, and the residents surrounding Indian Point, are footing the majority of the costs for Emergency Preparedness, and due to the short fall in decommissioning trust funds, will be burdened by the cost of site clean up. At Indian Point, Entergy is making a profit of nearly \$2 million dollars a day but does not adequately cover the costs of its plant's security.

Yet, as an example of the gross inequity and the violation of Fair

Trade standards, last year Entergy's Chairman received a salary of \$27 million dollars, even though Entergy New Orleans filed for bankruptcy, and received a government bailout of almost \$300 million, while at the same time ratepayers in New Orleans were smacked with greatly increased electrical bills.

Due to the deregulated electricity market, where free trade is a core tenet, there needs to be a fair analysis of increased costs and exposures to the community as it relates to Indian Point. Economic subsidies from tax dollars are going to support nuclear energy facilities, such as Indian Point. The claim that nuclear power is cheap energy should be fully explored, including but not limited to, operational costs, the costs of research and development, and costs borne by taxpayers by way of subsidies and research paid for through DOE hand outs to EPRI and universities such as MIT.

Entergy's large stake in unregulated wholesale markets for nuclear energy give it a big edge over traditional utilities. With profits for

its nuclear operations growing much more quickly than for its regulated utilities, Entergy plans to spin off its six unregulated nuclear plants, including Indian Point, into a different company. In fact, Entergy has filed a license transfer application, after filing the license renewal applications, for both IP2 and IP3 to Entergy Nuclear Operations.

This amounts to an environmental justice issue of MEDIUM TO HIGH concern, since the Stakeholders and Ratepayers are at a distinct disadvantage in advocating for public health and safety, when Entergy has the ability to throw it's unprecedented financial weight behind a powerful legal staff and a major public propaganda campaign.

In order to mitigate this imbalance, the NRC would be warranted in requiring Entergy to pay for the legal expenses of the community Stakeholders, and require a comprehensive study of the actual costs to taxpayers for the operation of Indian Point, including, but not limited to:

- a. Annual Federal, State and local Subsidies and tax credits
- b. State and local pilot tax deferments
- c. Price Anderson Insurance Liability Limitation-specifically the costs to citizens should an accident occur, since the act makes it impossible for citizens to insure against the losses that would be incurred from a significant nuclear incident or terrorist attack at the facility.
- d. Costs of emergency preparedness (at all levels of government).
- e. Costs of security for all nuclear facilities that are absorbed or offset by all levels of government.
- f. Federal and state funded research and development. This is to include all research for the ENTIRE fuel cycle.
- g. Costs of mining, including clean up of contaminated sites involved in the nuclear fuel cycle, including specifically Paducah and Portsmouth Gaseous Diffusion Plants. Further, all pay outs to former nuclear workers for health related issues should be included in this figure.
- h. Cost of processing, including transportation at all steps of the



process, governmental paid expenses associated with construction of fuel processing facilities, such as the Gaseous Diffusion Plants, and the proposed GNEP reprocessing plant. These costs should also include environmental restoration and clean up costs associated with these processing facilities, such as Hanford and other locations.

- i. Costs of plant construction (including loan guarantees, and siting grants.
- j. Costs of transportation
- k. Costs of radioactive waste storage (which should include the monthly surcharge being added to our bills to cover the expected costs of off site storage).
- l. Costs of decommissioning and returning site to green field.
- m. Cost of health effects, including deaths associated with the entire fuel cycle, including up through the long term storage of nuclear waste streams.
- n. Costs of regulatory enforcement not covered by licensee fees. As example, the \$980 million dollar budget this year for the NRC.

Additionally, the extent that there are dramatically unequal subsidies and total life-cycle costs between Nuclear Energy production and energy efficiency and renewable energy sources, such as geothermal, photovoltaic and wind, must be comprehensively considered. True sustainable and renewable safe, forms of energy that are widely viewed as the energy technologies of the “future,” as well as efficiency technologies and demand side options, must be considered in the EIS, including the replacement energy study by NAS commissioned by Nita Lowey.

Due to the fact that the environmental issues of violations of Fair Trade and of financially prejudice advocacy have not been considered in the GEIS, nor has mitigation of these issues been considered, the issues of Environmental Justice as it relates to Fair Trade must be fully considered as

a Category 2 issue in the EIS.

**ISSUE 27: Environmental justice - Sustenance Fishermen**  
**(issue 92)**

Sustenance Fishermen are affected by Entergy's failure to properly prevent releases of unmonitored radioactive waste into the environment, the air, the water and the ground.

The affected populations are those residents, specifically the non-English speaking residents and the residents of Haverstraw, Stony Point and Peekskill, living within 10 miles of Indian Point. They are unjustly endangered for the following reasons: 1) The Emergency Evacuation Booklet is in English. It is true that if you can read the booklet in English you could find out how to get a Spanish version; 2) A large number of non-English speaking residents are sustenance fishermen and fish the Hudson River without being informed that they are catching fish which are laced with strontium. There is no educational campaign or warning signs placed along the river at the customary fishing sites to inform such fisherman not to

eat the fish. These fishermen are unaware of the radioactive strontium in the bones of the fish. This is an issue of environmental justice because underrepresented members of the community and their families are being placed in danger from the ingestion of strontium 90. This is especially dangerous for young children, as strontium acts like calcium in bone formation.

The current magnitude of the impact on the affected population is at least MODERATE, and is evidenced by the increase in thyroid cancer in those communities closest to the plant. However as the plant continues to leak strontium, tritium and cesium into the Hudson River, the magnitude of the impact during the 20 year new superceding license will become at least LARGE if not GARGANTUAN, and the radiological adverse health will expand exponentially.

Indian Point is the only plant in the nation profusely leaking strontium 90, therefore the impact on the environment and human health is site specific. Mitigation measures which find, stop, and remediate any and all leaks of strontium, cesium and tritium from Indian Point into the ground, air, groundwater and river must be taken, and those site specific mitigation

measures must be included in the EIS.

Radiological Contaminants have already been found in the fish down river of Indian Point. Such findings have already had some impact on surface-water use such as parents leery of allowing their children to swim in the river and subsistence fisherman afraid of what might be in the fish. With the known leak issues at Indian Point, and subsequent contamination of the soils and ground waters there, any refurbishment at the site could increase these surface water impacts. A rain storm, for instance, coming down upon contaminated, freshly disturbed soil could further contaminate the river through soil erosion and/or run off during heavy spring rains.

A self serving profit biased in favor of NRC licenses, a corrupted process wherein NEI money and lobbying influence saw public safety take a second seat to licensee convenience and needs. Reliance on false or incorrect assumptions, such as assuming the licensee will use best industry standards in carrying out refurbishment on the site. Where does this belong?

Known infrastructure degradation related issues at Indian Point, along with known, yet unidentified radiological leaks throughout the site and known yet unidentified buried Mixed Wastes make any construction or refurbishment at Indian Point a significant action worthy of careful review and analysis under the constructs of NEPA.

Therefore , based upon the facts as provided, and the determination that the scope item is significant (not “small” ) but meets criteria for “medium” or “large” environmental affect, coupled with serious contamination issue both chemical and radiological at the Indian Point site, this the Environmental Justice issue of sustenance fisherman, should be included in the site specific EIS review as a category 2 issue.

The Category 1 analysis in the GEIS is insufficient because 1) the sustenance fisherman in the area surrounding Indian Point are uniquely affected by the site specific leaks at Indian Point and 2) the geological attributes of the site and the Hudson River are unduly effected.

**Emergent issues-- Previously approved EIS<sup>4</sup> are based upon assumptions that will no longer be valid if Entergy's Renewal Application to operate the facility for an additional 20 years is granted.**

**Design Basis Accidents. (issue 75)**

**ISSUE 28 Microbial Stainless Steel Corrosion of Rollerbearings on Travelling Water Screens (issue 99)**

In the ER Entergy's states that there are no impacts from Microbiological (Thermophilic) Organisms [10 CFR 51.53(c)(3)(ii)(G)]

**NONE.** IP2 and IP3 are not located on a small river or small lake, and do not have or use cooling ponds. Further consideration of mitigation measures is not warranted. Electromagnetic fields – Acute effects [10 CFR 51.53(c)(3)(ii)(H)]

The series 400 stainless steel roller bearings on the traveling water screens for IP3 have large holes, which are caused by corrosive microbes or a horrific lack of maintenance. This condition has existed since 1991, yet remains un-remediated. Workers at the plant have found that stainless steel nuts and bolts thrown into water are rapidly disintegrated, “eaten”, by the

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<sup>4</sup> In accordance with §51.12 only those post June 7, 1984.

microbes. The microbial corrosion potentially effects all the 400 series stainless steel, inspected and uninspected, components, pipes, fillers, and valves at Indian Point. Therefore the ability of Entergy to maintain a safe, once through, or closed system that does not contaminate the environment is jeopardized.

The population affected by this corrosion is the entire community within 50 miles of the plant. Such rapid corrosion caused by the microbes, can lead to a significant release of radioactive nuclides into the air, water, or ground.

The significance of the huge holes in the roller bearings on the traveling water screens is MODERATE, as it does not destabilize important attributes, however, the possibility of the corrosive microbes damaging other stainless steel components, pipes , filters and valves is LARGE. Corrosion that is clearly noticeable with the bare eye at any nuclear plant is completely unacceptable and is more than sufficient to destabilize important attributes of Indian Point.

The GEIS does not include analysis of this microbial corrosion and is



site specific to Indian Point. The GEIS does not consider additional mitigation measures to prevent the adverse effects of the microbial corrosion, yet such mitigation would be warranted. Therefore the criteria of Category 1 have not been met, and an additional plant specific review in the EIS is required.

### **ISSUE 29. Fire Protection:**

Both facilities currently have in place one or more EXEMPTIONS, EXCEPTIONS OR DEVIATIONS from NRC rules that will need to be carried forth into a new superceding license. Entergy is required as a part of the license renewal application to supply an analysis justifying why such exemptions should be carried forth into the new superceding license. Fire Protection, or the compromise of it, is very much an Environmental Cost and Impact issue that must be thoroughly investigated in the EIS Scoping. The Environmental Costs of a significant fire at Indian Point are monumental in scope.

Any fires that compromise the reactor, damages the reactor core, breaches the spent fuel pools, or impinges upon Entergy's ability to conduct and maintain Safe Shutdown of the reactors, are potentially catastrophic in nature and scope. The issue of whether both facilities can adequately protect

human health and the environment with regard to Fire Protection, includes, but is not limited to, any exemptions, exceptions or deviations granted by the NRC, and must be included in the EIS, as Fire Protection issues have significant Environmental Costs and Impacts.

**ISSUE 30. Impingement or significant damage to water intake:**

Individual or multiple failures of various infrastructures at the plant presents unique environmental risks and associated cost scenarios that must be included within the scope of the EIS investigation and report. Impingement and/or significant damage to the water intake for IP2 and IP3 (separately) will seriously damage and eliminate the Entergy staff's ability to conduct and maintain a safe shut down of the individual reactors and will have significant Environmental Costs and Impacts. Therefore, impingement or significant damage to water intake caused by clogging of screens that occurred in 2006-2007 must be included in the EIS.

**ISSUE 31. Accidents involving the breakdown of certain in-scope parts, components and systems:**

Accidents involving the breakdown of certain in-scope parts,

components and systems present greatly increased risks of an off site migration of radiological contaminants. Accident scenarios, and their associated significant Environmental Costs and Impacts include, but are not limited to, the following parts, components and systems at the Indian Point Facility:

a) Boric acid corrosion (BAC) represents a significant aging management issue affecting primary systems at Indian Point that could lead to release of radioactive contaminants into the environment. Indian Point's Aging Management plan for this important issue fails to adequately address, as one example, valve packing and valve body-to-bonnet gaskets. The fact that IP2 and IP3 are already working on the engineering difficulties involved in a complicated and dangerous reactor vessel head replacement is a significant issue that can result in an accidental release of radioactivity into the environment from reactor vessel head failure. Therefore the significant Environmental Costs and Impacts of such accident pathways must be included in the EIS.

b) The reactor vessel internals bolting at Indian Point is susceptible to age-related degradation which could lead to an off site release of

radioactive contaminants. The LRA and UFSAR documents fail to lay out an adequate aging management plan for inspection and replacement of reactor vessel internal baffle bolts. This creates an accident pathway which could lead to off site release of radioactive contaminants, with the resultant environmental risks , and therefore associated Environmental Costs and Impacts of such accident pathways must be included as a Category 2 issue in the EIS.

c) There are serious environmental and safety concerns related to Indian Point's inadequate Aging Management Plans for the Fuel Rod Control System, that includes dropped rod events, unplanned plant trips, complete equipment failure, shut-downs, and highly dangerous at-power-maintenance attempts. Such equipment failure creates significant off site release scenarios to the environment, and public safety issues. Therefore the associated Environmental Costs and Impacts of such accident pathways must be included in the EIS.

d) Severe Duty Valve failure, further complicated with sourcing issues for many approved valves which are no longer available,

create serious potential risks to Indian Point's ability to accomplish and maintain a safe shutdown of the facility. These valves include, but are not limited to, Feedpump recirculation control valves, Feedwater regulating valves, Atmospheric dump valves, Condenser dump valves, Feedpump discharge check valves, feedpump discharge check valves and Pressurizer spray valves. Failure of these valves, or inability to find and obtain approved replacement valves, directly impacts safety and reliability of the plant during the 20 years of the new superseding license period, and therefore the associated. Environmental Costs and Impacts of such accident pathways must be included in the EIS.

e) The reactor water coolant environment can have dramatic negative effects and increase the fatigue on important pressure water components, and greatly increase pipe leakage which in turn can lead to significant pipe burst events or core damage events. The associated Environmental Costs and Impacts of such pipe leaks, bursts and core damage accidents must be included in the EIS.

f) Cable degradation, especially in underground wet circuits, is a pathway to massive circuit failures that lead to loss of employees' ability to safely shut down reactors. Further, these wet circuits, and generally known fatigue issues surrounding medium voltage Ethylene Propylene Rubber Cables, could create a serious electrical fire as the cables can reach a point of electrical breakdown. The NRC has raised concerns on this very issue, and the associated significant Environmental Costs and Impacts of such accident pathways must be included in the EIS.

g) The potential accident pathways and associated significant Environmental Costs and Impacts associated with Indian Point reactor vessel internals having been, and continue to be, exposed to neutron irradiation which in turn causes a severe reduction in the fracture toughness and ductility of the PWR internals. This must be included in the EIS.

h) Entergy alleges there are no refurbishment issues to be considered in the EIS Scoping process. However, there is a far greater than 50 percent chance that IP2 and IP3 are facing the

necessity of replacing feedwater heaters. Lack of industry expertise, fewer vendors and manufacturers, coupled with material changes, are serious issues that negatively impinge on the licensee's ability to maintain safe operation of the reactors. Therefore, the associated significant Environmental Impacts and Costs and Impacts of such accident pathways must be included in the EIS.

i) Primary Water Stress Corrosion Cracking (PWSCC) which appear in heat affected zones of the stub runner/divider plate weld, though not mentioned in Entergy's LRA Appendix E, will result in significant Environmental Costs and Impacts, and therefore all associated Environmental Costs and Impacts must be included in the EIS.

j) Shell and heat exchanger replacement was not mentioned by Entergy's LRA Appendix E, however such shell and heat exchanger replacement will inevitably occur during the 20 year new superseding license. Therefore, the associated significant

Environmental Impacts and Costs of such accident pathways must be included in the EIS.

k) Entergy's LRA fails to adequately address the issue of PWSCC (Primary Water Stress Corrosion Cracking) of Alloy 600 and its weld metals. This serious issue impinges on both upper and lower reactor pressure vessel head penetrations. Additionally, this issue potentially manifests itself in reactor coolant system piping, lower head pressurizer penetrations and other components at Indian Point. Ongoing weld failures, coupled with a serious shortfall in technology keeping up with site degradation, and fatigue make this a potentially significant pathway for environmental contaminations and or accident pathways, therefore the associated significant Environmental Costs and Impacts of such accident pathways must be included in the EIS.

l) Fatigue of metal components void swelling of reactor internals, as well as serious issues regarding Entergy's inability to visually examine certain difficult, if not impossible, to reach components



and containments creates pathways resulting in significant release accidents, and therefore all associated Environmental Impacts and Costs that must be included in the EIS Scoping process.

m) Appendix E of Entergy's LRA fails to address any accident analysis for events that are beyond the current design basis for IP2 and IP3. Further, no plant specific analysis has been conducted for these types of events. Therefore, the significant Environmental Impacts and Costs of such accident pathways must be included in the EIS.

n) Entergy's LRA Environmental Supplement fails to address the obsolescence concerns as relates to digital upgrade of the rod control logic and power cabinets at Indian Point which will result in significant Environmental Costs and Impacts of such accident pathways, and therefore all associated Environmental Impacts and Costs must be included in the EIS.

o) Entergy's LRA Environmental Supplement fails to address the risks associated with lo-temperature flow-accelerated corrosion

(FAC), including unanticipated emergency shutdowns, which would result in significant Environmental Impacts and Costs of such accident pathways. Therefore, all associated Environmental Costs must be included in the EIS.

p) ) Entergy's LRA Environmental Supplement fails to address the known industry wide problem of securing and having on hand contingency spare parts. Availability, or lack thereof, in an emergency event, would result in significant Environmental Impacts and Costs of such accident pathways, and therefore all associated Environmental Costs and Impacts must be included in the EIS.

q) Entergy's LRA Environmental Supplement to the GEIS, fails to address the shortage of seasoned engineers with the knowledge pool to maintain the aging Indian Point Reactors. This severe intellectual shortage becomes crucial in numerous cases, such as where reverse engineering would be necessary to build replacement parts which are no longer available on the open market. Even if said reverse engineering is possible, the

replacement part would no longer be a like-for-like replacement, therefore resulting in significant Environmental Impacts and Costs of such accident pathways, and therefore all associated Environmental Costs and Impacts must be included in the EIS.

r) ) Entergy's LRA Environmental Supplement Appendix E fails to adequately address known premature failure of containment coatings, resulting in significant Environmental Impacts and Costs of such accident pathways, and therefore all associated Environmental Costs and Impacts must be included in the EIS.

s) ) Entergy's LRA Environmental Supplement fails to address the industry wide, and site specific, problem of ever increasing obsolescence issues with original equipment installed for Indian Point's instrumentation, control and safety system applications. Therefore, the associated significant Environmental Impacts and Costs of such accident pathways must be included in the EIS.

t) Reactor Pressure Vessel is the critical component for plant life management, due to the unacceptable consequences of its failure

and due to the difficulty of its replacement. The RPV is subjected to neutron irradiation in the core region, which results in irradiation-induced embrittlement that may lead to a shift of the ductile-to-brittle transition temperature. Entergy fails to adequately address this issue in their LRA, their UFSAR, and in Appendix E EIS supplemental report. Further, both industry and NRC have admitted to a severe lack of knowledge in this area. Therefore all associated significant Environmental Costs and Impacts of such accident pathways must be included in the EIS.

u) Cables are CRITICAL for plant safety and operation and shut down at Indian Point, yet Entergy fails to present an adequate aging management program for this critical component for safe plant operation and shut down. Degradation of these cables could lead to catastrophic accidents at the site resulting in an electric fire destroying major plant components and infrastructure, including, but not limited to, key safe components necessary for safe shut down, that would in turn lead to core meltdown. Therefore, all associated significant Environmental Costs and Impacts of such accident pathways must be included in the EIS.

### **ISSUE 32 Thermal Shock:**

Thermal shock is a key accident pathway that would result in the potential for significant off site release of radiological contaminants into the air, water and ground that must be investigated.

Old reactors well past their anticipated age of expected retirement are embrittled due to various factors, key amongst them is constant radiological bombardment. Any rapid significant change change in temperature, such as a sudden flooding of the reactor core could can cause said core to literally crack, or worse break apart. A thermal shock event would include the releae of radiological contaminants. This would result in significant Environmental impact, maybe LARGE, and therefore a comprehensive study of the thermal shock, as a Categrory 2 issue must be included in the EIS.

### **ISSUE 33. Transporation:**

Transportation accident involving radiological materials

coming into or leaving the Indian Point facility is a key accident pathway. (This scenario should also include radiological materials leaving Indian Point in any unplanned fashion, which has already occurred at the plant facility.) Unregulated transportation of radioactive materials is a key accident pathway that would result in the potential for significant off site release of radiological contaminants into the air, water and ground, resulting in significant Environmental costs and impact.

Transportation must be investigated, as transportation accidents would result in significant Environmental impact, maybe LARGE. Therefore, a comprehensive study of the transportation as a Category 2 issue must be included in the EIS.

#### **ISSUE 34. Missile projectile damage to reactor coolant and steam piping systems;**

Missile projectile damage to reactor coolant and steam piping systems is a key accident pathway that results in significant off site release of

radiological contaminants into the air, water and ground that must be investigated, and thereby associated significant Environmental Impacts must be included in the EIS. The impact may be LARGE, and therefore a comprehensive study of the Missile projectile damage to reactor coolant and steam piping system as a Category 2 issue must be included in the EIS.

**ISSUE 35. Internal reactor chemistry corrosion induced incidents.**

Internal reactor chemistry corrosion induced incidents are key accident pathways that results in significant off site release of radiological contaminants into the air, water and ground that must be investigated, and thereby associated significant Environmental costs and impacts must be included in the EIS. The impact may be LARGE, and therefore a comprehensive study of the Internal reactor chemistry corrosion induced incidents as a Category 2 issue must be included in the EIS.

**ISSUE 36. Pipe bursts from fatigue, corrosion, and other aging related failure scenarios.**

Pipe bursts from fatigue, corrosion, and other aging related failure scenarios are key accident pathways that results in significant off site release

of radiological contaminants into the air, water and ground that must be investigated, and thereby associated significant Environmental costs and impacts that must be included in the EIS. The impact may be LARGE, and therefore a comprehensive study of Pipe bursts from fatigue, corrosion, and other aging related failure scenarios as a Category 2 issue that must be included in the EIS.

**ISSUE 37. Pipe burst and leaks caused by plugs, and vibration redistribution.**

Pipe burst and leaks caused by plugs, and vibration redistribution are key accident pathways that results in significant off site release of radiological contaminants into the air, water and ground that must be investigated, and thereby associated significant Environmental costs and impacts must be included in the EIS. The impact may be LARGE, and therefore a comprehensive study of the . Pipe burst and leaks caused by plugs, and vibration redistribution. as a Category 2 issue, must be included in the EIS.

**ISSUE 37. Aesthetic Impacts (license renewal term)**

Several commitments were made to the citizens of the host community in the final EIS issued for IP2 LLC, and IP3 LLC, which were



intended to mitigate the aesthetic impacts of the Indian Point site. These commitments that have not been kept include, but are not limited to:

*80 acres of the 235 acre Indian Point site were to be changed into a beautiful woodland park complete with walking paths that would be used and enjoyed by the surrounding community.*

*Extensive landscaping of the entire 235 acre site to make it less stark and industrial.*

*There was to be a public access information and events center built, again with extensive landscaping for citizen use and enjoyment.*

These commitments are now over 30 years old. We do not have our 80 acre public park on the site. The status of the land donation is indeterminate, as well as the public boat marina built in Buchanan. The center envisioned and originally promised has not been delivered as well, and the landscaping of the site is woefully inadequate to mitigate the harsh industrial look of the Indian Point site.

These unfilled License Commitments though OLD, are new information that could only be learned with a complete review of the Final

SER and Final EIS for the original licensing of IP2 LLC and IP3 LLC. The NRC has categorized Aesthetics issues as Category 1, it is assumed, because they place little if any importance on landscaping and beautification of their License Sites. This assumption is born out in the classification of small given to Aesthetics issues in the GEIS.

Failure to fulfill your commitments is a serious violation of 10 CFR Rules and Regulations, but more importantly, failure to keep major commitments to the community erodes public trust in the licensee, and in the NRC charged with oversight. Turning 80 of the 235 acres of the Indian Point sight is not a small issue of little importance, not a medium issue, but a MAJOR issue. A full one third of the Indian Point was promised to the community, to be used for the public good in the form of a PUBLIC woodland park complete with walking paths, and thirty years later that License Commitment is unfulfilled.

It is imperative that promises made to create publicly accessible infrastructure be kept when significant projects such as Indian Point are built and constructed. The time has come for Entergy to fulfill those commitments, irrespective of the decision on their license renewal. We ask

that \$25 million dollars be placed into a trust by Entergy for the creation of the 80 acre park on site, and that a committee is formed consisting of not less than nine people, and not more than twelve people, to oversee the Indian Point Woodland Park creation on the Indian Point site and the management of its long term viability. Said committee must include on its board one member from each of the following: Riverkeeper, Clearwater, IPSEC and FUSE USA (usually it just says FUSE, but a few times it says FUSE USA), and at least one citizen at large. The remaining board members should be nominated by the governments of Buchanan and Peekskill. Committee members will serve for a term of ten years, and no committee member can serve more than three consecutive terms. Additionally, no current or past employee of any utility company, or company that has worked for a utility company, can serve on this committee. Lastly, the 80 acre park area on the Indian Point land shall be signed over to a living trust managed by the committee.

Furthermore, to keep their promise to the community, Entergy needs to earmark five percent of their pretax profits from the operation of Indian Point for landscaping of the Indian Point site, park management and maintenance, and community beautification. Entergy claims to be GREEN,

and the time has come for them to put their money where their propaganda campaign is at. All funds will be managed and awarded by the committee.

Further, in keeping commitments already made to the community, licensee should be ordered to build a publicly accessible information center that includes an auditorium of not less than 2500 seats to be used for various public stakeholder meetings. Said auditorium size is conservative in size, and would only house one percent of the stakeholders within a ten mile radius of the reactors. All expenses of constructing, operating and managing this public access building shall be born by Entergy (parent company).

### **Issue 38 Crack and rust propagation:**

Crack propagation leading to design basis accidents include a loss of coolant accident insufficiently monitored as evidenced by Indian Point 2 and 3 histories, a steam generator tube rupture accident on Unit 2, as well extreme near misses. These raise environmental impact issues as well as safety concerns.

On October 9, 2007, an NRC metallurgical engineer, James A. Davis, who was part of the agency's augmented inspection team that was sent to the Davis Besse plant within hours after the near-rupture of the reactor vessel head was discovered, testified that cracks in the old reactor head's most

problematic nozzle likely started about 1990—six years before any sizable leakage was documented and 12 years before the lid nearly blew to Kingdom Come. Mr. Davis made a point of saying he was testifying as an independent witness and not as an NRC employee. He said the nuclear industry and his agency have long settled on the average crack growth rate for reactor-head nozzles at 4 millimeters a year. [Exhibit 4.](#)

Material facts unpredicted at the time of preparation of the GEIS report, as well as subsequent additions, do not address the actual events since publication of NUREG 1437 are emergent, in particular regarding design basis accidents.

The notorious history of the Indian Point Plant is fraught with near misses of DBAs along with actual events that have never had EIS ex post facto and therefore require these studies prior to license renewal. FUSE stake holders are entitled to environmental impact analysis that include this as well as the actual history of the Indian point plants. [See Exhibit 3.](#) Deception of the Nuclear Regulatory Commission about the dangerous state of the plant's old reactor head in the fall of 2001, when it was leaking boric acid from its reactor, is only part of the issue. When the plant was shut down in early

2002, the NRC learned so much acid had leaked and burned through the plant's reactor lid that it nearly burst—an event that would have allowed radioactive steam to form in containment for the first time since half of Three Mile Island Unit 2's reactor melted in 1979.

Cracks of four millimeters per year compel SEIS, for all high energy lines of less than wall thickness of 6 inches, and in particular all reactor head nozzles, inspection frequencies of less than, or at least once per four years are required yet not addressed in Entergy's LRA. I'm not sure if I have this correct.

In 2001, the stakes were raised when the NRC learned that several U.S. reactor heads, especially Davis-Besse's, were susceptible to a more dangerous form of nozzle cracks, one that could form a circular pattern and pop off like champagne corks under an operating reactor's extreme pressure of 2,200 pounds per square inch. Under that scenario, a flash of radioactive steam could form. Mr. Davis testified that the cavity in Davis-Besse's reactor head - 5 inches wide, 7 inches long, and 6 1/2 inches deep - could not have been missed during FirstEnergy Corp.'s previous inspection in 2000 if the utility had done a credible job of inspecting the device.

Greg Gibbs, a onetime Davis-Besse quality-assurance director and engineering director, who left the plant in 1994, said he was disappointed after coming back as a consultant in 2001 to learn the utility never acted upon his insistence for larger holes in the reactor head's service structure to be used for inspections and cleaning.

In 2002 it was shown that First Energy vetoed a work order during the early 1990s for larger inspection ports, known as "mouse holes," to save \$250,000, even after being encouraged to do the modification by officials at a plant in Crystal River, Fla., with a similar design. The modification, which officials have said could have headed off Davis-Besse's problems, was done after the old reactor head nearly experienced a catastrophic burst in 2002.

Since 2001 it has been known that there is at least a two inch path of rust in the dome at Indian Point Unit 2. Entergy received an exemption for design basis of inspection with regard to this rust for 5 years. Even after the NRC ordered industry wide inspections after Davis-Besse, this issue was not comprehensively inspected.

Therefore, any and all rust in the dome at Indian Point has significant LARGE impact on the Environment, is a new circumstance and must be included in the EIS as a Category 2 issue.

### **Issue 38 Superceding NEW License**

In the event Entergy's LRA is approved, under the NRC regulations, the NRC will be retiring the current license and issuing a new superceding license for a twenty year period. Therefore, all Environmental citing criteria promulgated in the NRC regulations for a new license must be included in the EIS as they have LARGE significant Impacts and Environmental Costs, including, but not limited to, seismology, population density, water quality, emergency evacuation plans (etc).

US License Renewal Workshop Slide Presentation of Dr. P.T. Kuo, Director, Division of License Renewal March 28-30, 2007

Slide 4

Introduction

- Atomic Energy Act, as amended 1954
- 40-year license to operate



- Allows for renewal
- 10 CFR 54, “License Renewal Rule”  
allows a new license to be issued to  
operate for up to 20 years beyond the  
current 40-year term

All the original siting criteria for a new license must be considered, as delineated in Regulatory Guide 4.7 - Appendix A - Site Safety Considerations for Assessing Site Suitability for Nuclear Power Stations.

The criteria includes the following Regulations and Regulatory Guides which must be considered by the NRC prior to the issuance of a new license:

a. Geology/Seismology

Geologic and seismic characteristics of a site, such as surface faulting, ground motion, and foundation conditions (including liquefaction, subsidence, and landslide potential), may affect the safety of a nuclear power station. Including Relevant regulations 10 CFR 100.23 Geologic and Seismic Siting Factors", and Regulatory Guide 1.70, Chapter 2 (identifies safety-related site characteristics) Regulatory Guide 1.29 (discusses plant safety features which should be controlled by engineering design), Regulatory Guide 1.165 Identification and Characterization of Seismic Sources and Determination of Safe Shutdown Earthquake

Ground Motion, Regulatory Guide 1.132 Site Investigations for Foundations of Nuclear Power Plant.

Indian Point is located on the Ramapo fault. At the time of its initial siting 10 CFR 100.23 had not been finalized, and therefore a complete seismology evaluation was never done and/or completed.

b. Atmospheric Dispersion,

The atmospheric conditions at a site should provide sufficient dispersion of radioactive materials released during a postulated accident to reduce the radiation exposures of individuals at the exclusion area and low population zone boundaries to the values in 10 CFR 50.34, including 10CFR Part 50, and Regulatory Guide 1.23 "Onsite Meteorological Programs", Regulatory Guide 1.145 "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants", Regulatory Guide 1.4, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss of Coolant Accident for Pressurized Water Reactors, Regulatory Guide 1.25, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors.

c.. Exclusion Area and Low Population Zone

In the event of a postulated accident at a nuclear power station, radiological consequences for individual members of the public outside the station must be acceptably low, including 10 CFR Part 100, "Reactor Site Criteria," requires an "exclusion area" surrounding the reactor in which the reactor licensee has the authority to determine all activities, including exclusion or removal of personnel and property, and a "low population zone" (LPZ) which immediately surrounds the exclusion area.

10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," requires that at any point on the exclusion area boundary and on the outer boundary of the LPZ the exposure of an individual to a postulated release of fission products (as a consequence of an accident) be less than 25 rem total effective dose equivalent, for specified time periods. Regulatory Guides 1.3, 1.4, 1.5, and 1.25 give calculational methods,

Due to the significant LARGE impacts on health and the environment during the term of a New Superseding License, all citing issues must be comprehensively evaluated a plant-specific, as Category 2 issues

## **CONCLUSION:**

FUSE asserts that all of the above issues, must be included in the scope of the EIS, for it to be meaningful and for Entergy to fulfill the requirements of NEPA. The NRC has the obligation to the Stakeholders, and to its own regulations and originating mandate, to include any and all issues that significantly impact the environment and/or public health safety.

## **Exhibit 1**



NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
**DRAFT State Pollutant Discharge Elimination System (SPDES)**  
**DISCHARGE PERMIT**  
Special Conditions

First3.99

Industrial Code: **4911**  
Discharge Class (CL): **03**  
Toxic Class (TX): **T**  
Major Drainage Basin: **13**  
Sub Drainage Basin: **01**  
Water Index Number: **H**  
Compact Area: **IEC**

SPDES Number: **NY- 0004472**  
DEC Number:  
Effective Date (EDP):  
Expiration Date (ExDP):  
Modification Dates:

This SPDES permit is issued in compliance with Title 8 of Article 17 of the Environmental Conservation Law of New York State and in compliance with the Clean Water Act, as amended, (33 U.S.C. §1251 et.seq.)(hereinafter referred to as "the Act").

**PERMITTEE NAME AND ADDRESS**

Name: **Entergy Nuclear Indian Point Units #2 and #3 LLC** Attention: **Thomas Teague**  
Street: **440 H American Avenue**  
City: **White Plains** State: **NY** Zip Code: **10601**

is authorized to discharge from the facility described below:

**FACILITY NAME AND ADDRESS**

Name: **Entergy Nuclear Indian Point Units #2 and #3 LLC**  
Location (C,T,V): **Buchanan (V)** County: **Westchester**  
Facility Address: **Broadway and Bleakley Avenue**  
City: **Buchanan** State: **NY** Zip Code: **10511**

NYTM -E: NYTM - N:  
From Outfall No.: **001** at Latitude: **41 ° 16 ' 7 "** & Longitude: **73 ° 57 ' 19 "**  
into receiving waters known as: **Hudson River** Class: **SB**

and; (list other Outfalls, Receiving Waters & Water Classifications)

<b>001</b>	<b>Hudson River SB</b>	<b>005</b>	<b>Hudson River SB</b>	<b>01B</b>	<b>01P (01B-01P and 008) via 001</b>
<b>002</b>	<b>Hudson River SB</b>	<b>006</b>	<b>Hudson River SB</b>	<b>01C</b>	<b>01J</b>
<b>003</b>	<b>Hudson River SB</b>	<b>007</b>	<b>Hudson River SB</b>	<b>01D</b>	<b>01I</b>
<b>004</b>	<b>Hudson River SB</b>	<b>008</b>	<b>HR via 001 SB</b>	<b>01E</b>	<b>01L</b>
		<b>009</b>	<b>Hudson River SB</b>	<b>01G</b>	<b>01N, 01M</b>

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in this permit and 6 NYCRR Part 750.

**DISCHARGE MONITORING REPORT (DMR) MAILING ADDRESS**

Mailing Name: **Entergy Nuclear Indian Point Units #2 and 3 LLC**  
Street: **295 Broadway**  
City: **Buchanan** State: **NY** Zip Code: **10511**  
Responsible Official or Agent: **Thomas Teague** Phone: **914-734-6247**

This permit and the authorization to discharge shall expire on midnight of the expiration date shown above and the permittee shall not discharge after the expiration date unless this permit has been renewed, or extended pursuant to law. To be authorized to discharge beyond the expiration date, the permittee shall apply for permit renewal not less than 180 days prior to the expiration date shown above.

DISTRIBUTION: Bureau of Water Permits

Permit Administrator:	
Address:	
Signature:	Date: / /

**PERMIT LIMITS, LEVELS AND MONITORING DEFINITIONS**

C:\MyFiles\MyFiles\ppu\PDFs\IndianPointSPDES.wpd

OUTFALL	WASTEWATER TYPE		RECEIVING WATER	EFFECTIVE	EXPIRING			
	This cell describes the type of wastewater authorized for discharge. Examples include process or sanitary wastewater, storm water, non-contact cooling water.		This cell lists classified waters of the state to which the listed outfall discharges.	The date this page starts in effect. (e.g. EDP or EDPM)	The date this page is no longer in effect. (e.g. ExDP)			
PARAMETER	MINIMUM	MAXIMUM	UNITS	SAMPLE FREQ.	SAMPLE TYPE			
e.g. pH, TRC, Temperature, D.O.	The minimum level that must be maintained at all instants in time.	The maximum level that may not be exceeded at any instant in time.	SU, °F, mg/l, etc.					
PARA-METER	EFFLUENT LIMIT		PRACTICAL QUANTITATION LIMIT (PQL)		ACTION LEVEL	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE
	Limit types are defined below in <u>Note 1</u> . The effluent limit is developed based on the more stringent of technology-based limits, required under the Clean Water Act, or New York State water quality standards. The limit has been derived based on existing assumptions and rules. These assumptions include receiving water hardness, pH and temperature; rates of this and other discharges to the receiving stream; etc. If assumptions or rules change the limit may, after due process and modification of this permit, change.		For the purposes of compliance assessment, the analytical method specified in the permit shall be used to monitor the amount of the pollutant in the outfall to this level, provided that the laboratory analyst has complied with the specified quality assurance/quality control procedures in the relevant method. Monitoring results that are lower than this level must be reported, but shall not be used to determine compliance with the calculated limit. This PQL can be neither lowered nor raised without a modification of this permit.		Type I or Type II Action Levels are monitoring requirements, as defined below in <u>Note 2</u> , that trigger additional monitoring and permit review when exceeded.	This can include units of flow, pH, mass, Temperature, concentration. Examples include µg/l, lbs/d, etc.	Examples include Daily, 3/week, weekly, 2/month, monthly, quarterly, 2/yr and yearly.	Examples include grab, 24 hour composite and 3 grab samples collected over a 6 hour period.

Note 1: DAILY DISCHARGE.: The discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for the purposes of sampling. For pollutants expressed in units of mass, the 'daily discharge' is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the 'daily discharge' is calculated as the average measurement of the pollutant over the day.

DAILY MAX.: The highest allowable daily discharge. DAILY MIN.: The lowest allowable daily discharge.

MONTHLY AVG: The highest allowable average of daily discharges over a calendar month, calculated as the sum of each of the daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

7 DAY ARITHMETIC MEAN (7 day average): The highest allowable average of daily discharges over a calendar week.

30 DAY GEOMETRIC MEAN: The highest allowable geometric mean of daily discharges over a calendar month, calculated as the antilog of: the sum of the log of each of the daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

7 DAY GEOMETRIC MEAN: The highest allowable geometric mean of daily discharges over a calendar week.

RANGE: The minimum and maximum instantaneous measurements for the reporting period must remain between the two values shown.

Note 2: ACTION LEVELS: Routine Action Level monitoring results, if not provided for on the Discharge Monitoring Report (DMR) form, shall be appended to the DMR for the period during which the sampling was conducted. If the additional monitoring requirement is triggered as noted below, the permittee shall undertake a short-term, high-intensity monitoring program for the parameter(s). Samples identical to those required for routine monitoring purposes shall be taken on each of at least three consecutive operating and discharging days and analyzed. Results shall be expressed in terms of both concentration and mass, and shall be submitted no later than the end of the third month following the month when the additional monitoring requirement was triggered. Results may be appended to the DMR or transmitted under separate cover to the same address. If levels higher than the Action Levels are confirmed, the permit may be reopened by the Department for consideration of revised Action Levels or effluent limits. The permittee is not authorized to discharge any of the listed parameters at levels which may cause or contribute to a violation of water quality standards. TYPE I: The additional monitoring requirement is triggered upon receipt by the permittee of any monitoring results in excess of the stated Action Level. TYPE II: The additional monitoring requirement is triggered upon receipt by the permittee of any monitoring results that show the stated action level exceeded for four of six consecutive samples, or for two of six consecutive samples by 20 % or more, or for any one sample by 50 % or more.

**PERMIT LIMITS, LEVELS AND MONITORING**

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	SPECIAL CON. (SC)	EFFECTIVE	EXPIRING
001	Discharge Canal	Hudson River	1-11		

PARAMETER	MINIMUM	MAXIMUM	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	SPECIAL CONDITIONS (SC)
pH	6.0	9.0	SU	Weekly	Grab	

PARAMETER	COMPLIANCE LIMIT		MONITORING ACTION LEVEL		UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	SC
	Monthly Avg.	Daily Max.	TYPE I	TYPE II				
Total Residual Chlorine	NA	0.2			mg/l	Continuous	Recorder	9,10,11
Lithium Hydroxide	NA	0.01			mg/l	Monthly	Grab	12
Boron	NA	1.0			mg/l	Monthly	Grab	15
Boron	NA	525			lb/day	Monthly	Grab	15
Flow	MONITOR	MONITOR			MGD	Continuous	Recorder	6,8
Temperature	NA	110			degrees F	Continuous	Recorder	3,4,5,7

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
Sum of 01C & 01D	Combined Low volume Wastewater	Hudson River via Discharge Canal 001		

PARAMETER	ENFORCEABLE LIMIT		MONITORING ACTION LEVEL		UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	SC
	Monthly Avg.	Daily Max.	TYPE I	TYPE II				
Lithium Hydroxide	Monitor	Monitor			mg/l	Monthly	Grab	



OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
Sum of 01B, 01C, 01D, 01J & 01L	Combined Low volume Wastewater	Hudson River via Discharge Canal 001		

PARAMETER	ENFORCEABLE LIMIT		MONITORING ACTION LEVEL		UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	SC
	Monthly Avg.	Daily Max.	TYPE I	TYPE II				
Flow	Monitoring				MGD	Weekly	Instantaneous	14
Total Suspended Solids	30	50			mg/l	Weekly	Grab	14, 16

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
01C	Unit 2 Primary Waste Disposal System	Hudson River via Discharge Canal 001		

PARAMETER	ENFORCEABLE LIMIT		MONITORING ACTION LEVEL		UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	SC
	Monthly Avg.	Daily Max.	TYPE I	TYPE II				
Flow	Monitoring				MGD	Weekly	Instantaneous	

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
01E	Water Treatment Filter and GAC Backwash	Hudson River via Discharge Canal 001		

PARAMETER	ENFORCEABLE LIMIT		MONITORING ACTION LEVEL		UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	SC
	Monthly Avg.	Daily Max.	TYPE I	TYPE II				
Flow	Monitoring				MGD	Weekly	Instantaneous	

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
01G	Units 2 & 3 Service Boiler Blowdown	Hudson River via Discharge Canal 001		

PARAMETER	ENFORCEABLE LIMIT		MONITORING ACTION LEVEL		UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	SC
	Monthly Avg.	Daily Max.	TYPE I	TYPE II				
Flow	Monitoring				MGD	Weekly	Instantaneous	
Phosphates as P	16	38			lb/day	Monthly	Grab	13

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
01I	Units 2 & 3 Condenser and Service Waters	Hudson River via Discharge Canal 001		

PARAMETER	ENFORCEABLE LIMIT		MONITORING ACTION LEVEL		UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	SC
	Monthly Avg.	Daily Max.	TYPE I	TYPE II				
Flow	Monitoring				MGD	Continuous	Recorder	8

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
01J	Floor Drains from Units 1, 2, 3 Buildings	Hudson River via Discharge Canal 001		

PARAMETER	ENFORCEABLE LIMIT		MONITORING ACTION LEVEL		UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	SC
	Monthly Avg.	Daily Max.	TYPE I	TYPE II				
Flow	Monitoring				MGD	Weekly	Estimate Visual Observation	
Oil & Grease		15			mg/l	Weekly	Grab	14

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
Sum of 01C, 01D and 01L	Combined Discharge	Hudson River via Discharge Canal 001		

PARAMETER	ENFORCEABLE LIMIT		MONITORING ACTION LEVEL		UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	SC
	Monthly Avg.	Daily Max.	TYPE I	TYPE II				
Boron	Monitor	Monitor			mg/l	Weekly	Grab	18
Oil & Grease		15			mg/l	Monthly	Grab	17

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
01L	Unit 3 Condenser Polisher/makeup Demineralizer and Ion Exchange Regeneration	Hudson River via Discharge Canal 001		

PARAMETER	COMPLIANCE LIMIT		MONITORING ACTION LEVEL		UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	SC
	Monthly Avg.	Daily Max.	TYPE I	TYPE II				
Flow	Monitor	Monitor			GPD	Weekly	Instantaneous	
pH	Range 6.0 - 9.0				SU	Monthly	Grab	
Chlorine, Total Residual	NA	Monitor			mg/l	Monthly	Grab	
Fluorides			5		lbs/day	Semi-Annual	Grab	
Iron			4		mg/l	Semi-Annual	Grab	
Copper			1.0		mg/l	Semi-Annual	Grab	

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
01N	Reverse Osmosis Reject	Hudson River via Discharge Canal 001		

PARAMETER	COMPLIANCE LIMIT		MONITORING ACTION LEVEL		UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	SC
	Monthly Avg.	Daily Max.	TYPE I	TYPE II				
Flow	Monitor	Monitor			GPD	Weekly	Instantaneous	
Oil & Grease	NA	15			mg/l	Weekly	Grab	
Total Suspended Solids	30	50			mg/l	Weekly	Grab	

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
01P	Eductor Pit	Hudson River via Outfall 001		

PARAMETER	COMPLIANCE LIMIT		MONITORING ACTION LEVEL		UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	SC
	Monthly Avg.	Daily Max.	TYPE I	TYPE II				
Flow	Monitor	Monitor			GPD	Weekly	Instantaneous	
Oil & Grease	NA	15			mg/l	Weekly	Grab	
Total Suspended Solids	30	50			mg/l	Weekly	Grab	

OUTFALL No. 01M, 002-009 - Uncontaminated Stormwater Discharge

No monitoring required.

**SPECIAL CONDITIONS**

**CONDITIONS FOR OUTFALL 001**

1. Discharge through Outfall 001 shall occur only through the subsurface ports of the outfall structure.
2. Sampling location for Outfall 001 is to be located upstream of the discharge from the common discharge canal into the Hudson River.
3. At no time shall the maximum discharge temperature at Outfall 001 exceed 43.3 degrees C (110°F).
4. The maximum discharge temperature at Outfall 001 shall not exceed 34°C (93.2°F) for an average of more than ten days per year; provided that the daily average discharge temperature at Outfall 001 shall not exceed 34°C (93.2°F) on more than 15 days between April 15 and June 30 in any year.
5. When the temperature in the discharge canal exceeds 90°F or the site gross electric output equals or exceeds 600MW, the head differential across the outfall structure shall be maintained at a minimum of 1.75 feet. When required, adjustment of the ports shall be made within four hours of any change in the flow rate of the circulating water pumps. If compliance is not achieved, further adjustments of the ports shall be made to achieve compliance. Flow schedules in Special Condition 6, below, shall take priority over this condition.
6. The permittee must not exceed the maximum flows listed in the table below during the specified periods, unless it is necessary to ensure the safe operation of the facility or to comply with the thermal standards contained in this permit.

Period	Flow in MGD/Unit	Flow in GPM/Unit
January 1 - May 15	726	504,000
May 16 - May 22	806	560,000
May 23 - May 31	968	672,000
June 1 - June 8	1053	731,000
June 9 - September 30	1210	840,000
October 1 - October 31	1053	731,000
November 1 - December 31	726	504,000

If these mitigative flows are exceeded, permittee must send written notification of that exceedance within 5 business days to NYSDEC; Division of Fish, Wildlife and Marine Resources; Leader, Steam Electric Unit; 625 Broadway; Albany, NY 12233-4756.

7. a. The thermal discharge from Outfall 001 is subject to 6 NYCRR Part 704.

- b. Within six months of the effective date of the permit, the permittee shall submit to the NYSDEC, Division of Water, for review and approval, a protocol approvable as defined in 6 NYCRR Part 750-1.2(a)(8) for conducting a tri-axial (3-Dimensional) thermal study. The purpose of the thermal study will be to delineate the 90-degrees Fahrenheit isopleths at various depths and stages of tide to define the size of the mixing zone for the discharge from Outfall 001. The thermal study must be conducted under critical tidal current conditions when all units are operating under summer conditions. Temperatures must be recorded to the nearest degree Fahrenheit. The thermal study shall be conducted within one year after the NYSDEC approves the thermal study protocol. The results of the thermal study shall be submitted to the NYSDEC within three months of the completion of the study. The final report should also include the technical material necessary to satisfy the requirements of 6 NYCRR Part 704.3-Mixing zone criteria. Upon reviewing the results of the thermal study, the Division of Water will determine whether the requirements of 6 NYCRR Part 704.2 have been met. The protocol and final report (3 copies of each) shall be submitted to: NYSDEC, Division of Water, Director of the Bureau of Water Permits, 4<sup>th</sup> Floor, 625 Broadway, Albany, New York 12233-3505.
8. The flow of condenser cooling water discharges shall be monitored and recorded every eight hours by recording the operating mode of the circulating water pumps. Any changes in the flow rate of each circulating water pump shall be recorded, including the date and time, and reported monthly together with the Discharge Reporting Form. The permittee shall indicate whether any circulating pumps were not in operation due to pump breakdown or required pump maintenance and the period(s) (dates and times) the discharge temperature limitation was exceeded, if at all. Methods, equipment, installation, and procedures shall conform to those prescribed in the Water Measurement Manual, U.S. Department of the Interior, Bureau of Reclamation, Washington D.C.: 1967 or equivalent approved by the NYSDEC.
9. a The service water system may be chlorinated continuously.
- b. Should the condenser cooling water system be chlorinated, the maximum frequency of chlorination for the condensers of each unit shall be limited to two hours per day. The total time for chlorination of the three units for which this permit is issued shall not exceed nine hours per week. Chlorination shall take place during daylight hours and shall not occur at more than one unit at a time.
10. Continuous monitoring of Total Residual Chlorine (TRC) during condenser chlorination is required. If the continuous monitor fails, is inaccurate, or is unreliable, TRC shall be monitored during condenser chlorination by analyzing grab samples taken at least once every 30 minutes during each chlorination period.
11. Grab samples shall be taken at least once daily during low level service water chlorination and at least once every 30 minutes during high level service water chlorination. During service water chlorination, Outfall 001 TRC concentrations may be determined by either direct measurement at Outfall 001 or by multiplying a measured TRC concentration in the service water system by the ratio of chlorinated service water flow to the total site flow.

#### **CONDITIONS FOR SUB-OUTFALLS**

12. The calculated quantity of lithium hydroxide in the discharge shall be determined by using the analytical results obtained from sampling that is to be performed on internal waste streams 01C and 01D.
13. Phosphate limit applies to only those internal streams at Indian Point 2 and 3 which comprise outfall 01G.

14. Because Outfall 01J cannot be monitored, the following shall apply:
  - a. All oil spills shall be handled under the Spill Prevention Control and Countermeasure (SPCC) plan.
  - b. Flow into the floor drains shall not contain more than 15 mg/l of oil and grease nor any visible sheen.
  - c. Treated wastewater from the desilting operation within the intake structure and forebays shall be monitored once per 12 hour shift on the sand filter effluent. Grab samples shall be analyzed for total suspended solids and oil and grease. An estimate of discharge flow rate and a visual observation for the presence of any visible sheen shall be made on the sand filter effluent. The limitations for this discharge event are: 15 mg/l (oil & grease), 50 mg/l (total suspended solids) and no visible sheen.
15. The calculated quantity of boron in the discharge shall be determined by using the analytical results obtained from sampling that is to be performed on internal waste streams 01B, 01C, 01D and 01L.
16. One flow proportioned composite sample of total suspended solids (TSS) shall be obtained from one grab sample taken from each of the internal waste streams 01B, 01C, 01D, 01J and 01L.
17. One grab sample of oil and grease shall be obtained from each of the internal waste streams 01C, 01D, and 01L and the samples shall be analyzed separately. The results shall be reported by computing the flow-weighted average.
18. One flow proportioned composite sample of boron shall be obtained from one grab sample taken from each of the internal waste streams 01B, 01C, 01D, 01L.

**WATER QUALITY REPORTING REQUIREMENTS:**

19. The permittee shall submit on an annual basis to the NYSDEC at its offices in Tarrytown and Albany (see addresses below) a month-by-month report of daily operating data in EXCEL<sup>®</sup> format, by the 28<sup>th</sup> of January of the following year, that includes the following:
  - a. Daily minimum, maximum and average station electrical output shall be determined and logged.
  - b. Daily minimum, maximum and average water use shall be directly or indirectly measured or calculated and logged.
  - c. Temperature of the intake and discharges shall be measured and recorded continuously. Daily minimum, maximum and average intake and discharge temperatures shall be logged.
  - d. One copy of each annual report must be sent to the NYSDEC; Division of Water, Bureau of Watershed Compliance Programs; 625 Broadway; Albany, New York 12233-3506; and a second copy must be sent to NYSDEC; Regional Water Engineer, Region 3; 200 White Plains Road; Tarrytown, New York 10591.



20. Beginning upon the effective date of this permit, the permittee shall submit to the NYSDEC Offices in Albany and Tarrytown (see addresses in condition 19.d., above), a copy of their Semi-Annual Effluent and Waste Disposal Reports submitted to the Nuclear Regulatory Commission (NRC).

#### **OTHER WATER QUALITY REQUIREMENTS**

21. Notwithstanding any other requirements in this permit, the permittee shall also comply with all applicable Water Quality Regulations promulgated by the Interstate Environmental Commission (IEC), including Sections 1.01 and 2.05 (f) as they relate to oil and grease.
22. It is recognized that, despite the exercise of appropriate care and maintenance measures, and corrective measures by the permittee, influent quality changes, equipment malfunction, acts of God, or other circumstances beyond the control of the Permittee may, at times, result in effluent concentrations exceeding the permit limitations. The permittee may come forward to demonstrate to the NYSDEC that such circumstances exist in any case where effluent concentrations exceed those set forth in this permit. The NYSDEC, however, is not obligated to wait for, or solicit, such demonstrations prior to the initiation of any enforcement proceedings, nor must it accept as valid on its face the statement made in any such demonstration.
23. All chemicals listed and/or referenced in the permit application are approved for use. If use of new biocides, corrosion control chemicals or water treatment chemicals is intended, application must be made prior to use. No use will be approved that would cause exceedance of state water quality standards.
24. There shall be no net addition of PCBs by this facility's discharges to the Hudson River.

#### **BIOLOGICAL REQUIREMENTS:**

25. The permittee must continue to conduct the following long term Hudson River Monitoring programs during each calendar year:
- a. Long River Ichthyoplankton, Fall Shoals Trawls, and Beach Seine Survey  
All data recording, analysis of samples, and Quality Control and Assurance must be conducted in accordance with the 2002 Standard Operating Procedures (Normandeau Associates Inc., 2002) or in accordance with modified procedures approved in advance by the NYSDEC. The permittee must produce an annual year class report that presents the results of the above studies. Each annual report must be submitted to: NYSDEC; Division of Fish, Wildlife and Marine Resources; Leader, Steam Electric Unit, 625 Broadway, Albany, NY 12233-4756, no later than December 31 of the next calendar year.
  - b. Striped Bass/Atlantic Tomcod Mark-Recapture Survey  
All data recording, analysis of samples, and Quality Control and Assurance must be conducted in accordance with the 2001-2002 Standard Operating Procedures (Normandeau Associates Inc., 2001) or in accordance with modified procedures approved in advance by the NYSDEC. The permittee must produce an annual report that presents the results of the above study. Each annual report must be submitted to the NYSDEC's Steam Electric Unit Leader within 12 months of the completion of each year's field operations.

26. The permittee must schedule and take annual outages of no fewer than 42 unit-days between 23 February and 23 August of each calendar year. A unit-day outage is defined as a period of 24 consecutive hours during which cooling water circulation pumps are off at either Indian Point Unit 2 or Unit 3. During these outages, cooling water circulation pumps may temporarily run for maintenance and testing activities, and service water pumps may be in operation. The permittee must give the NYSDEC's Steam Electric Unit Leader an annual report that provides a list of unit-day outages for each calendar year. Annual reports must be provided to the Steam Electric Unit before 31 January of the next calendar year.
27. The Ristroph modified traveling screens number 21 through 26 and 31 through 36 must continue to be operated on continuous wash when the corresponding cooling water circulation pump is running. The low pressure wash nozzles installed at each of these screens must be operated at 4 to 15 PSI so that the fish and invertebrates are removed from the traveling screens, washed into the existing fish return sluiceway, and returned to the Hudson River. The operation of the screens and fish return system must be inspected daily and the screen wash pressures recorded in the wash operator's log. The traveling screens and the fish return and handling system must minimize the mortality of fish to the maximum extent practicable.
28. The permittee must take the following steps to construct closed-cycle cooling:
  - a. Within six months of the effective date of this permit, the permittee must submit to the NYSDEC, Division of Environmental Permits, Chief Permit Administrator, 625 Broadway, Albany, New York 12233-1750: (i) its schedule for seeking and obtaining, during this permit term, all necessary approvals from the NRC, Federal Energy Regulatory Commission (FERC), and other governmental agencies to enable construction and operation of closed-cycle cooling at Indian Point; and (ii) a report on the progress to date of the Pre-Design Engineering Report required in special condition 28. b., below.
  - b. Within one year of the effective date of this permit, the permittee must submit to: NYSDEC, Division of Environmental Permits, Chief Permit Administrator, 625 Broadway, Albany, NY 12233-1750, a Pre-Design Engineering Report addressing regulatory and engineering issues, including but not limited to federal, state and local approvals, associated with installing closed-cycle cooling at Indian Point Units 1, 2, and 3. At a minimum, this report must address: (i) the potential relocation of a segment of the Algonquin Gas Company's (Algonquin) gas pipeline to construct closed-cycle cooling; (ii) the potential need for blasting to construct closed-cycle cooling and its potential impacts; (iii) particulate emissions from cooling towers; (iv) sequential construction outages at Units 2 and 3, as opposed to simultaneous construction outages; (v) the potential impacts to energy reliability and capacity associated with anticipated construction outages as well as the 42 day annual operating outages; and (vi) additional measures to reduce potential impacts to energy reliability or capacity.
  - c. Within one year of the effective date of this permit, the permittee may also submit a Pre-Design Engineering Report to the Chief Permit Administrator for an alternative technology(s) that will minimize adverse environmental impact to a level equivalent to that which can be achieved by closed-cycle cooling.
  - d. If the permittee submits a Pre-Design Engineering Report to the NYSDEC for an alternative technology(s), as provided for in special condition number 28. c., above, the NYSDEC will evaluate the capability of the proposed alternative to minimize adverse environmental impacts to a level equivalent to that which can be achieved by closed-cycle cooling. If the NYSDEC determines that

the proposed alternative may be substituted for closed-cycle cooling, it will notify the permittee and, if appropriate, will commence a proceeding to modify this permit accordingly.

- e. Within one year after submission of the Pre-Design Engineering Report, the permittee must submit design plans that address all construction issues for the conversion of the cooling water systems for Units 1, 2, and 3 to a closed-cycle system, or for an alternative technology(s) if approved by the NYSDEC pursuant to special condition number 28. c. and d., above. All plans must be stamped and signed by a Professional Engineer licensed by the State of New York. The design plans must be submitted to NYSDEC, Division of Environmental Permits, Chief Permit Administrator. NYSDEC will review to determine if the design plans are consistent with this permit and its requirements.
  - f. The permittee must inform the NYSDEC, Division of Environmental Permits, Chief, Energy and Management Bureau, in writing within 5 business days of any application submitted to the Nuclear Regulatory Commission (NRC) for modification or extension of the current operating licenses for Units 2 and 3, which expire on September 28, 2013 and December 12, 2015, respectively.
  - g. Within 30 days after receipt of the NRC's approval of the proposed design plans for closed-cycle cooling for Units 1, 2 and 3, the permittee must submit for approval to the NYSDEC, Division of Environmental Permits, Chief Permit Administrator, an update of its June 2003 construction schedule (Enercon Services, Inc. 2003) reflecting any design and schedule changes resulting from the NRC approval.
  - h. The NYSDEC reserves the authority to unilaterally modify this permit pursuant to 6 NYCRR Part 621, or take other appropriate action in the event that: (i) the NRC modifies or denies the permittee's design plans for closed-cycle cooling for Units 1, 2 and 3, (ii) any necessary proposal to a state or federal agency for relocating a segment of the Algonquin pipeline is modified or denied, or (iii) the permittee determines that it will not seek extension of its NRC licenses, and it so advises the NYSDEC, Division of Environmental Permits, Chief, Energy and Management Bureau, in writing,
29. Within six months after the effective date of this permit, and annually thereafter on January 1 of each year, the permittee must pay \$24 million into an escrow account that it creates at a financial institution approved by the NYSDEC. The escrow account must be entitled the Hudson River Estuary Restoration Fund (HRERF). All of the monies in the HRERF shall be held for the benefit of the HRERF and made available to the NYSDEC to administer for projects or programs within the Hudson River Estuary (including tributaries to the estuary below the federal dam at Troy) designed to restore, enhance or protect aquatic habitats, fish species, or the quality of Hudson River Estuary waters. These funds will not be used to support any of the permittee's obligations under this permit. Payments to the HRERF are non-refundable. Partial year payments shall be prorated at \$65,750 per day.

#### **SCHEDULE OF COMPLIANCE:**

- 30. a. The permittee shall comply with the Schedule of Compliance (following page), including the reporting requirements set forth below.
- b. The permittee shall submit a written notice of compliance or non-compliance with each of the above schedule dates no later than 14 days following each elapsed date, unless conditions require more

immediate notice under terms of 6 NYCRR Part 750. All such compliance or non-compliance notification shall be sent to the locations listed under the section of this permit entitled RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS. Each notice of non-compliance shall include the following information:

1. A short description of the non-compliance;
2. A description of any actions taken or proposed by the permittee to comply with the elapsed schedule requirements without further delay and to limit environmental impact associated with the non-compliance;
3. A description of any factors which tend to explain or mitigate the non-compliance; and
4. An estimate of the date the permittee will comply with the elapsed schedule requirement and an assessment of the probability that the permittee will meet the next scheduled requirement on time.

c. Unless otherwise specified in this permit or in writing by the Department, the permittee shall submit copies of any document required by the above schedule of compliance to NYSDEC Regional Water Engineer, Region 3, 200 White Plains Road, Tarrytown, New York 10591 and to the NYSDEC, Division of Water, Bureau of Water Permits, 625 Broadway, Albany, N.Y. 12233-3505.

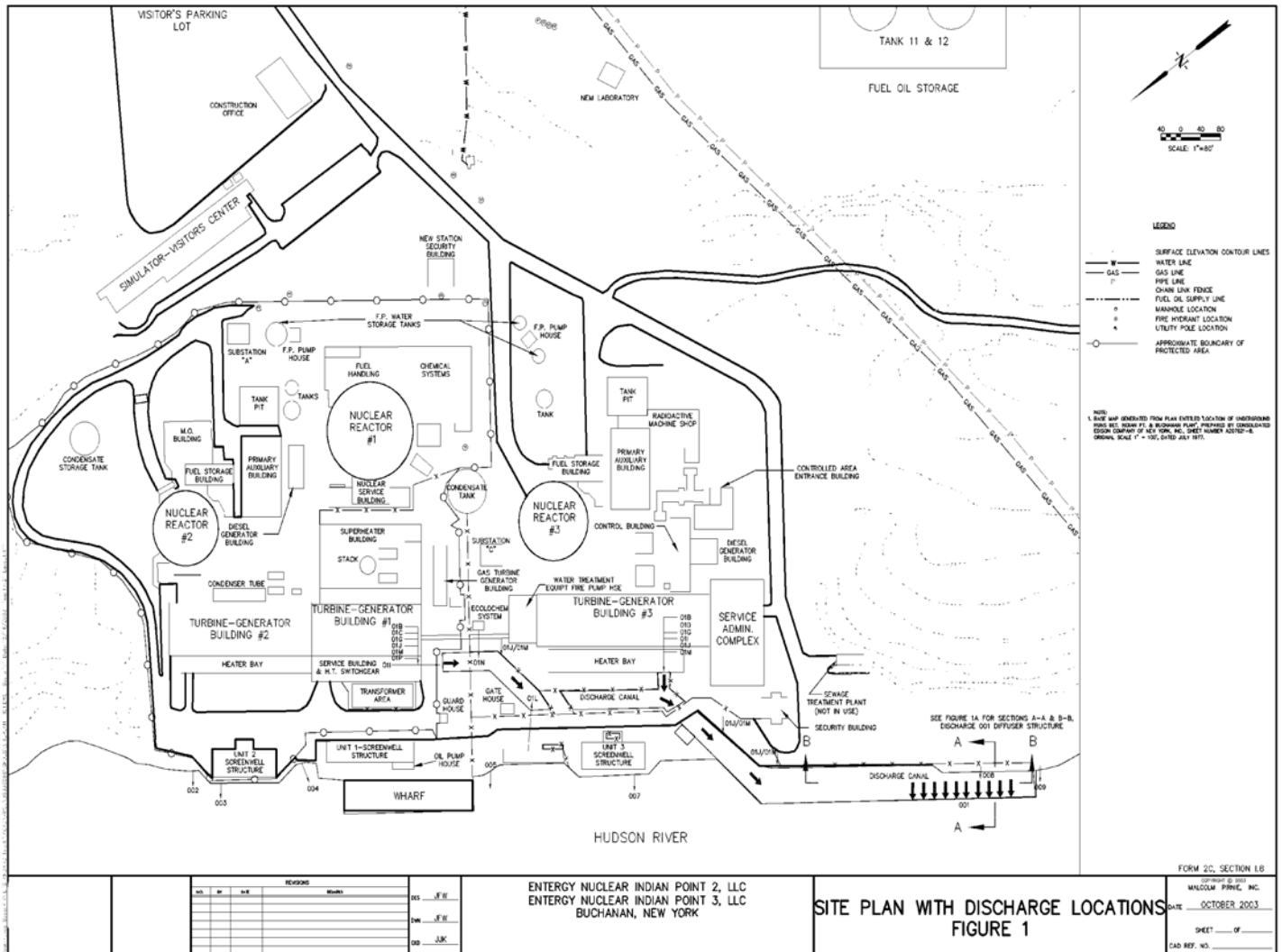
## SCHEDULE OF COMPLIANCE

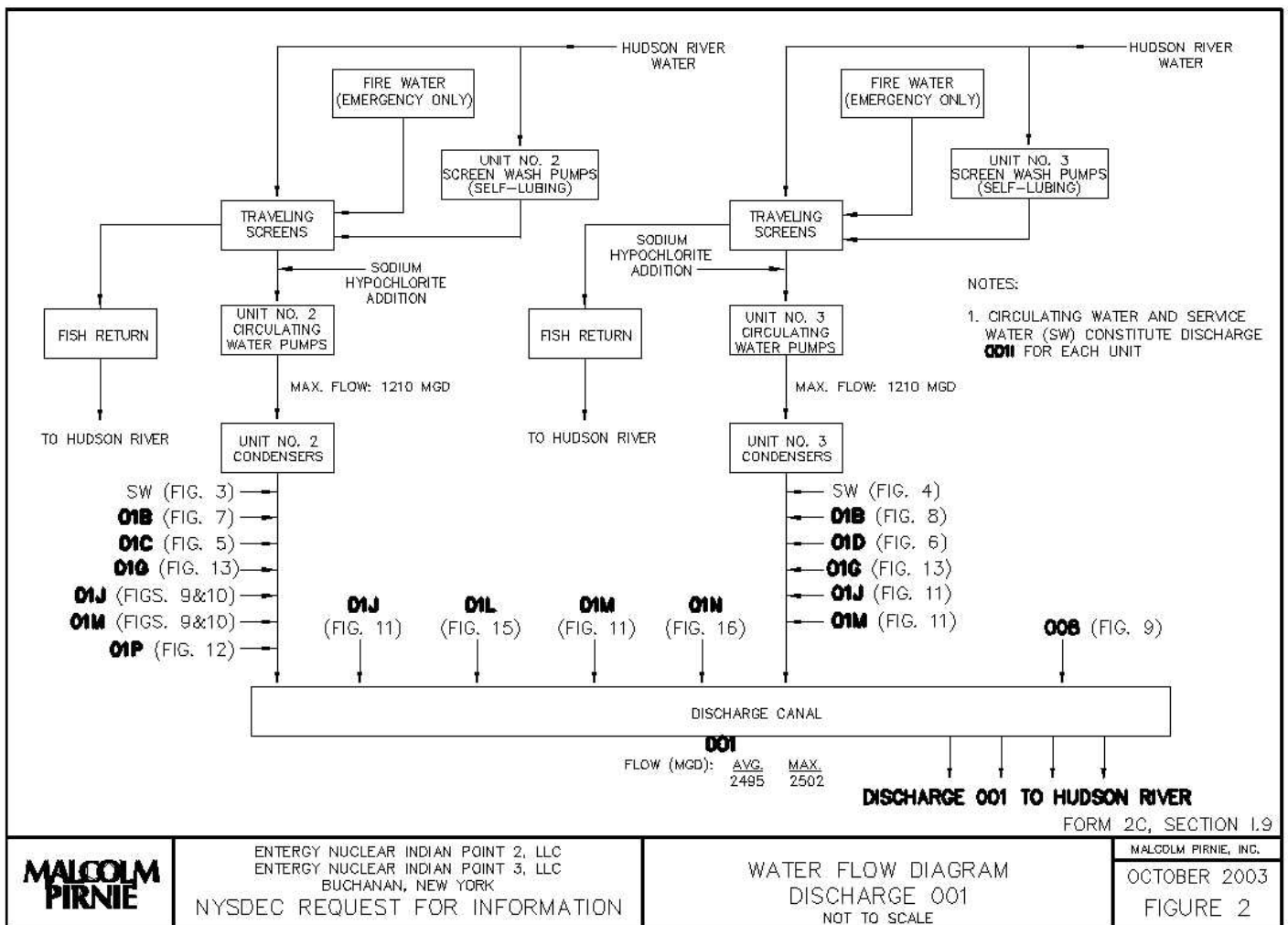
Action Code	Outfall Number(s)	Compliance Action	Due Date
	001	Submit approvable Protocol for Tri-Axial Thermal Study. (Special condition 7)	EDP + 6 months
	001	Submit a report on the progress to date of the Pre-Design Engineering Report (Special Condition 28. a)	EDP + 6 months
	001	Submit a schedule for obtaining all necessary approvals during the permit term from the Federal Energy Regulatory Commission (FERC), Nuclear Regulatory Commission (NRC), and other governmental agencies for the construction of closed cycle cooling at Indian Point during the next permit term. (Special condition 28. a)	EDP + 6 months
	001	Submit a Pre-Design Engineering Report addressing regulatory and engineering issues associated with installing closed cycle cooling at Units 1, 2, and 3 (Special condition 28.b)	EDP + 1 Year
	N/A	Permittee may submit Pre-Design Engineering Report for alternative technology(s) that achieves minimization of adverse environmental impact equivalent to closed-cycle cooling Special Condition 28.c).	EDP + 1 Year
	N/A	Annually, continue to ensure that biological monitoring projects [Longitudinal River Survey, Beach Seine Survey, Fall Shoals Trawls and Striped Bass/Atlantic Tomcod Mark Recapture Survey] are conducted according to the approved Standard Operation Procedures. Annual results from the Longitudinal River Survey, Beach Seine Survey, and Fall Shoals Trawls must be provided to the Department by 31 December of the next calendar year, while results from the Striped Bass/Atlantic Tomcod Mark Recapture Survey must be provided to the Department within 12 months of the completion of field operations. (Special condition 25)	EDP
	N/A	Schedule and take outages of no fewer than 42 unit-days between 23 February and 23 August in each calendar year over the permit term. Submit annual reports on outages prior to 31 January of each calendar year. (Special condition 26)	EDP
	N/A	Annually, the permittee must pay \$24 million into an Hudson River Estuary Restoration Fund. These funds will be used to restore or enhance the Hudson River Estuary (Special condition 29).	Annually
	001	Conduct Tri-Axial Thermal Study as Outlined in Special Condition 7.	EDP + 1.5 years
	001	Submit results of Tri-Axial Thermal Study as outlined in Special Condition 7.	EDP + 1.75 years
	N/A	Submit design plans that address all construction issues for the conversion of the cooling water systems for units 1, 2, and 3 to a closed cycle system or for construction of DEC-approved alternative technology(s) (Special condition 28.e.).	EDP+ 2 Years
	001	Month-by-month report of daily operating data on electrical output, water use, and intake and discharge temperature (Special Condition #19).	Annual
	N/A	Submit Semi-annual Effluent and Waste Disposal Reports prepared for NRC (Special Condition 20) .	Semi-Annual
	N/A	Submit revised construction schedule reflecting NRC approval process (Special Condition 28.g.)	NRC App + 30 Days
	N/A	Advise NYSDEC of extension of NRC licenses (Special Condition 28.f.)	October 3, 2008

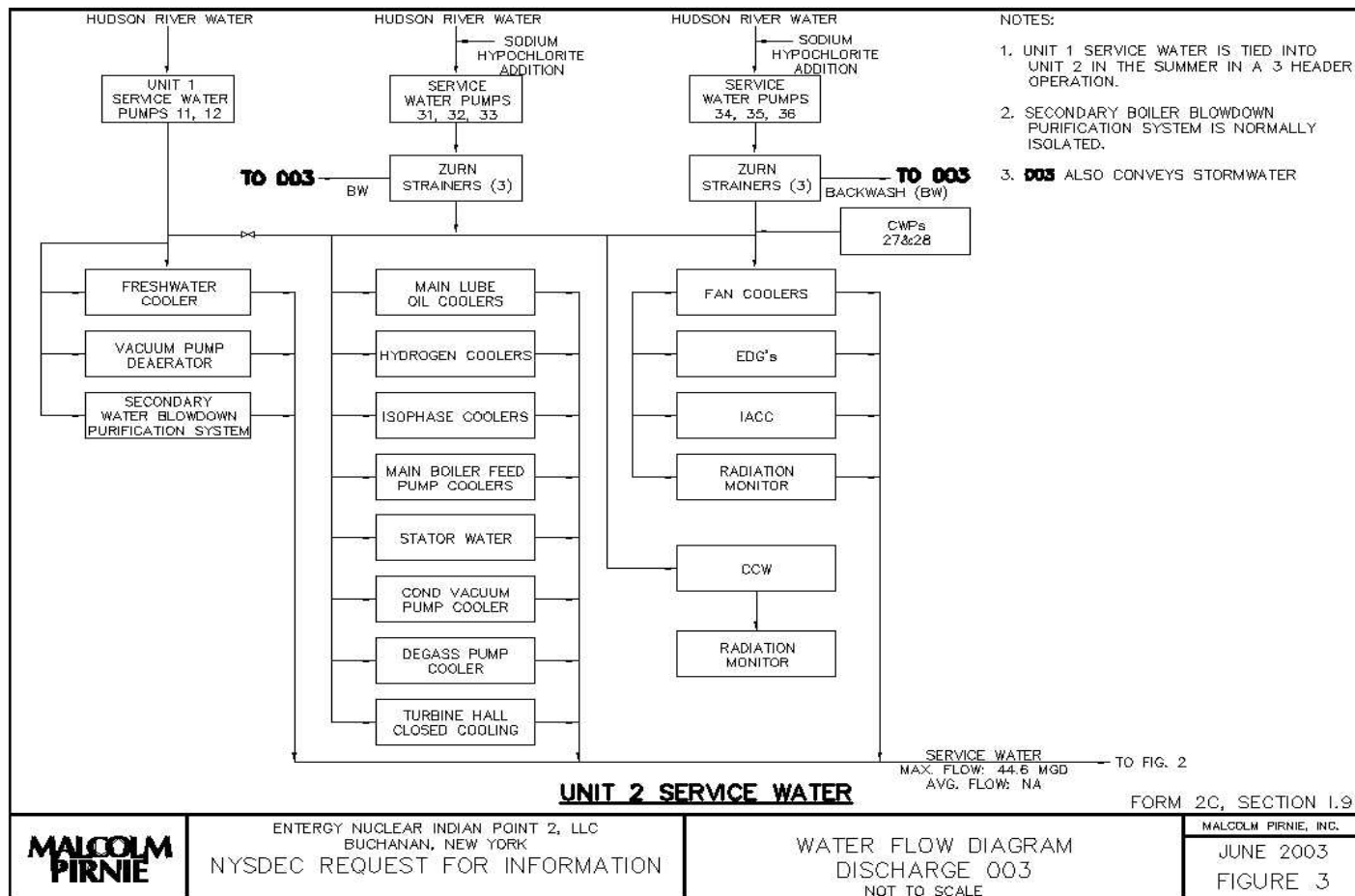
## STANDARD CONDITIONS

### MONITORING LOCATIONS

The permittee shall take samples and measurements, to comply with the monitoring requirements specified in this permit, at the location(s) shown in the three figures below:









## **BEST MANAGEMENT PRACTICES**

1. The permittee shall maintain and implement a Best Management Practices (BMP) plan to prevent, or minimize the potential for, release of significant amounts of toxic or hazardous pollutants to the waters of the State through plant site runoff; spillage and leaks; sludge or waste disposal; and storm water discharges including, but not limited to, drainage from raw material storage.
2. The permittee shall review all facility components or systems (including material storage areas; in-plant transfer, process and material handling areas; loading and unloading operations; storm water, erosion, and sediment control measures; process emergency control systems; and sludge and waste disposal areas) where toxic or hazardous pollutants are used, manufactured, stored or handled to evaluate the potential for the release of significant amounts of such pollutants to the waters of the State. In performing such an evaluation, the permittee shall consider such factors as the probability of equipment failure or improper operation, cross-contamination of storm water by process materials, settlement of facility air emissions, the effects of natural phenomena such as freezing temperatures and precipitation, fires, and the facility's history of spills and leaks. For hazardous pollutants, the list of reportable quantities as defined in 40 CFR, Part 117 may be used as a guide in determining significant amounts of releases. For toxic pollutants, the relative toxicity of the pollutant shall be considered in determining the significance of potential releases.

The review shall address all substances present at the facility that are listed as toxic pollutants under Section 307(a)(1) of the Clean Water Act or as hazardous pollutants under Section 311 of the Act or that are required to be reported on the Industrial Chemical Survey.

3. Whenever the potential for a significant release of toxic or hazardous pollutants to State waters is determined to be present, the permittee shall identify BMPs that have been established to minimize such potential releases. Where BMPs are inadequate or absent, appropriate BMPs shall be established. In selecting appropriate BMPs, the permittee shall consider typical industry practices such as spill reporting procedures, risk identification and assessment, employee training, inspections and records, preventive maintenance, good housekeeping, materials compatibility and security. In addition, the permittee may consider structural measures (such as secondary containment and erosion/sediment control devices and practices) where appropriate.
4. Development of the BMP plan shall include sampling of waste stream segments for the purpose of toxic "hot spot" identification. The economic achievability of effluent limits will not be considered until plant site "hot spot" sources have been identified, contained, removed or minimized through the imposition of site specific BMPs or application of internal facility treatment technology. For the purposes of this permit condition a "hot spot" is a segment of an industrial facility; including but not limited to soil, equipment, material storage areas, sewer lines etc.; which contributes elevated levels of problem pollutants to the wastewater and/or storm water collection system of that facility. For the purposes of this definition, problem pollutants are substances for which treatment to meet a water quality or technology requirement may, considering the results of waste stream segment sampling, be deemed unreasonable. For the purposes of this definition, an elevated level is a concentration or mass loading of the pollutant in question which is sufficiently higher than the concentration of that same pollutant at the compliance monitoring location so as to allow for an economically justifiable removal and/or isolation of the segment and/or B.A.T. treatment of wastewaters emanating from the segment.
5. The BMP plan shall be documented in narrative form and shall include any necessary plot plans, drawings or maps. Other documents already prepared for the facility such as a Safety Manual or a Spill Prevention,

Control and Countermeasure (SPCC) plan may be used as part of the plan and may be incorporated by reference. USEPA guidance for development of storm water elements of the BMP is available in the September 1992 manual "Storm Water Management for Industrial Activities," USEPA Office of Water Publication EPA 832-R-92-006 (available from NTIS, (703)487-4650, order number PB 92235969). A copy of the BMP plan shall be maintained at the facility and shall be available to authorized Department representatives upon request. As a minimum, the plan shall include the following BMP's:

- |                                     |                            |                                |
|-------------------------------------|----------------------------|--------------------------------|
| a. BMP Committee                    | e. Inspections and Records | i. Security                    |
| b. Reporting of BMP Incidents       | f. Preventive Maintenance  | j. Spill prevention & response |
| c. Risk Identification & Assessment | g. Good Housekeeping       | k. Erosion & sediment control  |
| d. Employee Training                | h. Materials Compatibility | l. Management of runoff        |

6. The BMP plan shall be reviewed annually and shall be modified whenever: (a) changes at the facility materially increase the potential for significant releases of toxic or hazardous pollutants, (b) actual releases indicate the plan is inadequate, or (c) a letter from the Regional Water Engineer highlights inadequacies in the plan.

7. **Facilities with Petroleum and/or Chemical Bulk Storage (PBS and CBS) Areas:**

Compliance must be maintained with all applicable regulations including those involving releases, registration, handling and storage (6NYCRR 595-599) and (6NYCRR 612-614). Stormwater discharges from handling and storage areas should be eliminated where practical.

A. Spill Cleanup - All spilled or leaked substances must be removed from secondary containment systems as quickly as practical and in all cases within 24 hours. The containment system must be thoroughly cleaned to remove any residual contamination which could cause contamination of stormwater and the resulting discharge of pollutants to waters of the State. Following spill cleanup the affected area must be completely flushed with clean water three times and the water removed after each flushing for proper disposal in an on-site or off-site wastewater treatment plant designed to treat such water and permitted to discharge such wastewater. Alternatively, the permittee may test the first batch of stormwater following the spill cleanup to determine discharge acceptability. If the water contains no pollutants it may be discharged. Otherwise it must be disposed of as noted above. See *Discharge Monitoring* below for the list of parameters to be sampled for.

B. Discharge Operation - Stormwater must be removed before it compromises the required containment system capacity. Each discharge may only proceed with the prior approval of the permittee staff person responsible for ensuring SPDES permit compliance. Bulk storage secondary containment drainage systems must be locked in a closed position except when the operator is in the process of draining accumulated stormwater. Transfer area secondary containment drainage systems must be locked in a closed position during all transfers and must not be reopened unless the transfer area is clean of contaminants. Stormwater discharges from secondary containment systems should be avoided during periods of precipitation. A logbook shall be maintained on-site noting the date, time and personnel supervising each discharge.

C. Discharge Screening - Prior to each discharge from a secondary containment system the stormwater must be screened for contamination. All stormwater must be inspected for visible evidence of contamination. Additional screening methods shall be developed by the permittee as part of the overall BMP Plan, e.g. the use

of volatile gas meters to detect the presence of gross levels of gasoline or volatile organic compounds. If the screening indicates contamination, the permittee must collect and analyze a representative sample of the stormwater. If the water contains no pollutants it may be discharged. Otherwise it must either be disposed of in an on-site or off-site wastewater treatment plant designed to treat and permitted to discharge such wastewater or the Regional Water Engineer can be contacted to determine if it may be discharged without treatment.

D. Discharge Monitoring - Unless the discharge from any bulk storage containment system outlet is identified in the SPDES permit as an outfall with explicit effluent and monitoring requirements, the permittee shall monitor the outlet as follows:

(i) *Bulk Storage Secondary Containment Systems:*

(a) The volume of each discharge from each outlet must be monitored. A representative sample shall be collected of the first discharge<sup>1</sup> following any cleaned up spill or leak. The sample must be analyzed for pH, the substance(s) stored within the containment area and any other pollutants the permittee knows or has reason to believe are present<sup>2</sup>.

(b) Every fourth discharge<sup>1</sup> from each outlet must be sampled for pH, the substance(s) stored within the containment area and any other pollutants the permittee knows or has reason to believe are present<sup>2</sup>.

(ii) *Transfer Area Secondary Containment Systems:*

The first discharge<sup>1</sup> following any spill or leak must be sampled for flow, pH, the substance(s) transferred in that area and any other pollutants the permittee knows or has reason to believe are present<sup>2</sup>.

E. Discharge Reporting - Any results of monitoring required above must be submitted to the Department by appending them to the corresponding discharge monitoring report (DMR). Failure to perform the required discharge monitoring and reporting shall constitute a violation of the terms of the SPDES permit.

F. Prohibited Discharges - **In all cases, any discharge which contains a visible sheen, foam, or odor, or may cause or contribute to a violation of water quality is prohibited.** The following discharges are prohibited unless specifically authorized elsewhere in this SPDES permit: spills or leaks, tank bottoms, maintenance wastewaters, wash waters where detergents or other chemicals have been used, tank hydrotest and ballast waters, contained fire fighting runoff, fire training water contaminated by contact with pollutants or containing foam or fire retardant additives, and, unnecessary discharges of water or wastewater into secondary containment systems. An example of a necessary discharge could be the addition of steam to prevent bulk storage containment area sump pumps from freezing during cold weather.

## DISCHARGE NOTIFICATION REQUIREMENTS:

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<sup>1</sup>Discharge includes stormwater discharges and snow and ice removal. If applicable, a representative sample of snow and/or ice should be collected and allowed to melt prior to assessment.

<sup>2</sup>If the stored substance is gasoline or aviation fuel then sampled for oil & grease, benzene, ethylbenzene, naphthalene, toluene and total xylenes (EPA method 602). If the stored substance is kerosene, diesel fuel, fuel oil or lubricating oil gasoline or aviation fuel then sampled for oil & grease and polynuclear aromatic hydrocarbons (EPA method 610). If the substance(s) are listed in Tables 6-8 of application form NY-2C sampling is required. If the substance(s) are listed in NY-2C Tables 9-10 sampling for appropriate indicator parameters may be required, e.g., substituting BOD5 for methanol, substituting toxicity testing for demeton. Discharge volume may be calculated by measuring the depth of water within the containment area times the wetted area converted to gallons or by other suitable methods. Form NY-2C is available on the NYSDEC web site. Contact the facility inspector for further guidance. In all cases flow and pH monitoring is required.

1. The permittee shall, except as set forth in (c) below, maintain the existing identification signs at all outfalls to surface waters, which have not been waived by the Department in accordance with 17-0815-a. The sign(s) shall be conspicuous, legible and in as close proximity to the point of discharge as is reasonably possible while ensuring the maximum visibility from the surface water and shore. The signs shall be installed in such a manner to pose minimal hazard to navigation, bathing or other water related activities. If the public has access to the water from the land in the vicinity of the outfall, an identical sign shall be posted to be visible from the direction approaching the surface water.

The signs shall have **minimum** dimensions of eighteen inches by twenty four inches (18" x 24") and shall have white letters on a green background and contain the following information:

**N.Y.S. PERMITTED DISCHARGE POINT**

**SPDES PERMIT No.: NY** \_\_\_\_\_

**OUTFALL No. :** \_\_\_\_\_

For information about this permitted discharge contact:

Permittee Name: \_\_\_\_\_

Permittee Contact: \_\_\_\_\_

Permittee Phone: (     ) - ### - #####

OR:

NYSDEC Division of Water Regional Office Address :

NYSDEC Division of Water Regional Phone: (     ) - ### - #####

2. For each discharge required to have a sign in accordance with a), above, the permittee shall provide for public review at a repository accessible to the public, copies of the Discharge Monitoring Reports (DMRs) as required by the **RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS** page of this permit. This repository shall be open to the public, at a minimum, during normal daytime business hours. The repository may be at the business office repository of the permittee or at an off-premises location of its choice (such location shall be the village, town, city or county clerk's office, the local library or other location as approved by the Department). In accordance with the **RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS** page of your permit, each DMR shall be maintained on record for a period of three years.
3. The permittee shall periodically inspect the outfall identification signs in order to ensure that they are maintained, are still visible and contain information that is current and factually correct.

**RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS:**

1. The permittee shall also refer to 6 NYCRR Part 750 ( <http://www.dec.state.ny.us/website/regs/750.htm>) for additional information concerning monitoring and reporting requirements and conditions.
2. The monitoring information required by this permit shall be summarized, signed and retained for a period of three years from the date of the sampling for subsequent inspection by the Department or its designated agent.

**Also, monitoring information required by this permit shall be summarized and reported by submitting:**

- ☒ (if box is checked) completed and signed Discharge Monitoring Report (DMR) forms for each 1 month reporting period to the locations specified below. Blank forms are available at the Department's Albany office listed below. The first reporting period begins on the effective date of this permit and the reports will be due no later than the 28th day of the month following the end of each reporting period.
- ☐ (if box is checked) an annual report to the Regional Water Engineer at the address specified below. The annual report is due by February 1 and must summarize information for January to December of the previous year in a format acceptable to the Department.
- ☐ (if box is checked) a monthly "Wastewater Facility Operation Report..." (form 92-15-7) to the:
- |  |  |
|--|--|
| <input type="checkbox"/> Regional Water Engineer<br>and/or | <input type="checkbox"/> County Health Department or Environmental Control Agency<br>specified below |
|--|--|

Send the **original** (top sheet) of each DMR page to:

Department of Environmental Conservation  
Division of Water  
Bureau of Watershed Compliance Programs  
625 Broadway  
Albany, New York 12233-3506

Phone: (518) 402-8177

Send the **first copy** (second sheet) of each DMR page to:

Department of Environmental Conservation  
Regional Water Engineer, Region 3  
200 White Plains Road  
Tarrytown, New York 10591

Phone: 914-332-1835

3. Noncompliance with the provisions of this permit shall be reported to the Department as prescribed in the attached General Conditions (Part II).
4. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.
5. If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR Part 136 or as specified in this permit, the results of this monitoring shall be included in the calculations and recording of the data on the Discharge Monitoring Reports.
6. Calculation for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this permit.
7. Unless otherwise specified, all information recorded on the Discharge Monitoring Report shall be based upon measurements and sampling carried out during the most recently completed reporting period.
8. Any laboratory test or sample analysis required by this permit for which the State Commissioner of Health issues

certificates of approval pursuant to section five hundred two of the Public Health Law shall be conducted by a laboratory which has been issued a certificate of approval. Inquiries regarding laboratory certification should be sent to the Environmental Laboratory Accreditation Program, New York State Health Department Center for Laboratories and Research, Division of Environmental Sciences, The Nelson A. Rockefeller Empire State Plaza, Albany, New York 12201.

## **Exhibit 2**

**CENSUS STUDY**

<b>ROCKLAND</b>	<b>2,006</b>		<b>2,002</b>	<b>2,000</b>	<b>1,990</b>	<b>1,970</b>
<b>Disabilty</b>		<b>Disabilty</b>				
Airmont				7,835		
Bardonia				4,487		
Blauvelt				4,838		
Chesnut Ridge				7,517		
Clarkstown				79,346	61,658	
Congers				8,003	5,928	
Haverstraw Village				9,438	8,198	
Haverstraw Town				32,712	25,311	
Hillcrest				6,447	5,357	
Monsey				13,986	8,797	
Montebello				2,950		
Mount Ivy				6,013		
Nanuet				14,065	10,447	
New City				33,673	27,344	
New Hempstead				4,200		
New Square				2,605	1,156	
Nyack				6,558	6,659	
Orangeburg CDP				3,583		
Orangetown				46,742	53,533	
Pearl River				15,314	17,146	
Pomona				2,611	1,792	
Ramapo				93,861	76,702	
Sloatsburg				3,035	3,134	
Spring Valley				21,802	18,112	
Stony Point CDP				10,587	8,270	
Stony Point Town				12,814	12,704	
Suffern				11,055	8,273	
Tappan				6,867	7,424	
Theills				5,204		
Valley Cottage				9,007	6,007	
Viola				4,504	5,136	
Wesley Hills				4,305		
West Haverstraw				9,183	8,558	
West Nyack				8,024		
<b>42,751</b>	<b>294,965</b>	<b>42,751</b>	<b>291,279</b>	<b>286,753</b>	<b>265,475</b>	<b>229,908</b>

**WESTCHESTER**

Ardasley				4,272	4,470
Armonk				2,745	
Bedford				16,906	18,329



Briarcliff Manor	7,070	6,521
Bronxville	6,028	6,674
Cortland Town	37,357	34,393
Croton On Hudson	7,018	7,523
Dobbs Ferry	9,940	10,353
Eastchester CDP	18,537	23,750
Eastchester Town	30,867	36,660
Elmsford	3,938	3,911
Greenburg	83,816	85,827
Harrison Village	23,308	
Harstdale	9,587	12,226
Hasting on Hudson	8,000	9,476
Hawthorne	4,764	
Irvington Village	6,348	5,878
Jefferson Valley-Yorktown	14,118	9,008
Larchmont Village	6,181	7,203
Lewisboro	11,313	6,610
Mamoroneck	17,325	18,909
Mt. Kisco	9,108	8,172
Mt. Pleasant Town	40,590	38,535
Mt. Vernon	67,153	72,778
New Castle	16,648	19,837
New Rochelle	67,265	75,385
North Castle	10,061	9,591
North Salem	4,725	3,825
North Tarrytown	8,152	8,334
OssingTown	34,124	32,397
Ossing Village	22,582	21,659
Peekskill	19,536	19,283
Pelham Village	6,413	2,076
Pelham Town	11,903	13,933
Pleasantville	6,592	7,110
Port Chester	24,728	25,803
Pound Ridge	4,550	3,792
Rye City	14,936	15,869
Rye Town	39,524	43,234
Rye Brooke	7,765	
Scarsdale	16,987	19,229
Tarrytown	10,739	11,115
Thormond CDP	7,025	6,874
Tukahoe	6,302	6,236
White Plains	48,718	50,346
Yonkers	188,082	204,297
Yorktown	33,467	28,064
Yorktown Heights	7,690	6,805

Totals	949,355	147,066	937,279	932,748	874,866	808,833
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#### ORANGE

Balmville	2,963	3,214
BloomingGrove	16,673	8,813
Chester Village	3,270	1,627
Chester Town	9,138	4,767

Cornwall Town					11,270	9,672
Cornwall on the Hudson					3,093	3,131
Crawford Town					6,394	3,896
Deerpark					7,832	4,370
East Middletown					4,974	2,640
Firthcliff					4,427	4,025
Gardentown					4,209	4,614
Goshentown					11,500	8,393
Greenville					3,120	1,379
Greenwood Lake					3,280	2,262
Hamptonburg					3,910	2,204
Highland Falls Village					3,937	4,638
Highland Mills					2,576	
Highland Town					13,667	14,661
Kiryas					7,437	
Maybrook Village					2,802	1,536
Middletown					24,160	22,607
Minsink					2,961	1,942
Monroe					6,672	4,439
Montgomery Town					18,501	13,995
Montgomery Village					2,696	1,533
Mount Hope					5,971	2,966
New Windsor CDP					8,898	8,803
New Windsor Town					22,937	16,650
Port Jervis					9,060	8,852
Scotchtown					8,765	2,119
Tuxedo					3,023	2,967
Walden Village					5,836	5,277
Warwick Village					5,984	3,604
Warwick Town					27,193	16,956
Washingtonville					4,906	1,887
Wawayanda					5,518	3,406
West Point					8,024	
Woodbury					8,236	4,660

	376,392	56,705	356,773	341,367	305,813	208,505
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**PUTNAM**

Carmel Hamlet					4,800	
Carmel Town					28,816	21,639
Lake Carmel					8,489	4,796
Mahopac					7,755	5,265
Patterson					8,679	4,124
Phillipstown					9,242	7,717
Putnam Lake					3,459	
Putnam Valley					9,094	5,029
Southeast Town					14,927	9,901

	100,603	12,859	98,257	95,745	87,002	58,471
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<b>TOTAL PER YEAR</b>	<b>1,721,315</b>	<b>259,381</b>	<b>1,683,588</b>	<b>1,656,613</b>	<b>1,533,156</b>	<b>1,305,717</b>
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	2006	06disability	2002	2000	1990	1970
Projected	ANNUAL AVERAGE YEARLY % INCREASE PROJECTED INCREASE AT SAME RATE		FROM 2007- 2032		25 YEARS	
30.75% INCREASE	529,304	79,760				
TOTAL PROJECTED POP. 203:	2,250,619	339,141				

Change in Population 1970-2006	% Change
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65,057	28.30%
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**140,522      17.37%**

**167,887      80.52%**

**42,132      72.06%**

**415,598      31.83%**

change70to'	%change
	1.23%
	30.75%

change 1970 % change to to 2032	2032
944,902	62.58%

### **Exhibit 3**



# Historic Time Line For Indian Point, Including Some Early Historical Nuclear Moments

**1898:** Pierre and Marie Sklodowska Curie discover radium, a powerful radiation source which is soon used for medical treatment and atomic physics research.

**1905:** Albert Einstein shows how large releases of energy can come from the breakdown of small amounts of matter in the atom.

**1942:** First nuclear reactor is built at the University of Chicago.

**1945:** Atomic bombs dropped on Hiroshima and Nagasaki, Japan-it is estimated that 214,000 innocent civilians were killed in these two bombings.

**1946:** Atomic Energy Commission is formed.

**1951:** World's first nuclear plant built near Arco, Idaho, starts up in 1955.

**1952:** The Atomic Energy Commission brings Con Edison together with other energy companies to develop commercial nuclear plants. The commission had already developed a prototype, but it was found to be inefficient.

**Jan. 5, 1954:** The Buchanan Village Board holds a 10-minute public hearing on rezoning the area known as Indian Point, formerly a popular park with beaches, trails, swimming pools and two piers receiving thousands of people by boat out for a day of fun. The plan is passed without opposition. According to terms of the deal, Con Edison is to pay 70 percent of the Hendrick-Hudson school district's taxes, install a village-wide sewer system, pave streets and provide mercury streetlights.

**October 1954:** Consolidated Edison buys Indian Point Park and an adjacent tract, totaling 350 acres on the banks of the Hudson River at Indian Point, which is a popular park with beaches, trails, swimming pools and two piers. The plants are sited on the Hudson River, the Ramapo earthquake fault line, and 24 miles from the New York City line.

**1955** After considering several reactor types, Con Edison, selected for development a pressurized-water thorium-uranium converter reactor. This concept was proposed by the B&W Co., the contractor for basic nuclear engineering and the designer and manufacturer of the major items of nuclear plant equipment.

**1955** 1955 [Babcock & Wilcox](#) issued construction permit for IP1 for [Con Ed](#); AEC has no citing criteria for nuclear plants, thus the plant, which is on the [Hudson River](#), on an active earthquake fault line, and is 24 miles from the NYC line, is approved without discussion of any of these factors (when such criteria are proposed in 1979, the IP plants are the only operating plants in the country to fail 5 of the 6 proposed criteria; the [NRC](#) refuses to adopt the new criteria, instead reverting to its 1962 "interim" rules). When it comes on-line in 1962, the

construction costs total 2 1/2 times higher than projected. Within a year of operation, its generating system fails, and is replaced with a [Westinghouse](#) system.

**1963:** The 265 megawatt Indian Point 1 plant starts operating.

**1966** Westinghouse issued construction permit for [IP2](#), to be operated by ConEd.

**1966:** Indian Point 2 starts construction.

**1969** Westinghouse issued construction permit for [IP3](#), to be operated by Con Ed

**1969** Indian Point 3 starts construction; Con Ed starts operation in 1976.

**1971** An arsonist sets fire to a building housing much of the cooling system, causing \$10 million in damage.

**Feb 1972** a 1/2 million gallon water tank spills at IP2.

**Aug 1972** Westinghouse replaces defective fuel system at IP2 at \$10 million cost.

**Nov 1972** ConEd President expresses disappointment at nuke plants' operations, noting that frequent breakdowns and repairs make plants uneconomical. Plants were built with promises of 80% or better capacity; IP1 has operated at less than 50% capacity, and nationally nuke plants operate at only 60% capacity.

**1973:** Operation at Indian Point 2 begins

**Nov, 1973** Engineers shut down IP1, hearing a "hammering noise." A 300-degree steam leak buckles the "heat proof" steel liner of the containment vessel, and leaking water fills the reactor vessel 4 1/2 feet deep. The reactor is shut down until March, 1974.

**Oct 1974** IP1 ordered to shut down, as it lacks mandated ECCS (emergency cooling systems). The reactor was never issued a full-term operating license, but ran for 12 years on its 18-month "provisional" license.

**1975** As part of a controversial state bail-out of ConEd, IP3 is bought by [NYPA](#) for \$349 million.

**Jan, 1976** Robert D. Pollard, NRC chief safety engineer and project manager for IP2 resigns, calling IP2 "an accident waiting to happen," and **citing design deficiencies in both IP plants.**

**1976** IP2 operates at 29% capacity for the year, due to extensive repairs. Con Ed is fined for overexposing a worker to radiation.

**July 1977:** A transformer explosion at Indian Point triggers a major blackout, causing dozens of people, fearing a major accident, to flee.

**1977** A leak spills tens of thousands of gallons of radioactive water into the basement of the reactor building.

**MARCH 28, 1979** A pressure relief valve sticks at [Three Mile Island](#), a reactor in central PA, leading to a major accident (a partial meltdown) and forcing the evacuation of nearly 100,000 people.

**Sept 1979** UCS, NYPIRG, and WESPAC petition the NRC to decommission IP1 and suspend operations at IP2 & 3, citing over 60 unresolved safety deficiencies, including problems in plant design.

**Dec 1979** IP2 cited for one of the highest rates of worker radiation exposure in the nuke industry.

**May, 1980** After a bombing at the Statue of Liberty, police receive a threatening call that "IP is next."

**June, 1980** NYPIRG releases a citizens task force report prepared with WESPAC, SHAD, and others, criticizing IP evacuation plan and IP2 safety record, and calling for shut down of the plant.

**Oct 17, 1980 to 1982** Con Ed discovers over 100,000 gallons of radioactive water spilled in the containment building of IP2, with water rising 25 feet in a floor cavity and eventually rising nine feet up the reactor vessel. No one had checked the area since Oct 3, despite warning lights showing water build-up, hence it is unclear how long the water had been leaking. Con Ed then attempts to restart the reactor three times, without first checking on possible damage from the spill. Neither the NRC, local officials, or the public are notified of the accident for three days. A UCS study showed 24 equipment failures and 21 management & operations errors in the period from Oct 1 to 20. IP2 is shut for 8 months; ConEd attempts to recoup losses from the shut down, estimated at \$800,000/day, with a 10% rate hike; WESPAC, NYPIRG, and 20 other groups organize a rate payers boycott, which by Dec includes nearly 1 million customers; WESPAC also calls for a public takeover of ConEd.

**1980-82** UCS, NYPIRG, and WESPAC initiate legal action to close IP pending NRC analysis of the consequences of a major accident. Subsequent NRC hearings on IP operations and emergency planning are stalled when the hearing board chair resigns in protest of a ruling that excludes much anti-nuclear testimony. The board declines the activists' petition. A NY Times editorial calls the hearing a "kangaroo conference," and states that the "regulatory game" is likely rigged against anti-nuke activists. Former NRC Commissioner Peter Bradford states afterwards, **"Nowhere has the commission majority's hostility to fundamental legal concepts of fairness been more clearly shown than in the Indian Point hearings."**

**April 26, 1986** [Chernobyl](#) accident: a Ukrainian reactor explodes, releasing most (if not all) of its radioactive matter.

**Aug, 1987** A GAO report notes that the NRC is slow to require corrective action in plants with chronic safety violations, **takes 10 years or more to act on even the riskiest safety problems, and lacks guidelines that identify safety violations severe enough to shut nuke plants.**

**Note-almost 20 years later, these guidelines still do not exist.**

**May, 1992** IP3 fined for failing to maintain critical safety systems.

**Sept, 1992** IP3 fined for failing to fix leaky coolant pipes. **A control room operator who failed a July drug test is back on the job, without a retest.**

**Oct, 1992** An NRC report card on IP3 finds declining performance in 5 of seven areas evaluated, including dropping the "engineering and technical support" grade from good to acceptable. The NRC points to a backlog of 3,500 pairs needing attention at IP3. (10)

**Dec, 1992** The FBI seizes NYPA records regarding a meeting at which a senior plant manager

knowingly lied to the NRC; in addition, the FBI seizes records showing that 25-30 plant operators admitted to "occasionally" falsifying log entries.

**Feb 27, 1993** NYPA shuts IP3, after a series of violations over the past year that led to fines totaling \$462,500. NYPA spokespeople hope for a restart in 2-3 months.

**June-Oct, 1993** NRC fines NYPA \$300,000 for 17 safety violations disclosed in April, 1993, including defects that caused a six month failure in a backup reactor shutdown system. NYPA also admits that it has been issuing inaccurate reports on radiation releases for 13 years. The utility was issuing the information assuming that a filtering device that was disconnected in 1980 had still been operable; **the NRC's resident inspector notes "They released more (radiation) than they thought they released."**

**June 22, 1993:** Indian Point 3 is placed on the NRC's "Watch List" of troubled plants. NRC fines Indian Point 3 \$300,000 for 17 safety violations.

**Sept, 1993** NRC report shows backup cooling pumps went for ten years without fuses; the report also cites a backup generator that operated 11 years longer than recommended by the manufacturer, louvers stuck shut due to lack of simple maintenance, and a reactor shield fastened with incorrect bolts--and missing nuts.

**September 14, 1993:** Plant workers accidentally dump 900 gallons of radioactive water into the Hudson; four days later, 1,000 gallons of boric acid solution are spilled at the plant.

**Nov, 1993** A senior operator, after getting caught submitting a bogus urine sample, tests positive for cocaine and marijuana, forcing his resignation. He is the 2nd senior operator testing positive for drugs at IP3.

**Nov, 1993** Two original safety valves at IP3 found to be insufficiently rated; in the rush to replace them before an upcoming NRC inspection, engineers install them backwards, blocking both cooling systems and disabling backup generators. (18)

**Dec 93-Jan, 1994** Parts of a secret nuclear industry document is leaked, revealing dangerous conditions at IP3 that both NYPA and the NRC were aware of for months or years before the Feb '93 shut down, including defects in the same kind of valves implicated in the 1979 meltdown at 3 Mile Island.

**April, 1994** Lehman Brothers ranks IP3 one of 8 US nuclear plants as "poor performers" in a report on nuclear investments.

**May, 1994** After an NRC directive forces the utility to inspect its spent fuel pool at IP1, Con Ed admits that water has been leaking the site for four years, with estimates of up to **150 gallons of radioactive water leaking each day.**

**June, 1994** An underground pipe at the shut down IP3 plant breaks, spilling 1,600 gallons of toxic waste into the Hudson. The spill continues for nine days before the rupture is discovered.

**July 1994** A maintenance worker at IP3 accidentally opens a valve and spills 500 gallons of water.

Sept, 1994 Assemblymen Richard Brodsky holds hearings on IP3 that challenge

the notion that the plants' generate energy cheaply enough to balance the public safety, health, and environmental costs. Testimony shows that other energy options are cheaper, that IP3 has run at only 42% efficiency over its lifetime, and that it ranks 95th out of 109 US nuclear plants in its lifetime capacity factor. Testimony shows rate payers could save up to \$140 million/year from closing IP3. (22)

**Oct, 1994** Another maintenance worker at IP3 accidentally opens a valve and spills 1500 gallons of water.

**April, 1995** Steam generator tube cracking discovered in 25% of tubes at IP2; despite recent findings at the [Maine Yankee](#) plant that such cracking can be missed by standard testing procedures, the NRC refuses to require that both IP plants immediately institute enhanced tests, despite their regulations that require such testing. (23)

**July 19, 1995** IP3 restarted after 2 1/2 year shut down. NYPA, having replaced 19 of its top 27 managers, claims that a "nuclear religion" instituted at the plant will insure safe operations.

**July, 1995** NYPA runs IP3 improperly for three days, risking safety system failures; the violation brings an NRC citation in Oct 95. (25)

**July 18, 1995** 28 thousand gallons of water spill from IP1 into the Hudson.

**August, 1995** NRC reports on July-August operations at IP3 criticizes operators for using strict procedural standards as loose guidelines and failing to report deviations from standards. (26)

**September 14, 1995** NYPA shuts IP3, again, citing need to review safety & operational procedures. NYPA expects shutdown to last 2-3 months.

**Jan, 1996** NRC fines NYPA \$50,000 for safety violations involving running while backup safety pumps are inoperable. (27)

**April 6, 1996** IP3 restarted after a 7 month shutdown.

**June, 1996** A hydrogen gas leak causes an explosion at IP3.

**October 1996** IP3 is cited as one of the nation's worst plants by [PublicCitizen](#), who note the plant's 22 safety system failures over three years --three times the national average. Although not on the list, IP2 is ranked third worst in the nation for safety system actuation and ninthworst for worker exposure.

**Oct, 1996** Con Ed announces reorganization plans, including moving its IP2 plant into a state regulated subsidiary, thereby shielding the plant from potential free market competition. Meanwhile, a NYPA deal to turn over management of IP3 to a private company falls through, as negotiators cannot agree on terms. (29)

Jan, 1997 IP3 shut down for heater repairs. IP2 shut down due for valve repairs.

Feb, 1997 Assemblyman R. Brodsky excoriates IP3 President Robert Schoenberger at a public hearing for secret NYPA dealings to turn over management to a private company, and accuses the NYPA executive of misleading the Assembly. (30)

May, 1997 A GAO report notes lax oversight at the NRC, echoing the 1987 GAO report. (31)

June 25, 1997 IP3 removed from NRC Watch List. Plant spokespeople assert that management's pursuit of excellence has turned things around, and will insure safe operations. (32)

August, 1997 IP3 is cited by the NRC for an "apparent" violation of safety standards, by failing to correctly translate design basis information into procedures. The utility is fined \$55,000 by the NRC for inadequacies in its emergency safety procedures. (33)

Aug 6-15, 1997 IP2 shut down, due to questionable pressurizer safety valve settings; also, the plant's fire protection systems are found in a degraded condition.

**1997:** Indian Point 3 is cited by the NRC for safety violations.

**November 19, 1998,** Indian Point 3 shut down in response to unauthorized entry into protected area.

**February 15, 2000:** First full scale alert declared at Indian Point when Indian Point 2 reactor manually tripped due to indications of steam generator tube rupture in generator number 24. Contaminated steam is released. The NRC later reveals that hundreds of gallons of radioactive water leaked into the Hudson River and the Buchanan water system. Indian Point 2 is shut down until December 2000.

**April 2, 2000:** NRC rates Indian Point 2 most trouble-plagued nuclear power plant in the country.

**November 2000:** Entergy, an energy conglomerate based in New Orleans , purchases Indian Point 3 & the James A. Fitzpatrick for \$967 million. Entergy's Northeast regional headquarters in White Plains announced the plant was worth more than \$152 million a year to the local economy.

**September 2001:** Entergy purchases Indian Point 1 and 2 for \$502 million.

**September 21, 2001:** NRC admits uncertainty that the nation's 103 plants could withstand the same kind of impact that leveled the World Trade Center .

**May 18, 2002:** Christopher Kozlow, Westchester 's deputy commissioner of emergency services, is dismissed after about six months on the job. Kozlow is to claim the county wouldn't let him change the evacuation plan.

**June 5, 2002:** Testimony before the U.S. Senate states that security guards at the nation's 104 nuclear power plants are not equally paid, trained or armed. Some earn less than janitors and carry shotguns that would be no defense against terrorists with automatic weapons, say lawmakers and security experts.

**June 8, 2002:** Westchester County gives away potassium iodide pills at first of three public distributions. Thousands show up to receive pills.

**August 2002:** Governor Pataki Hires James Lee Witt Associates to evaluate emergency plans for Indian Point and other state nuclear facilities.

**September 11, 2002:** Entergy shuts down Indian Point 2 to prevent a growing hydrogen gas leak from reaching potentially explosive levels in the air outside the nuclear power plant.

**January 10, 2003:** The Witt Report, an independent study of the evacuation plan

commissioned by Governor George Pataki, is made public. Report states evacuation plan can't protect public.

**January 14, 2003:** County executives from Westchester, Putnam, Rockland and Orange counties refuse to sign evacuation plan.

**February 2, 2003:** FEMA tells the state it must ignore the counties' protest and make its own decision about the

**January 10, 2003:** The Witt Report, an independent study of the evacuation plan commissioned by Governor George Pataki, is made public. Report states evacuation plan can't protect public.

**January 14, 2003:** County executives from Westchester, Putnam, Rockland and Orange counties refuse to sign evacuation plan.

**February 2, 2003:** FEMA tells the state it must ignore the counties' protest and make its own decision about the emergency evacuation plans.

**February 4, 2003:** Invoking the principle of home rule, SEMO rejects the federal directive, saying it will not overrule the counties' decision to refuse to sign their annual certification letters.

**February 21, 2003:** FEMA refuses to certify the emergency evacuation plans, saying it cannot give "reasonable assurance" that they can protect the public.

**February 28, 2003:** Riverkeeper releases study by Synapse Energy Economics that demonstrates closure of the Indian Point Nuclear Plant would have little or no effect on reliable electric service for New Yorkers.

**April 9, 2003:** Justice Thomas W. Keegan orders the State Department of Environmental Conservation to issue a draft permit for Indian Point's cooling system by Nov. 14, in response to a lawsuit brought by Assemblyman Richard Brodsky, Clearwater, Riverkeeper, Pete Seeger, and others. Millions of fish eggs, larvae, and young fish are killed every year by the power plant's water-intake system.

**April 28/29, 2003:** Mechanical problems cause Reactor 2 to trip due to offsite electrical problems on April 28. On April 29 a fire breaks out in Reactor 3; it took over 45 minutes to bring the fire under control. Both reactors are taken off-line.

**May 1, 2003:** Over 175 first responders state they cannot guarantee safety of residents.

**July 25, 2003:** FEMA and the NRC overrule the counties' and state's determination that the emergency evacuation plans can't protect the public. County inquiries and Congressional hearings are called in the aftermath.

**July 2003:** NRC reports that IP 2 & 3 received 28 whistleblower complaints for 2002, a 22 percent increase. 75% of the complaints primarily involved issues of security. National median was four.

**August 12, 2003:** NRC launches investigation into cause of 9 unplanned shutdowns at IP during the past 18 months. The national average is less than one unplanned shutdown per reactor.

**Aug14, 2003:** Blackout 2003. The entire region regains power without IP being online for nearly a week. This was an historic day for the nuclear power industry, as nine nuclear reactors at seven power

plants in New York, Ohio, Michigan, and New Jersey were forced to shut down during largest and most severe electricity blackout in U.S. history. The infamous Indian Point NPP in New York reported its two reactors having suffered an "Automatic reactor scram due to a loss of offsite power. All rods fully inserted. Supplying power to vital buses via emergency diesel generators. All systems operating properly." The event was later updated, with a declaration that "RPS Actuation (loss of flow) due to loss of site ' power. Auto actuation of AFW in response to the unit trips. Auto Start and Load of Emergency diesel generators in response to the loss of off-site power."

**September 8, 2003:** The Union of Concerned Scientists and Riverkeeper formally petition the Nuclear Regulatory Commission (NRC) to order the immediate shutdown of both nuclear power reactors, because the plant's drainage pits (also known as containment sumps) are "almost certain" to be blocked with debris during an accident.

**September 9, 2003:** NRC conducts a special inspection of IP's emergency-alert system to examine a discrepancy between Entergy and the 4 EPZ counties over the reliability of 154 sirens.

September 13, 2003: Nearly 600 electrical workers at Indian Point ask a federal court to block managers from shifting them between the Indian Point 2 & 3. The electrical workers claim that cuts in the work force have led to unsafe working conditions and poses safety issues for the public. Local 1-2 of the Utility Workers Union of America requests a restraining order against Entergy Nuclear Operations, a subdivision of Entergy Nuclear Northeast.

September 16, 2003: Project on Government Oversight (POGO) releases a letter it sent to the NRC criticizing the agency for making the security tests at Indian Point nuclear plant too easy. The letter based criticism of the "force-on-force" test on information gathered from participants and observers of the test.

**September 18, 2003:** The NRC initiates a special inspection of Indian Point's emergency-alert system to examine a discrepancy between Entergy Nuclear and the four emergency planning zone counties over the reliability of 154 sirens.

November 20, 2003: 276 rank-and-file workers at the Indian Point 3 unit schedule a strike authorization vote for Dec. 4, Local 1-2 Utility Workers Union of America. Manny Hellen, president of the local, said a strike would occur if a new contract isn't reached by Jan. 17.

October 22, 2003: An Entergy official admits on NRP-affiliate station WAMC that there is no updated seismic hazard analysis for Indian Point.

December 22, 2003: The Nuclear Regulatory Commission issues a report that examined numerous unplanned outages at Indian Point. The report reveals that during the August 14<sup>th</sup> blackout key back-up systems were not in operation. The NRC found that Entergy had not corrected a known problem with some of the plant's back-up diesel generators. As a result the diesel generators, needed to power air-conditioning to cool emergency response equipment, failed during the blackout.

December 29, 2003: Entergy sends a letter to the NRC formally notifying the agency



of their intent to store irradiated nuclear fuel in dry casks on the site of the Indian Point nuclear power plant, in an Independent Spent Fuel Storage Installation (ISFSI). Industry whistleblowers and nuclear safety watchdogs have raised concerns about design flaws with the Holtec dry cask model Entergy proposes to use at Indian Point and about Holtec's inadequate quality assurance program.

January 18, 2004: Entergy and Local 1-2 Utility Workers Union of America reach a tentative four-year agreement, averting a strike.

March 1, 2004: William Lemanski – a town councilman of Tuxedo, NY and a retired software manager at Indian Point 2 publicly announces at a town board meeting his concerns regarding improperly sorted electric cables at the Indian Point 2 nuclear power plant.

March 9, 2004: Indian Point 2 & 3 receives NRC green rating for safety. As a result, Indian Point will receive less intense oversight from the NRC.

April 15, 2004: A hundred concerned residents attend an NRC open meeting to discuss Entergy's plans to store high-level radioactive waste in above-the-ground casks.

April 26, 2004: The Indian Point Safe Energy Coalition calls on the NRC to conduct a realistic drill that includes a terrorist scenario with a fast-breaking release for the emergency plans for the 10-mile Emergency Planning Zone near Indian Point.

May 5, 2004: Stamford, CT emergency officials request to be on the Emergency Notification list for Indian Point.

May 2004: For the first time in US nuclear power history, the NRC ends the public's right to a hearing on safety issues.

May 25, 2004: Westchester County hires Boston-based Levitan & Associates to determine if and how the Indian Point nuclear plants can be closed and replaced with an alternative energy source

June 2, 2004: Dr. Erik Larsen, medical director of the STAT Flight emergency helicopter operation at the Westchester Medical Center, raises concerns that the facility could "fall apart" with as few as 50 people seeking treatment after an accident at Indian Point.

June 8, 2004: Biennial emergency evacuation drill for Indian Point conducted. Elected officials and the public are outraged when it is learned that the drill included a "terrorist-type attack" but no radiation was released in the scenario. FEMA and the NRC quickly rubber stamp the test as adequate.

June 2004: The 9/11 commission and its witnesses divulge that additional air-based terrorist attacks have already been attempted, that more major attacks are likely in the near future, and that nuclear power plants are top al-Qaeda targets.

June 23, 2004: Entergy employee raises concerns that emergency sirens may not operate properly during hot summer days.

July 15, 2004: Over 100 concerned residents attend NRC open house to discuss Entergy's proposed dry cask storage system. IPSEC and nuclear safety experts argue that large casks containing deadly toxic waste are attractive terrorist targets, particularly since Entergy's plan is to place them on a concrete pad with no protective structures or barriers.

July 22, 2004: The 9/11 commission report suggests that the 9/11 plot's ringleader had considered crashing a commercial airliner into a nuclear power plant in the New York area. The report explains that Mohamed Atta, who piloted one of the planes

that hit the World Trade Center , "considered targeting a nuclear facility he had seen during familiarization flights near New York ."

August 9, 2004: The NRC announces that it will no longer make available to the public the results of physical assessments of nuclear plant security or enforcement actions associated with such evaluations.

September 2, 2004: Entergy announces plans to cut work force at Indian Point by up to 500 workers.

September 2, 2004: Indian Point 2 shutdown for valve failure.

September 3, 2004: A new patrol boat is approved to be permanently stationed at Indian Point. Oversight of the boat will fall to the authority of the state Division of Military and Naval Affairs, which uses National Guard troops to staff its marine force.

September 8, 2004: Riverkeeper releases a study that finds the potential health consequences of a successful terrorist attack on the Indian Point nuclear plant could cause as many as 518,000 long-term deaths from cancer and as many as 44,000 near-term deaths from acute radiation poisoning, depending on weather conditions. Dr. Edwin Lyman , a senior staff scientist in the Global Security Program at the Union of Concerned Scientists, authored the report entitled "Chornobyl-on-the-Hudson?: The Health and Economic Impacts of a Terrorist Attack at the Indian Point Nuclear Plant."

September 15, 2004: Indian Point 2 shutdown for valve failure.

September 6, 2004: Entergy announces that it will seek a power uprate for Indian Point. The company wants to increase power generation by 90 megawatts.

September 20, 2004: Entergy drops its interest in building a small onsite gas plant at Indian Point site.

September 21, 2004: Congresswoman Sue Kelly (R-Katonah) calls on the NRC to inspect wiring at Indian Point after former worker raised allegations of improper cable separation at Indian Point.

September 24, 2004: Indian Point 2 shutdown for valve failure.

September 24, 2004: Orange County Board of Legislators Public Safety Committee passes resolution calling on federal authorities to investigate the safety of spent fuel storage at the Indian Point nuclear plant.

October 1, 2004: Indian Point security guards ratify a new five-year contract, averting a possible strike.

October 19, 2004: A labor dispute at Indian Point 2 triggers a sickout by approximately 40 electricians and other craft union workers after several workers were fired for allegedly raising safety concerns.

October 27, 2004: The NRC approves a 3.26% increase of electricity generating capacity for Indian Point 2.

**November 2004:** Up to 300 Indian Point workers are exposed to asbestos. Charles Pencola, a steam-fitter who has worked at Indian Point for 35 years, said Entergy managers declined to stop work in the area until the problem was properly corrected.

**December 2004:** A nuclear watchdog group releases data showing that there is no backup power for sirens, in the event of loss of electricity. Indian Point is one of many U.S nuclear plants without backpower to emergency sirens.

December 3, 2004: Indian Point 2 is shutdown for welding problems.

**December 10, 2004:** Emergency sirens fail to rotate properly.

**January 2005:** For the third consecutive year Westchester, Rockland , and Orange County officials refuse to submit their Annual Certification Letters, a checklist for the Indian Point emergency evacuation plans. For the second year in a row Putnam County Executive Robert Bondi submits his county's paperwork, despite no material changes to the plan since the Witt Report concluded that the plan is gravely flawed and probably cannot be fixed.

**January, 19 2005:** Westchester County hosts State Emergency Management Office Open House for Indian Point. Potassium Iodide pills are distributed to the public.

**January 24, 2005:** IP guard discovered drunk while acting as a safety supervisor at a firing range where other Entergy security workers were undergoing firearms training on the job at Indian Point. He receives a two week suspension.

**January 26, 2005:** Congressional delegates, Eliot Engel (D-NY), Nita Lowey (D-Westchester/Rockland) and Sue Kelly (R-NY) notify the NRC that any failure of emergency sirens at Indian Point is unacceptable.

**January 31, 2005:** At a Press Club luncheon NYS Attorney General Eliot Spitzer says he supports the closure of Indian Point, if energy reliability can be assured.

**February 8, 2005:** Westchester County Executive Andy Spano calls on the NRC to investigate emergency sirens at Indian Point.

**February 10/11, 2005:** Control rods fail to load properly at Indian Point.

February 10, 2005: Ulster County Board of Legislators overwhelmingly votes in favor of opposing a 20-year license extension on Indian Point. Ulster County becomes fourth county board, and joins an addition 16 municipal boards that have passed a similar resolution opposing the relicensing of Indian Point.

**February 14, 2005:** Due to Entergy's improper handling of radioactive waste, an Indian Point shipment of low-level radioactive waste is discovered leaking upon arrival at the Barnwell Waste Management Facility in Barnwell , South Carolina . According to the NRC at least one worker was exposed to radioactive materials; this is in violation of South Carolina laws regulating the handling of nuclear waste at the Barnwell facility.

**April 6, 2005:** The long awaited study by the National Academy of Sciences on the vulnerability of spent fuel pools at U.S. nuclear power plants is released. The report, released yesterday, confirms what Riverkeeper has maintained since the terrorist attacks of September 11, 2001: the spent fuel pools at nuclear power plants are soft targets, vulnerable to terrorist attack by aircraft or high explosives, and pose a high risk to public health and safety due to the high levels of volatile radionuclides present in the irradiated fuel. Riverkeeper calls on Governor Pataki and Congressional delegates to immediately appoint an independent commission to review Indian Point's spent fuel pools, their vulnerability to terrorist attack, and possible solutions to minimize the grave risks posed to the public in the event of a terrorist attack at Indian Point.

**April 12, 2005:** The Government Accountability Office issues a scathing report of the Nuclear Regulatory Commission and nuclear power plant owners, including Entergy, for their ineffective oversight, poor inventory management, and lax safety and security management of high-level radioactive spent fuel at the 103 nuclear power plants in the United States . In 2004 Entergy lost high-level radioactive spent fuel rods at its Vermont Yankee nuclear plant.

**May 18, 2005:** NRC issues a Notice of Violation to Entergy Nuclear, Indian Point 2,

following an inspection revealing that Entergy failed to respond adequately to a buildup of nitrogen gas in the safety injection pump system, which controls water flow in the emergency backup cooling system. The buildup of nitrogen gas had continued for 77 days before the NRC notified Entergy of the seriousness of the problem, knocking out one pump completely and damaging two others.

**June 9, 2005:** Levitan Associates releases a report commissioned by Westchester County to study the feasibility of retiring Indian Point before its licenses expire. The report states that the energy currently supplied by Indian Point 2 & 3 could be easily replaced through a combination of new plants and increased energy efficiency measures at the state level, with the increase to ratepayers estimated to be "less than a slice of pizza per month."

**June 20, 2005:** Congresswoman Nita Lowey authors The Nuclear Power Licensing Reform Act of 2005. If passed, it would require that the Nuclear Regulatory Commission must apply the same licensing standards to old nuclear power plants as new nuclear power plants, must take into account changes in population around a nuclear power plant, must require adequate emergency evacuation plans for populations within a 50-mile radius of a nuclear power plant, and must take into account threats to the population due to security and safety vulnerabilities at a nuclear power plant.

**July 2005:** Power to Indian Point's emergency siren system is knocked out on two different occasions, once for six hours before officials were aware of the problem.

**July 29, 2005 :** Entergy Nuclear NE publicly commits to replacing the malfunctioning emergency siren system, following repeated failed tests and power outages earlier in the summer. NY Senator Hillary Clinton's amendment to the 2005 Energy Bill– which was signed into law by President Bush – mandates that Indian Point's sirens have reliable backup power.

**August/September 2005:** The emergency siren system fails to operate properly during testing on several occasions, due to problems with Verizon's phone lines and software failures that resulted in all of Rockland County 's sirens failing to sound for nearly an hour.

**August 1, 2005:** NRC issues a "White Finding" to Entergy for their failed response to a nitrogen gas leak first discovered in April 2005.

**September 12-15, 2005:** Department of Homeland Security conducts a review of security and emergency planning at Indian Point, as part of the federal government's "Comprehensive Assessment" of the vulnerability of the nation's infrastructure to terrorist attack. A siren test conducted during the review once again fails to activate a significant number of sirens. The review is unrelated to the widespread criticism of FEMA/DHS following Hurricane Katrina.

**September 20, 2005:** NRC and Entergy notify the public that radioactive water is leaking from IP2's spent fuel pool. The leak was discovered by contractors excavating earth from the base of the pool in preparation for the installation of a new crane, for use in transferring spent fuel from the pool to dry cask storage. NRC assures the public there is no "immediate risk to public health or the environment." NRC later admits that Entergy first discovered the leak twenty days earlier, but did not believe it was serious enough to warrant public notification. NRC orders a special inspection to determine the source of the leak.

**September 29, 2005:** A control rod malfunction at IP3 forces the reactor to cut power by 35% immediately and notify the NRC. The control rods are designed to operate in unison, dropping into the reactor core to slow the fission process if a

problem arises. In this case, a single rod dropped into the core without warning.

**October 2-9, 2005:** Indian Point 3 is completely shut down following the control rod malfunction. The electrical switch the NRC believes caused the problem is replaced. Despite the loss of 1,000 MW to the NY power grid, there are no disruptions or significant price increases during the week that IP3 is inoperative.

**October 5, 2005:** Entergy notifies the NRC that a sample from a monitoring well located in the IP2 transformer yard shows tritium contamination that is ten times the EPA drinking water limit for the radionuclide, and is consistent with tritiated water from a spent fuel pool. The NRC broadens its special inspection to include this new information. The NRC also states in its report that the monitoring well had not been checked since its installation in 2000, following the transfer of IP's ownership from ConEd to Entergy.

**October 7, 2005 :** The NRC updates its Special Inspection Charter for the IP2 Tritium Leak to include a review of Entergy's efforts to control the ongoing leak from the IP1 Spent Fuel Pool.

**October 18, 2005 :** The NRC and Entergy confirm that the radioactive leak discovered in August is greater than initially believed. The radioactive isotope, tritium, has been discovered in five sampling wells around Indian Point 2, while the leak at the spent fuel pool has increased to about two liters per day. Exposure to tritium increases the risk of developing cancer. The company plans to test more wells, inspect the liner of the leaking fuel pool, and install additional monitoring wells.

**October 18, 2005:** A test of the Indian Point sirens failed again today. Ten of 15 sirens in Orange County and another four of the 156 total sirens within the 10-mile evacuation zone failed to sound during the routine test.

**October 28, 2005 :** NRC Region 1 Director Sam Collins formally requests permission from the agency's Executive Director of Operations to increase oversight at Indian Point on two matters, the tritium leak and the continued problems with the emergency sirens. Permission is granted three days later.

**November 16, 2005:** The NRC holds a public meeting with Entergy to discuss the company's plan for replacing the emergency siren system at Indian Point. Entergy announces their commitment to completely replacing the system by January 2007 with new sirens that will have backup battery power. However, statements by DHS officials regarding a lengthy approval process for the sirens put the time schedule in doubt. In addition, NRC official Erik Leeds argued that the Energy Policy Act of 2005 required that the NRC enforce the order within 18 months, not that backup power be installed within 18 months.

**November 26, 2005 :** The tritium leak at IP2 remains unsolved, nearly three months after its discovery. Entergy's use of underwater cameras and divers to visually inspect and test for leaks at three locations on the steel liner's surface yield no results. Entergy must now employ different cameras to inspect the liner near the bottom of the pool, where the radiation is too high for a human diver to enter.

**December 1, 2005 :** Entergy reports to the NRC that an initial sample from a new monitoring well five feet from the wall of the IP2 Spent Fuel Pool shows tritium levels in the groundwater at thirty times the EPA limit, the highest level of tritium contamination yet discovered. In addition, the NRC announces that preliminary tests of tritiated water found in the IP1 Pool Collection System contain too much tritium to be from the IP1 Pool, suggesting that tritium-laced water is being collected in the IP1 Drain from another, unknown source. The NRC still does not know where the leak is

coming from, how long it has been leaking, or the extent of groundwater contamination under the plant

## **Exhibit 4**

***Davis-Besse witness set to testify against trio  
Engineer to discuss coverup accusation***

***By TOM HENRY  
BLADE STAFF WRITER***

One of the key witnesses in the U.S. Department of Justice's case against three former Davis-Besse engineers is expected to testify today about the government's theory that he and the trio were part of a coverup that jeopardized northern Ohio's safety in the fall of 2001.

Prasoon Goyal, 61, of Toledo, who took the stand late yesterday, is a former senior design engineer who avoided prosecution by agreeing to cooperate with the Justice Department in its case against the other three.

Prosecutors said when the indictments were issued in 2006, Mr. Goyal and the three defendants - David Geisen, Rodney N. Cook, and Andrew Siemaszko - intentionally deceived the Nuclear Regulatory Commission about the dangerous state of the plant's old reactor head in the fall of 2001, when it was leaking boric acid from its reactor.

When the plant was shut down in early 2002, the NRC learned so much acid had leaked and burned through the plant's reactor lid that it nearly burst - an event that would have allowed radioactive steam to form in containment for the first time since half of Three Mile Island Unit 2's reactor melted in 1979. The accusation of a coverup was based on the results of a two-year grand jury inquiry.

Mr. Goyal agreed to a one-year ban on employment in the nuclear industry in exchange for his testimony. He has not returned to Davis-Besse, where he had worked since 1986.

Mr. Geisen and Mr. Cook are being tried first. Mr. Siemaszko's trial is to follow. All three face up to five years in prison and separate \$250,000 fines if convicted.

Earlier yesterday, an NRC metallurgical engineer, James A. Davis, who was part of the agency's augmented inspection team that was sent to the plant within hours after the near-rupture was discovered, testified that cracks in the old reactor head's most problematic nozzle likely started about 1990 - six years before any sizable leakage was documented and 12 years before the lid nearly blew.

Mr. Davis made a point of saying he was testifying as an independent witness and not as an NRC employee.



He said the nuclear industry and his agency have long settled on the average crack growth rate for reactor-head nozzles at 4 millimeters a year.

At that rate, it would have taken at least four years for a crack in one of those nozzles to develop a leak. Testimony last week revealed evidence of leaking as of 1996.

There are 69 such nozzles implanted in the reactor heads of pressurized-water reactors like Davis-Besse's.

They are made of a metal alloy that was found in France during the late 1980s to be susceptible to vertical cracks after years of high-temperature, high-pressure operation.

At 605 degrees, Davis-Besse was America's hottest-operating nuclear plant. In 2001, the stakes were raised when the NRC learned that several U.S. reactor heads, especially Davis-Besse's, were susceptible to a more dangerous form of nozzle cracks, one that could form a circular pattern and pop off like champagne corks under an operating reactor's extreme pressure of 2,200 pounds per square inch.

Under that scenario, a flash of radioactive steam could form.

Mr. Davis testified that the cavity in Davis-Besse's reactor head - 5 inches wide, 7 inches long, and 6 1/2 inches deep - could not have been missed during FirstEnergy Corp.'s previous inspection in 2000 if the utility had done a credible job of inspecting the device.

Defense attorneys referred to a recent FirstEnergy consultant report, which claimed the bulk of damage could have occurred unbeknownst to anyone during the last three weeks before shutdown.

FirstEnergy is using that report to support its claim for a \$200 million insurance payment on the grounds that the near-rupture might have been a fluke.

But prosecutors yesterday presented more evidence of a systematic, ongoing breakdown within the utility.

Greg Gibbs, a onetime Davis-Besse quality-assurance director and engineering director who left the plant in 1994, said he was disappointed after coming back as a consultant in 2001 to learn the utility never acted upon his insistence for larger holes in the reactor head's service structure to be used for inspections and cleaning.

A Blade investigation in 2002 showed that FirstEnergy vetoed a work order during the early 1990s for larger inspection ports, known as "mouse holes," to save \$250,000, even after being encouraged to do the modification by officials at a plant in Crystal River, Fla., with a similar design.

The modification, which officials have said could have headed off Davis-Besse's problems, was done after the old reactor head nearly burst in 2002.

Contact Tom Henry at: [thentry@theblade.com](mailto:thentry@theblade.com) or 419-724-6079.

## Exhibit 5

NOTES TO THE FILE – Susan Shapiro– August 30, 2007  
Conference call Discussion regarding Dry Cask Storage at Indian Point

Richard Barkely and Joe Sebrosky –Project Manager Division of Spent Fuel Storage,  
Transport, Nuclear Material Safety and Safe Guards

Part 72 Storage Cask

Capacity to Store Spent Fuel on IP Site

Independent Spent Fuel Storage Installation (ISFSI)

Estimates capacity

75 Holtec 100 High Storm Casks 18ft high x 14 ft in diameter

Multipurpose Canister 1/2 inch diameter holder 32 PDR fuel assemblies

Tech spacing for heat dispersal told us approximately 4 feet and then sent correct memo of 2.5 feet between casks.

Each Reactor has 193 fuel assemblies – nominally 1/3 of the core is replace at each refueling once every 2 years.

Per plant approximately 64 assemblies move every two years, assuming don't have to change fuel assemblies b/c of power uprate or other problem

The pad can store a total of 75 casks.

It is estimated that one cask per year, per plant.

Capacity amount of spent fuel in pools

Unit 2 1374 currently almost full

Unit 3 1345 currently almost full

IP 1 approximately 5 MPC (casks)

Looking into the future – fuel cladding problem was early generations.

Casks are 3 ft thick made of carbon steel inside concrete ---

Each PWR fuel assembly and dry cask weighs approx 1,400 lbs.

100 meter buffer of controlled land

Barnwell closing – so low level waste will be stored on site. They will get back to us regarding capacity for low level waste storage

Not sure about commingling at Unit 1

Plan to move Unit 3 waste to Unit 2 to package and move to Pad. Temporarily commingling waste.

Design Control program details certification – Amendment to support off loading fuel from Unit One – special transfer cask needed to remove fuel from #1 because shorter rods. Amend # 4 to high storm systems.

Part 72 Process – Site Specific- Certificate of Compliance HOLTE

John Bosca – Project manager – Part 50

Follow up letter from Richard Barkley Sept 6 2007

We have specialist technical staff on site this week doing an inspection of the Independent Spent Fuel Storage Installation lifting and transfer equipment. I asked one of them to review the blueprint for the thick reinforced concrete ISFSI pad; it is rectangular in shape and encompasses an area of  $1\frac{1}{2}$  (0.5) acres, slightly smaller than my original estimate. Thus even if the pad had to be doubled in size in the future, it would still represent just  $1\frac{1}{2}$  of 1% of the Indian Point site area.

I was sure my calculations were correct - I taught math at Holy Family University on Tuesday evenings this Spring, so I still remember how to multiply.

Talk to you soon!

Richard S. Barkley, P.E.

Technical Communications Assistant, NRC Region I  
(610) 337-5065  
Cell (610) 608-1517