Dear Ms. Falciano and everyone involved with our trip to Indian Point,

On behalf of myself and my class, I would like to say thank you for your informative lecture, openness to questions, and overall congenial attitude that most major corporations lack when dealing with skeptical visitors. As a student who has witnessed many public relations lectures concerning how and why I should think this or that way about any given topic, I can honestly say that this particular information center was not only lucid and persuasive, but also addressed and attempted to amend one of the greatest hurdles that proponents of nuclear power face today: public ignorance. Of course, both the media and public are correct in worrying about the safety hazards complicit with nuclear power (what with the disaster at Chernobyl and the frantic, though seemingly harmless meltdown at Three Mile Island), for they are a reality, no matter what anyone says. As long as we as humans use nuclear power as a source of energy, there will be an intrinsic fear of a catastrophe (meltdown, terrorist attack) and the problem as to where and how to dispose of high-level nuclear waste. However, not only was I thoroughly impressed with the excessive attention to security and safety at the power plant, but I also learned how environmentally friendly nuclear power actually is. Who would of thought that one ~~pote~~ pellet of uranium has the same energy potential as 2000 pounds of coal?!

Thanks again,

Tony Breen

By the way, the goody bags at the end of the tour would have converted even the most stubborn anti-nuclear power activist.

1

Mr. Falduto

Thank you very much for the wonderful tour of Indian Point. I have always been intrigued by nuclear power, and so I found your talk particularly interesting. It also settled many of my concerns about nuclear power and radiation. Thank you again for taking the time to talk to us and bring us around the plant, it was greatly appreciated.

Sincerely,

Ruby Cameron

1

Dear Pat Falciano,

Thank you very much for the educational tour of Indian Point. Honestly, I was always afraid of the dangers of nuclear power plants, and easily gave into the fearful media coverage. After learning about the mechanics of the plant, the beneficial effects industrially and the friendly impacts environmentally, I have definitely become a nuclear power supporter. The containment of the radioactive material and the minute amount that could ever affect surrounding people is comforting as I live within a 10 mile radius of the plants. The lecture was both informative and interesting and I thoroughly enjoyed the presentation. Confident in my ability to defend nuclear energy, I have already found myself enlightening others with the knowledge you have bestowed me with. Thank you for the tour as well, it was a great experience and I know the information I received I will remember for life.

Just as the generous items received in my "goodie bag" say, Indian Point is *safe*, *secure* and *vital* and with my newly gained knowledge, I have evidential support!

Thank you,

Chelsea Wendlinger
(Hackley School Student)

1

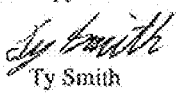
Dear Mr. Falciano,

I just wanted to take this opportunity to thank you for allowing our school to visit Indian Point Power Plant. I was personally fascinated by the precision and intracity of the technology used at Indian Point. You gave a very well done presentation on the power plant that was entirely factually based, which I very much appreciated to clear up some rumors. Through the media I developed a biased view toward the plant; I thought if even the slightest thing were to go wrong, or if it was attacked the effects would be catastrophic. I now know that is not true.

I was very impressed with the facilities and the warm atmosphere from the technicians at the plant. I also appreciated the high level of security, and while they were not as warm as the technicians, I understand the importance of maintaining a very high level of security.

I now think that nuclear energy is viable alternative to fossil fuels. Nuclear energy creates absolutely no pollution emissions, but there are draw-backs. We have to think about thermal pollution and storage of lethal radioactive waste. But, fossil fuels are more of a problem for our atmosphere at the present moment, so I think if we created an extra storage tank for the radioactive waste, or simply find ways of making the waste inert and non-lethal, harnessing radioactive energy would be just as Entergy says, "Safe, Secure and Vital." I won't go on about what should be done, but to simply thank you for giving me the educational opportunity to see what harnessing nuclear energy is really like first hand.

With great appreciation,



Ty Smith

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Dear Mr. Falcuono,

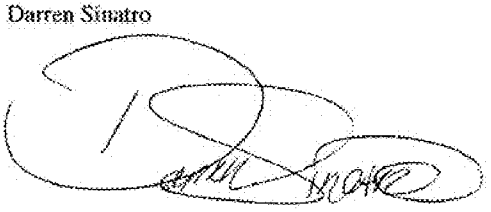
Thank you so much for giving us a very informative tour and presentation of Indian Point. I learned so much about the intricate workings of a nuclear power plant, especially in regard to the fuel rods and uranium pellets. I had no idea of how small they were, and how they were assembled within the reactor! Also I enjoyed learning how well constructed the containment buildings are, how little of an effect certain amounts of radiation can have on the human body, as well as how diluted the radioactive material becomes once it is two, five or ten miles away from its origin.

In addition to the information I learned during the presentation, I thoroughly enjoyed taking a tour of the power plant. It gave me an idea of how many components are included in the process of creating energy through the use of uranium. The amounts of water pumped into the plant each hour stunned me, as did size of the complex. The size of the room that contained the reactor alone was astonishing! One of the most impressive things I encountered at the plant, though, was the security. The fact that students were obliged to pass through a metal detector, a bomb detector and two sets of radioactive detectors was very reassuring, and showed the amount of technology available at the plant.

Again, I would like to thank you so much for our tour and presentation, and I know each one of us had an electrifying time at Indian Point.

Regards,

Darren Sinatro



3

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February 28th 2006

Dear Mr. Falciano,

I wanted to thank you for the informative lecture and tour you gave Hackley School last Wednesday. From the lecture, I found that nuclear plants, especially those as secure as Indian Point, are much safer than the public tends to think. Nuclear power is clean burning, safe, and secure. I believe that nuclear power will be very important in our futures (as rising adults) as the public learns how safe it really is. I enjoyed the tour immensely, and I loved how we had access to many sections of the plant. Thank you again for helping me understands the truth about nuclear plants and the many positive effects they have on society. Thank you!

Sincerely,

Kate Bibi

Kate Bibi

2

3

Dear Mr. Falciano,

I just wanted to tell you how much I enjoyed my time at Indian Point. I found the lecture very informative and interesting. I learned several things about power production in general, and nuclear power in particular, that I did not know before. Actually seeing the turbines and other parts of the plant was fun. Thanks so much for taking the time to give us a tour.

Sincerely,
Sarah Hunt

Dear Mr. Fabiano,

Before our trip to Indian Point I was both Apprehensive and Skeptical. Because of the media and public opinion, I admit I had a negative view of Indian Point. However, after your presentation and the tour my group was given, I no longer have that opinion. My view of Indian point is now possitive, and I would like to thank you for that. I now know that Indian Point is safe from terrorist attacks, even if a plane is used as a weapon. I now know that an incident such as Chernobyl is impossible. I now know that if there ever was a meltdown I know that we aren't doomed. And I also know Indian Point isn't polluting. All the skepticism I had about Indian point is no more and again I would like to thank you for that.

Sincerely,

1

Dear Mr. Valciano,

I am grateful to you and to your co-escorts for educating me and my class about nuclear power, and about the processes occurring at Indian Point. We all learned a great deal, and you served as a great counterbalance to the overwhelming slew of bad press that Indian Point has a tendency to generate.

Frankly, given all the negative hype about nuclear power, I half-expected to see a bunch of mad scientists trucking around weapons-grade plutonium on little handcarts everywhere. I think a fair number of my classmate were afraid that at any minute a 767 might slam into one of the containment buildings and nuke Westchester. Clearly, you can see how badly we needed education.

I think that what we learned last week goes farther than just how nuclear power works, and why Indian Point is not the threat we think it is. We also saw the people, such as yourself, working at the plant. As a twelfth grader vying for admission to college, I've been on a lot of tours lately. I wish that the students giving those college tours had been half as enthusiastic and passionate about their colleges as you and your colleagues were about nuclear power! I think that one major oversight that the public has in writing of nuclear power as evil is the quality of those working at your facility. I saw nothing but sincerity and integrity, and the dedication to keep Indian Point in top working order. I feel safe knowing that the nuclear power plant in my county is in such good hands.

Thank you again, for you have shown us a side of an issue that will only grow in importance, that nobody else could show us.

Sincerely,

1

Dear Mr. Falciano,

Thank you for taking time out of your busy schedule to educate us on the benefits of nuclear power plants. I did not know how safe they, in fact, were and how little radiation even a worker is exposed to there. The most interesting part of the entire trip for me was the video that demonstrated how virtually indestructible the transportation tanks were. Overall, the trip was very informative and gave me a new perspective on nuclear energy.

Thanks again for your time,

1

Dear Pat,

Thanks so much for taking so much time for us. The kids had a great time. They were very intresting in your talk & the plant. It was great for them to have such a pro nuclear point of view since the media gives them a con. I look forward to working with you next year!

Sincerely

1

Jonas Malpass
AP Environmental Science Class
February 27, 2006

Dear Mr. Falciano,

Thank you so much for your tour of Indian Point. The tour and lecture was very interesting and informative. The trip cleared up a lot of my fears and questions concerning nuclear energy. I learned many things while on the tour, and I am now in favor of nuclear energy.

Thank you very much for giving us your time, and touring us around Indian Point. I enjoyed myself very much.

Sincerely,

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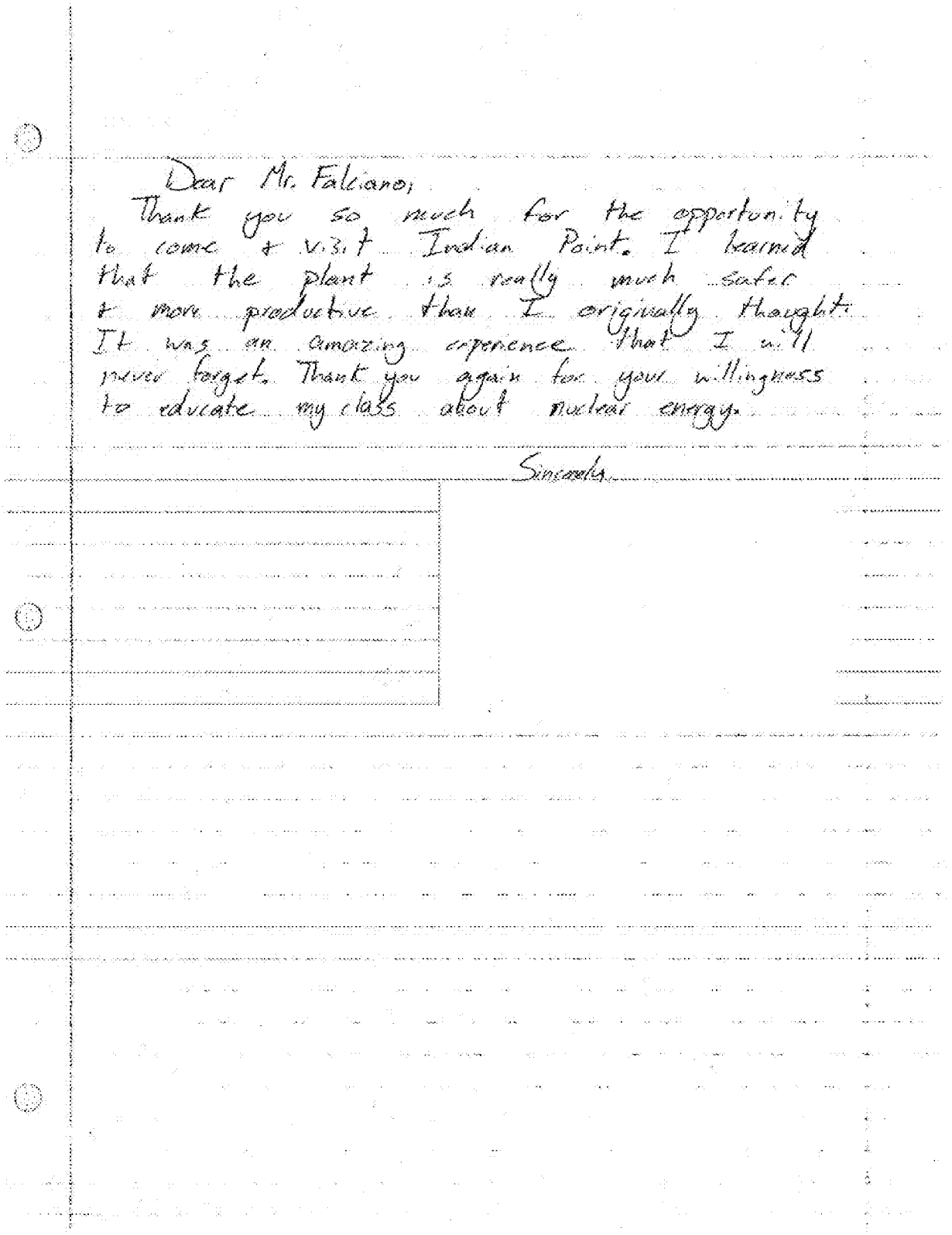

Dear Mr. Falciano,

Thank you so much for the opportunity to come & visit Indian Point. I learned that the plant is really much safer & more productive than I originally thought. It was an amazing experience that I will never forget. Thank you again for your willingness to educate my class about nuclear energy.

Sincerely,

1

February 28, 2006

Dear Mr. Falciano,

Thank you so much for the lecture and tour at Indian Point. Prior to hearing your talk, I had a bias against nuclear power and even favored closing Indian Point. I have drastically changed my view point, though. After hearing what you had to say about nuclear power. I now realize that the media takes the most extreme cases and twists the facts in order to prove their point. Most people never get to hear another side, though, and I got that opportunity. You have opened my eyes to another side of nuclear power and I am more educated for it. Thank you!

Sincerely,

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2/28/00

Dear Mr. Falciano,

Thank you so much for allowing my class and I to take a field trip to Indian Point. The experience was extremely beneficial and I learned a lot of important things about Nuclear Power Plants. Visiting the plant is an experience I will never forget. I loved seeing how everything was controlled in such an organized (and safe!) manner. It was informative and comforting at the same time. Thanks again!

2

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Dear Mr. Falciano,

Thank you very much for allowing my class to visit Indian Point. I won't lie; I had a lot of reservations about nuclear power from what I had studied previously. You and Jim, my tour guide, put all of my concerns to rest. You were very informative throughout your presentation and as was Jim during the tour. The passion that both of you had for your job was incredible! It was really very impressive and I thank you for doing your job to power my house and therefore my computer so I could write this note!

Thanks again,

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The Masters School
DOBBS

Dear Mr. Falciano,

On behalf of the entire 6th grade class, I would like to thank you for taking time out of your schedule to give a presentation on Indian Point and giving an informal discussion talk to Mrs George's students. The ideas presented in your PowerPoint have given students the tools to objectively evaluate the use of nuclear power in the U.S. We hope to continue using you as a resource to help enrich our curriculum.

Sincerely,

Scott Corn

49 Clinton Avenue | Dobbs Ferry, NY 10522-2202 | phone 914-479-6400 | fax 914-693-1230 | www.themastersschool.com

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3

NEW ROCHELLE HIGH SCHOOL
265 CLOVE ROAD
NEW ROCHELLE, NEW YORK 10801-3247

DONALD CONETTA
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FAX: (914) 576-4284

JOYCE KENT
SCIENCE CHAIRPERSON

TEL: (914) 576-4596
(914) 576-4580
EMAIL: JOYCEKENT@NRED.ORG

Pat Faciano
Indian Point Station
Broadway & Bleakley
Buchanan, NY 10511
New York, NY 10032

May 29, 2008

Dear Mr. Faciano,

Dr. Archibold and her students join me in thanking you for your informative talks on nuclear energy. We are truly facing an energy crisis and your lecture made us all aware of the importance of considering alternative sources of power.

It is beneficial to involve the community in the education of our youth. Your lecture served to make the students more aware of the problems the next generation will be facing. Urging them to find solutions enabled students to think about their effect on our fragile planet.

I look forward to seeing you again soon and hope to invite you back to speak to our students next year.

Sincerely,

Joyce S. Kent

Joyce S. Kent

cc: J.Archibold
J. Pollock

1

The Legislature of Rockland County

JOHN A. MURPHY
Legislator
Town of Orangetown - District 16

Budget & Finance Committee
Government Operations Committee

August 21, 2006

Mr. Thomas Fitzpatrick
Vice President
Giuliani Partners, LLC
5 Times Square
New York, NY 10036-6530

Ms. Kathleen McMullin
Communications Manager
Entergy Nuclear Operation, Inc
Indian Point Energy Center
205 Broadway, Suite 1
Buchanan, NY 10511-0249

Mr. Patrick Falciano
Outreach Coordinator
Indian Point Energy Communications
205 Broadway, Suite 1
Buchanan, NY 10511-0249

Dear Kathleen, Patrick and Thomas:

Thank you for being such gracious and professional hosts on my recent visit.

I was so impressed by your professionalism that I am moved to suggest a similar visit by my County Legislative colleagues who may not have enjoyed an opportunity to visit the Center to date. I would also like to include the Town Board of the Town of Orangetown, New York, in which lies my County Legislative District and, where I have resided for almost 50 years.

The Rockland County Legislature - Allison-Parris County Office Building - 11 New Hempstead Road - New City, New York 10956
Tel: (845) 638-5100 - Fax: (845) 638-5075 - www.rocklandgov.com

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Likewise, I would love the Publisher/Editor of our highly respected weekly newspaper, the "Our Town" to be invited. It is mailed free to every home in the Town of Orangetown every week.

Very truly yours,

John Murphy

JOHN A. MURPHY
County Legislator

JAM/ms

1

Falciano, Patrick

From: GRAVES, ALLISON LESLEY
Sent: Friday, December 08, 2006 2:00 PM
To: Theobalds, Kenneth; Fay, Deborah; McMullin, Kathleen M; Carpino, Ronald J; Falciano, Patrick
Cc: Kansler, Michael R; HEBERT, CURTIS L; Halvorsen, Jerald V
Subject: House Committee staff -- Indian Point tour follow-up

Deb, Kathy, Pat and Ron,

Thank you all for conducting and arranging the tour of Indian Point last Sunday. It was a very thorough and educational tour, and I appreciate you accommodating the House Committee staff's schedule and giving us so much of your time on Sunday. The knowledge Pat and Ron offered on the tour was fantastic. As you know, these four staffers represented both the Democratic and Republican staff of the House Homeland Security Committee -- a committee that could potentially help or hurt our nuclear fleet.

In fact, I saw Colleen O'Keefe last night. Colleen was the staffer that arranged the tour. She complimented the tour and said how impressed they all were with the facility, the security measures, our employees -- just overall impressed. She said, "in fact, we were talking about it this week -- how safe we would all feel living next to a nuclear power plant." She went on to say how much they appreciated us conducting the tour on Sunday and that we were much more accommodating than the folks on their tour of Plum Island the next day. Job well done! Thank you for showing some of these key Hill staffers what a well-run facility Indian Point is.

Have a good weekend.

Allison

Allison Graves
Director, Federal Energy Policy
ENTERGY CORPORATION
101 Constitution Ave., NW, Suite 200 East
Washington, DC 20001
202-530-7300 (office)
202-530-7350 (fax)
202-957-4022 (cell)
agrave1@entergy.com

12/11/2006

1

Westchester Community College
State University of New York

November 7, 2007

Mr. Patrick Falciano, Outreach Coordinator
IPEC Communications
Indian Point Energy Center
450 Broadway
P.O. Box 249
Buchanan, NY 10511-0249

Dear Mr. Falciano,

It was a pleasure to have you speak with our Green Team on Wednesday, October 24, 2007. Your presentation was invaluable and a learning experience for all those in attendance. Thank you for clarifying the misconceptions regarding the function and safe operation of Indian Point.

I will be in touch shortly to arrange for a tour of the Indian Point Power Plant for our Green Team.

Sincerely,

Seymour Rosenfeld
Professor Engineering Technology
Green Team Mentor

SR:wal

pc: Dr. Hankin, Dean Wang

75 Grasslands Road, Valhalla, NY 10595 • www.sunywcc.edu

1

SUNY ORANGE
WWW.SUNYORANGE.EDU
115 South Street, Middletown, New York 10940 (845) 344-6222
One Washington Center, Newburgh, New York 12550 (845) 562-2454

November 15, 2006

Ms. Kathy McMullin
Entergy Nuclear Northeast
Indian Point Energy Center
450 Broadway
P.O. Box 429
Buchanan, NY 10511-0294

Dear Ms. McMullin:

On a scale of 1 to 10 the recent visit of the Orange Country Community College Engineering Department to your Indian Point facility was a 10+. Mr. Charles Koesis and Mr. Patrick Falciano could not have been more welcoming and more professional. Our students have already been exposed to a fair amount of physics, chemistry, mathematics and engineering and Misters Koesis and Falciano instinctively found the correct level on which to address them. During the visit there were a few other gentlemen who assisted with hosting us but I did not get their names. I assure you that they too were first rate representatives of your company.

Our students thoroughly enjoyed the visit - a visit which reinforced both their theoretical physics/engineering courses as well as their desire to find a career in an exciting engineering field. The motivational factor that results from this quality of exposure cannot be overemphasized. The impressive expertise of Mr. Koesis and the obvious experience of Mr. Falciano served to motivate the students as well as inform them.

Thank you for making this opportunity possible.

Cordially,

John F. Cummins

John F. Cummins, Ph.D.
Chair, Science & Engineering

p.s. Should you bump into Jimmy Steets, please give him my regards
J

1

Falciano, Patrick

From: Shu-Ping Chang [spchang@us.ibm.com]
Sent: Monday, October 30, 2006 9:50 AM
To: Falciano, Patrick
Cc: PELLEGRINOR@coned.com
Subject: Feedback from attendees of IEEE TZ, ASME, SME Oct. 17 Energy Center meeting

Dear Friend:

We have received positive feedbacks from our attendees for the visit to your facility. Attached is one of them. We would like to thank you for your assistance to make our October meeting successful. We surely will plan future activity to your center to educate more of our members.

Cheers!
SP Chang, Ph. D.
IBM T.J. Watson Research Center
19 Skyline Dr. Hawthorne, NY 10532
Phone: +1 914 784-7746 (t/l 863-7746)
spchang@us.ibm.com

---- Forwarded by Shu-Ping Chang/Watson/IBM on 10/30/2006 09:44 AM ----

"Daniel Wallance" <dwallm@yahoo.com>

10/29/2006 08:04 PM

To Shu-Ping Chang/Watson/IBM@IBMUS
cc
Subject Re: IEEE TZ, ASME, SME Oct. 17 Energy Center meeting TOMORROW

Shu-Ping,

My father and I attended the IEEE / ASME / SME meeting and tour of Indian Point. Both of us had a wonderful time and learned a great deal about the Entergy Energy center. My father actually grew up in Croton on Hudson and although not an engineer was quite impressed with the visit. Visiting an actual nuclear power plant with a tour lead by one of its control room operators is an experience that is very unique and truly impressive and we very much appreciate the effort that went into planning the event. Reflecting back on the visit I came away with a more comfortable feeling about the operation and safety of nuclear plants than before I arrived.

Hopefully there will be more of such events in the future, opportunities to visit unique facilities in the New York area.

Please share my comments with those at Entergy.

Thank you again,

Daniel

10/30/2006

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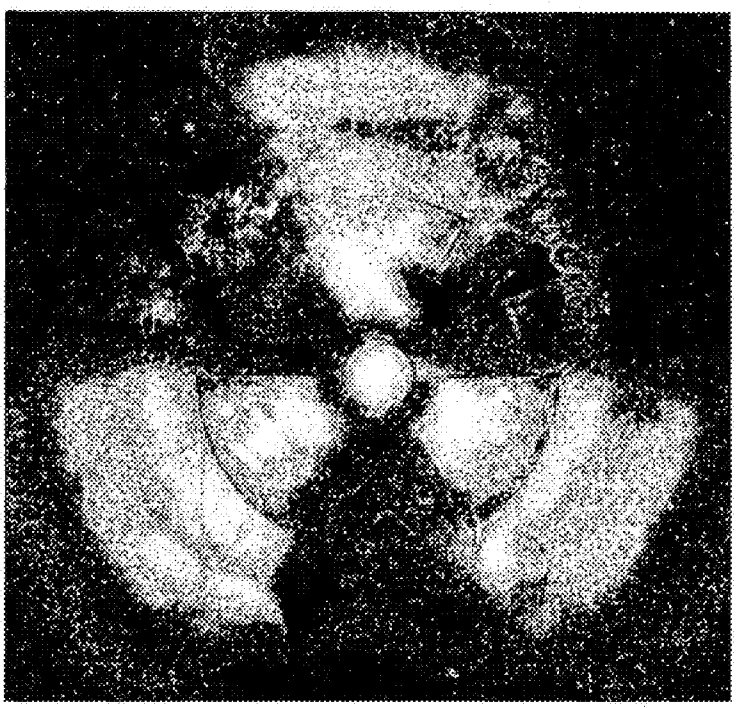
Thank you

Mr. Falciano!

From

New Rochelle High School

Chemistry Students



We appreciate the time you spent sharing what you know about Nuclear Power.

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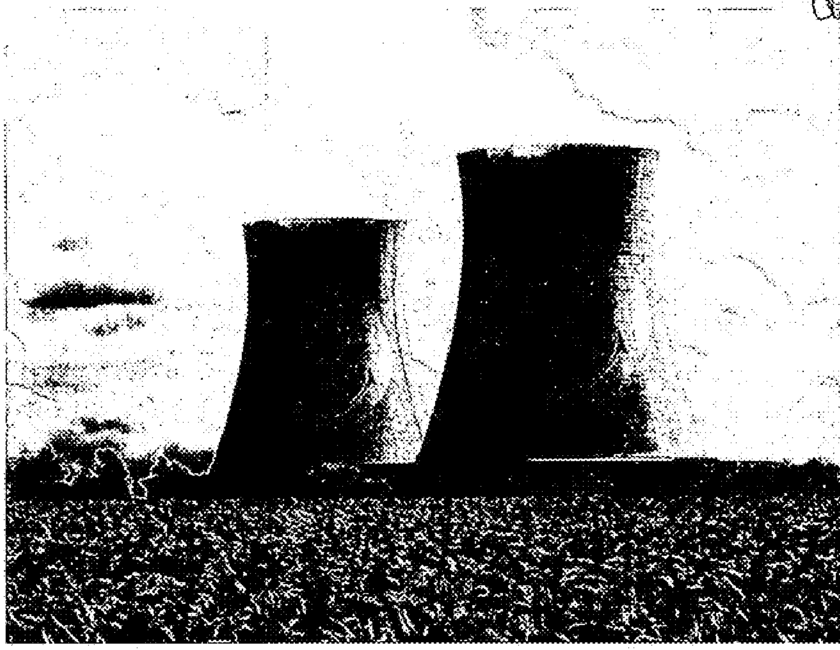
thank you for taking the time to teach us about nuclear chemistry it was great to learn about nuclear chem from a expert.
- Crystal Casco

Thanks
- Nick



Thanks so much for coming. Your talk on nuclear power really convinced me there are alternatives to green energy.
- Alex Kobon

Thanks for taking time out of your schedule to come and talk to us and prove to us nuclear power is safe. By the way the kid running the powerplant is Scott. (!!)
- Jenny Prakash

Thank you for taking out time in your schedual to come talk to us about nuclear power! It's greatly appriciated :)
- Maria Maffucci

Thank you for teaching us about nuclear stuff
- Danny Vargas

Thanks for coming to our class and teaching us about nuclear chemistry =)
- Chelsea

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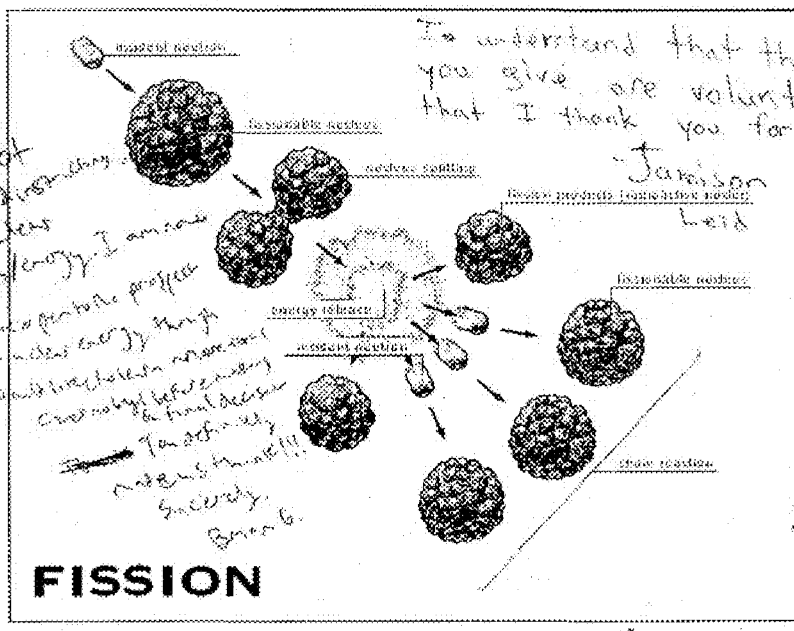
~~You don't know who I am, but I~~



I understand that these lectures you give are voluntary, and for that I thank you for your generosity
-Jamison Leid

Thank you for visiting us !! :)

Thanks a lot for coming and teaching us about nuclear power/energy. I am more [illegible] of nuclear energy [illegible] I [illegible] before making a final decision. Thank you [illegible]!!! Sincerely, Brian G.

I appreciate your visit. your presentation was very informative :) [illegible]

Thank you for coming in for the visit. You presentation was superb. Gloria

I appreciate the time you took to enlighten us
- Aki Bajulaiye

Thanks for coming by and teaching us!
-Charles (the Cynic)

Thanks a lot for [illegible]. I gained a lot of insight from your [illegible] - Karly Andarali

Thanks for Coming
I appreciate your coming and teaching us about Nuclear Power
- Jabbitha Drews

thanks for coming!
-Hannah

Thanks for giving your time to teach us about the nuclear power plant. It really changed my perspective about nuclear power
- Janeth Barajas

thanks for coming in !! :)
And giving up your time to teach us about the Nuclear Power Stuffs.
- Luckajyne Neal

Thank you for coming! I've enjoyed your lessons!
~Christa George

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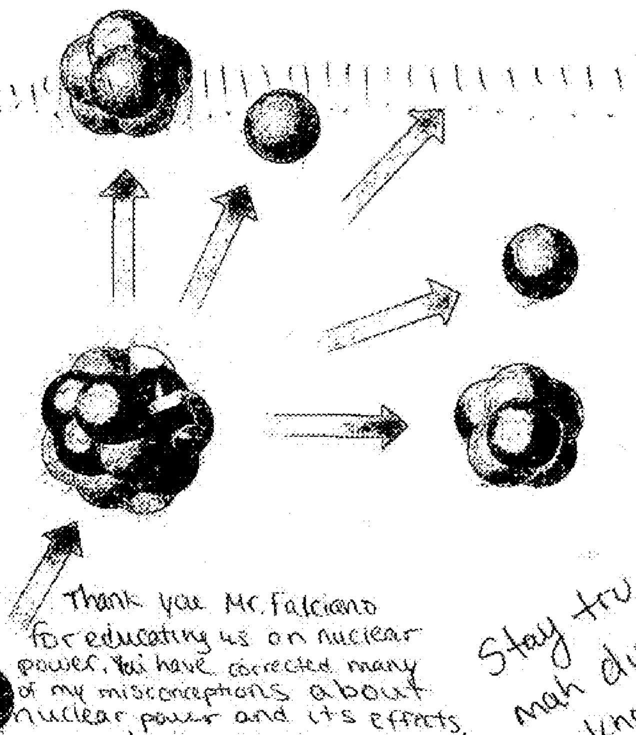
Mr. Falciano,
Wow!
Love, -Steven

Mr. Falciano
Thank you For
coming to [illegible].
[illegible] learned alot!!
You are a [illegible]
Love, Alex



My name is Tess
your presentation
was great! Thanks
for coming.

No that was
Nick Mendoza but
thanks for enlight-
ning us and really
showing how safe
nuclear power is.
I enjoyed your whole
presentation. :)
-Tess Kuhaj

Thank you Mr. Falciano
for educating us on nuclear
power. You have corrected many
of my misconceptions about
nuclear power and it's effects,
It was truly interesting and
thanks for your visit! :)
- Lauren Tsubayama

Stay tru
mah du!
you kno it!
- ya boyz
word

We truly appreciate the
time you spent enlightening
us about Nuclear power.
I had no idea it was
so safe!

Thanks
Nora

thank you so much
for coming! You're
presentation was
great.

Sincerely,
Stefanie

Thanks alot
for showing us
how safe nuclear
power was. I
truly learned alot.
-Jaime

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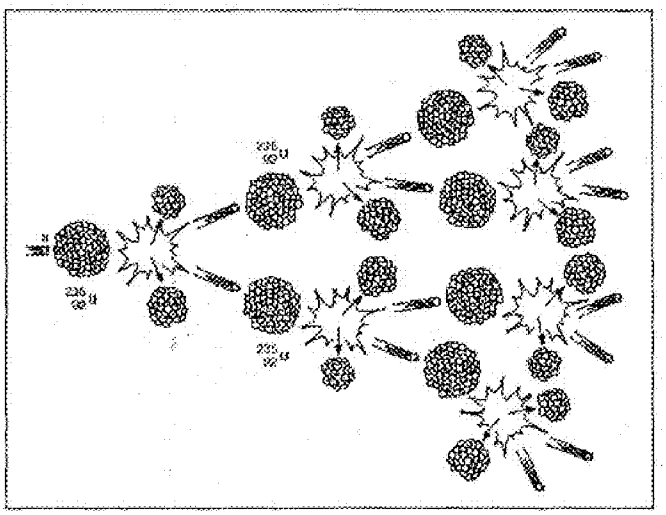
Thanks! I learned a lot! Jessica Mooney



Thanks for teaching us about nuclear power! I learned a lot!
-Sarah

Thank you so much for teaching us about nuclear energy! I learned a lot!
-Allison Richman

Thank you so much for taking your time to visit us and teach us a lot about nuclear power!! I learned many things from you
-Haeun Kang

Thanks a lot for teaching us about Nuclear Power plants, I was really interested in the anatomy of the Nuclear Reactors!
-Brian Bradley

Thank You for taking the time to teach us about Nuclear Power, I enjoyed me very much!
-Matt McClain

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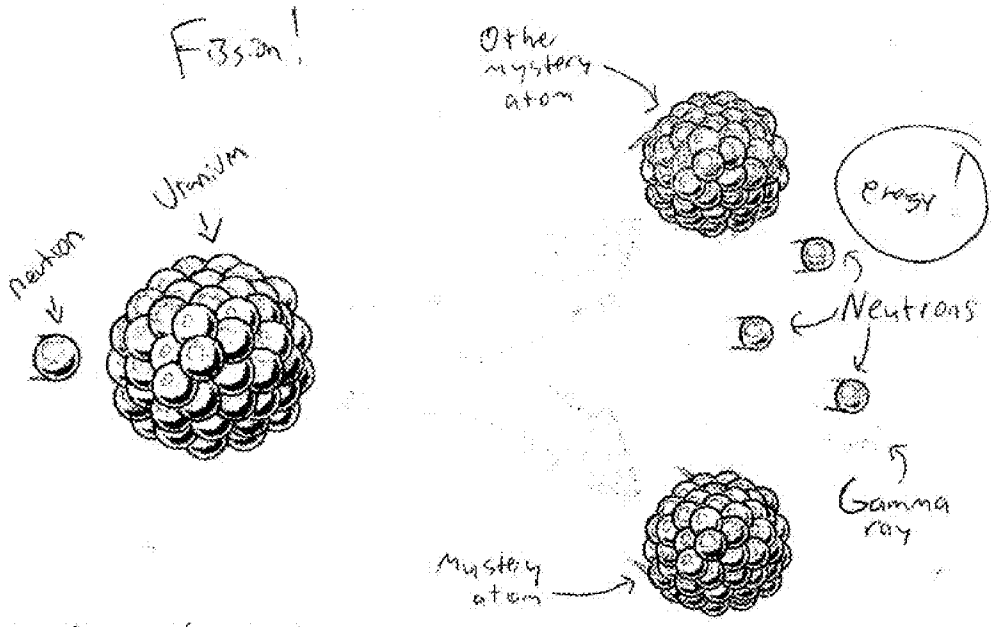

Thank you for coming and talking to us about nuclear power. I really enjoyed it and learned a lot.
-Scott McSweeney

Thank you for coming-
Mason

Thank you for taking time out to talk to us about nuclear energy as a reliable source of power!
-Brianna

Thank you for coming and teaching us about nuclear power. —Chris

Wooo Nuclear Power

Thanks
David

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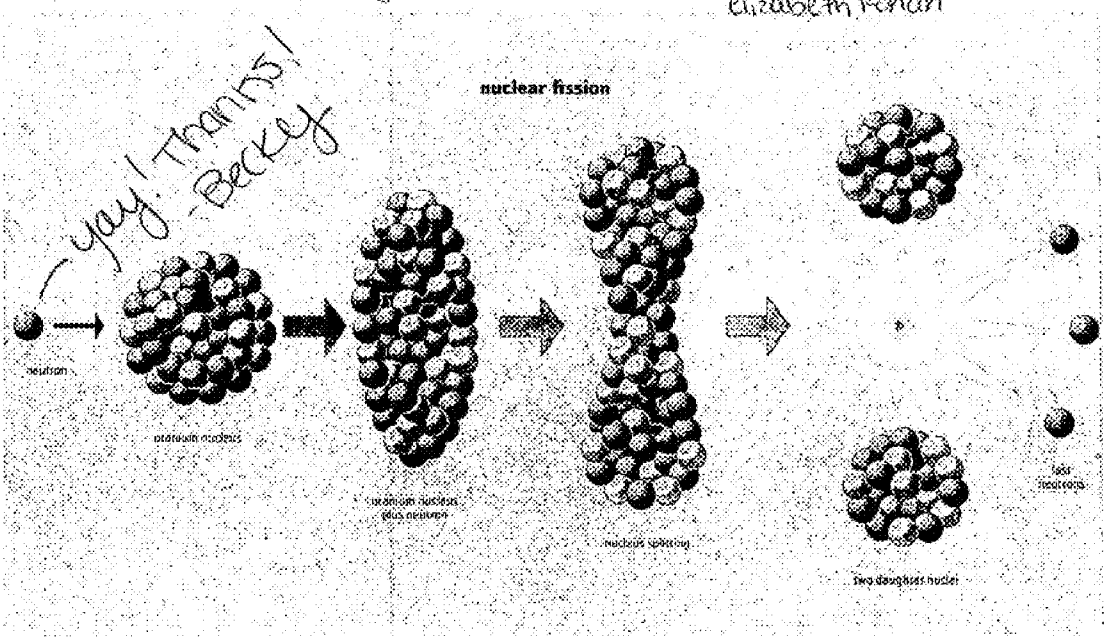
Thanks for coming. I enjoyed your presentation. -Mike

Thank you very much for coming and teaching us about nuclear power. It was very interesting and I learned a lot! Thanks Again Elizabeth Ronan

yay! Thanks! -Becky



Thanks for coming! It was really interesting to learn how safe Nuclear energy is! -Nick Pesqua

Thanks you really convinced me that nuclear energy is totaly safe -Andrew Difabbio

I love nuclear energy! -Mark Schweig

Thanks for coming -Dan

Thanks for spending time teaching us about nuclear power -Sam Watkins

Thank You -Paul Williams IV

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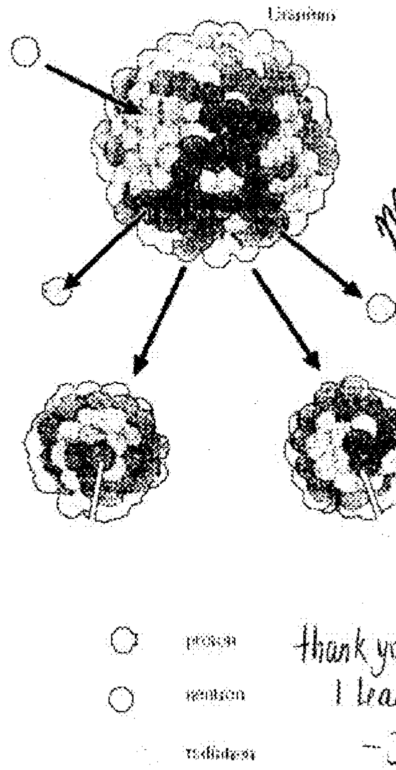

Nuclear energy is
cool... And scare you!
- Corey

Dear Mr. Falciano,
Thank you for teaching
the class how we can
solve the energy problem,
and teaching me facts
when I want to continue
defending Nuclear power.
- Justin
Laterrden

Mr. Falciano,
Thanks for coming
to NRHS to talk to us.
I really learned a lot
from you and enjoyed
the presentation!
- Mike

thank you for coming!
I learned a lot
- Julia

Dear Mr. Falciano,
I really enjoyed
your presentation. I
really learned a lot
about Nuclear power.
- Mia

Dear Mr. Falciano
when I came here
I thought this was
something I would
get bored. But I fund
it very interesting.
I see it to be very
sempely how energe is
made. I engoyed your
speech an you were abel
To anser all my questions
Thank you for coming
- Giovanni Gomez

Dear Mr. F,
I'm glad that you were able
to clear up all the confusion's
about nuclear power
— Max Langer

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OAGI0001367E_00275

MR. VITALE: Good afternoon, my name is Paul Vitale. I'm vice president of the government relations for the Business Council of Westchester. Business Council of Westchester is Westchester's largest business organization, representing over 1200 members ranging in size from large multinational corporations and mid-size businesses to professional firms not for profit organizations and small-business owners in every sector of the county's diverse economy. The economic situation in Westchester is increasingly distressing. As such, the closure of Indian Point, which is the backbone of Westchester County and the lower Hudson Valley's electricity network, would be economically devastating. It should be emphasized that Indian Point provides more than 75% of the electricity consumed within the lower Hudson Valley. Indian Point contributes over $50 million paid in local taxes, including sales taxes, payroll taxes, property taxes and state and local income taxes. Losing Indian Point could potentially cause major power disruptions, the loss of up to 11,000 jobs and $2.1 billion in cumulative lost wages, while Westchester's unemployment rate continues to increase. 169-a-AL/ EC/SO

The closure of Indian Point could result in the doubling of the electricity rates of the second highest rates that New York homeowners and businesses currently pay. Many 169-b-AL/ AQ/EC

businesses in Westchester County already having trouble managing their increasing costs, including the cost of reliable electricity. The alternatives laid out to replace Indian Point do not make sense economically or environmentally for this region. Replacing Indian Point with any fossil fuel equivalent would greatly increase the carbon emissions of the region at a time when we can ill afford to do so. Indian Point has been very important to this region and our communities. The renewal of the operating license for Indian Point is crucial more than ever before. Thank you for the chance to address this audience.

169-b-AL/ AQ/EC contd.

IPRenewalCEmails ML090780761

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From: Marion Walsh [marionwalsh@optonline.net]
Sent: Thursday, March 19, 2009 12:03 AM
To: IndianPointEIS Resource

To the Nuclear Regulatory Commission:

I offer the following comments to the draft plant-specific supplement to the Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS), NUREG-1437, regarding the renewal of operating licenses DPR-26 and DPR-64 for an additional 20 years of operation for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (IP2 and IP3), as a concerned citizen, a parent, and a resident of Cortlandt Manor since 1995. I presently serve on the Board of Education of the Hendrick Hudson School District but am commenting as a concerned individual.

I respectfully request that the Nuclear Regulatory Commission reject the conclusion that there are no environmental impacts that would preclude renewal of the operating license for the Indian Point nuclear power plant. Further, the NRC should reject the draft EIS as legally insufficient. 170-a-OR

The supplement to the Generic Environmental Impact Statement (GEIS), which is being issued for public comment that purportedly addresses the potential environmental impacts specific to the Indian Point plant site (Supplement 38 to the GEIS), quite frankly, shocks the conscience in its superficial analysis.

I. There is no Specific Analysis of the Environmental Impact of the Continued Operation of IP2 and IP3 on Children in the area

While I recognize that children are included in the analysis of the effects of radiation on the general population, radiation risks pose the greatest risk to children. The draft EIS only mentions the following about children:

"IP2 and IP3 are located in the Hendrick Hudson Central School District, Westchester County, 10 which had an enrollment of approximately 2800 students in 2003. Including the Hendrick 11 Hudson Central School District, Westchester County has 40 school districts with a total 12 enrollment of approximately 147,000 students".

This is inadequate. 170-b-HH

II. The Draft EIS Does not Adequately Consider the Growth in Population

The Draft EIS has acknowledge that approximately 16,791,654 people live 8 within 50 mi (80 km) of IP2 and IP3 (Entergy 2007a). This equates to a population density of 2138persons per sq mi (825 persons per sq km). The Draft EIS has acknowledged that IP2 and IP3 are located in a high-population area. Further, county populations are expected to continue to grow in all four counties in the next decades although Westchester County's population is expected to increase at a lower rate. However, the Draft EIS does not adequately consider this population growth, particularly in planning for a severe accident. 170-c-PA/SM

III. The NRC should Reconsider Severe Accident Mitigation Alternatives

In the relicensing of an aging nuclear facility, at the very least, the NRC should be more vigilant in assessing cost measures and not engage in a pro forma, deferential analysis of the costs of safety design measures provided by the plant owner. The environmental assessment should at least basis, besides costs, for not incorporating severe accident mitigation design alternatives. 170-d-SM

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Pursuant to 10 C.F. R. , § 51.30 an environmental assessment for a standard design certification must identify the proposed action, and will be limited to the consideration of the costs and benefits of severe accident mitigation design alternatives and the bases for not incorporating severe accident mitigation design alternatives in the design certification. An environmental assessment for an amendment to a design certification will be limited to the consideration of whether the design change which is the subject of the proposed amendment renders a severe accident mitigation design alternative previously rejected in the earlier environmental assessment to become cost beneficial, or results in the identification of new severe accident mitigation design alternatives, in which case the costs and benefits of new severe accident mitigation design alternatives and the bases for not incorporating new severe accident mitigation design alternatives in the design certification must be addressed.

Accordingly, I respectfully request that the NRC at the very least reconsider the benefits at least some of the following severe accident mitigation alternatives for IP2 and IP3 and not reject them only because the costs outweigh the associated benefits:
SAMA 9—Create a reactor cavity flooding system to reduce the impact of core-concrete interaction from molten core debris following core damage and vessel failure (cost beneficial in revised analysis, with uncertainties).
SAMA 28—Provide a portable diesel-driven battery charger to improve direct current (dc) power reliability. Safety-related disconnect would be used to change a selected battery. This modification would enhance the long-term operation of the turbine-driven auxiliary feed water (AFW) pump on battery depletion.
SAMA 44—Use fire water as backup for steam generator inventory to increase the availability of steam generator water supply to ensure adequate inventory for the operation of the turbine-driven AFW pump during SBO events (cost beneficial with uncertainties).
SAMA 53—Keep both pressurizer power-operated relief valve block valves open. This modification would reduce the CDF contribution from loss of secondary heat sink by improving the availability of feed and bleed (cost beneficial in revised analysis, with uncertainties).
SAMA 54—Install a flood alarm in the 480-volt (V) alternating current (ac) switchgear room to mitigate the occurrence of internal floods inside the 480-V ac switchgear room.
SAMA 56—Keep residual heat removal (RHR) heat exchanger discharge valves, motor26 operated valves 746 and 747, normally open. This procedure change would reduce the CDF contribution from transients and LOCAs (cost beneficial with uncertainties). SAMA 60—Provide added protection against flood propagation from stairwell 4 into the 480-V ac switchgear room to reduce the CDF contribution from flood sources within stairwell 4 adjacent to the 480-V ac switchgear room.
SAMA 61—Provide added protection against flood propagation from the deluge room into the 480-V ac switchgear room to reduce the CDF contribution from flood sources 33 within the deluge room adjacent to the 480-V ac switchgear room.
SAMA 65—Upgrade the alternate safe shutdown system to allow timely restoration of reactor coolant pump seal injection and cooling from events that cause loss of power from the 480-V ac vital buses.

IP3:
SAMA 30—Provide a portable diesel-driven battery charger to improve dc power reliability. Safety-related disconnect would be used to change a selected battery. This modification would enhance the long-term operation of the turbine-driven AFW pump on battery depletion.
SAMA 52—Proceduralize opening the city water supply valve for alternative AFW system pump suction to enhance the availability of AFW system.

170-d-PA/SM contd.

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SAMA 53—Install an excess flow valve to reduce the risk associated with hydrogen explosions inside the turbine building or primary auxiliary building (cost beneficial in revised analysis, with uncertainties).
SAMA 55—Provide the capability of powering one safety injection pump or RHR pump using the Appendix R diesel (MCC 312A) to enhance reactor cooling system injection 12 capability during events that cause loss of power from the 480-V ac vital buses.
SAMA 61—Upgrade the alternate safe-shutdown system to allow timely restoration of reactor coolant pump seal injection and cooling from events that cause loss of power from the 480-V ac vital buses.
SAMA 62—Install a flood alarm in the 480-V ac switchgear room to mitigate the occurrence of internal floods inside the 480-V ac switchgear room.

170-d-PA/SM contd.

IV. The Ground Water Issue Requires Further Research

One of the key points on the abnormal leak and ground water monitoring program: The draft EIS states that "*[t]he annual calculated exposure to the maximum exposed hypothetical individual, based on application of Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Release of Reactor Effluents for the Purpose of Evaluation Compliance with 10 14 CFR Part 50, Appendix I," relative to the liquid effluent aquatic food exposure pathway is currently, and expected to remain, less than 0.1 % of the NRC's "As Low As is Reasonably Achievable (ALARA)" guidelines of Appendix I of Part 50 (3 mrem/yr (0.03 mSv/yr) total body and 10 mrem/yr (0.1 mSv/yr) maximum organ), which is considered to be negligible with respect to public health and safety, and the environment.* This is by no means certain, and as noted by its own terms, is hypothetical. The NRC should require further research.

TThe National Research Council (2006) noted, for example, that ". . . the additional 2 GW required if IP2 and IP3 were to be closed could be met by some suitable combination of new generation in the New York City area, efficiency improvements and demand-side management, and new transmission capability from upstate." This is not a certain statement because the exact effects of the additional GW into the environment are unknown.

170-e-LE/WA

Conclusion

Essentially, the NRC staff has not identified any new and significant information during its independent review of the IP2 and IP3 ER, the site audit, the scoping process, or evaluation of other available information. Therefore, the NRC staff concludes that there are no offsite radiological impacts (individual effects) of the uranium fuel cycle during the renewal term beyond those discussed in the GEIS. Essentially, the NRC is concluding that because it has not identified impacts in the past, none exist for the future. This is unsound for several reasons:
The population in the area has incaof the last twenty years is new, and the NRC, should at the very least acknowledge that the plant does pose a risk to an increased number of people if a severe accident occurs. Moreover, the radiation released from the plant poses a risk to a greater number of people.

170-f-HH/PA/UF

The NRC staff concludes that the socioeconomic impacts of plant shutdown would likely be small and have moderate effects for the Hendrick Hudson Central School District, Village of Buchanan, Town of Cortlandt, and the Verplanck Fire District. I agree with this assessment and believe that the increased safety and vitality to our area if Indian Point shuts down would more than compensate for the lost revenues. I respectfully

170-g-AL

I oppose relicensing Indian Point because I believe that the continued operation of an aging nuclear power plant in such a heavily populated area creates an unreasonable risk of harm to citizens, most of all to the most vulnerable individuals, our children. At the very least, the NRC owes a duty to those living in the shadow of IP 2 and IP3 to conduct a more thorough, searching analysis, particularly of the impacts of a severe accident as

170-h-HH/OR

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well as day-to-day low levels of radiation. I urge you to please recognize that the health and safety of, literally, millions of citizens rely on this statement to consider all environmental impacts, including those of a catastrophic accident. The meet the requirements of the law to serve public safety and is unduly deferential to the plant owners and operators. I respectfully request that the NRC reject the Draft EIS as deficient as a matter of law and conduct further research.

170-h-HH/OR contd.

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Marion Walsh
16 Flanders Ln.
Cortlandt Manor, NY 10567
ph: (914)739-6484

MS. WALTZER: Hi. In considering whether Indian Point should remain open or not, I'd like us to look to the past and to the future. From sitting here tonight, I realize how very important job issue is to so many people. And it's a valid issue. But I want to remind you that when we had sailboats and we went into steam boats, those sailors didn't lose their jobs. When we had horses and went to cars, people still kept their jobs. They might have changed to something more for the future. But we still keep our jobs. They just change. The other thing I would like to remind you is that this is a human issue. These are human beings that are running Indian Point as any nuclear power plant. I'd like you to think of any realm of human endeavor. Whether it's business, government, financial institutions, religious organizations, sports, politics, the arts, the space program, even in families. We're human beings. And we are subject to making mistakes. To corruption. To sabotage. To blackmail. We're vulnerable to terrorism. We make errors and so on. So I'd like to ask you, what makes you think that this aging, leaking power plant would be immune to all of these human frailties? Thank you.

171-a-SO

171-b-PA/ST

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IPRenewalCEmails

From: Jeff Wanshel [jwanshel@earthlink.net]
Sent: Wednesday, March 18, 2009 12:34 PM
To: IndianPointEIS Resource
Subject: Indian Point environmental impact comment

To the Nuclear Regulatory Commission, in re theenvironmental impact of relicensing Indian Point.

Every so often, in the moral life of those in a position of responsibility, a defining moment comes along disguised as business-as-usual.

The reactors at Indian Point have released more radioactive gases than almost any other operating nuclear facility. In so doing they have polluted the area with radioactivity. It's not a question of whether the plants have contaminated the environment, but of how much, and long-term consequences. Strontium-90 emitted by this facility has been found in fish and the bodies of citizens - mother's milk - in Westchester County and New York State. Small but continued releases, as measured at the source, may have large consequences for living organisms - cancer - due to constant exposure through repeated ingestion and internalization of radioactive particles. If the Commission cared to fund a study of radioactive contamination in living organisms surrounding the plant, it would find radioactivity moving right up the food chain. Measurements of fish and swallow eggs adjacent to another nuclear facility showed concentrations a million times radioactive content in the water. But a government body intent on subverting the intent of its charter - to protect the public - will not want to look for what it does not want to find. This facility is not only a disaster waiting to happen, it's a disgrace that has happened already. 172-a-HH/RI

Called a "nightmare" by a past NRC commissioner, the siting of these plants, in the midst of the greatest concentration of humanity of any operating facility, close to the most vital city, economically, in this country, in an area that cannot be evacuated in timely fashion, if at all, is an outrage permitted only by the willful deliberate blindness of the sitting Commission. Perhaps those who originally sited it here might now say, we couldn't foresee the future. We didn't know. The sitting committee has no such excuse. 172-b-DE/EP

As is surely known to this Commission, an Al Queda operative flatly stated Indian Point was the original 9/11 target, but that target was changed because of the scale of the damage a successful strike would entail. Thanks to long-term storage of immortal lethal toxins at the facility - the almost unimaginably radioactive contents of the spent fuel pools - no other U.S. facility has the capacity to destroy the country's economy and security via a single terrorist blow. Indian Point, and this country, were on 9/11, and are now, thanks to the NRC, living in the shadow of those planes. 172-c-ST

You took an oath to serve and protect the public. You must now find it within you to observe, not willfully obfuscating limitations that conveniently state such-and-such need not be considered so as to protect the nuclear industry, but the spirit and intent of that oath. This is not, must not be, another of the Commission's run-of-the-mill industry-yes-man rubber-stamp deliberations. This decision is vital to the health and well-being of all citizens in the tri-state area - and perhaps, if terrorism returns to these shores, the future economic well-being of every American. 172-d-LR

Fulfill, do not willfully violate, your oath. Make the right choice. History may judge you.

Respectfully,

Jeff Wanshel

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IPRenewalCEmails ML 0960438?

From: Roxanne Warren Architects [rwaa@verizon.net]
Sent: Friday, February 27, 2009 11:00 AM
To: IndianPointEIS Resource
Subject: close down Indian Point

to:

Chief, Rulemaking, Directives and Editing Branch
Division of Administrative Services
Office of Administration, Mailstop T-6D59,
U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001

The Indian Point nuclear plant represents an extreme danger, located so close to our major American city, New York. Not only evacuation plans are incomplete for people immediately surrounding the plant, but the plant represents a tempting target for terrorists. This is in addition to the ongoing environmental damages to the Hudson River as a habitat for fish. } 173-a-AE/EP/ST

The plant should be closed down and replaced by extensive wind farms. } 173-b-AL/OR

Thank you for considering my request.

Roxanne Warren, AIA
523 West 112th Street
New York, NY 10025-1880

ML090700177

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IPRenewalCEmails

From: Ellen Weininger [eeweininger@gmail.com]
Sent: Tuesday, March 10, 2009 4:20 PM
To: IndianPointEIS Resource
Subject: re: Indian Point Draft EIS

Sent by email, March 10, 2009

Chief, Rules Review and Directives Branch
U.S. Nuclear Regulatory Commission
Mail Stop TWB-05-B01
Washington, DC 20555-0001

Dear Panel:

The Draft EIS fails to properly and fully evaluate the long-term and cumulative effects upon human health of the planned and unplanned releases of radiation into the air, soil, groundwater and Hudson River. The Draft EIS further completely fails to look at the impact upon human health of the synergistic interactions of such radiation with other known toxins which are known to have been released into the regional environment, most notably the PCBs and mercury in the Hudson River.

174-a-HH/RI

The Draft EIS utterly and appallingly ignores the impact upon the environment and human health of keeping spent fuel and other nuclear waste on site indefinately. The evidence available strongly supports the conclusion that the Indian Point site will, de facto, become a high level nuclear waste dump for the foreseeable future.

174-b-RI

Exposure to certain environmental toxins has been linked to a growing list of health problems in children, including cancer, certain types of birth defects and developmental disabilities. Children are being exposed to an increasing number of toxins in utero, as infants and as growing children. Due to various physiological and behavioral factors, children are uniquely vulnerable to these toxins and permanent adverse health effects may result from exposure during critical windows of physiological development.

174-c-HH

The Draft EIS fails to analyze seismic hazards. This is a manifest dereliction of the NRC's duty, especially in light of recent seismic activity in the region and recent studies conducted by Columbia University's Lamont-Doherty Earth Observatory which specifically note the potential threat to Indian Point.

174-d-PA

The cost/benefit analysis of the Draft EIS is incomplete and inadequate and constitutes a violation of NEPA. It relies upon the preposterous conclusion that a major nuclear accident need not be of concern, and even if one occurred, it would not have a significant effect on the environment or public health. This flies in the face of the United States government's (including the NRC's) own former analyses. The NRC must include the postulation of a major radioactive release -- including the possibility of a meltdown and spent fuel fire -- in its cost/benefit analysis.

174-e-NE/PA

The Draft EIS is defective in neglecting to evaluate the environmental risks inherent in the realities that the operator and the NRC have acknowledged that it is not feasible to fully inspect the fuel pools, the buried and embedded piping, critical electrical wiring, or the dome, where rust has already been detected.

174-f-GI/OM

The Draft EIS is defective in neglecting to evaluate the environmental risks inherent in an aging nuclear facility which has already demonstrably shown signs of deterioration. The NRC's disregard of aging as a separate crucial factor, and its reliance upon "aging management" as a failsafe for finding all potentially critical problems, not only flies in the face of standard engineering risk analysis, but is belied by the actual experience at the plant.

174-g-AM

The Draft EIS is defective in neglecting to evaluate the environmental risks created by the fireproofing exemptions given by the NRC to Indian Point.

174-h-SA

The Draft EIS is inadequate, incomplete, and cursory and fails to evaluate the options for obtaining electricity by clean, sustainable forms of energy (e.g., through solar, wind, geothermal, small hydro) or for dramatically reducing consumption (e.g., through efficiency technologies, reducing energy waste, and green buildings). The final EIS must properly evaluate the No Action Alternative.

174-i-AL

The failure of the NRC to acknowledge the above is wreckless and ill-advised and represents a complete disregard of the NRC mandate to protect human health and the environment and strongly suggests that the Draft EIS is merely a rubberstamp for Indian Point's relicensing. Substantial evidence of harm must be the trigger for action to protect innocent lives and to reject Indian Point's application for relicensing.

174-j-OR

Sincerely,
Ellen Weininger
White Plains, New York 10606

IPRenewalCEmails ML 090720072

From: annettew8@optimum.net
Sent: Wednesday, March 11, 2009 10:12 AM
To: IndianPointEIS Resource
Subject: Do not renew their license to run Indian Point

Dear Sir or Madam,
I urge you not to renew Indian Points nuclear plant license. The management has been very lax in running the plant. There are too many people in the area who are at risk for great harm because of the accidents waiting to happen. 175-a-OP/OR/PA
Sincerely,
Annette Weininger
75 Brook Hills Circle
White Plains NY 10605

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IPRenewalCEmails ML 090700183

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From: Dava Weinstein [d2calstein@earthlink.net]
Sent: Monday, March 09, 2009 8:31 PM
To: IndianPointEIS Resource
Subject: Opposition to license renewal of Indian Point

Dear NRC,

We would like to register our **opposition to the license renewal of Indian Point**, and are concerned with the following environmental impacts outlined by Riverkeeper: 176-a-OR

--The slaughter of billions of fish, eggs and shvae every year that results from Indian Point's outdated cooling water intake system, which uses billions of gallons of Hudson River water every day to keep the plant running. 176-b-AE
--The killing of shortnose and Atlantic sturgeon when they are trapped against the cooling water intake screens. Shortnose sturgeon are listed as an endangered species under the federal Endangered Species Act. 176-c-AE
--The continuing leak of radioactive water from the Indian Point 2 spent fuel pool into the groundwater and Hudson River, and the residual contamination caused by the plumes of contaminated groundwater that slowly leach toxic strontium-90 and cesium-137 into the Hudson River. 176-d-LE
--The long term storage of thousands of tons of highly toxic nuclear waste on the banks of the Hudson River, currently housed in poorly maintained spent fuel pools and "dry casks" that are vulnerable to terrorist attack. 176-e-RW/ SF/ST

We depend on regulatory bodies like yours to make our New York communities safer and more sustainable. Indian Point is too old with too many insurmountable problems to continue with its license. Thank you for your attention and we await your just action. 176-f-OR

Sincerely, Dorothy Calvani
Dava Weinstein

MR. WILSON: Thank you. Good evening. My name is Craig Wilson. I am the Executive Director of SHARE. SHARE is a non-profit coalition of organizations that are committed to ensuring the continued supply of reliable clean and affordable electricity for all New Yorkers. We're especially pleased today that we have members of SHARE that made the trip from various parts of the city: Brooklyn, many of our folks are from. May you all have a round. And some great signs too that you can show. For too long high electricity prices have placed an undue economic burden on New York's families and businesses. While poor air quality has led to high asthma rates which place our most vulnerable at risk. Right now, as we all are too well aware, we are in the midst of a most severe economic crisis since the Great Depression. Community residents, small businesses and working men and women from communities across the region are struggling. And yet there is a light at the end of the tunnel that we can see right now. Recognizing the turmoil within our economy, now is not the time to shut our source of clean, safe and affordable power for the region.

177-a-AQ/ EC/SO

As much as 40% of our power, used for everything from our schools, hospitals and businesses comes from the Indian .Energy Center. If it were to be closed, it is estimated that electricity costs for small, excuse me, electricity costs for small businesses could rise as much as $10,000 annually, while

177-b-EC

individual residences would pay an additional $1500 a year. Our members simply are not able to pay these dramatically higher electricity bills particularly in these economic times. Beyond the financial benefits, the Indian Point Energy Center greatly reduces the amount of pollution emitted into our air. Unlike all other power plants within the region, Indian Point does not release asthma causing pollutants or greenhouse gases into the atmosphere. This is of great benefit to our air quality as nearly all the counties served by Indian Point consistently have their air-quality rated an `F` by the American Lung Association. Clearly, we need more clean energy facilities like Indian Point, not fewer. Moreover, many of the members of our members live in low-income communities where asthma rates are four times the national average. And one in four children suffer from this serious life altering disease. Nearly one third of New York City children with asthma reside in the Bronx with neighborhoods like Hunts Point and Mont Haven having among the highest asthma rates in the country. For these reasons, SHARE and its member organizations, firmly support the continued operation of the clean, safe and secure Indian Point Energy Center. Additionally, we are committed to working with local stakeholders in the New York metropolitan area to provide to provide all New Yorkers with the clean and affordable power they deserve. Thank you.

177-b-EC contd.

177-c-AQ

177-d-AQ/ EJ/SR

SHARE SAFE HEALTHY AFFORDABLE RELIABLE ENERGY

WWW.SHARENY.ORG

Mr. Andrew Stuyvenberg
Environmental Project Manager
Division of License Renewal, Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Stop 0-11F1
Washington, DC 20555-0001

RE: February 12, 2009 Public Hearing on the Relicensing of the Indian Point Energy Center

Good evening, my name is Craig Wilson and I am the Executive Director of SHARE. SHARE is a non-profit coalition of organizations committed to ensuring the continued supply of reliable, clean and affordable electricity for all New Yorkers. For too long, high electricity prices have placed an undue economic burden on New York's families and businesses, while poor air quality has led to high asthma rates which place our most vulnerable at risk.

Right now, as we are all too well aware, we are in the midst of the most severe economic crisis since the Great Depression. Community residents, small businesses and working men and woman from communities across the region are struggling. And as of right now, there isn't yet light at the end of the tunnel.

177-a-AQ/EC/SO

Recognizing the turmoil within our economy, now is not the time to shutter a source of clean, safe and affordable power for the region. As much as 40% of our power, used for everything from our schools, hospitals and businesses, comes from the Indian Point Energy Center. And if it were to be closed, it is estimated that electricity costs for small businesses would rise $10,000 annually while individual residences would pay an additional $1,500. Our members are simply not able to pay these dramatically higher electricity bills, particularly in these economic times.

177-b-EC

Beyond the financial benefits, the Indian Point Energy Center greatly reduces the amount of pollution emitted into our air. Unlike all other power plants within the region, Indian Point does not release asthma causing pollutants or greenhouse gases into the atmosphere. This is of great benefit to our air quality as nearly all of the counties served by Indian Point consistently have their air quality rated an F by the American Lung Association. Clearly, we need more clean energy facilities like Indian Point, and not fewer.

177-c-AQ

Moreover, many of members live in low-income communities where asthma rates are four times the national average and one in four children suffer from this serious, life-altering disease. Nearly one-third of New York City children with asthma reside in the Bronx, with neighborhoods like Hunts Point and Mott Haven having among the highest rates of asthma in the country.

For these reasons, SHARE, and its member organizations, firmly support the continued operation of the clean, safe and secure Indian Point Energy Center. Additionally, we are committed to working with local stakeholders in the New York metropolitan area to provide all New Yorkers with the clean and affordable power they deserve. Thank you.

177-d-AQ/EJ/SR

445 HAMILTON AVENUE
SUITE 1102
WHITE PLAINS, NY 10601
PHONE: (914) 422-8042
FAX: (914) 422-0282

305 BROADWAY
14TH FLOOR
NEW YORK, NY 10007
PHONE: (212) 897-5842
FAX: (212) 897-5827

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IPRenewalCEmails ML090640359

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From: Leigh Willnow [leighw79@gmail.com]
Sent: Friday, February 27, 2009 3:56 AM
To: IndianPointEIS Resource
Subject: Do not relicense Indian Point.

Do Not relicense Indian Point. 20 more years of contamination will only get worse!

The continuing leak of radioactive water from the Indian Point 2 spent fuel pool into the groundwater and Hudson River, and the residual contamination caused by the plumes of contaminated groundwater that slowly leach toxic strontium-90 and cesium-137 into the Hudson River.

The long term storage of thousands of tons of highly toxic nuclear waste on the banks of the Hudson River, currently housed in poorly maintained spent fuel pools and "dry casks" that are VULNERABLE.

178-a-LE/OR/RW

Leigh Ann Willnow

MR. WOLF: Good afternoon. While I am certainly sympathetic to the comments that have been made about the environment, I believe this meeting is about the environment and specifically the environmental statement. Rather than going through the thousand of pages of material, I'd like to get back to basics. Because sometimes we're so inundated by the information that is contained in these documents that we lose sight of what we really need to consider and what the NRC needs to consider. The NRC's 2008 citizen's report states that the NRC's vision is quote excellence in regulating the safe and secure use and management of radioactive materials for public good unquote. They also say that their number one strategic goal is safety, as evidenced by the first strategic outcome, which is to quote prevent the occurrence of any releases of any radioactive materials that would result in significant radiation exposures unquote and/or quote adverse environmental impacts unquote. Which is on page 8. Their factors, which singley or certainly in combination, create an untenable environmental risk regarding the releases of radioactive material regarding Indian Point. Including but not limited to number one: the type of above ground storage of spent fuel.

179-a-SA/ SF/RW

Again this report on page 7 says, typically the spent fuel from nuclear power plants is stored either in water filled pools at each reactor site or as a storage facility in Illinois unquote. And that quote several nuclear power plants have also begun not using dry-cask to store spent fuel and that the heavy metal in concrete casks rests on concrete pads adjacent to the reactor facility. My understanding is that this type of storage is not as safe as underground in water. Now, we know that a lot of this has come because Yucca Mountain cannot accept the nuclear waste that was envisioned when the plant was created. But nonetheless, we have to deal with the reality of what this means in storing these casks above ground.

179-a-SA/SF/RW contd.

Two: the unusual high number of leaks or shutdowns and other indications of mismanagement of the facility has compromised the safety for the community around it and the apparent continuation of its radioactive leaks is indicated that Indian Point is not responsibly dealing with the environmental and safety aspect of this plant.

179-b-LE/OP/SA

Three: the plant falls on a fault-line creating an earthquake risk, which means that if there is an earthquake and storage facilities are not adequate that radiation will go throughout the community.

179-c-PA

Four: again, it's not Indian Point's initial problem because they didn't build the plant, but the fact is that it is perilously close to high population areas. 179-d-DE

Five: there is the possibility of the continuation of radioactive leaks and further contamination into the Hudson River. 179-e-LE/WA

Six: even though we're now in the year 2009, the threats that were created in 2001, still exist and are still a problem, especially when you're talking about aboveground storage of spent nuclear waste. 179-f-RW/SF/ST

And seven: we don't know and I don't think from what I've seen that the report adequately deals with the fact that you're now going to have a plant that's 40 to 60 years old. And we don't have a very good safety record dealing with the first 40 years, and I think that the NRC needs to look at this as well. 179-g-AM

We all take risks every day. Even driving here to make this statement involved risk. But we must evaluate the risk/reward ratio and make a determination. The NRC also must make a determination as to the continued safety and viability of having Indian Point operate for another 20 years. Based on the risks outlined above as well as other risks that have been discussed in these reports, it would 179-h-OR/SA

seem incumbent upon the Nuclear Regulatory Commission in its primary goal of excellence in regulating safe and secure management of radioactive materials for the public good to turn down the application for the re-licensing of Indian Point. Thank you.

179-h-OR/SA contd.

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25 Main Street – Suite B
Hastings-on-Hudson, NY 10706
March 17, 2009

VIA OVERNIGHT COURIER and E-MAIL

Nuclear Regulatory Commission
11545 Rockville Pike – Room T-6D559
Rockville, MD 20852

Attn: Chairman Dale E. Klein

re: Environmental Impact Statement: License Renewal Application: DPR-26 & DPR-64
Indian Point Nuclear Generating Units 2 and 3 – Buchanan, NY (owned by Entergy)

Dear Mr. Klein:

These comments are in response to the Environmental Impact Statement (EIS) prepared as part of the re-licensing process regarding the application by Entergy for a 20 year extension to continue operating Indian Point Units 2 & 3.

It appears that the full import of some critical environmental factors is not properly considered in the EIS, and should be a vital part of the NRC's review process; the factors of particular concern include, but are not limited to:

- Close proximity to a densely populated area (24 miles north of New York City),
- Location on a fault line, which has shown recent earthquake activity,
- Potentially Attractive Target to Terrorists,
- Manner in which Nuclear Waste is stored above ground,
- Continued Operation continuing to kill aquatic species in the Hudson River,
- History of Leaks & Shutdowns about 5 times higher than the national average,
- Unknown risks attendant with additional 20 years operation for this Facility,
- No credible study of the effects of different types of "accidents" at Indian Point on surrounding areas, especially considering the history of other nuclear accidents

179-i-OE

If the NRC ignores does not properly consider the above environmental factors, then it would seem that it cannot fulfill its self-stated vision of "Excellence in regulating the safe and secure management of radioactive materials for the public good."

I strongly urge the NRC fully consider the environmental factors, which were and which should have been discussed in the EIS, in determining whether to re-license the two Indian Point units.

Sincerely Yours,

Peter D. Wolf

IPRenewalCEmails ML090700178

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From: Patti Wood [pjw@grassrootsinfo.org]
Sent: Tuesday, March 10, 2009 4:02 PM
To: IndianPointEIS Resource
Subject: Indian Point

To Whom it May Concern:

I write with the greatest concern over the operation of the ENTERGY nuclear power plant at Indian Point. My life's work involves the protection of humans from environmental hazards and I see too many innocent people as victims of large corporations that ignore the tremendous impact they are having on local populations by operating unsafe industries.

Please consider the following points as you proceed with the licensing process:

The Draft EIS fails to properly and fully evaluate the long-term and cumulative effects upon human health of the planned and unplanned releases of radiation into the air, soil, groundwater and Hudson River. The Draft EIS further completely fails to look at the impact upon human health of the synergistic interactions of such radiation with other known toxins which are known to have been released into the regional environment, most notably the PCBs and mercury in the Hudson River. — 180-a-HH/LE/RI

The Draft EIS is inadequate, incomplete, and cursory and utterly fails to evaluate the options for obtaining electricity by clean, sustainable forms of energy (e.g., through solar, wind, geothermal, small hydro) or for dramatically reducing consumption (e.g., through efficiency technologies, reducing energy waste, and green buildings). The final EIS must properly evaluate the No Action Alternative. — 180-b-AL

The Draft EIS fails to properly and fully evaluate the impact of Indian Point on the aquatic ecology of the Hudson River and related waterways, especially with respect to endangered species and the coastal zone. — 180-c-AE

The Draft EIS fails to evaluate the impact of global warming - including the projected warming of the Hudson River and the projected increase and severity of storms and flooding - upon Indian Point. Two examples. (1) The warming of the Hudson River will exacerbate the impact of the hot plume of water expelled by Indian Point into the river. (2) Increased storms and flooding will exacerbate the corrosion, rusting, etc. of underground piping and other systems at the plant, thereby increasing the likelihood of more accidental radiation releases such as the one discovered in February 2009. — 180-d-AM/GL

The Draft EIS fails to analyze seismic hazards. This is a manifest dereliction of the NRC's duty, especially in light of recent seismic activity in the region and recent studies conducted by Columbia University's Lamont-Doherty Earth Observatory which specifically note the potential threat to Indian Point. — 180-e-PA

The Draft EIS utterly and appallingly ignores the impact upon the environment and human health of keeping spent fuel and other nuclear waste on site indefinitely. The evidence available strongly supports the conclusion that the Indian Point site will, de facto, become a high level nuclear waste dump for the foreseeable future. — 180-f-RW

The cost/benefit analysis of the Draft EIS is incomplete and inadequate and constitutes a violation of NEPA. Notably, it relies upon the preposterous conclusion that a major nuclear accident need not be of concern, and even if one occurred, it would not have a significant effect on the environment or public health. This flies in the face of the United States government's (including the NRC's) own former analyses. The NRC must include the postulation of a major radioactive release -- the including the possibility of a meltdown and spent fuel fire - in its cost/benefit analysis. — 180-g-NE/PA

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The Draft EIS is defective in neglecting to evaluate the environmental risks inherent in the realities that the operator and the NRC have acknowledged that it is not feasible to fully inspect the fuel pools, the buried and embedded piping, critical electrical wiring, or the dome, where rust has already been detected. 180-h-GI/OM

The Draft EIS is defective in neglecting to evaluate the environmental risks inherent in an aging nuclear facility which has already demonstrably shown signs of deterioration. The NRC's disregard of aging as a separate crucial factor, and its reliance upon "aging management" as a failsafe for finding all potentially critical problems, not only flies in the face of standard engineering risk analysis, but is belied by the actual experience at the plant. 180-i-AM

The Draft EIS is defective in neglecting to evaluate the environmental risks created by the fireproofing exemptions given by the NRC to Indian Point. 180-j-OM

Thank you for your attention.

Patti Wood
Executive Director
Grassroots Environmental Education
52 Main Street
Port Washington, NY 11050
PH (516) 883-0887
FX (616) 944-8586
www.grassrootsinfo.org

MR. YANOFSKY: Boy, that's a tough act to follow and I'm in the performing arts. I'm violating the cardinal rule which is never follow a great act. But my name is John Yanofsky and I'm here under three auspices.

The first is I'm the executive director of the Paramount Center for the Arts, which is a non-profit organization housed in an historic theater built in 1930 located in downtown Peekskill. I'm also a board member of the Westchester Arts Council, which now goes by the name of Arts Westchester, which is a countywide organization that not only re-grants to non-profits throughout the county, but also does an extensive amount of direct services and programs out of their headquarters in downtown White Plains. And thirdly, I'm a homeowner and resident here in Peekskill.

I am here to strongly urge the renewal of the Indian Point license. The parent company of Indian Point, Entergy has been a model corporate citizen to the Paramount, to Arts Westchester, to dozens of arts organizations through out the region as well as non-profits. There are few corporations in the county who do more for the non-profit sector than Entergy. Their commitment to the quality-of-life issues that we all face is reflected in their demonstrative commitment to supporting essential programs and services that

181-a-SE/SR

non-profits like the Paramount provide and serve in the community and to our residents. Specifically with respect to the Paramount, Entergy was there for our organization during a very critical period when we began our revitalization and restoration of our historic theater and they were the lead supporter of our ability to renovate a historic theater, which now draws tens of thousands of people to downtown Peekskill to support local businesses and restaurants and have become, our theater has become a major anchor to the downtown revitalization in Peekskill. We could not have accomplished that without the support of Entergy.

I've also had the personal honor and privilege to serve with several Entergy employees in my role as a board member of Arts Westchester, as well as on the Board of Trustees at the Paramount Center. In addition to volunteers and colleagues that I've come into contact with, not only through my work at the Paramount, but in other organizations who donate their time and services to the quality-of-life and improving the quality of life in our county. Entergy's support is also instrumental to the vitality of other arts organizations, as I alluded to. And certainly, given our current financial situations becomes even more desperate and dire situation. For some organization's, Entergy's support

181-a-SE/SR contd.

really means and make the difference between staying open and closing its doors. As a business professional, as a resident of this county, someone who lives and works here and has dedicated his professional life to the ongoing improvement through culture and artistic expression, I strongly urge the NRC to re-license Indian Point for another 20 years and to keep Entergy a vital force in our communities and in the lives of our county. Thank you.

181-a-SE/SR contd.

IPRenewalCEmails ML090720678

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From: JUDITH YARME [yarmeco@aol.com]
Sent: Thursday, March 12, 2009 6:15 PM
To: IndianPointEIS Resource
Subject: re-licensing

To Whom it may Concern.

I attended a hearing of the NRC re: the re-licensing of the Indian Point plant for 20 more years. I was shocked. I thought Oh My God, the government agency meant to regulate and protect us, is in the pocket of industry.

Briefly, I don't believe that relicensing, for any period of time, should proceed before Entergy complies with all existing laws and regulations. Apparently, they have not addressed numerous leaks of radioactive material into the groundwater and into the Hudson. Now a new leak has been identified. This is strontium 90 we are talking about!

Daily fish kills are un-addressed, heated water being dumped back into the river is un-addressed. High and low level nuclear waste on site remains un-addressed, health concerns of citizens remains un-addressed.

More frightening still is the serious risk of terrorism against this power plant. It seems a wonderful target to those who would do us harm. It could turn New York City, and of course, a huge radius around the city, into a new Chernobyl. Clearly, there is no way to make this site, with it's stored nuclear waste, safe from an attack. And the arguments about the siren systems are ridiculous, there is no way to evacuate the area. All those close-in are already dead or dying if there is an attack, or even an accident.

The meeting I attended felt rigged and deceitful. There were groups of inner city people who were supporting the relicensing because they have clearly been coached that their utility rates would go up if this plant is not operating. Or more dirty coal plants will be placed in minority communities if this plant does not remain operational.

Scare tactics from the NRC? Unbelievable. They talked about the increases in the need for more energy for all the appliances we will want in the future. They belittled the options for sustainable energy.

There was scant mention of conservation, better distribution of existing power or scaling back on our thirst for more electricity.

These comments were couched in terms of the limits of alternatives.

If we are able to commit to solar, wind, wave, tidal, and other alternative energy in the future, there will be safer, cleaner and cheaper ways to provide power to the cities, particularly if we stop subsidizing dirty power, high risk power. Moving ahead with this old technology in the 21st century will take this country back in time. If Indian Point "needs" to continue, than at least only license for one year at a time, giving Entergy time to comply with the laws and fix the problems before offering them this huge 20 year extension.

Sincerely,

Judith Yarme, Gardiner New York

182-a-LE/OR

182-b-AE/HH/RW/SF

182-c-EP/ST

182-d-AL/EJ/OR

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IPRenewalCEmails ML090771344

From: yaronet1@aol.com
Sent: Monday, March 16, 2009 12:54 PM
To: IndianPointEIS Resource
Cc: nfo@riverkeeper.org
Subject: License Renewal

I live within the 10-mile radius of Indian Point and wanted to voice my concerns regarding the license renewal of Indian Point Units 2 and 3.

As a supporter of Riverkeeper, I totally agree with all the environmental hazard concerns already raised by this organization. The impact on Hudson River fish, spent fuel pool leaks of strontium-90, cesium 137, tritium and boric acid are unacceptable. The ever-increasing amount (1,500 tons currently?) of nuclear waste stored aboveground is dangerous and would only get worse if the license is renewed. Since the new administration has decided to slash its funding and not pursue the Yucca Mountain project, what is Entergy's plan for storage? 183-a-EP/HH/PA

I'd also like to know how Entergy monitors its 239-acre underground cable system, some of which was recently submerged under water. How can Entergy possibly detect, evaluate or prevent future problems with such an aging infrastructure? 183-b-AM/OM

I urge you to PLEASE not only focus on the above risks but also on the big picture and cumulative impacts of smaller issues and not overlook human considerations in the relicensing discussion. Whenever there's an incident at Indian Point, all we hear from the NRC is that "...it's safe; nothing significant; no need to worry...". Indian Point gets a "green" light every time! Meanwhile, we live in constant fear, ready to take our potassium iodide tablets, don our gas masks and run with our backpacks; but, where can we go? The so-called "evacuation plan" is totally useless in this heavily congested area. Even without a major incident at Indian Point, there are health threats involving thyroid and childhood cancer. And, to top it off, Indian Point sits above the Ramapo fault, which is not very comforting! 183-c-EP/HH/PA

Finally, the vulnerability of Indian Point to a terrorist attack is very scary. The new administration seems to have somewhat softened its position on terrorists as well as illegal aliens. This could adversely affect Indian Point security. 183-d-ST

Since I am sure, no matter what the public says, the NRC will renew Indian Point's license, I hope, at least, there will be a NO-FLY ZONE instituted over the plant; otherwise we will be forced to continue living with this ticking time bomb in our backyards!

Helen Yaroscak-Lanzotti
Yorktown Heights, New York

Appendix B

Contributors to the Supplement

Appendix B

Contributors to the Supplement

The Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, had overall responsibility for the preparation of this supplement, assisted by staff from other NRC organizations, AECOM, and Pacific Northwest National Laboratory.

Name	Function or Expertise
U.S. Nuclear Regulatory Commission	
Andrew Stuyvenberg	Environmental Project Manager/Alternatives
Rani Franovich	Branch Chief
David Wrona	Branch Chief
Bo Pham	Branch Chief
Andy Imboden	Branch Chief
Dennis Beissel	Hydrology/Water Use
Elizabeth Wexler	Ecology
Dennis Logan	Ecology
Briana Balsam	Ecology
Jeffrey Rikhoff	Socioeconomics/Land Use/Env. Justice
Jennifer Davis	Historical/Archeological Resources
Steve Klementowicz	Radiation Protection/Human Health
Andrew Carrera	Radiation Protection/Human Health
Ekaterina Lenning	Air Quality
Robert Palla	Severe Accident Mitigation Alternatives
Tina Ghosh	Severe Accident Mitigation Alternatives
Paula Cooper	Comment Resolution
April Bebault	Comment Resolution
AECOM	
Roberta Hurley	Project Manager
Kevin Taylor	Alternatives
Stephen Duda	Ecology
Stephen Dillard	Terrestrial Ecology

Name	Function or Expertise
Ed Kaczmarczyk	Air Quality
Matthew Goodwin	Historical/Archeological Resources
Robert Dover	Alternatives/Nuclear Fuel Cycle
Nicole Spangler	Project Coordinator
Katie Broom	Project Support
Bonnie Freeman	Administrative Support
Pacific Northwest National Laboratory	
Jeffrey A. Ward	Aquatic Ecology
Valerie Cullinan	Aquatic Ecology
Lance W. Vail	Hydrology/Water Use
Sandia National Laboratory	
Joseph Jones	Severe Accident Mitigation Alternatives
Nathan Bixler	Severe Accident Mitigation Alternatives
Fotini Watson	Severe Accident Mitigation Alternatives

Appendix C

Chronology of NRC Staff Environmental Review Correspondence Related to the Entergy Nuclear Operations, Inc.

Application for License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3

Appendix C

Chronology of NRC Staff Environmental Review Correspondence Related to the Entergy Nuclear Operations, Inc., Application for License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3

This appendix contains a chronological listing of correspondence between the U.S. Nuclear Regulatory Commission (NRC) and Entergy Nuclear Operations, Inc. (Entergy), and other correspondence related to the NRC staff's environmental review under Title 10, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions" of the *Code of Federal Regulations* (10 CFR Part 51), of Entergy's application for renewal of the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3. All documents, with the exception of those containing proprietary information, have been placed in the NRC's Public Document Room at One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland. These documents are also available electronically from the Public Electronic Reading Room found on the Internet at http://www.nrc.gov/reading-rm.html. From this site, the public can gain access to the NRC's Agencywide Documents Access and Management System (ADAMS), which provides text and image files of NRC's public documents in the Publicly Available Records component of ADAMS. The ADAMS accession numbers for each document are included below.

April 23, 2007	Letter to NRC from Entergy forwarding the application for renewal of operating licenses for Indian Point Nuclear Generating Units 2 and 3, requesting extension of operating licenses for an additional 20 years. (Accession No. ML071207512)
April 23, 2007	Letter to NRC from Entergy forwarding a copy of reference documents used in preparing the Environmental Report (Appendix E) for the Indian Point Nuclear Generating Units 2 and 3 license renewal application. (Accession No. ML071210108)
May 7, 2007	Letter to Entergy from NRC, "Receipt and Availability of the License Renewal Application for Indian Point Nuclear Generating Unit Nos. 2 and 3." (Accession No. ML071080133)
May 7, 2007	Letter to Ms. Patricia Thorsen, White Plains Public Library, from NRC, "Maintenance of Reference Materials at the White Plains Public Library Related to the Review of the Entergy Nuclear Operations, Inc., License Renewal Application." (Accession No. ML071070518)
May 7, 2007	Letter to Ms. Resa Getman, Hendrick Hudson Free Library, from NRC, "Maintenance of Reference Materials at the Hendrick Hudson

	Free Library Related to the Review of the Entergy Nuclear Operations, Inc., License Renewal Application." (Accession No. ML071080080)
May 7, 2007	Letter to Ms. Susan Thaler, The Field Library, from NRC, "Maintenance of Reference Materials at The Field Library Related to the Review of the Entergy Nuclear Operations, Inc., License Renewal Application." (Accession No. ML071080122)
July 25, 2007	Letter to Entergy from NRC transmitting "Determination of Acceptability and Sufficiency for Docketing, Proposed Review Schedule, and Opportunity for a Hearing Regarding the Application from Entergy Nuclear Operations, Inc. for Renewal of Operating Licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3." (Accession No. ML071900365)
August 6, 2007	Letter to Entergy from NRC, "Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process for License Renewal for Indian Pont Nuclear Generating Unit Nos. 2 and 3," and forwarding *Federal Register* notice. (Accession No. ML071840939)
August 9, 2007	Memorandum on "Forthcoming Meeting to Discuss Environmental Scoping Process for Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application." (Accession No. ML072180296)
August 9, 2007	Letter to New York State Office of Parks, Recreation, and Historic Preservation from NRC, "Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point) License Renewal Application Review (SHPO No. 06PR06720)." (Accession No. ML072130333)
August 9, 2007	Letter to Advisory Council on Historic Preservation from NRC, "Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072130367)
August 16, 2007	Letter to Mr. David Stillwell, U.S. Fish and Wildlife Service (USFWS), "Request for List of Protected Species Within the Area Under Evaluation for the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072130211)
August 16, 2007	Letter to Mr. Peter Colosi, National Marine Fisheries Service (NMFS), "Request for List of Protected Species and Essential Fish Habitat Within the Area Under Evaluation for the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072130388)
August 24, 2007	Letter to Mr. Andy Warrior, Absentee Shawnee Tribe of Oklahoma,

	"Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072250103)
August 24, 2007	Letter to The Honorable Maurice John, Cattaraugus Reservation, Seneca Nation, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072250171)
August 24, 2007	Letter to Mr. Clint Halftown, Cayuga Nation, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072250394)
August 24, 2007	Letter to Ms. Nikki Owings-Crumm, Delaware Nation, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072250459)
August 24, 2007	Letter to The Honorable Jerry Douglas, Delaware Tribe of Indians, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072250488)
August 24, 2007	Letter to The Honorable C.W. Longlow, Echota Chickamauga Cherokee Tribe of New Jersey, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072250534)
August 24, 2007	Letter to The Honorable Michael Thomas, Mashantucket Pequot Tribe, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072260033)
August 24, 2007	Letter to Ms. Jeanne Schbotte, Mohegan Tribe, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072260047)
August 24, 2007	Letter to Mr. Ray Halbritter, Oneida Indian Nation of New York, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072260201)
August 24, 2007	Letter to Council of Chiefs, Onondaga Nation, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072260245)

August 24, 2007	Letter to The Honorable Dwaine Perry, Ramapough Lenape, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072260491)
August 24, 2007	Letter to Mr. Mike John, Seneca Nation of Indians, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072260519)
August 24, 2007	Letter to Mr. Randy Kind, Shinnecock Tribe, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072270070)
August 24, 2007	Letter to The Honorable Harry B. Wallace, Unkechaug Nation, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072270113)
August 24, 2007	Letter to The Honorable Leo Henry, Tuscarora Nation, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072270548)
August 24, 2007	Letter to The Honorable Roger Hill, Tonawanda Band of Senecas, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072270590)
August 24, 2007	Letter to Ms. Sherry White, Stockbridge-Munsee Community Band of Mohican Indians, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review" (Accession No. ML072270615)
August 24, 2007	Letter to Mr. Ken Jock, St. Regis Mohawk Tribal Council, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072280045)
August 29, 2007	Letter to NRC from USFWS, "Indian Point Nuclear Generating Unit Nos. 2 and 3 Protected Species Response." (Accession No. ML0732307840)
October 4, 2007	Letter to NRC from NMFS regarding endangered species near Indian Point Nuclear Generating Unit Nos. 2 and 3. (Accession No. ML073340068)

October 5, 2007	Letter to NRC from New York State Department of Environmental Conservation (NYSDEC), "Indian Point Units 2 and 3 Relicensing Extension Request for Scoping Comments on SEIS." (Accession No. ML072820746)
October 10, 2007	Letter to NRC from NYSDEC, "Indian Point Units 2 and 3 Relicensing Extension Request for Scoping Comments on SEIS." (Accession No. ML072900470)
October 11, 2007	Letter to NYSDEC from NRC regarding extension request for scoping comments. (Accession No. ML072840275)
October 24, 2007	"Meeting Summary of Public Environmental Scoping Meetings Related to the Review of the Indian Point Nuclear Generating Unit Nos. 2 and 3, License Renewal Application (TAC nos. MD5411 and MD5412)." (Accession No. ML072851079)
November 8, 2007	Summary of Site Audit Related to the Review of the License Renewal Application for Indian Point Nuclear Generating Unit Nos. 2 and 3. (Accession No. ML073050267)
November 14, 2007	Letter to NRC from Entergy, "Supplement to License Renewal Application (LRA) Environmental Report References." (Accession No. ML073330590)
November 27, 2007	Letter to NYSDEC from NRC, "Request for List of State Protected Species Within the Area Under Evaluation for the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML073190161)
December 5, 2007	Letter to Entergy from NRC, "Request for Additional Information Regarding Environmental Review for Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal (TAC nos. MD5411 and MD5412)." (Accession No. ML073330931)
December 7, 2007	Letter to Entergy from NRC, "Request for Additional Information Regarding Severe Accident Mitigation Alternatives for Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal (TAC nos. MD5411 and MD5412)." (Accession No. ML073110447)
December 20, 2007	Letter to NRC from Entergy, "Supplement to License Renewal Application (LRA)—Environmental Report References." (Accession No. ML080080205)
December 28, 2007	Letter to NRC from NYSDEC regarding rare or State-listed animals and plants, significant natural communities, and other habitats on or in the vicinity of the Indian Point site. (Accession No. ML080070085, withheld from public disclosure per request by NYSDEC)

January 4, 2008	Letter to NRC from Entergy, "Reply to Request for Additional Information Regarding Environmental Review for License Renewal Application." (Accession No. ML080110372)
January 10, 2008	Letter to NRC from Entergy, "Supplemental Response to Request for Additional Information Regarding Environmental Review for License Renewal Application." (Accession No. ML080220165)
January 30, 2008	Letter to NRC from Entergy, "Supplemental Response to Request for Additional Information Regarding Environmental Review for License Renewal Application." (Accession No. ML080380096)
February 20, 2008	Letter to NRC from Entergy, "Document Request for Additional Information Regarding Environmental Review for License Renewal Application—Electronic Copy of Impingement Data—Tables 4-1 and 4-2 of the 1990 Annual Report (EA 1991)." (Accession No. ML080580408)
February 28, 2008	Letter to NRC from NMFS, "Essential Fish Habitat Information Request for Docket Nos. 50-247 and 50-286; Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal; at the Village of Buchanan, Town of Cortlandt, Westchester County, NY." (Accession No. ML080990403)
March 7, 2008	Letter to NRC from Entergy, "Document Request for Additional Information Regarding Environmental Review for License Renewal Application—Hudson River Fisheries Program Data (Year Class Report)." (Accession No. ML080770457)
April 9, 2008	Letter to Entergy from NRC, "Request for Additional Information Regarding the Review of the License Renewal Application for Indian Point Nuclear Generating Unit Nos. 2 and 3 (TAC nos. MD5411 and MD5412)." (Accession No. ML080880104)
April 14, 2008	Letter to Entergy from NRC, "Request for Additional Information Regarding the Review of the License Renewal Application for Indian Point Nuclear Generating Unit Nos. 2 and 3 (TAC nos. MD5411 and MD5412)." (Accession No. ML080940408)
April 23, 2008	Letter to Entergy from NRC, "Revision of Schedule for the Review of the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application (TAC nos. MD5411 and MD5412)." (Accession No. ML081000441)
April 23, 2008	Letter to NRC from Entergy, "Reply to Document Request for Additional Information Regarding Site Audit Review of License Renewal Application for Indian Point Nuclear Generating Unit Nos. 2 and 3." (Accession No. ML081230243)

May 14, 2008	Letter to NRC from Entergy, "Reply to Request for Additional Information Regarding License Renewal Application—Refurbishment." (Accession No. ML081440052)
May 22, 2008	Letter to NRC from Entergy, "Supplemental Reply to Request for Additional Information Regarding License Renewal Application—Severe Accident Mitigation Alternatives Analysis." (Accession No. ML081490336)
December 19, 2008	Letter to Entergy from NRC, "Issuance of Environmental Scoping Summary Report Associated with the Staff's Review of the Application for Renewal of the Operating Licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3 (TAC Nos. MD5411 and MD5412)." (Accession No. ML083360062)
December 22, 2008	Letter to Entergy from NRC, "Notice of Availability of the Draft Plant-Specific Supplement 38 to the Generic Environmental Impact Statement for License Renewal of Nuclear Plants Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3 (TAC Nos. MD5411 and MD5412)." (Accession No. ML083390523)
December 22, 2008	Letter to U.S. Environmental Protection Agency from NRC, "Notice of Availability of the Draft Plant-Specific Supplement 38 to the Generic Environmental Impact Statement for License Renewal of Nuclear Plants Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3." (Accession No. ML083400180)
December 22, 2008	Letter to New York State Historic Preservation Officer (Ms. Carol Ash) from NRC, "Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML083400192)
December 22, 2008	Letter to National Marine Fisheries Service (Ms. Mary Colligan) from NRC, "Biological Assessment for License Renewal of the Indian Point Nuclear Generating Unit Nos. 2 and 3." (Accession No. ML083450723)
January 12, 2009	Letter to Delaware Nation of Oklahoma (Ms. Danieala Nieto) from NRC, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3, Draft Supplemental Environmental Impact Statement." (Accession No. ML083500409)
February 24, 2009	Letter from National Marine Fisheries Service (Ms. Mary Colligan) to NRC, "RE: Biological Assessment for License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3." (Accession No. ML090820316)
March 11, 2009	Letter to NRC from U.S. Environmental Protection Agency (John

	Filippelli). (Accession No. ML090860878)
April 30, 2009	Letter to National Marine Fisheries Service (Mr. Peter Colosi) from NRC, "Essential Fish Habitat Assessment for License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3 (TAC Nos. MD5411 and MD5412)". (Accession No. ML090790176)
July 1, 2009	Letter to NRC from Entergy, "Transmission of Additional Requested Information Regarding Sturgeon Impingement Data." (Accession No. ML091950345)
November 24, 1009	Letter from Entergy to NRC, "Request for Additional Information Related to License Renewal Indian Point Nuclear Application Environmental Report - Impingement Data." (Accession No. ML093420528)
December 11, 2009	Letter from Entergy to NRC, "License Renewal Application - SAMA Reanalysis Using Alternate Meteorological Tower Data." (Accession No. ML093580089.)
December 17, 2009	Letter from Entergy to NRC, "Documents Related to License Renewal Application - Environmental Report." (Accession No ML100290495)
January 14, 2010	Letter to NRC from Entergy, "License Renewal Application - Supplement to SAMA Reanalysis Using Alternate Meteorological Tower Data." (Accession No. ML100260750)
February 2, 2010	Letter to Entergy from NRC, "Revision of Schedule for Review of the Indian Point Nuclear Generating Unit Nos. 2 and 3, License Renewal Application." (Accession No. ML100110063)
May 25, 2010	Letter to Entergy from NRC, "Revision of Schedule for Review of the Indian Point Nuclear Generating Unit Nos. 2 and 3, License Renewal Application." (Accession No. ML101260536)
May 27, 2010	Letter to NRC from Entergy, "Correction to License Renewal Application (TAC Nos. MD5407 and MD5408) Indian Point Unit Numbers 2 and 3." (Accession No. ML101590515)
August 31, 2010	Letter to Entergy from NRC, "Revision of Schedule for Review of the Indian Point Nuclear Generating Unit Nos. 2 and 3, License Renewal Application." (Accession No. ML101260536)
September 21, 2010	Letter to National Marine Fisheries Service (Mr. Peter D. Colosi) from NRC, "Essential Fish Habitat Consultation for License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3 (TAC Nos. MD5411 and MD5412)." (Accession No. ML092860253)
September 27, 2010	Letter to New York State Office of Parks, Recreation and Historic

	Preservation (Ms. Ruth L. Pierpont) from NRC, "Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review (SHPO No. 06PR06720)." (Accession No. ML092860228)
October 12, 2010	Letter to NRC from National Marine Fisheries Service (Mr. Peter D. Colosi), "Re: Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal; Docket Nos. 50-247 and 50-268 [sic]; Essential Fish Habitat Consultation." (Accession No. ML102930012)
October 26, 2010	Letter to NRC from New York State Office of Parks, Recreation and Historic Preservation (Mr. Thomas B. Lyons), "Re: NRC, Indian Point License Renewal, Buchanan, Westchester County." (Accession No. ML103060210)

Appendix D

Organizations Contacted

Appendix D

Organizations Contacted

The U.S. Nuclear Regulatory Commission contacted the following Federal, State, regional, and local agencies, and Native American Tribes, during its independent review of the environmental impacts related to the application by Entergy Nuclear Operations, Inc., for renewal of the operating licenses for Indian Point Nuclear Generating Units Nos. 2 and 3:

Absentee Shawnee Tribe of Oklahoma

Cattaraugus Reservation, Seneca Nation

Cayuga Nation

Delaware Nation

Delaware Tribe of Indians

Echota Chickamauga Cherokee Tribe of New Jersey

National Marine Fisheries Service

New York State Department of Environmental Conservation

New York State Office of Parks, Recreation and Historic Preservation, Historic Preservation Field Services Bureau

Oneida Indian Nation of New York

Onondaga Nation

Ramapough Lenape, Ramapough Tribal Office

Seneca Nation of Indians

Seneca Nation Tribal Historic Preservation

Shinnecock Tribe

St. Regis Mohawk Tribal Council

Stockbridge-Munsee Community Band of Mohican Indians, Tribal Historic Preservation Office

The Mashantucket Pequot Tribe (CT)

The Mohegan Tribe (CT)

Tonawanda Band of Senecas

Tuscarora Nation

Unkechaug Nation

U.S. Environmental Protection Agency, Region 2

U.S. Fish and Wildlife Service

Appendix E

Compliance Status and Consultation Correspondence

1

Appendix E

Indian Point Nuclear Generating Unit Nos. 2 and 3 Compliance Status and Consultation Correspondence

Consultation correspondence related to the evaluation of the application for renewal of the operating licenses for Indian Point Nuclear Generating Units 2 and 3 (IP2 and IP3, respectively) is identified in Table E-1. Copies of the correspondence are included in this appendix.

The licenses, permits, consultations, and other approvals obtained from Federal, State, regional, and local authorities for SSES are listed in Table E-2.

Table E-1. Consultation Correspondence

Source	Recipient	Date of Letter
U.S. Nuclear Regulatory Commission (R. Franovich)	State Historical Preservation Office (Office of Parks, Recreation, and Historic Preservation, R. L. Pierpont)	August 9, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Advisory Council on Historic Preservation (D. Klima)	August 9, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	U.S. Fish and Wildlife Service (D. Stillwell)	August 16, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	National Marine Fisheries Service (P. Colosi)	August 16, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Absentee Shawnee Tribe of Oklahoma (A. Warrior)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Cattaraugus Reservation, Seneca Nation (The Hon. M. John)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Cayuga Nation (C. Halftown)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Delaware Nation (N. Owings-Crumm)	August 24, 2007

U.S. Nuclear Regulatory Commission (R. Franovich)	Delaware Tribe of Indians (The Hon. J. Douglas)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Echota Chickamauga Cherokee Tribe of New Jersey (The Hon. C.W. Longlow)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Mashantucket Pequot Tribe (The Hon. M. Thomas)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Mohegan Tribe (J. Schbotte)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Oneida Indian Nation of New York (R. Halbritter)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Onondaga Nation (Council of Chiefs)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Ramapough Lenape (The Hon. D. Perry)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Seneca Nation of Indians (M. John)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Shinnecock Tribe (R. Kind)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Unkechaug Nation (The Hon. H. B. Wallace)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Tuscarora Nation (The Hon. L. Henry)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Tonawanda Band of Senecas (The Hon. R. Hill)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Stockbridge-Munsee Community Band of Mohican Indians (S. White)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	St. Regis Mohawk Tribal Council (K. Jock)	August 24, 2007
U.S. Fish and Wildlife Service (M. VanDonsell and R. Niver)	U.S. Nuclear Regulatory Commission (R. Franovich)	August 29, 2007
Delaware Nation (D. Nieto)	U.S. Nuclear Regulatory Commission	September 5, 2007
National Marine Fisheries Service (M. A. Colligan)	U.S. Nuclear Regulatory Commission (R. Franovich)	October 4, 2007

U.S. Nuclear Regulatory Commission (R. Franovich)	New York State Dept. of Environmental Conservation (J. Pietrusiak)	November 11, 2007
New York State Department of Environmental Conservation (T. Seoane)	U.S. Nuclear Regulatory Commission (R. Franovich)	December 28, 2007
National Marine Fisheries Service (P. Colosi)	U.S. Nuclear Regulatory Commission (R. Franovich)	February 28, 2008
U.S. Nuclear Regulatory Commission (D. Wrona)	New York State Historic Preservation Office (Carol Ash)	December 22, 2008
U.S. Nuclear Regulatory Commission (D. Wrona)	National Marine Fisheries Service (M.A. Colligan)	December 22, 2008
U.S. Nuclear Regulatory Commission (D. Wrona)	Delaware Nation (D. Nieto)	January 12, 2009
National Marine Fisheries Service (M.A. Colligan)	U.S. Nuclear Regulatory Commission (D. Wrona)	February 24, 2009
U.S. Nuclear Regulatory Commission (D. Wrona)	National Marine Fisheries Service (P. Colosi)	April 30, 2009
U.S. Nuclear Regulatory Commission (D. Wrona)	National Marine Fisheries Service (P. Colosi)	September 21, 2010
U.S. Nuclear Regulatory Commission (D. Wrona)	New York State Office of Parks, Recreation and Historic Preservation (R. Pierpont)	September 27, 2010
National Marine Fisheries Service (P. Colosi)	U.S. Nuclear Regulatory Commission (D. Wrona)	October 12, 2010
New York State Office of Parks, Recreation and Historic Preservation (T. Lyons)	U.S. Nuclear Regulatory Commission (D. Wrona)	October 26, 2010

Table E-2. Federal, State, Local, and Regional Licenses, Permits, Consultations, and Other Approvals for the Indian Point site

Agency	Authority	Description	Number	Expiration Date	Remarks
NRC	10 CFR Part 50	Possession License, Indian Point Unit 1	DPR-5	09/28/13	Authorizes SAFSTOR for Unit 1
NRC	10 CFR Part 50	Operating license, IP2	DPR-26	09/28/13	Authorizes operation of IP2
NRC	10 CFR Part 50	Operating license, IP3	DPR-64	12/10/15	Authorizes operation of IP3
DOT	49 CFR Part 107	IP2 Hazardous Materials Certificate of Registration	051909552037 RT	06/30/12	Radioactive and hazardous materials shipments
DOT	49 CFR Part 107	IP3 Hazardous Materials Certificate of Registration	05919552032R T	06/30/12	Radioactive and hazardous materials shipments
EPA	40 CFR Part 264	IP2 Hazardous Solid Waste Amendment Permit (1)	NYD991304411	10/14/02	Accumulation and temporary onsite storage of mixed waste for >90 days
EPA	40 CFR Part 264	IP3 Hazardous Solid Waste Amendment Permit (2)	NYD085503746	10/17/01	Accumulation and temporary onsite storage of mixed waste for >90 days
NYSDEC	6 NYCRR Part 325	IP2 Pesticide Application Business Registration	12696	04/30/12	Pesticide application
NYSDEC	6 NYCRR Part 325	IP3 Pesticide Application Business Registration	13163	04/30/12	Pesticide application
NYSDEC	6 NYCRR Parts 704 and 750	IP1, 2, and 3 SPDES Permit (3)	NY 000 4472	10/01/92[3]	Discharge of wastewaters and stormwaters to waters of the State
NYSDEC	6 NYCRR Part 704	Simulator Transformer Vault SPDES Permit	NY 025 0414	02/28/13	Discharge of wastewaters to waters of the State

Agency	Authority	Description	Number	Expiration Date	Remarks
NYSDEC	6 NYCRR Part 704	Buchanan Gas Turbine SPDES Permit	NY 022 4826	02/28/13	Discharge of wastewaters to waters of the State
NYSDEC	6 NYCRR Part 750	ISFSI Project SPDES Multi-Sector General Permit	NYR 00E 125	NA	Stormwater discharge during construction of dry cask spent fuel storage
NYSDEC	6 NYCRR Parts 200 and 201	IP2 Air Permit	3-5522-00011/00026	NA	Operation of air emission sources (boilers, turbines and generators)
NYSDEC	6 NYCRR Parts 200 and 201	IP3 Air Permit	3-5522-00105/00009	NA	Operation of air emission sources (boilers, turbines and generators)
NYSDEC	6 NYCRR Part 596	IP2 Hazardous Substance Bulk Storage Registration Certificate	3-000107	09/04/11	Onsite bulk storage of hazardous substances
NYSDEC	6 NYCRR Part 596	IP3 Hazardous Substance Bulk Storage Registration Certificate	3-000071	08/16/12	Onsite bulk storage of hazardous substances
NYSDEC	6 NYCRR Part 610	IP2 Major Oil Storage Facility [4]	3-2140	--	Onsite bulk storage of >400,000 gallons of petroleum products
NYSDEC	6 NYCRR Part 372	IP2 Hazardous Waste Generator Identification	NYD991304411	NA	Hazardous waste generation
NYSDEC	6 NYCRR Part 372	IP3 Hazardous Waste Generator Identification	NYD085503746	NA	Hazardous waste generation
NYSDEC	6 NYCRR Part 373	IP2 Hazardous Waste Part 373 Permit [5]	NYD991304411	02/28/07	Accumulation and temporary onsite storage of mixed waste for >90 days

Agency	Authority	Description	Number	Expiration Date	Remarks
WCDOH	Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County	IP2 Gas Turbine 1 Air Permit	#00021	12/31/12	Operation of an air contamination source
WCDOH	Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County	IP2 Gas Turbine 2 Air Permit	#00022	12/31/12	Operation of an air contamination source
WCDOH	Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County	IP2 Gas Turbine 3 Air Permit	#00023	12/31/12	Operation of an air contamination source
WCDOH	Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County	IP2 Boiler Permit	52-4493	NA	Operation of an air contamination source
WCDOH	Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County	IP2 Vapor Extractor Air Permit	VE0001	12/31/12	Operation of an air contamination source
WCDOH	Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County	IP3 Vapor Extractor Air Permit (6)	NA	NA	Operation of an air contamination source
WCDOH	Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County	IP3 Boiler Permit	52-6497	NA	Operation of an air contamination source
WCDOH	Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County	IP3 Training Center Boiler Permit	52-6498	NA	Operation of an air contamination source
WCDOH	Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County	IP3 Vapor Extractor Air Permit	--	--	Operation of an air contamination source
WCDOH	Westchester County Sanitary Code, Article XXV	IP3 Petroleum Bulk Storage Registration Certificate	3-166367	09/07/10	Onsite Bulk Storage of Petroleum Products

Agency	Authority	Description	Number	Expiration Date	Remarks
TDEC	Tennessee Department of Environment and Conservation Regulations	IP2 Tennessee Radioactive Waste-License-for-Delivery	T-NY-010-L09	12/31/10	Shipment of radioactive material into Tennessee to a disposal/ processing facility.
TDEC	Tennessee Department of Environment and Conservation Regulations	IP3 Tennessee Radioactive Waste-License-for-Delivery	T-NY-005-L09	12/31/10	Shipment of radioactive material into Tennessee to a disposal/ processing facility.

Notes:

(1) IP2 Hazardous Solid Waste Amendment Permit = Permit has been administratively continued based on conditional mixed waste exemption.

(2) IP3 Hazardous Solid Waste Amendment Permit = Permit has been administratively continued based on conditional mixed waste exemption.

(3) IP1, 2, and 3 SPDES Permit = Timely Renewal application was submitted; therefore, permit is administratively continued under New York Administrative Procedures Act.

(4) IP2 Major Oil Storage Facility = Timely renewal application was submitted; therefore, permit is administratively continued under New York Administrative Procedures Act.

(5) IPs Hazardous Waste Part 373 Permit = Timely renewal application was submitted; therefore, permit is administratively continued under New York Administrative Procedures Act.

(6) IP3 Vapor Extractor Air Permit = Application has been submitted to WCDOH, but permit has not yet been issued.

CFR = Code of Federal Regulations

DOT = U.S. Department of Transportation

EPA = U.S. Environmental Protection Agency

IP 2 = Indian Point, Unit 2

IP 3 = Indian Point, Unit 3

NRC = U.S. Nuclear Regulatory Commission

NYCRR = New York Codes, Rules, and Regulations

NYSDEC = New York State Department of Environmental Conservation

SAFSTOR = Safe Storage

SPDES = State Pollutant Discharge Elimination System

TDEC = Tennessee Department of Environment and Conservation

WCDOH = Westchester County Department of Health

August 9, 2007

Ms. Ruth L. Pierpont, Director
New York State Office of Parks, Recreation
and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, P.O. Box 189
Waterford, NY 12188-0189

SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 & 3 (INDIAN POINT)
LICENSE RENEWAL APPLICATION REVIEW (SHPO NO. 06PR06720)

Dear Ms. Pierpont:

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing an application to renew the operating license for Indian Point, which is located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is operated by Entergy Nuclear Operations, Inc. (Entergy). The application for renewal was submitted by Entergy by letter dated April 23, 2007, and supplemented by letters dated May 3, and June 21, 2007, pursuant to Title 10 of the *Code of Federal Regulations* Part 54 (10 CFR Part 54).

The NRC has established that, as part of the staff's review of any nuclear power plant license renewal action, a site-specific Supplemental Environmental Impact Statement (SEIS) to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," NUREG-1437, will be prepared under the provisions of 10 CFR Part 51, the NRC's regulation that implements the National Environmental Policy Act of 1969 (NEPA). In accordance with 36 CFR 800.8(c), the SEIS will include analyses of potential impacts to historic and cultural resources.

In the context of the National Historic Preservation Act of 1966, as amended, the NRC staff has determined that the area of potential effect (APE) for a license renewal action is the area at the power plant site and its immediate environs that may be impacted by post-license renewal land-disturbing operations or projected refurbishment activities associated with the proposed action. The APE may extend beyond the immediate environs in those instances where post-license renewal land-disturbing operations or projected refurbishment activities specifically related to license renewal may potentially have an effect on known or proposed historic sites. This determination is made irrespective of ownership or control of the lands of interest.

On September 19, 2007, the NRC will conduct two public NEPA scoping meetings at the Colonial Terrace, located at 119 Oregon Road in Cortlandt Manor, NY. You and your staff are invited to attend. Your office will receive a copy of the draft SEIS along with a request for comments. The staff expects to publish the draft SEIS in July 2008.

R. Pierpont -2-

If you have any questions or require additional information, please contact Ms. Jill Caverly, Environmental Project Manager, by phone at 301-415-6699 or by email at jbc1@nrc.gov.

Sincerely,

/RA/
Rani Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 9, 2007

Mr. Don L. Klima, Director
Advisory Council on Historic Preservation
Office of Federal Agency Programs
1100 Pennsylvania Ave, NW, Suite 803
Washington, DC 20004

SUBJECT: INDIAN POINT GENERATING UNIT NOS. 2 & 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Mr. Klima:

The U.S. Nuclear Regulatory Commission (NRC and the staff) is reviewing an application to renew the operating licenses for Indian Point Generating Unit Nos. 2 & 3 (Indian Point) which is located in Buchanan, New York, approximately 24 miles north of the New York City boundary line. Indian Point is operated by Entergy Nuclear Operations, Inc. (Entergy). The application for renewal was submitted by Entergy by letter dated April 23, 2007, and supplemented by letters dated May 3, and June 21, 2007, pursuant to Title 10 of the *Code of Federal Regulations* Part 54 (10 CFR Part 54).

The NRC has established that, as part of the staff's review of any nuclear power plant license renewal action, a site-specific Supplemental Environmental Impact Statement (SEIS) to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," NUREG-1437, will be prepared under the provisions of 10 CFR Part 51, the NRC's regulation that implements the National Environmental Policy Act of 1969 (NEPA). In accordance with 36 CFR 800.8(c), the SEIS will include analyses of potential impacts to historic and cultural resources.

The NRC staff plans to hold two public NEPA scoping meetings on September 19, 2007, at Colonial Terrace, located at 119 Oregon Road in Cortlandt Manor, New York. The first meeting will convene at 1:30 p.m. and will continue until 4:30 p.m., as necessary. The second meeting will convene at 7:00 p.m., with a repeat of the overview portions of the first meeting, and will continue until 10:00 p.m., as necessary. In addition, staff will conduct a site audit September 10-14, 2007, at Indian Point. You and your staff are invited to attend both the public meetings and the site audit. Your office will receive a copy of the draft SEIS along with a request for comments. The anticipated publication date for the draft SEIS is late July 2008.

D. Klima -2-

If you have any questions or require additional information, please contact the Environmental Project Manager, Ms. Jill Caverly at 301-415-6699 or via e-mail at jsc@nrc.gov.

Sincerely,

/RA/
Rani Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50–268

cc: See next page

August 16, 2007

Mr. David Stilwell
Field Supervisor
U.S. Fish and Wildlife Service
New York Field Office
3817 Luker Road
Cortland, NY 13045

SUBJECT: REQUEST FOR LIST OF PROTECTED SPECIES WITHIN THE AREA UNDER EVALUATION FOR THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 & 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Mr. David Stilwell:

The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application submitted by Entergy Nuclear Operations, Inc., for the renewal of the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 & 3 (Indian Point). Indian Point is located in Buchanan, New York, approximately 24 miles north of the New York City boundary line. As part of the review of the license renewal application (LRA), the NRC is preparing a Supplemental Environmental Impact Statement (SEIS) under the provisions of Title 10 of the *Code of Federal Regulations* Part 51 (10 CFR Part 51), the NRC's regulation that implements the National Environmental Policy Act (NEPA) of 1969. The SEIS includes an analysis of pertinent environmental issues, including endangered or threatened species and impacts to fish and wildlife. This letter is being submitted under the provisions of the Endangered Species Act of 1973, as amended, and the Fish and Wildlife Coordination Act of 1934, as amended.

The proposed action is to renew the facility operating licenses for Indian Point for an additional 20 years beyond the expiration of the current operating licenses. The proposed action would include the use and continued maintenance of existing plant facilities and transmission lines. The Indian Point site covers approximately 239 acres. Indian Point is bordered on the north, south and east by partially wooded privately owned land and on the west by the Hudson River. Enclosures 1 and 2 provide a general overview of the site location and site layout.

Indian Point is equipped with a once-through open-cycle cooling system that withdraws cooling water from and discharges back into the Hudson River. The intake system includes seven bays for each unit located at the shore. Six 96-inch pipes discharge water beneath the water's surface within a 40-foot wide discharge canal.

The transmission lines in the scope of NRC's environmental review for license renewal are those that were originally constructed for the specific purpose of connecting the plant to the transmission system. The transmission line corridor to the Buchanan Substation (approximately 2100 feet southeast from the reactors, just across Broadway from the facility's main entrance) is located in the industrial portion of the site, except for where the lines cross Broadway. This transmission line corridor is being evaluated as part of the environmental review process.

D. Stillwell -2-

The enclosed transmission line map shows the transmission system that is being evaluated in the SEIS. Two 345-kilovolt (kV) lines connect Indian Point to the Buchanan Substation. This corridor also includes 138-kV transmission lines that supply offsite power from the substation into Indian Point.

To support the SEIS preparation process and to ensure compliance with Section 7 of the Endangered Species Act, the NRC requests information on Federally-listed, proposed, and candidate species and critical habitat that may be in the vicinity of Indian Point and its associated transmission line rights-of-way. In addition, please provide any information you consider appropriate under the provisions of the Fish and Wildlife Coordination Act.

The NRC staff plans to hold two public NEPA scoping meetings on September 19, 2007, at Colonial Terrace, located at 119 Oregon Road in Cortlandt Manor, New York. The first meeting will convene at 1:30 p.m. and will continue until 4:30 p.m., as necessary. The second meeting will convene at 7:00 p.m., with a repeat of the overview portions of the first meeting, and will continue until 10:00 p.m., as necessary. In addition, the NRC staff plans to conduct a site audit at Indian Point during the week of September 10, 2007. You and your staff are invited to attend both the public meetings and the site audit. Your office will receive a copy of the draft SEIS along with a request for comments. The anticipated publication date for the draft SEIS is late July 2008.

If you have any questions concerning the NRC staff's review of this LRA, please contact Ms. Jill Caverly, Project Manager, at 301-415-8450 or via e-mail at jsc1@nrc.gov.

Sincerely,

/RA/
Rani Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

Enclosures:
1. Site Location
2. Site Layout

cc w/encls: See next page

August 16, 2007

Mr. Peter Colosi
Habitat Conservation Coordinator
National Marine Fisheries Service
One Blackburn Drive
Glouster, MA 01930

SUBJECT: REQUEST FOR LIST OF PROTECTED SPECIES AND ESSENTIAL FISH HABITAT WITHIN THE AREA UNDER EVALUATION FOR THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Mr. Colosi:

The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application submitted by Entergy Nuclear Operations, Inc. for the renewal of the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point). Indian Point is located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. As part of the review of the license renewal application (LRA), the NRC is preparing a Supplemental Environmental Impact Statement (SEIS) under the provisions of Title 10 of the *Code of Federal Regulations* Part 51 (10 CFR Part 51), the NRC's regulation that implements the National Environmental Policy Act (NEPA) of 1969. The SEIS includes an analysis of pertinent environmental issues, including endangered or threatened species and impacts to marine resources and habitat. This letter is being submitted under the provisions of the Endangered Species Act of 1973, as amended; the Fish and Wildlife Coordination Act of 1934, as amended; and the Sustainable Fisheries Act of 1996.

The proposed action is to renew the facility operating licenses for Indian Point for an additional 20 years beyond the expiration of the current operating licenses. The proposed action would include the use and continued maintenance of existing plant facilities and transmission lines. The Indian Point site covers approximately 239 acres. Indian Point is bordered on the north, south and east by partially wooded privately owned land and on the west by the Hudson River. Enclosures 1 and 2 provide a general overview of the site location and site layout.

Indian Point is equipped with a once-through open-cycle cooling system that withdraws cooling water from and discharges back into the Hudson River. The intake system includes seven bays for each unit located at the shore. Six 96-inch pipes discharge water beneath the water's surface within a 40-foot wide discharge canal.

The transmission lines in the scope of NRC's environmental review for license renewal are those that were originally constructed for the specific purpose of connecting the plant to the transmission system. The transmission line corridor to the Buchanan Substation (approximately 2100 feet southeast from the reactors, just across Broadway from the facility's main entrance) is located in the industrial portion of the site, except for where the lines cross Broadway. This transmission line corridor is being evaluated as part of the SEIS process. The enclosed transmission line map shows the transmission system that is being evaluated in the SEIS. Two 345-kilovolt (kV) lines connect Indian Point to the Buchanan Substation. This corridor also includes 138-kV transmission lines that supply offsite power from the substation into Indian Point.

To support the SEIS preparation process and to ensure compliance with Section 7 of the Endangered Species Act, the NRC requests information on Federally listed, proposed, and candidate species and critical habitat that may be in the vicinity of the Indian Point site. In addition, please provide any information you consider appropriate under the provisions of the Fish and Wildlife Coordination Act. Also, in support of the SEIS preparation and to ensure compliance with Section 305 of the Magnuson-Stevens Fishery Conservation and Management Act, the NRC requests a list of essential fish habitats that have been designated in the vicinity of the Indian Point site.

On September 19, 2007, the NRC staff plans to hold two public NEPA scoping meetings at the Colonial Terrace, located at 119 Oregon Rd. in Cortlandt Manor, NY. The first session will convene at 1:30 p.m. and will continue until 4:30 p.m., as necessary. The second session will convene at 7:00 p.m., with a repeat of the overview portions of the meeting, and will continue until 10:00 p.m., as necessary. The NRC staff plans to conduct a site audit at the Indian Point site during the week of September 10, 2007. You and your staff are invited to attend both the public meetings and the site audit. In addition, your office will receive a copy of the draft SEIS along with a request for comments. The anticipated publication date for the draft SEIS is July 2008.

If you have any questions concerning the NRC staff review of this LRA, please contact Ms. Jill Caverly, Project Manager at 301-415-8699 or jxc1@nrc.gov.

Sincerely,

/RA/
Rani Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

Enclosures:
As stated

cc w/encls: See next page

August 24, 2007

Mr. Andy Warrior
Director, Cultural Preservation
Absentee Shawnee Tribe of Oklahoma
2025 S. Gordon Cooper Drive
Shawnee, OK 74801

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Mr. Warrior:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Absentee Shawnee Tribe of Oklahoma. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Absentee Shawnee Tribe of Oklahoma to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

Under NRC regulations, the original operating license for a nuclear power plant is issued for up to 40 years. The license may be renewed for up to an additional 20 years if NRC requirements are met. The current operating licenses for Indian Point will expire in September, 2013, and December, 2015. Entergy submitted its application for renewal of the Indian Point operating licenses in a letter dated April 23, 2007, as supplemented by letters dated May 3 and June 21, 2007.

The NRC is gathering information for an Indian Point site-specific supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (GEIS), NUREG-1437. The supplement will contain the results of the review of the environmental impacts on the area surrounding the Indian Point site related to terrestrial ecology, aquatic ecology, hydrology, cultural resources, and socioeconomic issues (among others), and will contain a recommendation regarding the environmental acceptability of the license renewal action.

To accommodate interested members of the public, the NRC will hold two public scoping meetings for the Indian Point license renewal supplement to the GEIS on Wednesday, September 19, 2007, at The Colonial Terrace, located at 119 Oregon Rd. in Cortlandt Manor, NY. The first session will convene at 1:30 p.m. and will continue until 4:30 p.m., as necessary. The second session will convene at 7:00 p.m., with a repeat of the overview portions of the meeting, and will continue until 10:00 p.m., as necessary. Additionally, the NRC staff will host informal discussions one hour before the start of each session.

The license renewal application (LRA) is publicly available at the NRC Public Document Room (PDR), located at One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852, or from the NRC's Agencywide Documents Access and Management System (ADAMS). The ADAMS Public Electronic Reading Room is accessible at http://adamswebsearch.nrc.gov/dologin.html. The accession number for the LRA is ML071210507. Persons who do not have access to ADAMS, or who encounter problems in accessing the documents located in ADAMS, should contact the NRC's PDR Reference staff by telephone at 1-800-397-4209 or 301-415-4737, or by e-mail at pdr@nrc.gov.

The Indian Point LRA is also available on the Internet at http://www.nrc.gov/reactors/operating/licensing/renewal/applications/indian-point.html. In addition, the Hendrick Hudson Free Library, located in Montrose, NY, the Field Library, located in Peekskill, NY, and the White Plains Public Library located in White Plains, NY, have agreed to make the LRA available for public inspection.

The GEIS, which documents the NRC's assessment of the scope and impact of environmental effects that would be associated with license renewal at any nuclear power plant site, can also be found on the NRC's website or at the NRC's PDR.

Please submit any comments that the Absentee Shawnee Tribe of Oklahoma may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at indianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

The staff expects to publish the draft supplement to the GEIS in July 2008. The NRC will hold another set of public meetings in the site vicinity to solicit comments on the draft supplemental environmental impact statement (SEIS). A copy of the draft SEIS will be sent to you for your review and comment. After consideration of public comments received on the draft, the NRC will prepare a final SEIS. The issuance of a final SEIS for Indian Point is planned for April 2009. If you need additional information regarding the environmental review process, please contact Ms. Jill Caverly, Environmental Project Manager, at 301-415-6699 or at jsc1@nrc.gov.

Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

The Honorable Maurice John, President
Cattaraugus Reservation, Seneca Nation
140 Rt. 438
Irving, NY 14081

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear President John:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Cattaraugus Reservation, Seneca Nation. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Cattaraugus Reservation, Seneca Nation to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

Under NRC regulations, the original operating license for a nuclear power plant is issued for up to 40 years. The license may be renewed for up to an additional 20 years if NRC requirements are met. The current operating licenses for Indian Point will expire in September, 2013, and December, 2015. Entergy submitted its application for renewal of the Indian Point operating licenses in a letter dated April 23, 2007, as supplemented by letters dated May 3 and June 21, 2007.

The NRC is gathering information for an Indian Point site-specific supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (GEIS), NUREG-1437. The supplement will contain the results of the review of the environmental impacts on the area surrounding the Indian Point site related to terrestrial ecology, aquatic ecology, hydrology, cultural resources, and socioeconomic issues (among others), and will contain a recommendation regarding the environmental acceptability of the license renewal action.

To accommodate interested members of the public, the NRC will hold two public scoping meetings for the Indian Point license renewal supplement to the GEIS on Wednesday, September 19, 2007, at The Colonial Terrace, located at 119 Oregon Rd. in Cortlandt Manor, NY. The first session will convene at 1:30 p.m. and will continue until 4:30 p.m., as necessary. The second session will convene at 7:00 p.m., with a repeat of the overview portions of the meeting, and will continue until 10:00 p.m., as necessary. Additionally, the NRC staff will host informal discussions one hour before the start of each session.

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The Indian Point LRA is also available on the Internet at http://www.nrc.gov/reactors/operating/licensing/renewal/applications/indian-point.html. In addition, the Hendrick Hudson Free Library, located in Montrose, NY, the Field Library, located in Peekskill, NY, and the White Plains Public Library located in White Plains, NY, have agreed to make the LRA available for public inspection.

The GEIS, which documents the NRC's assessment of the scope and impact of environmental effects that would be associated with license renewal at any nuclear power plant site, can also be found on the NRC's website or at the NRC's PDR.

Please submit any comments that the Cattaraugus Reservation, Seneca Nation may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

The staff expects to publish the draft supplement to the GEIS in July 2008. The NRC will hold another set of public meetings in the site vicinity to solicit comments on the draft supplemental environmental impact statement (SEIS). A copy of the draft SEIS will be sent to you for your review and comment. After consideration of public comments received on the draft, the NRC will prepare a final SEIS. The issuance of a final SEIS for Indian Point is planned for April 2009. If you need additional information regarding the environmental review process, please contact Ms. Jill Caverly, Environmental Project Manager, at 301-415-8699 or at jxc1@nrc.gov.

Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Mr. Clint Halftown
Representative
Cayuga Nation
P.O. Box 11
Versailles, NY 14168

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Mr. Halftown:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Cayuga Nation. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Cayuga Nation to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

Under NRC regulations, the original operating license for a nuclear power plant is issued for up to 40 years. The license may be renewed for up to an additional 20 years if NRC requirements are met. The current operating licenses for Indian Point will expire in September, 2013, and December, 2015. Entergy submitted its application for renewal of the Indian Point operating licenses in a letter dated April 23, 2007, as supplemented by letters dated May 3 and June 21, 2007.

The NRC is gathering information for an Indian Point site-specific supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (GEIS), NUREG-1437. The supplement will contain the results of the review of the environmental impacts on the area surrounding the Indian Point site related to terrestrial ecology, aquatic ecology, hydrology, cultural resources, and socioeconomic issues (among others), and will contain a recommendation regarding the environmental acceptability of the license renewal action.

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The Indian Point LRA is also available on the Internet at http://www.nrc.gov/reactors/operating/licensing/renewal/applications/indian-point.html. In addition, the Hendrick Hudson Free Library, located in Montrose, NY, the Field Library, located in Peekskill, NY, and the White Plains Public Library located in White Plains, NY, have agreed to make the LRA available for public inspection.

The GEIS, which documents the NRC's assessment of the scope and impact of environmental effects that would be associated with license renewal at any nuclear power plant site, can also be found on the NRC's website or at the NRC's PDR.

Please submit any comments that the Cayuga Nation may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

C. Halftown -3-

The staff expects to publish the draft supplement to the GEIS in July 2008. The NRC will hold another set of public meetings in the site vicinity to solicit comments on the draft supplemental environmental impact statement (SEIS). A copy of the draft SEIS will be sent to you for your review and comment. After consideration of public comments received on the draft, the NRC will prepare a final SEIS. The issuance of a final SEIS for Indian Point is planned for April 2009. If you need additional information regarding the environmental review process, please contact Ms. Jill Caverly, Environmental Project Manager, at 301-415-6699 or at jsc1@nrc.gov.

Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Ms. Nikki Owings-Crumm
Environmental Director
Delaware Nation
P.O. Box 825
Andarko, OK 73005

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Ms. Owings-Crumm:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Delaware Nation. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Delaware Nation to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

Under NRC regulations, the original operating license for a nuclear power plant is issued for up to 40 years. The license may be renewed for up to an additional 20 years if NRC requirements are met. The current operating licenses for Indian Point will expire in September, 2013, and December, 2015. Entergy submitted its application for renewal of the Indian Point operating licenses in a letter dated April 23, 2007, as supplemented by letters dated May 3 and June 21, 2007.

The NRC is gathering information for an Indian Point site-specific supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (GEIS), NUREG-1437. The supplement will contain the results of the review of the environmental impacts on the area surrounding the Indian Point site related to terrestrial ecology, aquatic ecology, hydrology, cultural resources, and socioeconomic issues (among others), and will contain a recommendation regarding the environmental acceptability of the license renewal action.

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Please submit any comments that the Delaware Nation may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

The Honorable Jerry Douglas, Chief
Delaware Tribe of Indians
Delaware Tribal Headquarters
170 North East Barbara
Bartlesville, OK 74006

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Chief Douglas:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Delaware Tribe of Indians. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Delaware Tribe of Indians to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

The Honorable C.W. Longlow, Chief
Echota Chickamauga Cherokee Tribe
of New Jersey
1164 Stuyvesant Avenue
Irvington, NJ 07111

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Chief Longlow:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Echota Chickamauga Cherokee Tribe of New Jersey. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Echota Chickamauga Cherokee Tribe of New Jersey to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

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The license renewal application (LRA) is publicly available at the NRC Public Document Room (PDR), located at One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852, or from the NRC's Agencywide Documents Access and Management System (ADAMS). The ADAMS Public Electronic Reading Room is accessible at http://adamswebsearch.nrc.gov/dologin.html. The accession number for the LRA is ML071210507. Persons who do not have access to ADAMS, or who encounter problems in accessing the documents located in ADAMS, should contact the NRC's PDR Reference staff by telephone at 1-800-397-4209 or 301-415-4737, or by e-mail at pdr@nrc.gov.

The Indian Point LRA is also available on the Internet at http://www.nrc.gov/reactors/operating/licensing/renewal/applications/indian-point.html. In addition, the Hendrick Hudson Free Library, located in Montrose, NY, the Field Library, located in Peekskill, NY, and the White Plains Public Library located in White Plains, NY, have agreed to make the LRA available for public inspection.

The GEIS, which documents the NRC's assessment of the scope and impact of environmental effects that would be associated with license renewal at any nuclear power plant site, can also be found on the NRC's website or at the NRC's PDR.

Please submit any comments that the Echota Chickamauga Cherokee Tribe of New Jersey may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

C.W. Longlow -3-

The staff expects to publish the draft supplement to the GEIS in July 2008. The NRC will hold another set of public meetings in the site vicinity to solicit comments on the draft supplemental environmental impact statement (SEIS). A copy of the draft SEIS will be sent to you for your review and comment. After consideration of public comments received on the draft, the NRC will prepare a final SEIS. The issuance of a final SEIS for Indian Point is planned for April 2009. If you need additional information regarding the environmental review process, please contact Ms. Jill Caverly, Environmental Project Manager, at 301-415-6699 or at jmc1@nrc.gov.

Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

The Honorable Michael Thomas, Chairman
Mashantucket Pequot Tribe
110 Pequot Trail
P.O. Box 3180
Mashantucket, CT 06339

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Chairman Thomas:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Mashantucket Pequot Tribe. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Mashantucket Pequot Tribe to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

Under NRC regulations, the original operating license for a nuclear power plant is issued for up to 40 years. The license may be renewed for up to an additional 20 years if NRC requirements are met. The current operating licenses for Indian Point will expire in September, 2013, and December, 2015. Entergy submitted its application for renewal of the Indian Point operating licenses in a letter dated April 23, 2007, as supplemented by letters dated May 3 and June 21, 2007.

The NRC is gathering information for an Indian Point site-specific supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (GEIS), NUREG-1437. The supplement will contain the results of the review of the environmental impacts on the area surrounding the Indian Point site related to terrestrial ecology, aquatic ecology, hydrology, cultural resources, and socioeconomic issues (among others), and will contain a recommendation regarding the environmental acceptability of the license renewal action.

M. Thomas -2-

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The GEIS, which documents the NRC's assessment of the scope and impact of environmental effects that would be associated with license renewal at any nuclear power plant site, can also be found on the NRC's website or at the NRC's PDR.

Please submit any comments that the Mashantucket Pequot Tribe may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Ms. Jeanne Schbotte
Mohegan Tribe
5 Crow Hill Road
Uncasville, CT 06382

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Ms. Schbotte:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Mohegan Tribe. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Mohegan Tribe to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

Under NRC regulations, the original operating license for a nuclear power plant is issued for up to 40 years. The license may be renewed for up to an additional 20 years if NRC requirements are met. The current operating licenses for Indian Point will expire in September, 2013, and December, 2015. Entergy submitted its application for renewal of the Indian Point operating licenses in a letter dated April 23, 2007, as supplemented by letters dated May 3 and June 21, 2007.

The NRC is gathering information for an Indian Point site-specific supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (GEIS), NUREG-1437. The supplement will contain the results of the review of the environmental impacts on the area surrounding the Indian Point site related to terrestrial ecology, aquatic ecology, hydrology, cultural resources, and socioeconomic issues (among others), and will contain a recommendation regarding the environmental acceptability of the license renewal action.

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The GEIS, which documents the NRC's assessment of the scope and impact of environmental effects that would be associated with license renewal at any nuclear power plant site, can also be found on the NRC's website or at the NRC's PDR.

Please submit any comments that the Mohegan Tribe may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

J. Schbotte -3-

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Mr. Ray Halbritter, Nation Representative
Oneida Indian Nation of New York
Genessee Street, Ames Plaza
Oneida, NY 13421

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Mr. Halbritter:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Oneida Indian Nation of New York. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Oneida Indian Nation of New York to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

Under NRC regulations, the original operating license for a nuclear power plant is issued for up to 40 years. The license may be renewed for up to an additional 20 years if NRC requirements are met. The current operating licenses for Indian Point will expire in September, 2013, and December, 2015. Entergy submitted its application for renewal of the Indian Point operating licenses in a letter dated April 23, 2007, as supplemented by letters dated May 3 and June 21, 2007.

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Please submit any comments that the Oneida Indian Nation of New York may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Council of Chiefs
Onondaga Nation
258 C Route 11a
Onondaga Nation
Nedrow, NY 13120

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Council Members:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Onondaga Nation. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Onondaga Nation to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

The Honorable Dwaine Perry, Chief
Ramapough Lenape
Ramapough Tribal Office
189 Stag Hill Road
Mahwah, NJ 07430

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Chief Perry:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Ramapough Lenape. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Ramapough Lenape to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

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D. Perry -2-

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D. Perry -3-

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Mr. Mike John
Conservationist
Seneca Nation of Indians
P.O. Box 231
Salamanca, NY 14479

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Mr. John:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Seneca Nation of Indians. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Seneca Nation of Indians to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

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The NRC is gathering information for an Indian Point site-specific supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (GEIS), NUREG-1437. The supplement will contain the results of the review of the environmental impacts on the area surrounding the Indian Point site related to terrestrial ecology, aquatic ecology, hydrology, cultural resources, and socioeconomic issues (among others), and will contain a recommendation regarding the environmental acceptability of the license renewal action.

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The Indian Point LRA is also available on the Internet at http://www.nrc.gov/reactors/operating/licensing/renewal/applications/indian-point.html. In addition, the Hendrick Hudson Free Library, located in Montrose, NY, the Field Library, located in Peekskill, NY, and the White Plains Public Library located in White Plains, NY, have agreed to make the LRA available for public inspection.

The GEIS, which documents the NRC's assessment of the scope and impact of environmental effects that would be associated with license renewal at any nuclear power plant site, can also be found on the NRC's website or at the NRC's PDR.

Please submit any comments that the Seneca Nation of Indians may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

M. John -3-

The staff expects to publish the draft supplement to the GEIS in July 2008. The NRC will hold another set of public meetings in the site vicinity to solicit comments on the draft supplemental environmental impact statement (SEIS). A copy of the draft SEIS will be sent to you for your review and comment. After consideration of public comments received on the draft, the NRC will prepare a final SEIS. The issuance of a final SEIS for Indian Point is planned for April 2009. If you need additional information regarding the environmental review process, please contact Ms. Jill Caverly, Environmental Project Manager, at 301-415-6699 or at jsc1@nrc.gov.

Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Mr. Randy Kind, Chairman
Shinnecock Tribe
Rte 27-A, Montauk Hwy
Southhampton, NY 11968

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Chairman Kind:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Shinnecock Tribe. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Shinnecock Tribe to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

Under NRC regulations, the original operating license for a nuclear power plant is issued for up to 40 years. The license may be renewed for up to an additional 20 years if NRC requirements are met. The current operating licenses for Indian Point will expire in September, 2013, and December, 2015. Entergy submitted its application for renewal of the Indian Point operating licenses in a letter dated April 23, 2007, as supplemented by letters dated May 3 and June 21, 2007.

The NRC is gathering information for an Indian Point site-specific supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (GEIS), NUREG-1437. The supplement will contain the results of the review of the environmental impacts on the area surrounding the Indian Point site related to terrestrial ecology, aquatic ecology, hydrology, cultural resources, and socioeconomic issues (among others), and will contain a recommendation regarding the environmental acceptability of the license renewal action.

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The GEIS, which documents the NRC's assessment of the scope and impact of environmental effects that would be associated with license renewal at any nuclear power plant site, can also be found on the NRC's website or at the NRC's PDR.

Please submit any comments that the Shinnecock Tribe may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

R. Kind -3-

The staff expects to publish the draft supplement to the GEIS in July 2008. The NRC will hold another set of public meetings in the site vicinity to solicit comments on the draft supplemental environmental impact statement (SEIS). A copy of the draft SEIS will be sent to you for your review and comment. After consideration of public comments received on the draft, the NRC will prepare a final SEIS. The issuance of a final SEIS for Indian Point is planned for April 2009. If you need additional information regarding the environmental review process, please contact Ms. Jill Caverly, Environmental Project Manager, at 301-415-6699 or at jmc1@nrc.gov.

Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

The Honorable Harry B. Wallace, Chief
Unkechaug Nation
P.O. Box 86
Mastic, New York 11950

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Chief Wallace:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Unkechaug Nation. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Unkechaug Nation to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

Under NRC regulations, the original operating license for a nuclear power plant is issued for up to 40 years. The license may be renewed for up to an additional 20 years if NRC requirements are met. The current operating licenses for Indian Point will expire in September, 2013, and December, 2015. Entergy submitted its application for renewal of the Indian Point operating licenses in a letter dated April 23, 2007, as supplemented by letters dated May 3 and June 21, 2007.

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The GEIS, which documents the NRC's assessment of the scope and impact of environmental effects that would be associated with license renewal at any nuclear power plant site, can also be found on the NRC's website or at the NRC's PDR.

Please submit any comments that the Unkechaug Nation may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

The Honorable Leo Henry, Chief
Tuscarora Nation
5616 Walmore Road
Lewiston, New York 14092

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Chief Henry:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Units No. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Tuscarora Nation. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Tuscarora Nation to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

DISTRIBUTION: See next page

August 24, 2007

The Honorable Roger Hill, Chief
Tonawanda Band of Senecas
7027 Meadville Road
Bason, New York 14013

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Chief Hill:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Units No. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Tonawanda Band of Senecas. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Tonawanda Band of Senecas to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Ms. Sherry White
Tribal Historic Preservation Officer
Stockbridge-Munsee Community Band of
Mohican Indians
W13447 Camp 14 Road
Bowler, WI 54416

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Ms. White:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Stockbridge-Munsee Community Band of Mohican Indians. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Stockbridge-Munsee Community Band of Mohican Indians to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

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S. White -3-

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Mr. Ken Jock
Council Member
St. Regis Mohawk Tribal Council
412 State Route 37
Akwesasne, NY 13655

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Mr. Jock:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the St. Regis Mohawk Tribal Council. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the St. Regis Mohawk Tribal Council to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

Under NRC regulations, the original operating license for a nuclear power plant is issued for up to 40 years. The license may be renewed for up to an additional 20 years if NRC requirements are met. The current operating licenses for Indian Point will expire in September, 2013, and December, 2015. Entergy submitted its application for renewal of the Indian Point operating licenses in a letter dated April 23, 2007, as supplemented by letters dated May 3 and June 21, 2007.

The NRC is gathering information for an Indian Point site-specific supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (GEIS), NUREG-1437. The supplement will contain the results of the review of the environmental impacts on the area surrounding the Indian Point site related to terrestrial ecology, aquatic ecology, hydrology, cultural resources, and socioeconomic issues (among others), and will contain a recommendation regarding the environmental acceptability of the license renewal action.

To accommodate interested members of the public, the NRC will hold two public scoping meetings for the Indian Point license renewal supplement to the GEIS on Wednesday, September 19, 2007, at The Colonial Terrace, located at 119 Oregon Road in Cortlandt Manor, NY. The first session will convene at 1:30 p.m. and will continue until 4:30 p.m., as necessary. The second session will convene at 7:00 p.m., with a repeat of the overview portions of the meeting, and will continue until 10:00 p.m., as necessary. Additionally, the NRC staff will host informal discussions one hour before the start of each session.

The license renewal application (LRA) is publicly available at the NRC Public Document Room (PDR), located at One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852, or from the NRC's Agencywide Documents Access and Management System (ADAMS). The ADAMS Public Electronic Reading Room is accessible at http://adamswebsearch.nrc.gov/dologin.htm. The accession number for the LRA is ML071210507. Persons who do not have access to ADAMS, or who encounter problems in accessing the documents located in ADAMS, should contact the NRC's PDR Reference staff by telephone at 1-800-397-4209 or 301-415-4737, or by e-mail at pdr@nrc.gov.

The Indian Point LRA is also available on the Internet at http://www.nrc.gov/reactors/operating/licensing/renewal/applications/indian-point.html. In addition, the Hendrick Hudson Free Library, located in Montrose, NY, the Field Library, located in Peekskill, NY, and the White Plains Public Library located in White Plains, NY, have agreed to make the LRA available for public inspection.

The GEIS, which documents the NRC's assessment of the scope and impact of environmental effects that would be associated with license renewal at any nuclear power plant site, can also be found on the NRC's website or at the NRC's PDR.

Please submit any comments that the St. Regis Mohawk Tribal Council may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

The staff expects to publish the draft supplement to the GEIS in July 2008. The NRC will hold another set of public meetings in the site vicinity to solicit comments on the draft supplemental environmental impact statement (SEIS). A copy of the draft SEIS will be sent to you for your review and comment. After consideration of public comments received on the draft, the NRC will prepare a final SEIS. The issuance of a final SEIS for Indian Point is planned for April 2009. If you need additional information regarding the environmental review process, please contact Ms. Jill Caverly, Environmental Project Manager, at 301-415-8699 or at jsc1@nrc.gov.

Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

Delaware Nation
Environmental Programs
P.O. Box 825
Anadarko, OK 73005
405 / 247-2448 x 137
Fax: 405 / 247-9393

RECEIVED
2007 SEP 12 AM 9: 57
RULES AND DIRECTIVES BRANCH USNRC

9/11/07
72 FR 26850
(2)

September 5, 2007

U.S. Nuclear Regulatory Commission
Chief of Rules and Directives Branch
Division of Administrative Services
Mail Stop T-6D59
Washington, D.C. 20555-0001

Re: Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review

Dear Sir:

I am writing in regard to your letter dated August 24, 2007 requesting comments concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 license renewal application review. As mentioned in the environmental report, the Delaware people were one of the aboriginal entities located in the Hudson-Mohawk Basin in the early 17th century and should have been one of the initial consulting parties. As one of the aboriginal entities, we are very interested in being a part of the review process not only for cultural preservation but for environmental protection as well.

In order for Delaware Nation personnel to be thoroughly informed about this project and to provide comments we would like to request status as a consulting party. With this status, we are confident that you would be able to forward a copy of all formal documents sent to all consulting parties prior to the August 24, 2007 letter we received. It is important to the Delaware Nation that all cultural sites are properly maintained and the environmental impacts be reviewed before further action is taken.

Thank you for contacting the Delaware Nation to be included in the review of this application renewal. We look forward to your quick response and receipt of the documents requested to continue a productive relationship with your organization. If you have any questions or require additional information, you may contact Mrs. Danicala Nieto, Acting Director of Environmental Programs and/or Ms. Tamara Francis, Cultural Preservation Director by telephone at (405) 247-2448 or by fax at (405) 247-9393.

Sincerely,

Danicala Nieto

Danicala Nieto, Air Program Coordinator and Acting Director
Delaware Nation of Oklahoma Environmental Programs

cc: Tamara Francis, Cultural Preservation Director
Orvel Gibson, Tribal Administrator

SUNSI Review Complete
Template = ADM-013

E-RIDS = ADM-03
Call = Bo Pham (bmp)

Jill Caverly - Indian Point Nuclear Generating Unit Nos. 2 and 3 Protected Species Response

From: <MaryEllen_VanDonsel@fws.gov>
To: <jsc1@nrc.gov>
Date: 08/29/2007 11:06 AM
Subject: Indian Point Nuclear Generating Unit Nos. 2 and 3 Protected Species Response

Please see the attached file for our response from the U.S. Fish and Wildlife Service.

MaryEllen VanDonsel
U.S. Fish and Wildlife Service
3817 Luker Road
Cortland, NY 13045
Phone: 607-753-9334
Fax: 607-753-9699

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New York Field Office
3817 Luker Road
Cortland, NY 13045
Phone: (607) 753-9334 Fax: (607) 753-9699
http://www.fws.gov/northeast/nyfo

Project Number: 7093

To: Rani Franovich Date: 8-29-07

Regarding: Indian Point Nuclear Generating Units 2 and 3

Town/County: Buchanan / Westchester

We have received your request for information regarding occurrences of Federally-listed threatened and endangered species within the vicinity of the above-referenced project/property. Due to increasing workload and reduction of staff, we are no longer able to reply to endangered species list requests in a timely manner. In an effort to streamline project reviews, we are shifting the majority of species list requests to our website at http://www.fws.gov/northeast/nyfo/es/section7.htm. Please go to our website and print the appropriate portions of our county list of endangered, threatened, proposed, and candidate species, and the official list request response. Step-by-step instructions are found on our website.

As a reminder, Section 9 of the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) prohibits unauthorized taking* of listed species and applies to Federal and non-Federal activities. Additionally, endangered species and their habitats are protected by Section 7(a)(2) of the ESA, which requires Federal agencies, in consultation with the U.S. Fish and Wildlife Service (Service), to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. An assessment of the potential direct, indirect, and cumulative impacts is required for all Federal actions that may affect listed species. For projects not authorized, funded, or carried out by a Federal agency, consultation with the Service pursuant to Section 7(a)(2) of the ESA is not required. However, no person is authorized to "take"* any listed species without appropriate authorizations from the Service. Therefore, we provide technical assistance to individuals and agencies to assist with project planning to avoid the potential for "take," or when appropriate, to provide assistance with their application for an incidental take permit pursuant to Section 10(a)(1)(B) of the ESA.

Project construction or implementation should not commence until all requirements of the ESA have been fulfilled. If you have any questions or require further assistance regarding threatened or endangered species, please contact the Endangered Species Program at (607) 753-9334. Please refer to the above document control number in any future correspondence.

Endangered Species Biologist: Robyn A. Niver RAN

*Under the Act and regulations, it is illegal for any person subject to the jurisdiction of the United States to *take* (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt any of these), import or export, ship in interstate or foreign commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any endangered fish or wildlife species and most threatened fish and wildlife species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. "Harm" includes any act which actually kills or injures fish or wildlife, and case law has clarified that such acts may include significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife.

New York State Department of Environmental Conservation
Office of General Counsel, 14th Floor
625 Broadway, Albany, New York 12233-1500
FAX: (518) 402-9018 or (518) 402-9019
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

October 5, 2007

Via e-mail and Regular First Class Mail

Mr. Bo Pham
Senior Project Manager - Indian Point Relicensing Application
Division of License Renewal
Mail Stop 0-7B1
United States Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Re: Indian Point Units 2 and 3 Relicensing
Extension Request for Scoping Comments on SEIS

Dear Mr. Pham:

The State of New York respectfully requests an extension until October 31, 2007, in which to file written Scoping Comments on the draft Supplemental Environmental Impact Statement (SEIS) that the Nuclear Regulatory Commission (NRC) is preparing in conjunction with the relicensing application filed by Entergy Nuclear Operations, Inc., for the Indian Point nuclear power plants (Indian Point 2 and Indian Point 3) in Buchanan, New York.

The State has been working diligently to prepare its comments. As you know, the Department of Environmental Conservation has assumed the role of coordinating with other State Executive Agencies on the relicensing application. The Executive Agencies are also working closely with the State Attorney General's Office on the relicensing application. The additional time will allow for more efficient coordination on the scoping comments.

Moreover, the NRC has extended the deadline until November 30, 2007, in which to file a Request for a Hearing/Petition for Leave to Intervene on the relicensing application. The State is thus in the process of identifying environmental issues to raise as contentions. Without question, that process is related to the drafting of comments on the SEIS. Extending the deadline to file Scoping Comments will more closely coordinate with the State's efforts on the Request for a Hearing/Petition for Leave to Intervene.

Finally, Joan Matthews, the lead counsel for the State Executive Agencies, has had a significant family medical emergency since Labor Day, which only this week appears to be resolving, allowing her to once again devote her full attention to this matter.

Please feel to contact either one of us if you have any questions about this request.

Respectfully submitted,

JOAN LEARY MATTHEWS
Senior Attorney for Special Projects
New York State Department of
Environmental Conservation
518-402-9190
jlmatthe@gw.dec.state.ny.us

JOHN SIPOS
Assistant Attorney General
New York State Department of Law
Environmental Protection Bureau
The Capitol
Albany, NY 12224
518-402-2251
john.sipos@oag.state.ny.us

New York State Department of Environmental Conservation
Office of General Counsel, 14th Floor
625 Broadway, Albany, New York 12233-1500
FAX: (518) 402-9018 or (518) 402-9019
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

October 10, 2007

Via e-mail and Regular First Class Mail

Mr. Bo Pham
Senior Project Manager - Indian Point Relicensing Application
Division of License Renewal
Mail Stop 0-7B1
United States Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Re: Indian Point Units 2 and 3 Relicensing
Extension Request for Scoping Comments on SEIS

Dear Mr. Pham:

Thank you for your telephone call yesterday in response to the State of New York's request to submit scoping comments by October 31, 2007, on the above matter. This letter is to confirm that the State will submit its scoping comments by October 31, 2007, and that the NRC will consider these comments. These written comments will be in addition to the oral comments that the New York Department of Environmental Conservation and the New York Department of Law provided at the scoping session on September 19, 2007. We very much appreciate this accommodation.

Respectfully submitted,

JOAN LEARY MATTHEWS
Senior Attorney for Special Projects
New York State Department of
Environmental Conservation
518-402-9190
jlmatthe@gw.dec.state.ny.us

JOHN SIPOS
Assistant Attorney General
New York State Department of Law
Environmental Protection Bureau
The Capitol
Albany, NY 12224
518-402-2251
john.sipos@oag.state.ny.us

EDMS #280184

October 11, 2007

Joan Leary Matthews
Senior Attorney for Special Projects
New York State Department of Environmental Conservation
Office of General Counsel, 14th Floor
625 Broadway
Albany, NY 12233-1500

Dear Ms. Matthews:

I am responding to your letter of October 5, 2007, in which you requested an extension until October 31, 2007, to file written scoping comments for the environmental impact statement that the U.S. Nuclear Regulatory Commission (NRC) will be preparing as part of its review of the Indian Point Nuclear Generating, Unit Nos. 2 and 3, license renewal application.

The NRC staff has considered your request, but has determined that an extension of the comment period is not warranted. As you know, a Notice was published in the *Federal Register* on August 10, 2007, inviting members of the public to attend the environmental scoping meeting scheduled for September 19, 2007, and providing an opportunity for interested persons to submit written scoping comments during a two-month period following publication of the Notice (72 FR 45075). As stated in the *Federal Register*, written scoping comments should be submitted no later than October 12, 2007, to be considered in the scoping process. Numerous comments have been submitted to the NRC, during the scoping meeting and in writing, and we anticipate further written comments before the end of the comment period. Nonetheless, the NRC will consider comments received after such date, to the extent that it is practicable to do so. We encourage you to submit your written scoping comments at your earliest opportunity.

Thank you for your interest and participation in the license renewal process.

Sincerely,

/RA by Jill Caverly for/
Bo M. Pham, Senior Project Manager
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

cc: See next page

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

OCT -4 2007

Docket 50-247
50-286

Chief, Rules and Directives Branch
Division of Administrative Services
Office of Administration
Mailstop T-6D59
US Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: 72 FR45075-6 (August 10, 2007)

To Whom It May Concern:

These comments are submitted by the Protected Resources Division (PRD) of NOAA's National Marine Fisheries Service (NMFS) regarding the application for renewal of Facility Operating Licenses DPR-26 and DPR-64 for an additional 20 years of operation at Indian Point Nuclear Generating Unit Nos. 2 and 3. A request for comments related to the Nuclear Regulatory Commission's (NRC) intent to prepare an Environmental Impact Statement (EIS) and conduct the scoping process pursuant to the National Environmental Policy Act (NEPA) was published in the Federal Register on August 10, 2007.

A population of federally endangered shortnose sturgeon (*Acipenser brevirostrum*) occurs in the Hudson River. Additionally, Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) are also present in the Hudson River. Atlantic sturgeon are considered a Candidate Species as NMFS has initiated a status review for this species to determine if listing as threatened or endangered under the ESA is warranted. A status review report was completed by the status review team in February 2007. NMFS is currently reviewing the report and other available information to determine if listing under the ESA is warranted. A listing determination, and, if listing is warranted, any accompanying proposed rule(s), is expected to be published by NMFS in 2008. If it is determined that listing is warranted, a listing determination and final rule listing the species could be published within a year from the date of publication of the listing determination or proposed rule. The Status Review report is available at: *http://www.nero.noaa.gov/prot_res/CandidateSpeciesProgram/AtlSturgeonStatusReviewReport.pdf*.

NMFS has several concerns regarding the potential for the continued operation of the Indian Point facility to affect sturgeon. NMFS' primary concern is the likelihood of impingement of

sturgeon on screens or racks at plant intakes. Information provided in the application by Dynegy for an Endangered Species Act (ESA) Section 10(a)(1)(B) permit for their Roseton and Danskammer plants indicated that from 1972-1998, 37 shortnose sturgeon were impinged at Indian Point Unit 2 and from 1976-1998, 26 shortnose sturgeon were impinged at Indian Point Unit 3. It is NMFS understanding that no monitoring of the intakes has occurred since screening and a fish return system were installed in 1998. While the screening and fish return system were designed to minimize entrainment and reduce the levels of injury and mortality associated with impingement, no studies have been conducted to demonstrate the effectiveness of these systems for sturgeon. While NMFS has no information on likely impingement rates since 1998, we also have no information that suggests it no longer occurs. Shortnose sturgeon impinged on intake screens or racks experience high levels of injury and/or mortality.

Sturgeon yolk sac larvae (YSL) and post yolk sac larvae (PYSL) have been documented in the vicinity of Indian Point. Given that two distinct distributions of YSL and PYSL have been identified in the river (above RM 120 and RM 48 to 110), it is assumed that the larvae in the lower river grouping are Atlantic sturgeon. As such, entrainment is a significant concern for Atlantic sturgeon in this area of the river.

The best available information suggests that unauthorized take (as defined in Section 9 of the ESA) has occurred in the past at the Indian Point facility and may continue to occur. Additionally, Atlantic sturgeon eggs and/or larvae are likely to be present in this region of the river and may be subject to entrainment in the facility's intakes. Both shortnose and Atlantic sturgeon may also be affected by the discharge of heated effluent, chlorine, and other pollutants or antifouling agents.

Section 7(a)(2) of the ESA states that each Federal agency shall, in consultation with the Secretary, insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Any discretionary federal action that may affect a listed species must undergo section 7 consultation. The relicensing of Indian Point by the NRC is a federal action that will require section 7 consultation. If it is determined through consultation between the NRC and NMFS that the action is likely to adversely affect any listed species (i.e., if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effects are not: discountable, insignificant, or beneficial) then a formal consultation, resulting in the issuance of a Biological Opinion and accompanying Incidental Take Statement would be required.

Any NEPA documentation prepared by NRC relating to the relicensing of this facility should contain an assessment of the facility's impact on shortnose and Atlantic sturgeon. Additionally, NMFS expects the NRC to initiate section 7 consultation with NMFS on the effects of the proposed action on listed species. In order to conduct a consultation, NMFS will need a complete project description and a complete assessment of the facility's impacts on listed species. NMFS expects that this assessment will include an estimate of the number of shortnose sturgeon likely to be impinged and/or entrained at the facility's intakes over the life of the proposed 20 year license. This information should be submitted to NMFS along with a request for concurrence with NRC's determination of effects and justification for that determination.

My staff looks forward to working cooperatively with the NRC during the relicensing process. Should you have any questions regarding shortnose sturgeon or the section 7 process in general, please contact Pat Scida, Endangered Species Coordinator (978-281-9208 or Pasquale.Scida@noaa.gov). For questions specific to Atlantic sturgeon, please contact Kim Damon-Randall, Proactive Conservation Program Coordinator (978-281-9300 x6535).

Sincerely,

Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

Cc: Nash, NRC
Crocker, Damon-Randall - F/NER4
Rusanowsky, Colosi - F/NER3
Lindow, F

File Code: Sec 7 NRC Indian Point Relicensing
PCTS: F/NER/2006/07100

November 27, 2007

Ms. Jean Pietrusiak
New York State Department of the Environment
NYDEC-DFWMR
NY Natural Heritage Program – Information Services
625 Broadway, 5th Floor
Albany, NY 12233-4757

SUBJECT: REQUEST FOR LIST OF STATE PROTECTED SPECIES WITHIN THE AREA UNDER EVALUATION FOR THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Ms. Pietrusiak:

The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application submitted by Entergy Nuclear Operations, Inc. (Entergy), for the renewal of the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point). Indian Point is located in Buchanan, New York, approximately 24 miles north of the New York City boundary line. As part of the review of the license renewal application (LRA), the NRC is preparing a Supplemental Environmental Impact Statement (SEIS) under the provisions of Title 10 of the *Code of Federal Regulations* Part 51 (10 CFR Part 51), the NRC's regulation that implements the National Environmental Policy Act (NEPA) of 1969. The SEIS includes an analysis of pertinent environmental issues, including endangered or threatened species and impacts to fish and wildlife. This letter is being submitted under the provisions of the Endangered Species Act of 1973, as amended, and the Fish and Wildlife Coordination Act of 1934, as amended.

The proposed action is to renew the facility operating licenses for Indian Point for an additional 20 years beyond the expiration of the current operating licenses. The proposed action would include the use and continued maintenance of existing plant facilities and transmission lines. The Indian Point site covers approximately 239 acres. Indian Point is bordered on the north, south and east by partially wooded, privately owned land and on the west by the Hudson River. Enclosures 1 and 2 provide a general overview of the site location and site layout.

Indian Point is equipped with a once-through open-cycle cooling system that withdraws cooling water from, and discharges water back into, the Hudson River. The intake system includes seven bays for each unit located at the shore. Six 96-inch pipes discharge water beneath the river's surface within a 40-foot wide discharge canal.

The transmission lines in the scope of NRC's environmental review for license renewal are those that were originally constructed for the specific purpose of connecting the plant to the transmission system. The transmission line corridor to the Buchanan Substation (approximately 2100 feet southeast from the reactors, just across Broadway from the facility's main entrance) is located in the industrial portion of the site, except for where the lines cross Broadway. This transmission line corridor is being evaluated as part of the SEIS process.

The enclosed transmission line map shows the transmission system that is being evaluated in the SEIS. Two 345-kilovolt (kV) lines connect Indian Point to the Buchanan Substation. This

corridor also includes 138-kV transmission lines that supply offsite power from the substation into Indian Point.

To support the SEIS preparation process, the NRC requests information on state-listed, proposed, and candidate species and critical habitat that may be in the vicinity of Indian Point. In addition, please provide any information you consider appropriate under the provisions of the Fish and Wildlife Coordination Act.

If you have any questions concerning the NRC staff's review of this license renewal application, please contact Ms. Jill Caverly, Environmental Project Manager, at 301-415-6699 or by e-mail at jsc1@nrc.gov.

Sincerely,

/RA Bo Pham for/

Rani Franovich, Branch Chief
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

Enclosures:
1. Site location map
2. Site layout map

cc w/encls: See next page

New York State Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, Albany, New York 12233-4757
Phone: (518) 402-8935 · **FAX:** (518) 402-8925
Website: www.dec.state.ny.us

Alexander B. Grannis
Commissioner

December 28, 2007

Rani Franovich
U. S. Nuclear Regulatory Commission
Projects Branch 2, Division License Renewal
Washington, DC 20555-0001

Dear Ms. Franovich:

In response to your recent request, we have reviewed the New York Natural Heritage Program databases with respect to an Environmental Assessment for the proposed License Renewal Application - Indian Point Nuclear Generating Units 2 and 3, area as indicated on the map you provided, located in Town of Buchanan.

Enclosed is a report of rare or state-listed animals and plants, significant natural communities, and other significant habitats, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site. The information contained in this report is considered sensitive and should not be released to the public without permission from the New York Natural Heritage Program.

This project location is adjacent to a designated Significant Coastal Fish and Wildlife Habitat. This habitat is part of New York State's Coastal Management Program (CMP), which is administered by the NYS Department of State (DOS). Projects which may impact the habitat are reviewed by DOS for consistency with the CMP. For more information regarding this designated habitat and applicable consistency review requirements, please contact:

Jeff Zappieri or Vance Barr - (518) 474-6000
NYS Department of State
Division of Coastal Resources and Waterfront Revitalization
41 State Street, Albany, NY 12231

The presence of rare species may result in your project requiring additional permits, permit conditions, or review. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the enclosed address.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our databases. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. This information should NOT be substituted for on-site surveys that may be required for environmental impact assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

Sincerely,

Tara Seoane

Tara Seoane
Information Services
NY Natural Heritage Program

cc: Reg. 3, Fisheries Mgr.
Peter Nye, Endangered Species Unit, Albany
Shaun Keeler, Bureau of Fisheries, Albany
Chris Hogan, Environmental Permits, 4th floor, Albany

Enclosure (report containing a list of rare or State-listed plants and animals) withheld by NRC as sensitive information per New York Natural Heritage Program request.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

FEB 28 2008

Ms. Rani Franovich
Branch Chief, Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Re: Essential Fish Habitat Information Request for Docket Nos. 50-247 and 50-286; Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal; at the Village of Buchanan, Town of Cortlandt, Westchester County, NY

Dear Ms. Franovich:

Reference is made to your information request regarding essential fish habitat (EFH) designated in the vicinity of the Indian Point Nuclear Generating Station (Indian Point). Your letter indicates that the Nuclear Regulatory Commission is in the process of preparing a supplemental environmental impact statement (SEIS) under the provisions of Title 10 of the Code of Federal Regulations Part 51 (10 CFR Part 51), the NRC's regulation that implements the National Environmental Policy Act (NEPA) of 1969. The SEIS is being prepared in conjunction with a request by Entergy Nuclear Operations, Inc. for the renewal of the operating licenses for the two operating units at Indian Point. This proposed renewal would extend the current operating licenses 20 years beyond their current expiration dates, and would cover the use and continued maintenance of Units Two and Three and appurtenant transmission lines that connect Indian Point to the nearby Buchanan Substation.

The facilities lie on the eastern shore of the Hudson River in Westchester County, approximately 24 miles north of the New York City limits. The industrial portions of the site occupy approximately 239 acres bounded to the north, east, and south by private property and by the Hudson River on the west. Entergy Nuclear Northeast owns all three units at the site. At this time, only Units Two and Three are operational, and Unit One is intact but has been decommissioned. The operating units feature Westinghouse pressurized water reactors that are cooled by water drawn from the Hudson River via a once-through, open-cycle cooling system. The intake system includes seven bays for each unit. Thermally-enriched water subsequently is returned back into the river through six, 96" pipes that empty into the plant's 40' wide discharge canal.

The Buchanan reach of the Hudson River is tidally-dominated and tends to exhibit mesohaline or oligohaline salinity ranges that vary seasonally. Salinity influences the distribution and function of aquatic communities, which comprise a wide variety of diadromous and resident fishes, a diverse forage species including a wide array of insects, crustaceans, and other invertebrates. While not intended to be an exhaustive list, it should be noted that the fish community includes American eel (*Anguilla rostrata*), striped bass (*Morone saxatilis*), white perch (*Morone americana*), blue crab (*Callinectes sapidus*), bay anchovy (*Anchoa mitchilli*), Atlantic silversides (*Menidia menidia*), hogchoker (*Trinectes maculates*), American shad (*Alosa sapidissima*), tomcod (*Microgadus tomcod*), blueback herring (*Alosa aestivalis*), and alewife (*Alosa*

pseudoharengus) which use the general project reach for a variety of habitat functions, notably spawning and nursery habitat, resting and seasonal concentration areas.

Atlantic sturgeon (*Acipenser oxyrinchus*), a candidate species for listing under the Endangered Species Act (ESA) as announced in the Federal Register on October 16, 2006 (71 FRN 61002), also occur in the Hudson River. The term "candidate species" refers to (a) species that are the subject of a petition to list as threatened or endangered; (b) species for which NMFS has determined that listing pursuant to section 4 (b)(3)(A) of the ESA may be warranted; and (c) those species are not the subject of a petition but for which NMFS has announced the initiation of a status review in the Federal Register. The notice of availability of the status review for the Atlantic sturgeon was published in the Federal Register on April 3, 2007 (72 FRN 15865). A copy of the report can be downloaded from the following website: www.nero.noaa.gov/prot_res/candidatespeciesprogram/esr.htm.

The Atlantic Sturgeon Status Review Team (SRT) has determined that the Hudson River and Delaware River Atlantic sturgeon stock constitute a distinct population segment (DPS) called the New York Bight DPS. The SRT has also concluded that the New York Bight DPS was likely (>50 % chance) to become endangered within the next 20 years. NMFS is currently considering the information in the status report to determine if action under the ESA is warranted. The SRT also identifies several different stressors that may impact the Atlantic sturgeon populations including dams for flood control and hydropower generation, water quality degradation, dredging, and blasting.

Federally endangered shortnose sturgeon (*Acipenser brevirostrum*) may be found in the Hudson River in the vicinity of Indian Point. Any federal action, such as the approval, funding, or implementation of a project by a federal agency that may affect a listed species must undergo consultation pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, as amended. Once specific projects are identified and project plans are developed, the NRC should submit its determination of effects, along with justification for the determination and a request for concurrence, to the attention of the Endangered Species Coordinator, NMFS, Northeast Regional Office, Protected Resources Division, One Blackburn Drive, Gloucester, MA 01930.

In addition, EFH has been designated in the Hudson River mixing zone for a variety of federally managed fishery resources. These include certain life stages of the red hake (*Urophycis chuss*), winter flounder (*Pseudopleuronectes americanus*), windowpane (*Scopthalmus aquosus*), bluefish (*Pomatomus saltatrix*), Atlantic butter fish (*Peprilus triacanthus*), summer flounder (*Paralichthys dentatus*), Atlantic sea herring (*Clupea harengus*), and the black sea bass (*Centropristus striata*). Information regarding these designations may be found at our regional website (http://www.nero.noaa.gov/hcd/index.html#efh). This information is intended as a generic guide that lists the EFH species within an area and is not intended for use on its own. The actual EFH descriptions, the species habitat preferences, and life history parameters are provided in Guide to EFH Descriptions. The Councils' Fishery Management Plans (FMPs) also should be referred to for more extensive information regarding EFH

Section 305(b)(2) of the MSA requires all federal agencies to consult with NMFS on any action authorized, funded, or undertaken by that agency that may adversely affect EFH. Included in this consultation process is the preparation of an EFH assessment to provide necessary information on which to consult. Our EFH regulation at 50 CFR 600.905 mandates the preparation of EFH assessments and generally outlines each agency's obligations in this consultation procedure. The level of detail in the EFH assessment should be commensurate with the potential impacts of the

proposed project. It should also evaluate all of the direct, indirect, individual, and cumulative impacts on EFH.

The required contents of an EFH assessment include: 1) a description of the action; 2) an analysis of the potential adverse effects of the action on EFH and the managed species; 3) the NRC's conclusions regarding the effects of the action on EFH; 4) proposed mitigation, if applicable. Other information that should be contained in the EFH assessment, if appropriate, includes: 1) the results of on-site inspections to evaluate the habitat and site-specific effects; 2) the views of recognized experts on the habitat or the species that may be affected; 3) a review of pertinent literature and related information; and 5) an analysis of alternatives to the action that could avoid or minimize the adverse effects on EFH.

In order to allow us to evaluate fully the project's impacts on EFH and federally managed species, additional information on the impacts of continued plant operation, especially with regard to the once-through cooling water intake from the river and water release back to the river. This information will allow us to develop EFH conservation recommendations to further minimize impacts on EFH and federally managed species. Depending upon the expected impacts and the construction schedule, additional best management practices or seasonal work restrictions may be appropriate EFH conservation recommendations

Thank you for your inquiry regarding habitat uses by resources of concern in the Indian Point area. We appreciate the opportunity to provide you with this preliminary coordination information. Should you wish to discuss these comments further, please contact Diane Kusanowsky at (203) 882-6504.

Sincerely,

Peter D. Colosi, Jr.
Assistant Regional Administrator
for Habitat Conservation

dr: 08_indian_point_spl.doc

cc: F/NER4 – Milford
F/NER3 – Protected Resources
USACE – NAN
USFWS – Cortland

December 22, 2008

Ms. Carol Ash
State Historic Preservation Officer
Parks, Recreation & Historic Preservation
Agency Building #1
Empire State Plaza
Albany, NY 12238

SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Ms. Ash:

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing an application to renew the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3 (IP2 and IP3), which are located in Westchester County in the village of Buchanan, New York, approximately 24 miles north of New York City. IP2 and IP3 are operated by Entergy Nuclear Operations, Inc. (the licensee).

As part of its review of the proposed action, the NRC staff has prepared a site-specific Supplemental Environmental Impact Statement (SEIS) to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," NUREG-1437. The SEIS includes analyses of relevant environmental issues, including potential impacts to historic and archaeological resources from extended operation and refurbishment activities associated with license renewal. In accordance with our letter to you dated August 9, 2007, a copy of the draft SEIS is enclosed. Pursuant to Title 36 of the *Code of Federal Regulations*, Chapter 800.8(c), we are requesting your comments on the draft SEIS and on our preliminary conclusions regarding historic properties.

As stated in our letter dated August 9, 2007, the NRC staff has determined that the area of potential effect (APE) for a license renewal action is the area at the power plant site and its immediate environs that may be impacted by post-license renewal land disturbing operation or projected refurbishment activities associated with the proposed action. The staff views the APE for the IP2 and IP3 license renewal as including the IP2 and IP3 site and the immediate environs.

The NRC staff has conducted an environmental audit at the site and has reviewed historic and archaeological records. The NRC staff also contacted 15 Native American Tribes identified as having potential interest in the proposed undertaking. The NRC staff is transmitting a copy of the draft SEIS to the Delaware Nation for their review and comment.

In the context of the National Environmental Policy Act of 1969, under which the draft SEIS was prepared, the NRC staff's preliminary determination is that the impact of license renewal on historical and archaeological resources is small. Under the provisions of the National Historic Preservation Act of 1966, the NRC staff's preliminary determination is that no historic properties will be affected by the proposed action.

Please note that the period for public comment expires on March 18, 2009. If your office requires additional time, or if there are any other questions regarding this correspondence, please have your representative contact the Environmental Project Manager, Mr. Andrew Stuyvenberg, at 301-415-4006 or Andrew.Stuyvenberg@nrc.gov.

Sincerely,

/RA/

David J. Wrona, Branch Chief
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-247 and 50-286

cc w/o encl.: See next page

December 22, 2008

Ms. Mary A. Colligan
Assistant Regional Administrator for Protected Resources
U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Region
One Blackburn Drive
Gloucester, MA 01930-2298

SUBJECT: BIOLOGICAL ASSESSMENT FOR LICENSE RENEWAL OF THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3

Dear Ms. Colligan:

The Nuclear Regulatory Commission (NRC) staff has prepared a biological assessment (BA), which is included in Appendix E of the enclosed draft Supplemental Environmental Impact Statement (SEIS). The SEIS is the site-specific supplement to the "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," NUREG-1437. This report evaluates whether the proposed renewal of the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point) operating licenses for a period of an additional 20 years would have adverse effects on listed species. The proposed action (license renewal) is not a major construction activity.

In a letter dated August 16, 2007, the NRC requested that the National Marine Fisheries Service (NMFS) provide lists of Federally listed endangered or threatened species and information on protected, proposed, and candidate species, as well as any designated critical habitat, that may be in the vicinity of Indian Point and its associated transmission line right of ways. The NMFS responded to the NRC request in a letter dated October 4, 2007, and indicated that the Federally listed endangered shortnose sturgeon (*Acipenser brevirostrum*) and the candidate species Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) should be considered for potential impacts of license renewal and operation.

The NRC staff found that renewal of the operating license of Indian Point to include another 20 years of operation could adversely affect the population of shortnose sturgeons in the Hudson River through impingement and thermal impacts. At this time, the NRC staff cannot quantify the extent to which the population could be affected.

The NRC staff is preparing an essential fish habitat (EFH) assessment to evaluate whether the proposed renewal of the Indian Point operating licenses for a period of an additional 20 years would have adverse effects on habitats. This assessment is performed in accordance with the 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSA, 16 U.S.C. 1801 et seq.) to identify the importance of habitat protection to healthy fisheries. The NRC staff will transmit the EFH assessment under a separate cover letter.

M. Colligan - 2 -

We are requesting your concurrence with our determination. In reaching our conclusion, the NRC staff relied on information provided by the applicant, on research performed by NRC staff, and on information from NMFS (including a current listing of species provided by the NMFS). If you have any questions regarding this BA or the staff's request, please contact Mr. Andrew Stuyvenberg, Environmental Project Manager, at 301-415-4006 or by e-mail at Andrew.Stuyvenberg@nrc.gov.

Sincerely,

/RA/

David J. Wrona, Branch Chief
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos.: 50-247 and 50-286

cc w/o encl.: See next page

Ms. Danieala Nieto
Air Program Coordinator and Acting
Director
Delaware Nation of Oklahoma
Environmental Programs
P.O. Box 825
Anadarko, OK 73005

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3, DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Dear Ms. Nieto:

The U.S. Nuclear Regulatory Commission (NRC) staff is seeking input for its environmental review of an application to renew the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3 (IP2 and IP3), which are located in Westchester County in the village of Buchanan, NY, approximately 24 miles north of New York City. IP2 and IP3 are operated by Entergy Nuclear Operations, Inc.

As part of its review of the proposed action, the NRC staff has prepared a draft site-specific Supplemental Environmental Impact Statement (SEIS) to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," NUREG-1437. This draft document includes analyses of relevant environmental issues, including potential impacts to historic and archaeological resources from extended operation and refurbishment activities associated with license renewal. By letter dated December 22, 2008, NRC staff transmitted the draft SEIS to interested parties, including your organization.

In your letter to us dated September 5, 2007, you requested that all formal consultation documents be sent to you as a consulting party. Appendix C of the draft SEIS contains a chronology of formal correspondence associated with the license renewal environmental review for IP2 and IP3, and Appendix E contains copies of consultation correspondence.

In accordance with Title 10 of the *Code of Federal Regulations* Part 51, Section 73, we request your comments on the draft SEIS and on our preliminary conclusions contained therein. Please submit any comments that you may have on the draft SEIS by March 18, 2009. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPoint.EIS@nrc.gov. All relevant comments will be addressed in the final SEIS.

The NRC will hold two public meetings to receive oral comments on the IP2 and IP3 license renewal draft SEIS on February 12, 2009; both will be at the Colonial Terrace, 119 Oregon Road, Cortlandt Manor, New York 10567. The first meeting will convene at 1:30 p.m. and will continue until 4:30 p.m., as necessary. The second meeting will convene at 7:00 p.m. and will continue until 10:00 p.m., as necessary. Additionally, the NRC staff will host informal discussions one hour before the start of each session. Both meeting sessions will be

transcribed and any comments received at the meetings will be handled using the same process as written comments provided by mail or e-mail.

The IP2 and IP3 license renewal application, the draft SEIS, and other relevant documents are available on the internet at http://www.nrc.gov/reactors/operating/licensing/renewal/applications/indian-point.html. The staff expects to publish the final SEIS – which will include responses to relevant comments received on the draft SEIS – in February 2010.

Please note that the period for public comment expires on March 18, 2009. If you and your organization have any questions regarding this correspondence, please contact the Environmental Project Manager, Mr. Andrew Stuyvenberg, at 301-415-4006 or Andrew.Stuyvenberg@nrc.gov.

Sincerely,

/RA/

David J. Wrona, Branch Chief
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos.: 50-247 and 50-286

cc w/o encl: See next page

Received
3/05/2009

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

FEB 24 2009

David J. Wrona, Branch Chief
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Program
US Nuclear Regulatory Commission
Washington, DC 20555-0001

RE: Biological Assessment for License Renewal of the Indian Point Nuclear Generating Unit Nos. 2 and 3

Dear Mr. Wrona:

This correspondence responds to a letter dated December 22, 2008 (received January 2, 2009) regarding the initiation of formal consultation for the proposed renewal by the US Nuclear Regulatory Commission (NRC) of the Indian Point Nuclear Generating Unit Nos. 2 and 3 (IP2 and IP3) operating licenses for a period of an additional 20 years pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, as amended. The current operating licenses for these units expire on September 28, 2013 (IP2) and December 12, 2015 (IP3). Consultation with NOAA's National Marine Fisheries Service (NMFS) regarding the proposed license renewal is appropriate as the action may adversely affect the federally endangered shortnose sturgeon (*Acipenser brevirostrum*). Accompanying your letter was a Biological Assessment (BA) evaluating the impact of the proposed renewal on federally endangered shortnose sturgeon (*Acipenser brevirostrum*), as well as a copy of the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 39 Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3 Draft Report*. NMFS has completed an initial review of the BA and draft EIS and has determined that we have not received all of the information necessary to initiate consultation. To complete the initiation package, we will require the information outlined below.

Section 4 of the BA contains life history and status information for shortnose sturgeon. Several corrections are necessary in this section. In the Hudson River, shortnose sturgeon spawn when water temperatures are between 8 and 15°C, which typically occurs in April. Recent information suggests that the population estimate calculated by Bain, and included in the BA, likely overestimates the number of shortnose sturgeon in the Hudson River. Dr. Katherine Hattala, a

biologist with the State of New York, has examined the data used by Bain and determined that a more appropriate estimate is approximately 30,000 adult shortnose sturgeon.

Section 4.3.2 of the BA assesses the impact of impingement on shortnose sturgeon. The BA contains a summary of the available information on impingement of shortnose sturgeon (Table 2). NMFS requests that NRC staff provide the following information in regards to Table 2: (a) for each year, indicate the level of monitoring effort (e.g. weekly for six months, etc.); (b) for each year when there is no number recorded, indicate whether that was due to a lack of monitoring, or due to a lack of capture; (c) indicate the date of impingement; and, (d) indicate the size and condition (i.e., alive, injured or dead) of the impinged fish. It is our understanding that no impingement monitoring has been conducted since traveling Ristroph-type screens were installed at the facility in 1991. As noted in the BA, the lack of information makes it difficult to predict the effects of relicensing and an additional 20 years of operation on shortnose sturgeon. If the NRC is not able to require the applicant to conduct monitoring in support of relicensing, NMFS requests that the NRC provide an estimate, based on the best available scientific information, of the likely number of shortnose sturgeon impinged at the facility with the traveling Ristroph-type screens in use. NMFS expects that the NRC could use the existing impingement data in conjunction with data on the effectiveness of Ristroph-type screens to calculate this estimate. As noted in the BA, another important factor is the mortality rate of impinged sturgeons. NMFS requests that NRC provide an estimate of the mortality rate for impinged shortnose sturgeon. NMFS expects this rate could be calculated based on available mortality rate data for other similar species and/or other facilities where similar screen types have been installed.

Section 4.3.3 of the BA discusses thermal impacts. As noted in the BA, without a model of the thermal plume it is extremely difficult to predict what the level of exposure to elevated water temperatures is for shortnose sturgeon. If NRC is unable to require that the applicant conduct modeling of the thermal plume in support of relicensing, NMFS requests that the NRC use the best available scientific information to estimate the likely temporal and spatial extent to which shortnose sturgeon will be exposed to water temperatures where adverse effects are likely (i.e., greater than 28°C).

It is NMFS understanding that the proposed action is the relicensing of the facility with no modification to the existing intakes. However, in the DEIS, the NRC discusses alternatives including cooling towers. NMFS seeks clarification as to the process by which the NRC will determine whether the installation of cooling towers, or other measures, will be required of the applicant. NMFS also seeks clarification regarding the current requirements of the National Pollutant Discharge Elimination System (NPDES) Permit issued by the State of New York and the potential outcome of the adjudication process currently ongoing regarding this permit, as well as the potential for the State NPDES permit to require cooling towers.

The formal consultation process for the proposed action will not begin until we receive all of the requested information or a statement explaining why that information cannot be made available. We will notify you when we receive this additional information; our notification letter will also outline the dates within which formal consultation should be complete and the biological opinion

delivered. My staff is available to discuss these information needs with NRC staff. I look forward to continuing to work with you and your staff during the consultation process. If you have any questions or concerns about this letter or about the consultation process in general, please contact Julie Crocker at (978) 282-8480.

Sincerely,

Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

cc: Crocker, F/NER3 (hardcopy)
Damon-Randall, Hartley – F/NER3 (pdf)
Rusanowsky– F/NER4 (pdf)
Logan – NRC (pdf)

File Code: Sec 7 NRC Indian Point Nuclear Plant Relicensing

PCTS: F/NER/2009/00619

April 30, 2009

Mr. Peter D. Colosi
Assistant Regional Administrator
for Habitat Conservation
National Marine Fisheries Service
Northeast Regional Office
One Blackburn Drive
Gloucester, MA 01930-2237

SUBJECT: ESSENTIAL FISH HABITAT ASSESSMENT FOR LICENSE RENEWAL OF INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 (TAC NOS. MD5411 AND MD5412)

Dear Mr. Colosi:

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act, the U.S. Nuclear Regulatory Commission (NRC) is requesting initiation of an Essential Fish Habitat (EFH) consultation regarding the proposed action of license renewal for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (IP2 and IP3) for a period of an additional 20 years. Enclosed is the NRC staff's EFH assessment, as well as a copy of the draft site-specific Supplement 38 to NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (GEIS).

IP2 and IP3 are located on the eastern bank of the Hudson River at river mile 43 (river kilometer 69), in the Village of Buchanan, in upper Westchester County, New York. IP2 and IP3 are equipped with a once-through heat dissipation system that withdraws cooling water from and discharges it to the Hudson River. Water for cooling and service water is withdrawn from the Hudson River via two separate intake structures. After circulating through the condensers, cooling water is returned to the Hudson River via a discharge channel to the south of the intakes.

As described in the EFH Assessment, the NRC staff identified 8 species that have EFH designated in the vicinity of IP2 and IP3. The NRC staff has determined that there may be adverse individual or cumulative effects on EFH in the project area for one or more life stages of 5 of these species from the proposed license renewal. The NRC staff has determined that continued operation of the IP2 and IP3 cooling system, with its existing mitigation measures, is expected to have an overall minimal adverse effect on EFH within the Hudson River ecosystem.

In reaching these conclusions, the NRC staff relied on information provided by the applicant, on research and statistical analysis performed by NRC staff, on information from the Fish and Wildlife Service, and on information from National Marine Fisheries Service. If you have any questions regarding the enclosed draft supplement to the GEIS, the EFH Assessment, or the staff's request, please contact Mr. Andrew Stuyvenberg, Project Manager, at 301-415-4006 or by e-mail at andrew.stuyvenberg@nrc.gov.

Sincerely,

/RA/

Brian E. Holian, Director
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

Enclosure:
As stated

cc w/encl: See next page

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 21, 2010

Mr. Peter D. Colosi
Assistant Regional Administrator
for Habitat Conservation
National Marine Fisheries Service
Northeast Regional Office
One Blackburn Drive
Gloucester, MA 01930-2237

SUBJECT: ESSENTIAL FISH HABITAT CONSULTATION FOR LICENSE RENEWAL OF INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 (TAC NOS. MD5411 AND MD5412)

Dear Mr. Colosi:

By letter dated April 30, 2009, the staff of the U.S. Nuclear Regulatory Commission (NRC) requested initiation of an Essential Fish Habitat (EFH) consultation regarding the proposed action of license renewal for the Indian Point Nuclear Generating Unit Nos. 2 and No. 3 (IP2 and IP3), in accordance with Sections 305(b)(2) and (b)(4) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), 16 U.S.C. Section 1855(b). With its letter of April 30, the NRC staff forwarded a copy of the NRC staff's EFH assessment and the NRC staff's draft site-specific Supplement 38 to NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (Draft SEIS) concerning IP2/IP3 license renewal. The NRC staff also sent copies of the letter, the EFH assessment, and the Draft SEIS to the Milford Laboratory on May 13, 2009, as requested by Ms. Diane Rusanowsky, Fishery Biologist in the NOAA/NMFS Habitat Conservation Division, Milford Field Office, in her e-mail message of March 18, 2009. NRC staff subsequently attempted to contact her on several occasions to obtain her comment, without success.

As described in the EFH assessment, the NRC staff identified eight species for which NMFS has designated EFH in the vicinity of IP2 and IP3. The NRC staff has determined that there may be adverse individual or cumulative effects on EFH in the project area for one or more life stages of five of these species resulting from the proposed license renewal. The NRC staff further determined that continued operation of the IP2 and IP3 cooling system, with its existing mitigation measures, is expected to have an overall minimal adverse effect on EFH within the Hudson River ecosystem. In reaching these conclusions, the NRC staff relied on information provided by the applicant, research and statistical analysis performed by NRC staff, and information from the U.S. Fish and Wildlife Service and NMFS. The NRC staff also considered additional mitigation measures in its EFH assessment and in the body of the Draft SEIS.

More than 20 months have passed since the NRC staff issued the Draft SEIS for IP2/IP3 license renewal, and more than one year has elapsed since NRC staff issued the EFH assessment. Comments on the Draft SEIS were due within 75 days, while NMFS comments on the NRC staff's EFH assessment were due within 30 days after notification of the EFH assessment, in accordance with 50 *Code of Federal Regulations* Section 600.920(h)(4); further, this period exceeds the 60-day time period which would have been allotted for expanded consultation on the EFH assessment, under 50 C.F.R. § 600.920(h)(4)(i)(4). The NRC staff requested

comments on its EFH assessment from NMFS and the Milford Laboratory staff, but has received no comments to date from either NMFS or the Milford Laboratory staff on either the NRC staff's EFH assessment or the Draft SEIS for IP2/IP3 license renewal.

In view of the time that has passed since the NRC staff initiated consultation with NMFS under Section 305(b) of the Magnuson-Stevens Act, and in the absence of any comments by NMFS on the EFH assessment, the NRC staff considers that it has fulfilled its responsibilities for consultation under the Magnuson-Stevens Act. Nonetheless, the NRC staff requests that any comments from NMFS on the EFH assessment be submitted within 15 days of the date of this letter so that the NRC staff may consider those comments.

If you have any questions, please contact Mr. Andrew Stuyvenberg, Environmental Project Manager, at 301-415-4006 or by e-mail at Andrew.Stuyvenberg@nrc.gov.

Sincerely,

David J. Wrona, Chief
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: Distribution via Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 27, 2010

Ms. Ruth L. Pierpont, Director
Field Services Bureau
New York State Parks, Recreation & Historic
Preservation
Peebles Island P.O. 189
Waterford, NY 12188-0189

SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW (SHPO NO. 06PR06720)

Dear Ms. Pierpont:

As you know, the staff of the U.S. Nuclear Regulatory Commission (NRC) is reviewing an application to renew the operating licenses for Indian Point Nuclear Generating Units No. 2 (IP2) and No. 3 (IP3), which are located in Westchester County, in the Village of Buchanan, New York, approximately 24 miles north of New York City. IP2 and IP3 are operated by Entergy Nuclear Operations, Inc. (Entergy).

On August 9, 2007, the NRC staff wrote to you, informing you of the application, the staff's determination of the area of potential effect (APE), the environmental scoping process that would be conducted and the schedule for review. On December 22, 2008, the NRC staff transmitted to Ms. Carol Ash, the New York State Historic Preservation Officer (SHPO), a copy of the draft Supplemental Environmental Impact Statement (Draft SEIS) for license renewal of IP2 and IP3. In that letter, the NRC staff informed the SHPO that it had made a preliminary determination that the impact of IP2/IP3 license renewal on historical and archaeological resources is "Small," and that no historic properties will be affected by the proposed action. Further, the NRC staff requested the SHPO's comments on the Draft SEIS and the Staff's preliminary conclusions regarding historic properties, and noted that the period for public comment would expire on March 18, 2009. The NRC staff subsequently communicated with Mr. Kenneth Markunas of your office regarding this matter, by telephone and in e-mail messages transmitted on June 30 and September 10, 2009.

To date, the NRC staff has received no comments from your agency regarding the conclusions in the Draft SEIS; the letter of December 22, 2008, to Ms. Carol Ash; or the follow-up e-mails and telephone communications between NRC staff and Mr. Kenneth Markunas of your office. While the formal comment period for the IP2 and IP3 Draft SEIS closed on March 18, 2009, the NRC staff forwarded copies of consultation letters and a hard copy of the Draft SEIS to Mr. Markunas in July 2009, in order to be sure that your agency was aware of the proposed action as well as the NRC staff's conclusions, and to be sure that the letter and Draft SEIS reached the appropriate review staff.

As stated in NRC's letter of December 22, 2008, in the context of the National Environmental Policy Act of 1969 (under which the Draft SEIS was prepared), the NRC staff's preliminary determination is that the impact of license renewal on historical and archaeological resources is small. As further stated in that letter, under the provisions of the National Historic Preservation Act of 1966 (NHPA), the NRC staff's preliminary determination is that no historic properties will be affected by the proposed action. The NRC staff also sought comments from the Delaware

Nation of Oklahoma – which had requested consulting party status – in a letter dated January 12, 2009. The Delaware Nation of Oklahoma submitted no comments on the Draft SEIS.

The NRC staff is aware of your letter dated December 14, 2006, to James A. Thomas of Enercon Services (Entergy's contractor) indicating that the proposed renewal project "will have No Adverse Effect upon cultural resources in or eligible for inclusion in the National Registers of Historic Places." That letter also indicated that your agency had reviewed the project in accordance with Section 106 of the NHPA. While that letter did not address the Draft SEIS for IP2/IP3, its conclusions appear to be consistent with the NRC staff's preliminary determination, recited above, that the impact of IP2/IP3 license renewal on historical and archaeological resources is small, and that no historic properties will be affected by the proposed action.

Pursuant to 36 *Code of Federal Regulations* (CFR) Section 800.4(d)(1)(i), your agency was required to object to the NRC staff's findings within 30 days. Inasmuch as the comment period for the Draft SEIS closed long ago, and no comments have been received from your office regarding the Draft SEIS or the potential impacts of IP2/IP3 license renewal on historical and archaeological resources, the NRC staff considers that it has fulfilled its consultation responsibilities under Section 106 of the NHPA, as stated in 36 CFR § 800.4(d)(1)(i). Nonetheless, if your agency has any comments on the staff's conclusions under NHPA, the NRC staff requests that your agency respond within 15 days of the date of this letter so the comments may be considered by NRC staff.

If you or your staff have any other questions regarding this correspondence, please have your representative contact the Environmental Project Manager, Mr. Andrew Stuyvenberg, at 301-415-4006 or Andrew.Stuyvenberg@nrc.gov. Thank you for your time and attention.

Sincerely,

David J. Wrona, Chief
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: Distribution via Listserv

Received 10/18

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

Mr. Brian E. Holian, Director
Division of License Renewal
Office of Nuclear Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

OCT 12 2010

Mr. David J. Wrona, Chief
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Re: Indian Point Generating Unit Nos. 2 & 3 License Renewal;
Docket Nos. 50-247 and 50-268; Essential Fish Habitat Consultation

Dear Messrs. Holian and Wrona:

The National Marine Fisheries Service [NMFS] has reviewed the essential fish habitat [EFH] assessment and supplemental information provided within the United States Nuclear Regulatory Commission's [NRC] 'Generic Environmental Impacts Statement for License Renewal of Nuclear Plants, Supplement 38, Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3' [dGEIS], and its attendant appendices. These documents evaluate the proposed renewal of the operating licenses for Indian Point Energy Center's Units 2 [IP2] and 3 [IP3] for a period of twenty years. The documents include a brief description and analysis of adverse effects to a variety of diadromous and estuary-dependent fishes, crustaceans and other invertebrates, as well as EFH that is designated in the immediate project vicinity. We will elaborate on the affected resources and our concerns regarding continued operations at IP2 and IP3 under present conditions in subsequent sections of this letter. However, upon our review of the available information, NMFS does not reach all of the same conclusions as the NRC with respect to adverse effects that relicensing IP2 and IP3 would have on fishery resources and their habitats. We appreciate the opportunity to provide comments at this time in accordance with Mr. Wrona's letter of 21 September 2010.

The current licenses for the two Indian Point nuclear generation facilities are due to expire in 2013 and 2015, respectively. Because IP2 and IP3 withdraw and discharge water into the Hudson River, a navigable surface water body, their operations are subject to Clean Water Act oversight. In New York, this oversight is administered by the New York State Department of Environmental Conservation, which issues Clean Water Act §401 Water Quality Certificate [WQC] decisions under its State Pollutant Discharge and Elimination System [SPDES] program. The New York State Department of State also has a bearing on these proceedings in that it is responsible for any decisions relating to the consistency of the proposed action with the state's Coastal Management Program. Entergy Corporation [Entergy], the current owner-operator of the Indian Point Energy Center [Indian Point] generating units, has made application for the necessary state and federal authorizations and has requested that they are issued to run concurrently. Since these state actions may effect EFH, the NMFS is invoking its option to share our comments and recommendations to the involved state agencies on their activities as provided by the EFH implementing regulations. We do so here by including them in the service list for this correspondence.

The dGEIS and EFH assessment prepared by the NRC evaluate the proposed action of the license renewal for IP2 and IP3 and form the base documentation for consultation between NRC and the National Marine Fisheries Service [NMFS]. The authorities under which we engage in consultation include the

NRC's environmental protection regulations in Title 10, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions", of the Code of Federal Regulations (10 CFR Part 51), which implement the National Environmental Policy Act of 1969, as amended (NEPA); the Fish and Wildlife Coordination Act (FWCA) , the Endangered Species Act (ESA), and the requirements of our EFH regulation at 50 CFR 600.905 of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), which mandates the preparation of EFH assessments and generally outlines each agency's obligations in this consultation procedure. The comments provided in this letter pertain to the FWCA and MSFCMA coordination issues that are part of your NEPA and relicensing processes.[1] To summarize briefly, these documents acknowledge that operating once-through cooling systems at Indian Point has resulted in adverse environmental impacts, yet both documents nonetheless conclude with NRC's preliminary determination that the adverse effects associated with license renewal would have only minimal impacts on both living aquatic resources themselves and on EFH designated for federally managed species in the immediate Indian Point area. NRC's analysis of impacts relies upon comparing near field impacts that would occur in the immediate project vicinity versus all EFH designated for a particular species. We frame the issue differently, and instead consider both the adverse effects to the local fishery stocks emanating from the Hudson and the unusually high potential capacity of the mid-Hudson for recruitment of estuary-dependent fishes and production of forage species as important defining issues that lead us to a different conclusion.

Project Background:

The Indian Point Energy Center [Indian Point] is a three-unit power station located on the east shore of the Hudson River in the Village of Buchannan, Town of Cortlandt, Westchester County, New York. Only two of the generating units are operating. Indian Point Unit 1 was permanently shut down in 1974 because the emergency core cooling system did not meet regulatory requirements and therefore posed an unacceptable public risk; IP2 and IP3 continue to operate and are the subjects of upcoming license renewals requested by Entergy. Indian Point has a long presence in the Hudson and is one of the facilities included in the 'Hudson River Settlement Agreement' [HRSA] agreed among the U.S. Environmental Protection Agency and five New York electric utility companies in a controversy regarding coastal habitat and water uses, fish kills and ecological damage in the Mid-Hudson region.

Under the HRSA, the power plant owners and operators made several concessions to stakeholders representing various environmental interests in exchange for them agreeing to withhold imminent pursuit of forced installation of closed-cycle cooling at Indian Point and several other once-through cooled power plants in the mid-Hudson region. In particular, Consolidated Edison abandoned its plans for developing a major pumped storage [hydroelectric] facility at Storm King Mountain, and the various plant operators agreed to collect data and analyze impacts their facilities were having on living aquatic resources for a period of ten years. Subsequent modifications to the HRSA extended the study period by another decade and have allowed these plants to continue withdrawing about a trillion gallons of river water or more per year. Total river water consumption is dependent upon how many days each plant is operating annually and at what output level. Scheduled outages at Indian Point and more sporadic operation of the fossil fueled plants are all determining factors in terms of the actual water consumption levels at any given time. The biological and ecological effects of these withdrawals are somewhat seasonal in that they reflect the biomass and species assemblage present at the time that the water withdrawals are taking place. The extended study period included implementing a variety of measures that partially mitigated for impingement and entrainment impacts, but these individually and cumulatively did not achieve the level of impact reduction that would result from installing closed cycle cooling at Indian Point.

The Indian Point generating units alone consume about 2.5 billion gallons of water *per day* for their pressurized-water reactors. To meet this need, Indian Point relies upon the Hudson River as a cooling water source and heat sink. Water is withdrawn directly from the river through batteries of seven intake

[1] ESA issues have been coordinated in consultation with our counterparts in the Northeast Regional Office's Protected Resources Division and we do not address them here.

bays into each generating unit and distributed to once-through condensers and auxiliary cooling systems. Cooling water is drawn into the plants by variable- or dual-speed pumps. As it first enters, the withdrawn water is skimmed of floating debris and subsequently passed over modified, vertical Ristroph traveling screens designed to protect aquatic life by retaining water and minimizing vortex stress. These modified screens attempt to reduce, but do not eliminate, impingement mortality. A high pressure spray-wash system removes debris from the front of the traveling screen mechanism and a low pressure spray-wash system flushes impinged fishes off the screen and into a sluice system that returns them to the Hudson River.

Under the HRSA, the former owners of Indian Point conducted impingement monitoring between 1975 and 1990 using a variety of techniques; however, neither the previous nor the current owner-operators have performed validation studies to evaluate the actual performance of the modified traveling screens. The EFH assessment Table 6 contains impingement data for IP2 and IP3 collected between 1981 and 1990. Revised data populating this table were provided to the NRC in December, 2009. Upon NMFS' request, these data were provided for our use on October 01, 2010 and were used in our review. Entrained organisms are not removed from the cooling water stream and instead are carried into and through the plants' cooling systems, as they are first collected by the circulating pumps, and subsequently passed through the plant intakes into the condenser tubes used to cool the turbine exhaust steam. Within the condensers, the organisms are subjected to mechanical damage and shear stress, thermal shock, and exposure to chlorine, industrial chemicals and biocide residues. Both the entrained organisms and heated effluent streams then exit the generating plant and are returned to the Hudson River through a shared discharge channel. According to the dGEIS, the prior Indian Point owner-operators periodically conducted entrainment loss studies for IP2 and IP3 since the early 1970s. The most recent data of this nature reported in the dGEIS are from 1990.

Environmental Setting:

The Hudson River Estuary supports an unusually large and diverse assemblage of fish and shellfish, and has long been recognized as a valuable national and regional resource. That is in part because the Hudson makes large contributions not only to local aquatic resource communities, but also to coastal and offshore fisheries that are supported by prey and other nutrients emanating from the estuary. Some of these fishery resources are managed by on an inter-state basis by the Atlantic States Marine Fisheries Commission [ASMFC] and others are managed federally pursuant to the Magnuson-Stevens Fishery Conservation and Management Act [MSFCMA] or the Endangered Species Act [ESA]. All of these aquatic organisms as well as non-managed species such as forage species and other lower trophic level organisms receive consideration under the federal Fish and Wildlife Coordination Act [FWCA] as NOAA trust resources.

More than 200 fish species have been recorded from within the entire Hudson watershed, and approximately two thirds of these occur in the estuary itself for all or part of their life cycles. More specifically, the Buchanan reach of the Hudson River is a tidally-dominated habitat that serves as a migratory corridor, spawning habitat, and nursery area for an unusually diverse species assemblage of resident or diadromous fishes, crustaceans, shellfish, and many lower trophic level prey items (Smith and Lake 1990). Ambient salinity conditions vary seasonally, and generally tend to lie in the mesohaline or oligohaline ranges. The immediate project reach is within the EFH designations for the Hudson-Raritan estuary and is significant with respect to the resources under the stewardship of the agencies mentioned above. As is true of other estuarine habitats, local temperature and salinity regimes, water depth, bottom type, sediment load and current velocities all influence the distribution and function of aquatic communities.

Evidence suggests that northeast coast estuaries have lost much of their rich former fishery productivity because of habitat degradation or loss, but lack of absolute species abundance data for early historical periods prior to significant human disturbances makes this conclusion somewhat inferential. Yet the linkage is supported by strong evidence, particularly that stock sizes for most estuarine dependent fishery resources under the jurisdiction of the Atlantic States Marine Fisheries Commission, New England or Mid-

Atlantic Management Councils, or the states of New York and New Jersey fishery management agencies, are not currently over fished, but fall below historic levels (NEFMC 1998; ASMFC 2005). This observation suggests that the Hudson River's ability to support and produce living aquatic organisms has been compromised over the years by lost habitat quality and quantity as humans have dredged, filled, and withdrawn river water for a myriad of uses, resulting in conflicts of use with fishery resources.[2]

As described above in the Project Background section of this letter, water withdrawals for once-through cooling systems that serve the mid-Hudson power plants has been a major conflict of use that has gone unresolved for decades. A total of five units remain in operation in the mid-Hudson: IP2, IP3, Bowline Point, Danskammer, and Roseton Generating Stations. All of these plants use one-through cooling systems. In the interim since the most recent relicensing was completed for the Indian Point plants, most fish species have experienced declines, and essential fish habitat [EFH] has been designated in order to better manage adverse anthropogenic effects on fisheries. For the immediate Indian Point area, designated EFH includes acreage that produces organisms that are under direct federal stewardship as well as prey items for species further downriver and offshore. The Hudson River is an important regional source for both harvested stocks and prey, so reductions in its productivity are of great significance to fishery ecology and fishery management.

Given the immense natural productive potential of the Hudson River Estuary, and taking into consideration the staggering numbers of organisms that are lost directly, indirectly and cumulatively through continued operation of electric generating stations that continue to use once-through cooling technology in the Mid-Hudson reach,[3] the National Marine Fisheries Service [NMFS] suggests that the current Indian Point relicensing process is an appropriate and opportune time to apply the Clean Water Act § 316(a) and 316 (b) provisions regarding large power generation facilities. We note that the Indian Point generating units comfortably fit under the criteria for being required to ensure that the location, design, construction, and capacity for cooling water intake structures reflect the best technology available [BAT] to protect aquatic organisms from being killed or injured by impingement or entrainment. We provide further rationale for this conclusion in the following sections of this letter.

General Comments on NRCs Exposition of Environmental Impacts of Operation in the dGEIS:

Nuclear power plant system operation may create a number of habitat disturbances that range from minor to major risk to aquatic resources. The evaluation of these impacts would have been enhanced by a more expanded discussion rather than being distilled to a series of summaries on pp. 4-3 to 4-6. These bullets address topics related to a variety of predominantly physical impacts that the NRC dismisses based upon prior experience at other nuclear plants or on the basis of information presented elsewhere in the EIS. We suggest that the NRC reconsider their evaluation before the GEIS and supplement is finalized. Several of these bullets mention subjects which have a potential bearing on EFH and other aquatic resources of concern, and some modifications would demonstrate adequate support for its conclusions. For instance, on page 4-3, the NRC considers altered currents at intake and discharge structures and finds:

> "Altered current patterns have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term".

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[2] We note that the U.S. EPA generally has determined that operation of industrial scale cooling water intakes results in a wide spectrum of undesirable and unacceptable adverse effects on aquatic resources including entrainment and impingement; disrupting the food chain; and losses to aquatic populations that may result in reductions in biological diversity or other undesirable effects on ecosystem structure or function. See 66 Federal Register 65,256, 65,292 (December 18, 2001), 69 Federal Register 41,576, 41,586 (July 9, 2004). In addition,

[3] Described in NYSDEC's April 2, 2010 denial of Entergy's water quality certificate and also in the NRC's Supplement 38 to the generic Environmental Impact Statement for the proposed re-licenseing of IP2 and IP3

Given the large volumes of water consumed at Indian Point each day and the relatively narrow configuration of the Hudson River at the project reach, it seems plausible that under full operation, the plant *could* induce noticeable changes in the current regime or perhaps induce changes in the local erosion and accretion rates that have unintended adverse effects such as losses of submerged aquatic vegetation, chronic disturbances that discourage settlement of tiny prey items, and similar effects. Although NRC regulations do not compel the project proponents to provide plume modeling or field studies, our EFH regulations compel us to assume the worst case scenario that the effluent is creating a barrier to migrating fishes and other unacceptable environmental conditions that would adversely affect the amount and quality of available EFH. We understand that the plant operators have been using various measures to partially mitigate for these effects, but the lack of a detailed study that 1) evaluates the impacts of once-through cooling at Indian Point and the three other generating units ***and*** 2) clearly demonstrates that the measures they have been implementing are functionally equivalent to the installation of closed-cycle cooling leaves their position on the Clean Water Act § 316(a) and 316 (b) provisions as unsupported assertions. After several extensions of the HRSA, the situation remains fundamentally unchanged with regard to fish stocks and the plants are potential triggers for lost EFH in the form of direct habitat loss compounded by lost productivity in designated EFH.

There is similar concern in the statements for many of the other bullets in this section of the dGEIS, notably as regards the potential release of chemical or thermal pollution [and attendant adverse impacts to fishery resource movements, etc.]; entrainment of phytoplankton and zooplankton; induction of low dissolved oxygen; and other line items that would reduce the quality and quantity of designated EFH as described in the implementing regulations for the MSFCMA. As such, it is difficult for us to dismiss these topics so easily as problems that could be thoroughly assessed in our overall FWCA and EFH coordination. Along these same lines, existing entrainment study results from IP2 and IP3 collected from 1981-1987 do not seem to include hard data or discussion of the entrainment implications for fish eggs and larvae, copepods and other invertebrate prey items that are described clearly as prey in the EFH vignettes included for red hake, winter flounder, windowpane, bluefish and Atlantic butterfish. While Section H.1.2 of the dGEIS and its corresponding subsections do provide a short discussion of entrainment, and even casually observe that a wide variety of phytoplankton, zooplankton, and early life stages of fish and shellfish are vulnerable to becoming drawn into the generating plants via the cooling water stream, the review documents do not provide a thorough analysis of impacts to EFH with respect to their operations. Losses of this nature would have at least indirect and cumulative adverse effects on EFH not just in the mid-Hudson region, but extending into the marine portions of the coastal zone.

Coincidentally, the discussion noted in the foregoing paragraph touches upon the controversial nature of how different stakeholders view entrainment survival, which has a bearing on how a disagreement like the Hudson River power plant example can take deep root, intensify and perpetuate. For entrainment, the NRC documents note a wide range of perceptions on how different stakeholders view the potential for entrainment survival. As these documents suggest, the most conservative estimates consider entrainment 100% fatal, while some of the power companies suggest that some species or life stages could fare considerably better based upon 96-hour survival studies. The NRC correctly acknowledges in the dGEIS that the latter studies do not take into account indirect losses that arise to organisms becoming injured, disoriented or less able to forage in the event that they are fortunate enough to survive entrainment initially, and conclude for the purposes of their assessment that such losses are unknown. Consequently, NMFS does not see justification in the gDEIS to support a conclusion that impingement effects are not significant, or that any mitigation attempted to date has been as effective as the BAT for industrial scale operations, namely, closed-cycle cooling. This calls into question any progress claimed to have been made in implementing the HRSA in part because it gives the appearance that the various Indian Point operators did not follow through completely on their commitments under the HRSA. Moreover, it appears the operators are content to continue under the *status quo* without demonstrating that their mitigation to date has been functionally equivalent to best available technology as required under CWA §316(b).

NRCs Evaluation of Impacts on Aquatic Resources from Operation of the Cooling Water Intake:

The *intake* impacts for once-through cooling systems largely surround physical habitat loss associated with construction of the intakes themselves as well as the inability of aquatic species from being successfully able to use habitat within the volumes of water withdrawn from the source supply. These impacts may include changing particular ecological features such as local hydrological patterns as suggested in the foregoing section, but the preponderance of the impacts usually are associated with organism impingement and entrainment.

Impingement impacts tend to accrue to larger species and life stages that cannot pass through the impingement screens nor avoid the intake current, but become trapped on cooling water screens and sometimes cannot escape before suffering exhaustion, injury or even mortality. For the subject re-licensing proposal, we note that the most recent study results reported in the dGEIS and EFH assessment are decades old, with the most recent information collected in 1990. This fact concerns us on two counts: 1) the data may not accurately depict contemporary habitat usage of the mid-Hudson region by fishes, invertebrates, and other aquatic life, and 2) the project proponents have not evaluated the effectiveness of adaptive measures that have been implemented since the original HRSA was put into place. For instance, installation of the modified Ristroph traveling screens as a means of addressing some of the impacts associated with impingement injury and mortality was predicated on assumptions made in a limited pilot study. The review materials suggest that the actual performance of this gear has not been demonstrated *in situ*. This is an important consideration because gear does not always perform the same in the field as it does in a laboratory setting and its effectiveness can vary based upon the living aquatic resource assemblages it encounters in different geographic settings. Thus, we are left without empirical data to estimate the effectiveness of installing the modified screens and other mitigation measures against closed-cycle cooling. While the new gear may or may not have improved a less than ideal situation, neither NRC nor Entergy can definitively state how effectively the new screen designs are performing as a means of justifying an additional license renewal that permits continued use of once-through cooling in a potential license renewal.

Unlike impingement impacts, which tend to exhibit some selective characteristics in that they largely accrue to larger taxa or more mature life stages, entrainment of organisms into the cooling water source stream are relatively indiscriminate and may adversely affect *any* organism that fits through the screens and cannot counter the suction force of the intake. While the review material indicate that the IP2 and IP3 cooling systems have been retrofitted with dual-speed and variable-flow pumps in order that intake flows can be regulated to some degree to provide some level of mitigation or protection, we note that the dGEIS also indicates that using planned seasonal outages or maximum pump speeds does not eliminate the losses of fishes and other organisms to entrainment.

Regarding these collective intake impact matters, NMFS disagrees with the NRCs approach to presenting and analyzing the impingement and entrainment data. We particularly dispute the NRCs decision to attempt correlating overall *population level* trends with operation of the Indian Point nuclear generating facilities. First of all, analyzing the data over the entire range of a species instead of a more meaningful population segment does not follow the spirit of the National Environmental Policy Act nor the implementing regulations for EFH in the MSA because it ignores real and obvious impacts that could adversely affect a local stock. It is rare for the preponderance of a particular species be extirpated unless it already is endangered or threatened, but it certainly is quite plausible that a more local segment of an otherwise healthy population could be effectively decimated in an acute event or after years of suffering chronic or cumulative impacts. Thus, when considering the impacts of cooling water withdrawal on more local stock contributions emanating from the Hudson River and potentially recruiting to a greatly dispersed coastal fishery, the effects of cooling withdrawal even from a limited portion of the total available habitat (as it is construed in the dGEIS) could be quite profound. Finally, we are critical of this type of data transformation because it also has great potential for creating undesirable artifacts because it assumes all fishery habitats, regardless of their geographic location, size, and ecological condition, are equally valuable to the living resources that they support. The scientific literature is replete with studies that organisms do not use habitats uniformly over their ranges, and this observation is borne out in our

own status and trends data that have been used to select closed areas or to make similar resource management decisions for certain federally managed fishery resources.

In concluding Section 4.1.5 of the dGEIS, upon which the NRC relies to support its overall EFH conclusions, the NRC posits that "impingement and entrainment from the operation of IP2 and IP3 are likely to have an adverse effect on aquatic ecosystems in the lower Hudson River during the period of extended operation", and goes so far as to name several potential mitigation options, but neither arrives at the specific conclusions that the units should be retrofitted with closed-cycle cooling systems, nor selects particular alternatives that they would recommend in lieu of closed-cycle cooling.

NRCs Evaluation of Impacts on Aquatic Resources from Operation of the Cooling Water Discharge:

As disclosed in the dGEIS, the *discharge* of heated water into the Hudson River can manifest a variety of lethal and sublethal effects on aquatic life, influence local ecological conditions, and create barriers to fish migrations. Direct effects tend to be thought of as mortalities that occur when an individual is exposed to conditions beyond their upper thermal tolerance limits. Indirect effects can result in changes to reproductive behaviors, changes in growth rate or survival of young, blocking migratory movements, altered predator-prey relationships, and similar community level disruptions. Oversight of these matters is regulated under a SPDES permit, which imposes effluent limitations, monitoring requirements, and other conditions to ensure that all discharges are in compliance with New York state code and the CWA. The most recent SPDES permit sets a maximum discharge temperature of 110^0F, and limits daily average discharge temperatures not to exceed 93.2^0F for a set number of days from mid-April through June. These terms have changed over a series of four consent orders since the original SPDES was let.

The NRC bases its evaluation of thermal effects on the status of the SPDES permits for Indian Point. According to the applicant's assessment, IP2 and IP3 are in compliance with terms of a SPDES permit issued by the State of New York as well as further mitigation required under the fourth HRSA consent order. The New York State Department of Environmental Conservation (NYSDEC), which maintains regulatory oversight over this arrangement, concludes that under certain circumstances, modeling demonstrates that discharges from the operating units at Indian Point allow greater than the four degree (F.) over ambient temperature limit, or a maximum of 83^0F, whichever is less, in certain estuary cross sections specified under New York State regulations. These matters have been, and remain, in dispute among the plant operators and the NYSDEC, culminating in the state denying a water quality certificate in April, 2010. An ongoing proceeding with the DEC has not resolved the problem, and the NRC notes in the dGEIS that the matter may not be concluded before the NRC issues its final SEIS.

The lack of a thermal study proposed by the NYSDEC or an alternative proposed by the applicant leaves the NRC in the position of having to use existing information to determine the appropriate thermal impact. This resulted in their finding that continued operations with once-through cooling and various mitigation measures would have a small to moderate effect, depending on the extent or magnitude of the plume, the sensitivity of aquatic life stages that were present, and related criteria. In addition to thermal discharges, the NRC considered the potential for plant operations resulting in other impacts to aquatic resources, and concluded that impingement and entrainment are likely to have adverse effects. The significance and extent of these impacts remain in dispute among the involved parties. The project proponents hold that existing operations adequately mitigate impingement and entrainment effects because dual- and variable-speed pumps as well as modified Ristroph were installed at IP2 and IP3, but the efficacy of these and related measures has not been verified by studies. The NYSDEC disagrees with their position, and has concluded that closed cycle cooling is the BAT to address the Hudson River utilities' impacts to aquatic resources. The NRC considered several additional mitigation options and determined that wedgewire screening systems are not feasible; and marine life exclusion systems and/or behavioral deterrents potentially would require further study.

We realize that the ongoing dispute between the plant operator and the State have hampered the NRC's ability to present a full analysis of additional mitigation options available for the existing cooling system, and its potential utility for conserving or protecting EFH functions and values. Nevertheless, we maintain that our analysis of the severity of the project impacts on NOAA trust resources is compelling, and that our conservation recommendations are necessary and appropriate to address the project impacts.

Essential Fish Habitat Comments:

Eight federally managed species with EFH designations within the mixing zone of the Hudson River estuary were identified in the NRCs EFH assessment. Of these, according to NRCs assessment, "there may be adverse individual or cumulative impacts on EFH in the project area for red hake larvae, winter flounder larvae, windowpane juveniles and adults, bluefish juveniles, and Atlantic butterfish juveniles and adults". However, the NRC went on to say in its preliminary EFH determination that they were of the opinion that none of these impacts would rise to a level of concern because "the proportion of EFH affected by IP2 and IP3 is small compared to EFH for the total managed stock". The NRC also proposed that continued operations of the open-cycle cooling systems for these units could continue in a renewed license scenario provided that appropriate mitigation measures were implemented to reduce thermal effluent as well as entrainment and impingement effects.

While the review materials include examples of measures that have been (or could be) implemented to reduce mortalities, it neither advocates a *particular* approach nor evaluates the effectiveness of those measures for protecting and conserving designated EFH or other fishery resource uses. We also note that because the EFH evaluation relies on comparing the immediate project waterfront against the total EFH designated coastally for selected species and life stages, it does not give adequate consideration to the fact that occupation and use of EFH is not uniform. The EFH designations are made on the basis of habitat that is supporting particular species and generic life stages, but does not currently discriminate more finely as to how that habitat is used within a designation. As an example, early juvenile life stages tend to focus on occupation of inshore nurseries and later [but still juvenile] fishes may be using coastal and offshore EFH that better meet their needs. Thus, we do not consider it appropriate to suggest that EFH for a one or two year old juvenile fish is equally suitable for supporting current young of the year juveniles.

Constraining the analysis of impacts to the immediate Indian Point reach and comparing that information against the habitat available to support the entire population and not the stocks originating from the Hudson River, erroneously creates the setting for not being able to find any impacts to EFH. A more appropriate analysis extends the view of entrainment, impingement and thermal discharge impacts to include the mortalities and reduced productivity of forage species, diadromous species, and resident fishes; to assess their impacts on coastal fisheries including species for which EFH is designated downstream; and to discuss how the lost productivity out of the mid-Hudson represents a net reduction in forage opportunities for offshore and downstream resources. This latter class of impacts is quite relevant in this situation and is not analyzed by the NRCs review materials. Nonetheless, the NRCs EFH assessment concluded that there may be adverse individual or cumulative effects of the proposed action on red hake larvae, winter flounder larvae, windowpane juveniles and adults, bluefish juveniles, and Atlantic butterfish juveniles and adults. However, in making this judgment, the NRC did not specify particular impacts of concern in the EFH assessment itself. Extrapolating from the dGEIS, NMFS notes that the primary impacts of concern regarding fishery resources and their habitat generally, and for EFH in particular, that would be associated with continued operations using an open-ended cooling system would be organism loss and habitat degradation. We could not enumerate these impacts based upon the materials provided for our review, but note that at over 2 billion gallons of water consumed per day, the amount of prey available to fishes in particular would be significantly diminished through entrainment alone.

While we recognize the impediments associated with lack of newer studies and related information, NMFS does not agree with some of the methods that the NRC used or assumptions that it made in performing its fish impact evaluations. According to the review materials provided, operating IP2 and IP3 as they currently are leads to direct impacts to EFH species and their prey in the mid-Hudson region. We also note that the EFH assessment and associated analyses were configured too narrowly to capture the breadth and implications that continued operations would have on living aquatic resources and their habitats both in the mid-Hudson and to coastal fisheries. As noted above, we are particularly concerned with the potential for Indian Point operations leading to reduced production or availability of prey, which constitutes an indirect or cumulative adverse effect that diminishes the quality of designated EFH as defined in the MSFCMA. Similarly, it is our opinion that a proper cumulative effects analysis for this situation should have included the adverse effects associated with operations at all of the mid-Hudson power plants that rely on Hudson River water to feed once-through cooling systems. We are not alone in this conviction. According to the NYDECs Final Draft Fact Sheet NY-0004472, dated November, 2003, regarding Indian Point's Surface Water Renewal Permit Action, "Pursuant to Section 316(b) of the CWA, and 6 NYCRR Section 704.5, the Department has determined that the site-specific best technology available (BTA) to minimize adverse environmental impact of the Indian Point Units 1, 2 and 3 cooling water intake structures is closed-cycle cooling." NMFS agrees with New York that a closed-cycle cooling system would significantly limit the amount of intake flow and thereby reduce impacts associated with especially impingement and entrainment. It is our opinion that implementing this measure is in the best interest of fishery resources and also is the most appropriate option for meeting our mutual EFH mandates while allowing continued electric generation at IP2 and IP3 in an otherwise sensitive ecological area.

Essential Fish Habitat Recommendations:

To minimize the impacts on EFH, pursuant to Section 305(b)(4)(A) of the MDFCMA, NMFS recommends that the following conservation recommendations be adopted in conjunction with the proposed federal action:

Implement the best available practicable technology to mitigate impingement, entrainment, and thermal impacts. The BAT for Indian Point would be reconfiguring the facilities by replacing the once-through cooling system with a state-of-the-art, closed-cycle design. A closed cycle cooling system would minimize water intake rates and return little to no heated water back into the Hudson River. The reduced water withdrawals and greatly diminished, perhaps even non-existent, plume associated with a closed-cycle cooling system would avoid and minimize what NMFS considers to be highly significant mortalities of billions of aquatic organisms and their attendant impacts to coastal fisheries.

Please note that Secton 305(b)(4)(B) of the MSFCMA requires that the NRC provide NMFS with a detailed written response to the EFH conservation recommendation, including a description of the measures adopted by the NRC for avoiding, mitigating, or offsetting the impact of the project on EFH. In the case of a response that is inconsistent with NMFS' recommendation(s), Section 305(b)(4)(B) o the MSFCMA also indicates that the NRC must explain its reasons for not following the recommendation(s). Included in such reasoning would be the scientific justification for any disagreements with NMFS over the anticipated effect of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects pursuant to 50 CFR 600.920(k).

Please note that a distinct and further EFH consultation must be re-initiated pursuant to 50 CFR 600.920(1), if new information becomes available or the project is revised in such a manner that it affects the basis for the above EFH conservation recommendation.

Endangered Species Act:

The federally listed, endangered SNS and the candidate species for listing Atlantic sturgeon may be present in the project area. The NRC is currently in consultation with NMFS NEROs Protected Resources Division pursuant to Section 7 of the ESA and the NRC will conclude the ESA consultation with our

colleagues in this Division of NMFS. The contents of the above EFH and FWCA coordination does not replace or supersede any negotiations that you may have conducted or will conduct with our PR division, and only pertains to our mutual obligations under the FWCA and MSFCMA.

Should you have any question regarding these comments or need additional information, please contact Diane Rusanowsky at diane.rusanowsky@noaa.gov; 203-882-6504

Sincerely,

Peter Colosi

Peter D. Colosi, Jr.
Assistant Regional Administrator
For Habitat Conservation

New York State Office of Parks, Recreation and Historic Preservation

The Governor Nelson A. Rockefeller Empire State Plaza • Agency Building 1, Albany, New York 12238
www.nysparks.com

David A. Paterson
Governor

Carol Ash
Commissioner

October 26, 2010

David J. Wrona
Chief, Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation
US Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Re: NRC
Indian Point License Renewal
Buchanan, Westchester County

Dear Mr. Wrona:

Thank you for your letter dated September 27, 2010 to Ruth Pierpont regarding the license renewal of the Indian Point Nuclear Power Generating Units 2 and 3. The New York State Historic Preservation Office (SHPO) previously commented on this matter under Section 106 of the National Historic Preservation Act by letter dated March 24, 2009 (copy attached). As noted in that letter, SHPO's comments "do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act . . . ." The New York State Office of Parks, Recreation and Historic Preservation therefore appreciates this opportunity to comment upon a specific impact upon one of our irreplaceable facilities that does not appear to have been addressed in the draft Supplemental Environmental Impact Statement (DSEIS).

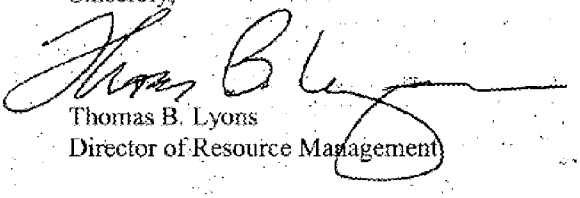
As noted in section 2.2.9 of the DSEIS, Stony Point Battlefield State Historic Site is located just south of and directly across the Hudson River from the Indian Point facility. This historic site is directly associated with the July 16, 1779 battle of Stony Point where General Anthony Wayne and a small elite force of the Continental Army captured the British garrison stationed at the point. This event marked the last major conflict of the Revolutionary War in the northern theater. The 45-acre park is characterized by surviving 18th century earth works and an early 19th century navigational light house. The site was designated a National Historic Landmark by the United Stated Department of the Interior on January 20, 1961. This is the Nation's highest historical site recognition status.

According to the Department of the Interior "National Historic Landmarks are nationally significant historic places designated by the Secretary of the Interior because they possess exceptional value or quality in illustrating or interpreting the heritage of the United States. Today, fewer than 2,500 historic places bear this national distinction." The DOI goes on to state: "National Historic Landmarks are exceptional places. They form a common bond between all Americans. While there are many historic places across the nation, only a small number have meaning to all Americans--these we call our National Historic Landmarks." As such, the Stony Point Battlefield is an irreplaceable asset to the people of New York State and the Nation.

The DSEIS in Chapter 5.2 purports to assess the impacts of a Severe Accident and the feasibility of Mitigation Alternatives, but ignores the impact of such an accident upon Stony Point Battlefield and fails to consider the implementation of alternatives to mitigate such impacts. Any loss, temporary or otherwise, of the public's access to this place would significantly diminish the Nation's lexicon of tangible historic resources associated with the American Revolutionary War. Stony Point Battle Field Historic Site is a significant historic and cultural asset to the people of New York State and the Nation and we request that any potential impacts to this site be fully assessed in the environmental analysis of the relicensing of Indian Point.

If you should have any questions regarding these comments I can be reached at (518) 474-0409.

Sincerely,



Thomas B. Lyons
Director of Resource Management

cc: Tom Alworth

Enclosure

David A. Paterson
Governor
Carol Ash
Commissioner

New York State Office of Parks, Recreation and Historic Preservation

The Governor Nelson A. Rockefeller Empire State Plaza • Agency Building 1 • Albany, New York 12238
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March 24, 2009

Tim Basham
Enercon Services Inc.
6525 N. Meridian, Suite 400
Oklahoma City, Oklahoma 73116

Re: NRC
Entergy Indian Point Units 2 and 3 Operating License Renewal
450 Broadway
Town of Buchanan, Westchester County
06PR06720

Dear Mr. Basham:

Thank you for requesting the comments of the State Historic Preservation Office (SHPO). We have reviewed the project in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

It is our understanding that the potential Cooling Tower Construction locations are being studied for feasibility as a requirement by the NYSDEC. If the cooling towers will need to be constructed at a later date, further consultation will be necessary.

The proposed scope for the Phase IB methodology should include determining the Area of Potential Effect (APE), evaluating and documenting the vertical/horizontal disturbances and testing using the Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State and the 2005 NYSHPO Phase I Archaeological Report Format Requirements. A geomorphologist should determine the need for deep testing if there is the potential for buried deposits. Testing may be necessary to determine fill depth and/or disturbance of original soil.

Finally, the visual effect will have to be assessed as part of the project if the cooling towers will be built.

For further correspondence regarding this project, please be sure to refer to the OPRHP Project Review (PR) number noted above. If you have any questions, please call me at (518) 237-8643, extension 3288.

Sincerely,

Cynthia Blakemore

Cynthia Blakemore
Historic Preservation Program Analyst

cc. James Thomas, Enercon Services
James Briscoe, Enercon Services (vial e-mail)
Dara Gray, IPEC (via e-mail)

Appendix F

GEIS Environmental Issues Not Applicable to Indian Point Nuclear Generating Station Unit Nos. 2 and 3

Appendix F

GEIS Environmental Issues Not Applicable to Indian Point Nuclear Generating Unit Nos. 2 and 3

Table F-1 lists those environmental issues identified in NUREG-1437, Volumes 1 and 2, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (hereafter referred to as the GEIS), issued 1996 and 1999,[1] and in Table B-1 of Appendix B to Subpart A of Title 10, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," of the *Code of Federal Regulations* (10 CFR Part 51), that are not applicable to Indian Point Nuclear Generating Unit Nos. 2 and 3 (IP2 and IP3) because of plant or site characteristics.

Table F-1. GEIS Environmental Issues Not Applicable to IP2 and IP3

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	Category	GEIS Sections	Comment
SURFACE WATER QUALITY, HYDROLOGY, AND USE (FOR ALL PLANTS)			
Altered thermal stratification of lakes	1	4.2.1.2.3, 4.4.2.2	IP2 and IP3 do not discharge into a lake.
Water use conflicts (plants with cooling pond or cooling towers using makeup water from a small river with low flow)	1	4.3.2.1, 4.4.2.1	IP2 and IP3 have a once-through cooling system.
Water use conflicts (plants with cooling towers and cooling ponds using make-up water from a small river with low flow)	2	4.3.2.1 4.4.2.1	This issue is related to heat-dissipation systems that are not installed at IP2 and IP3.

(1) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the GEIS include both the GEIS and its Addendum 1.

AQUATIC ECOLOGY (FOR ALL PLANTS)			
AQUATIC ECOLOGY (FOR PLANTS WITH COOLING TOWER-BASED HEAT DISSIPATION SYSTEMS)			
Entrainment of fish and shellfish in early life stages	1	4.2.2.1.2, 4.4.3	This issue is related to heat-dissipation systems that are not installed at IP2 and IP3.
Impingement of fish and shellfish	1	4.2.2.1.3, 4.4.3	This issue is related to heat-dissipation systems that are not installed at IP2 and IP3.
Heat shock	1	4.2.2.1.4, 4.4.4	This issue is related to heat-dissipation systems that are not installed at IP2 and IP3.
GROUND WATER USE AND QUALITY			
Ground water use conflicts (potable and service water, and dewatering; plants that use <100 gpm)	1	4.8.1.1, 4.8.1.2	IP2 and IP3 do not use ground water for any purpose.
Ground water use conflicts (potable and service water, and dewatering; plants that use >100 gpm)	2	4.8.1.1, 4.8.1.2	IP2 and IP3 do not use ground water for any purpose.
Ground water use conflicts (plants using cooling towers withdrawing makeup water from a small river)	2	4.8.1.3	This issue is related to heat-dissipation systems that are not installed at IP2 and IP3.
Ground water use conflicts (Ranney wells)	2	4.8.1.4	IP2 and IP3 do not have or use Ranney wells.
Ground water quality degradation (Ranney wells)	1	4.8.2.2	IP2 and IP3 do not have or use Ranney wells.
Ground water quality degradation (saltwater intrusion)	1	4.8.2.1	IP2 and IP3 do not use groundwater for any purpose.

Ground water quality degradation (cooling ponds in salt marshes)	1	4.8.3	IP2 and IP3 do not use cooling ponds.
Ground water quality degradation (cooling ponds at inland sites)	2	4.8.3	IP2 and IP3 do not use cooling ponds.
HUMAN HEALTH			
Microbial organisms (occupational health)	1	4.3.6	This issue is related to a heat-dissipation system that is not installed at IP2 and IP3.
Microbiological organisms (public health; plants lakes or canals, cooling towers, or cooling ponds that discharge to a small river)	2	4.3.6	This issue is related to a heat-dissipation system that is not installed at IP2 and IP3.
TERRESTRIAL RESOURCES			
Cooling tower impacts on crops and ornamental vegetation	1	4.3.4	This issue is related to a heat-dissipation system that is not installed at IP2 and IP3.
Cooling tower impacts on native plants	1	4.3.5.1	This issue is related to a heat-dissipation system that is not installed at IP2 and IP3.
Bird collisions with cooling towers	1	4.3.5.2	This issue is related to a heat-dissipation system that is not installed at IP2 and IP3.
Cooling pond impacts on terrestrial resources	1	4.4.4	This issue is related to a heat-dissipation system that is not installed at IP2 and IP3.

Appendix F

References

Code of Federal Regulations, Title 10, "Energy," Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

U.S. Nuclear Regulatory Commission, NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," Volumes 1 and 2, May 1996.

U.S. Nuclear Regulatory Commission, NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Main Report," Section 6.3, "Transportation," Table 9.1, "Summary of Findings on NEPA Issues for License Renewal of Nuclear Power Plants," Final Report, Volume 1, Addendum 1, August 1999.

Appendix G

U.S. Nuclear Regulatory Commission Staff Evaluation of Severe Accident Mitigation Alternatives for Indian Point Nuclear Generating Unit Nos. 2 and 3 in Support of License Renewal Application Review

Appendix G

U.S. Nuclear Regulatory Commission Staff Evaluation of Severe Accident Mitigation Alternatives for Indian Point Nuclear Generating Unit Nos. 2 and 3 in Support of License Renewal Application Review

G.1 Introduction

Entergy Nuclear Operations, Inc. (Entergy) submitted an assessment of severe accident mitigation alternatives (SAMAs) for Indian Point Nuclear Generating Unit Nos. 2 and 3 (IP2 and IP3) as part of the environmental report (ER) (Entergy 2007). Entergy based its assessment on the most recent probabilistic safety assessment (PSA) for IP2 and IP3 (a site-specific offsite consequence analysis performed using the MELCOR Accident Consequence Code System 2 (MACCS2) computer code), and on insights from the Individual Plant Examination (IPE) (Con Ed 1992 and NYPA 1994) and the Individual Plant Examination of External Events (IPEEE) (Con Ed 1995 and NYPA 1997) for each unit. In identifying and evaluating potential SAMAs, Entergy considered SAMAs that addressed the major contributors to core damage frequency (CDF) and large early release frequency (LERF) at IP2 and IP3, as well as SAMA candidates for other operating plants that have submitted license renewal applications. Entergy identified 231 candidate SAMAs for IP2 and 237 SAMAs for IP3. This list was reduced to 68 (IP2) and 62 (IP3) unique SAMAs by eliminating SAMAs that are not applicable at IP2 and IP3 because they have design differences, they have already been implemented at IP2 and IP3, or they are similar in nature and could be combined with another SAMA candidate. Entergy assessed the costs and benefits associated with each of the potential SAMAs and concluded in the ER that several of these were potentially cost beneficial.

Based on a review of the SAMA assessment, the U.S. Nuclear Regulatory Commission (NRC) issued requests for additional information (RAIs) to Entergy in letters dated December 7, 2007 (NRC 2007), and April 9, 2008 (NRC 2008). Key questions concerned major changes to the internal flood model in each of the PSA updates; PSA peer review comments and their resolution; MACCS2 input data and assumptions (including core inventory, evacuation modeling, and offsite economic costs); assumptions used to quantify the benefits for certain SAMAs; reasons for unit-to-unit differences for certain risk contributors and estimated SAMA benefits; and further information on several specific candidate SAMAs and low-cost alternatives, including SAMAs related to steam generator tube rupture (SGTR) events. Entergy submitted additional information by letters dated February 5, 2008 (Entergy 2008a), and May 22, 2008 (Entergy 2008b). In response to the RAIs, Entergy provided clarification of the internal flooding analysis changes in each PSA model version; additional information regarding the peer review process and comment resolution; details regarding the MACCS2 input data, including results of a sensitivity analysis addressing loss of tourism and business; additional explanation and justification for the assumptions in each analysis case; descriptions of plant-specific features that account for differences in risk and SAMA benefits between units; and additional information regarding several specific SAMAs, including SGTR-related SAMAs. Entergy's responses addressed the NRC staff's concerns and resulted in the identification of several additional

potentially cost-beneficial SAMAs and the elimination of one previously identified cost-beneficial SAMA. Subsequent to issuance of the Draft Supplemental Environmental Impact Statement (DSEIS), Entergy identified an error in the Indian Point site meteorology file used to calculate offsite consequences of severe accidents, and submitted a SAMA re-analysis based on the corrected meteorological data (Entergy 2009). The SAMA re-analysis resulted in the identification of several additional potentially cost-beneficial SAMAs beyond those identified in the ER and the DSEIS.

An assessment of SAMAs for IP2 and IP3 is presented below.

G.2 Estimate of Risk for IP2 and IP3

Entergy's estimates of offsite risk at IP2 and IP3 are summarized in Section G.2.1. The summary is followed by the NRC staff's review of Entergy's risk estimates in Section G.2.2.

G.2.1. Entergy's Risk Estimates

The two distinct analyses that are combined to form the basis for the risk estimates used in the SAMA analysis are (1) the IP2 and IP3 Level 1 and Level 2 PSA models, which are updated versions of the IPE (Con Ed 1992 and NYPA 1994) and IPEEE (Con Ed 1995 and NYPA 1997) for each unit, and (2) supplemental analyses of offsite consequences and economic impacts (essentially a Level 3 PSA model) developed specifically for the SAMA analysis. The SAMA analysis is based on the most recent IP2 and IP3 Level 1 and Level 2 PSA models available at the time of the ER, referred to as the IP2 Revision 1 PSA model (April 2007) for IP2 and the IP3 Revision 2 PSA model (April 2007) for IP3. The scope of the PSA models does not include external events.

The baseline CDF for the purpose of the SAMA evaluation is approximately 1.79×10^{-5} per year for IP2 and 1.15×10^{-5} per year for IP3. The CDF is based on the risk assessment for internally initiated events, including internal flooding. Entergy did not include the contributions from external events within the IP2 and IP3 risk estimates; however, it did perform separate assessments of the CDF from external events and did account for the potential risk reduction benefits associated with external events by multiplying the estimated benefits for internal events by a factor of approximately 3.8 for IP2 and 5.5 for IP3. This is discussed further in Sections G.2.2 and G.6.2.

The breakdown of CDF by initiating event is provided in Table G-1 for IP2 and IP3. For IP2, loss of offsite power sequences, including station blackout (SBO) events and internal flooding initiators are the dominant contributors to CDF. For IP3, internal flooding initiators, loss-of-coolant accidents (LOCAs), SGTR events, and anticipated transient without scram (ATWS) events are the dominant contributors to CDF.

There are several significant differences between the two Indian Point units that account for differences in the risk contributions shown in Table G-1. These differences include:

The pressurizer PORV block valves are normally closed in Unit 2, and normally open in Unit 3. Thus, the ability to use the PORVs for feed and bleed cooling in LOOP and partial power loss events is greater at Unit 3, resulting in a lower CDF for LOOP events in Unit 3.

There are differences in the internal flooding sources and building configurations (e.g., ingress and egress paths). These physical differences together with differences in the method for calculating failure frequencies result in higher flood CDF frequencies in Unit 2.

In Unit 2, DC control power for EDGs and other loads on emergency 480 VAC busses is supplied from either normal or emergency backup supplies, with automatic switching between supplies. Unit 3 does not have this backup capability. This results in a lower CDF contribution from loss of DC power events in Unit 2.

Table G-1. IP2 and IP3 Core Damage Frequency (Entergy, 2007)

Initiating Event	IP2		IP3	
	CDF (Per Year)	% Contribution to CDF	CDF (Per Year)	% Contribution to CDF
Loss of offsite power [1]	6.7×10^{-6}	38	1.2×10^{-7}	1
Internal flooding	4.7×10^{-6}	26	2.2×10^{-6}	20
LOCA	1.5×10^{-6}	8	2.2×10^{-6}	19
Transients [1]	1.2×10^{-6}	7	8.5×10^{-7}	7
ATWS	9.9×10^{-7}	6	1.5×10^{-6}	13
SBO	8.5×10^{-7}	5	7.2×10^{-7}	6
SGTR	7.2×10^{-7}	4	1.6×10^{-6}	14
Loss of component cooling water (CCW)	5.8×10^{-7}	3	1.1×10^{-7}	<1
Loss of nonessential service water	3.0×10^{-7}	2	2.8×10^{-7}	2
Interfacing systems LOCA (ISLOCA)	1.5×10^{-7}	<1	1.5×10^{-7}	1
Reactor vessel rupture	1.0×10^{-7}	<1	1.0×10^{-7}	<1
Loss of 125 volts (V) direct current (dc) power	5.8×10^{-8}	<1	1.0×10^{-6}	9
Total loss of service water system	4.4×10^{-8}	<1	5.4×10^{-7}	5
Loss of essential service water	1.9×10^{-10}	<1	1.8×10^{-8}	<1
Total CDF (internal events)	**1.79×10^{-5}**	**100**	**1.15×10^{-5}**	**100**

[1] Contributions from SBO and ATWS events are noted separately and are not included in the reported values for loss of offsite power or transients.

The current Level 2 PSA models are based on the IPE models, with updates to reflect changes to the plant and modeling techniques, including a 3.3 percent and 4.8 percent power uprate for IP2 and IP3, respectively; inclusion of additional plant damage states (PDSs) to improve the Level 1–Level 2 PSA interface; and updated accident progression and source term analyses using a later version of the Modular Accident Analysis Program (MAAP) computer code. The Level 1 core damage sequences are placed into one of 57 PDS bins that provide the interface between the Level 1 and Level 2 analyses. The Level 2 models use a single containment event tree (CET) with functional nodes representing both systemic and phenomenological events. CET nodes are evaluated using supporting fault trees and logic rules.

The result of the Level 2 PSA is a set of nine release categories with their respective frequency and release characteristics. The results of this analysis for IP2 and IP3 are provided in Tables

E.1-9 (IP2) and E.3-9 (IP3) of the ER. The frequency of each release category was obtained by summing the frequency of the individual accident progression CET endpoints binned into the release category. Source terms were developed for each of the nine release categories using the results of MAAP 4.04 computer code calculations. The release characteristics for each release category were obtained by frequency-weighting the release characteristics for each CET endpoint contributing to the release category (Entergy 2007).

The offsite consequences and economic impact analyses use the MACCS2 code to determine the offsite risk impacts on the surrounding environment and public. Inputs for these analyses include plant-specific and site-specific input values for core radionuclide inventory, source term and release characteristics, site meteorological data, projected population distribution (within an 80-kilometer [50-mile] radius) for the year 2035, emergency response evacuation modeling, and economic data. The magnitude of the onsite impacts (in terms of cleanup and decontamination costs and occupational dose) is based on information provided in NUREG/BR-0184 (NRC 1997a).

In its SAMA analysis, as revised, Entergy estimated the dose to the population within 80 kilometers (50 miles) of the IP2 and IP3 site to be approximately 0.87 person-sievert (Sv; 87 person-rem) per year for IP2, and 0.95 Sv (95 person-rem) per year for IP3. The breakdown of the total population dose by containment failure mode is summarized in Table G-2, based on information provided in Entergy's SAMA re-analysis submitted subsequent to issuance of the DSEIS (Entergy 2009). SGTR events and late containment failures caused by gradual overpressurization by steam and noncondensable gases dominate the population dose risk at both units.

Table G-2. Breakdown of Population Dose by Containment Failure Mode (Entergy 2009)

	IP2		IP3	
Containment Failure Mode	**Population Dose (Person-Rem[1] Per Year)**	**Percent Contribution**	**Population Dose (Person Rem[1] Per Year)**	**Percent Contribution**
Intact containment	<0.1	<1	<0.1	<1
Basemat meltthrough	4.1	5	2.4	3
Gradual overpressure	28.3	32	16.8	18
Late hydrogen burns	3.6	4	2.1	2
Early hydrogen burns	8.6	10	3.2	3
Invessel steam explosion	0.6	<1	0.2	<1
Reactor vessel rupture	4.1	5	1.5	2
ISLOCA	6.6	8	4.2	4
SGTR	31.5	36	64.4	68
Total	**87.4**	**100**	**94.8**	**100**

[1] A "rem" (Roentgen equivalent man) is a standard unit used to measure the dose equivalent (or effective dose) of radiation, which combines the amount of energy from ionizing radiation that is deposited in human tissue, along with the medical effects of the particular type of radiation (alpha, beta, gamma or neutron) involved . As defined in 10 CFR 20.1004, a rem is a dose-equivalent quantity of radiation equal to the absorbed dose in "rads" (radiation absorbed dose). A "person-rem" is the total dose (in rems) received by a population. One person-rem = 0.01 Sv.

G.2.2 Review of Entergy's Risk Estimates

Entergy's determination of offsite risk at IP2 and IP3 is based on the following four major elements of analysis:

(1) The Level 1 and Level 2 risk models that form the bases for the IPE submittals (Con Ed 1992, NYPA 1994) and the IPEEE submittals (Con Ed 1995,NYPA 1997);

(2) The major modifications to the IPE models that have been incorporated in the IP2 and IP3 2007 PSA updates;

(3) Adjustments to the IPEEE seismic and fire risk results to represent recent plant changes, updated failure probabilities, and more realistic assumptions;

(4) The MACCS2 analyses performed to translate fission product source terms and release frequencies from the Level 2 PSA model into offsite consequence measures.

Each of these analyses was reviewed to determine the acceptability of Entergy's risk estimates for the SAMA analysis, as summarized below.

The NRC staff's reviews of the IP2 and IP3 IPE submittals are described in the NRC reports dated August 14, 1996 (NRC 1996) and October 20, 1995 (NRC 1995), for IP2 and IP3, respectively. Based on its review of the IPE submittals and responses to RAIs, the NRC staff concluded that the IPE submittals met the intent of Generic Letter (GL) 88-20; that is, the licensee's IPE process is capable of identifying the most likely severe accidents and severe accident vulnerabilities. Although no vulnerabilities were identified in the IPE, several plant improvements were identified. These improvements have either been implemented at the site or addressed by a SAMA (Entergy 2007). These improvements are discussed in Section G.3.2.

There have been three revisions to the IP2 PSA model and two revisions to the IP3 PSA model since the respective IPE submittals. A comparison of the internal events CDF between the IPE submittals and the current PSA models indicates a decrease of approximately 45 and 75 percent for IP2 and IP3, respectively (from 3.13×10^{-5} per year to 1.79×10^{-5} per year for IP2 and from 4.40×10^{-5} per year to 1.15×10^{-5} per year for IP3). A description of those changes that resulted in the greatest impact on the internal-event CDF is provided in Sections E.1.4 and E.3.4 of the ER (Entergy 2007) and in response to a staff RAI (Entergy 2008a) and is summarized in Tables G-3a and G-3b for IP2 and IP3, respectively.

1 **Table G-3a. IP2 PSA Historical Summary**

PSA Version	Summary of Changes from Prior Model	CDF (per year)
1992	IPE submittal (excluding internal flooding) (RISKMAN)	3.13×10^{-5}
Update	5/2003 PSA Update (RISKMAN) - credited recovery of feedwater and condensate - added treatment of cross-header common-cause failure (CCF) for essential and nonessential service water headers - updated equipment performance and unavailability data - revised human error probabilities based on thermal-hydraulic calculations - updated reactor coolant pump (RCP) seal LOCA model - added treatment of internal flooding events	2.19×10^{-5}
Rev. 0	3/2005 PSA update (Computer-Aided Fault-Tree Analysis code [CAFTA]) - updated initiating event, component failure, and unavailability databases - updated offsite power recovery data per EPRI 1009889 - revised internal flooding analysis, including pipe-break frequencies and human error probabilities - changed CCF model from multiple Greek letter to Alpha method - updated human reliability analysis (HRA) method to the EPRI HRA method - updated RCP seal LOCA model to WCAP-16141 (WOG2000) - updated ISLOCA model to address ISLOCAs inside containment, to credit mitigation only for small LOCAs outside containment, and to remove credit for makeup to the refueling water storage tank (RWST)	1.71×10^{-5}

PSA Version	Summary of Changes from Prior Model	CDF (per year)
		1.79×10^{-5}
Rev. 1	2/2007 PSA update - updated selected initiating event frequencies - updated offsite power recovery model per NUREG/CR-6890 - included CCF for plugging service water pump strainers - revised model to reflect that normal offsite power feeds to the 480-V ac safeguards buses do not trip on a safety injection (SI) signal without a concurrent loss of offsite power - added credit for Indian Point Unit 1 (IP1) station air compressors for scenarios that do not involve loss of offsite power - revised auxiliary feedwater (AFW) success criterion to require flow to two (rather than one) steam generators for normal (non-ATWS) response	

1 **Table G-3b. IP3 PSA Historical Summary**

PSA Version	Summary of Changes from Prior Model	CDF (per year)
1994	IPE submittal (including internal flooding CDF of 6.5×10^{-6})	4.40×10^{-5}
Rev. 1	6/2001 PSA Update - updated initiating event, component failure, and unavailability databases - updated offsite power recovery model per NUREG/CR-5496 - revised and added CCF component groups consistent with the most recent probabilistic risk assessment (PRA) practices, and updated CCF data - revised HRA to reflect EOP changes - updated RCP seal LOCA model per Brookhaven model, including credit for qualified high-temperature RCP seals	1.35×10^{-5}

	- incorporated major plant design changes, including: • replacement of power-operated relief valves (PORVs) to eliminate leakage and allow operation with the block valve open • reassignment of power supplies to emergency diesel generator (EDG) room exhaust fans to eliminate dependencies • modification of backup battery charger 35 to be able to be powered from 480-V MCC 36C, 36D, or 36E • installation of a diesel-driven station air compressor • installation of temperature detectors to provide control room alarm if high temperature on the 15 and 33 feet (ft) elevation of the control building • installation of a waterproof door to the deluge valve station	
Rev. 2	2/2007 PSA Update - added a total loss of service water initiating event - updated offsite power recovery model per NUREG/CR-6890 - changed CCF model from modified Beta method to Alpha method - updated RCP seal LOCA model to WCAP-16141 (WOG2000) - revised AFW success criterion to require flow to two (rather than one) steam generators for normal (non-ATWS) response - modified success criteria for cooling of internal recirculation pumps to remove credit for cooling by redundant systems - removed the credit for an offsite gas turbine (which is no longer maintained)	1.15×10^{-5}

1

The CDF values from the IP2 and IP3 IPE submittals (3.13×10^{-5} per year and 4.40×10^{-5} per year, respectively) are near the average of the CDF values reported in the IPEs for pressurized-water reactors (PWRs) with dry containments. Figure 11.2 of NUREG-1560 shows that the IPE-based total internal events for these plants range from 9×10^{-8} to 8×10^{-5} per year, with an average CDF for the group of 2×10^{-5} per year (NRC 1997b). The NRC staff recognizes that other plants have updated the values for CDF subsequent to the IPE submittals to reflect modeling and hardware changes. The current internal event CDF results for IP2 and IP3 (1.79×10^{-5} per year and 1.15×10^{-5} per year, respectively) are comparable to those for other plants of similar vintage and characteristics.

The NRC staff considered the peer reviews performed for the IP2 and IP3 PSAs and the potential impact of the review findings on the SAMA evaluation in order to reach a conclusion regarding adequacy of the PRA to support SAMA evaluation. In the ER, Entergy described the peer review by the (former) Westinghouse Owner's Group (WOG) of the IP2 PSA model, conducted in May 2002, and of the IP3 PSA model, conducted in January 2001. The IP2 model reviewed was an updated version of the IPE that predated the May 2003 version described in Table G-3a. Similarly, the IP3 model reviewed was an updated version of the IPE that predated the June 2001 version described in Table G-3b.

For both IP2 and IP3, the ER states that all of the technical elements were graded as sufficient to support applications requiring the capabilities defined for grade 2 (e.g., risk-ranking applications). In addition, most of the elements were further graded as sufficient to support applications requiring the capabilities defined for grade 3 (e.g., risk-informed applications supported by deterministic insights).

For IP2, the ER states that there were no Level A findings (for which immediate model changes would have been appropriate) from the peer review. Although a number of minor model corrections were made following the peer review, no significant changes were made to the model structure or underlying assumptions in the May 2003 PSA update. The IP2 model was subsequently converted from the support-state RISKMAN model to a linked-fault-tree CAFTA model. Entergy indicates that the conversion effort included a number of modeling changes for consistency with other Entergy models and addressed the remaining findings and observations (F&Os) from the IP2 Peer Review (i.e., Level B, C, and D F&Os), where appropriate. In addition, the issues raised during the peer review of the IP3 model were also examined for applicability to IP2; all applicable issues were addressed consistent with the treatment used for IP3. For IP3, the ER states that all Level A and B F&Os from the IP3 peer review were addressed in the final version of the Revision 1 PSA model for IP3, which was issued in June 2001, and that less significant (Level C & D) F&Os were addressed, where appropriate.

Entergy indicates that the model changes incorporated in the IP2 Revision 1 and the IP3 Revision 2 PSA models also underwent an internal independent review by Entergy PSA staff and plant personnel and were subjected to a focused self-assessment to demonstrate technical quality in preparation for the NRC Mitigating Systems Performance Indicator (MSPI) program in 2006. In addition, the IP2 model was also subjected to a weeklong review by a team of industry peers from outside the Entergy staff in July 2005. Finally, the ER indicates that the model changes in the IP2 Revision 1 and the IP3 Revision 2 PSA models were peer reviewed for accuracy and consistency by members of the Entergy Nuclear Systems Analysis Group not directly involved in their implementation (Entergy 2007).

Given that the IP2 and IP3 internal events PSA models have been peer reviewed and the peer review findings were either addressed or judged to have no adverse impact on the SAMA evaluation, and that Entergy has satisfactorily addressed the NRC questions regarding the PSA (NRC 2007, NRC 2008, Entergy 2008a, Entergy 2008b). The NRC staff concludes that the internal events Level 1 PSA model for the plants is of sufficient quality to support the SAMA evaluation.

Section E.1.4 of the ER states that, for IP2, internal flooding was examined as part of the IPEEE, while Section E.3.4 indicates that internal flooding was included in the IP3 IPE. Internal flooding was later incorporated into the IP2 May 2003 PSA update, resulting in the consistent treatment of internal flooding for the two units.

The IP2 IPEEE analysis of internal flooding yielded a CDF of 6.6×10^{-6} per year while the IP3 IPE internal flooding analysis yielded a CDF of 6.5×10^{-6} per year. For each plant, three scenarios accounted for more than 80 percent of the flood CDF. All these scenarios result in a reactor trip and the nonrecoverable loss of safety-related switchgear from flooding sources located in or adjacent to each unit's 480-V switchgear room.

The internal flooding analysis was included in the WOG peer review. In response to an RAI, Entergy provided a detailed discussion on the incorporation of peer review comments for IP2 and IP3. For IP2, the licensee indicated that there were only two WOG peer review findings associated with the internal flooding analysis.

The first finding related to use of a flooding event screening criterion of 1×10^{-6} per year in the analysis. That criterion, however, was only applied to a scenario involving the potential for intercompartmental flooding from the EDG building to the electrical tunnel and involved leakage that could be accommodated by existing plant drains rather than catastrophic failure. Therefore, it was determined that screening of this scenario was appropriate and a model change was not needed.

The second finding was a general concern that the flooding study had not been updated since 1993. The IP2 internal flooding analysis was subsequently updated in 2005 (Entergy 2008a). For IP3, the licensee indicated that the IP3 WOG peer review concluded that the internal flooding analysis demonstrated a superior combination of industry data and models to obtain plant-specific piping rupture frequencies. The peer review identified four F&Os related to the internal flooding analysis. One F&O was a strength that warranted no change to the model. The other findings related to incorporation of historical data, assembly of walkdown records, and consideration of applicable draft American Society of Mechanical Engineers (ASME) standards to enhance the flooding analysis. The findings related to the incorporation of historical data and to the assembly of walkdown records were resolved during preparation of the final version of Revision 1 of the IP3 PSA model. The draft ASME standards identified by the review team were reviewed, and no modeling changes were warranted. Therefore, all internal flooding review comments that affect the model were addressed in the model used for the SAMA analysis (Entergy 2008a).

As indicated above, the current IP2 and IP3 PSA models do not include external events. In the absence of such an analysis, Entergy used the IP2 and IP3 IPEEEs, in conjunction with minor adjustments in fire and seismic scenarios, to identify the highest risk accident sequences and the potential means of reducing the risk posed by those sequences, as discussed below.

The IP2 and IP3 IPEEEs were submitted in December 1995 (Con Ed 1995) and September 1997 (NYPA 1997), in response to Supplement 4 of GL 88-20 (NRC 1991). These submittals included a seismic PRA analysis, a fire PRA, a high-wind risk model, and a screening analysis for other external events. While no fundamental weaknesses or vulnerabilities to severe accident risk in regard to the external events were identified, several opportunities for risk reduction were identified and implemented, as discussed below. In letters dated August 13, 1999, and February 15, 2001, the NRC staff concluded that the submittals for IP2 and IP3 generally met the intent of Supplement 4 to GL 88-20, and that the licensee's IPEEE process is capable of identifying the most likely severe accidents and severe accident vulnerabilities (NRC 1999, NRC 2001). For IP3, the NRC staff identified an issue related to misdirection of manual fire suppression, which can fail equipment, but decided to resolve that issue separately from the IPEEE.

The IPEEE seismic analyses employed a seismic PSA following the guidance of NUREG-1407. The IPEEE estimated a seismic CDF of 1.46×10^{-5} and 4.4×10^{-5} per year for IP2 and IP3, respectively. Components related to decay heat removal were modeled in the seismic PSA for both units. No unique decay-heat removal vulnerabilities were found for either unit based on the quantitative risk results. Seismic-induced flooding and fires were examined as part of the IPEEE process for both units. Specific seismic-fire interactions were identified by Entergy, as listed in Table 2.12 of NUREG-1742 (NRC 2002). However, upon further consideration, the NRC staff concluded that the contribution to the CDF is small because the conditional probability of a fire, given an earthquake, is small (NRC 2001). For IP2 and IP3, the IPEEEs also addressed the issue of relay chattering through a detailed examination of the relays used in IP2 and IP3 against the low-capacity relay list found in Appendix D of Electric Power Research Institute (EPRI) NP-7148-SL. A list of the dominant contributors to the seismic CDF for IP2 and IP3 is provided in Tables G-4a and G-4b, based on the information provided in response to an RAI (Entergy 2008a).

In Section 4.21.5.4 of the ER, Entergy noted that conservative assumptions were used in the seismic analyses, including the use of a single, conservative surrogate element to model the most seismically rugged components, the assumption that redundant components are completely correlated in determining the probability of seismic-induced failure, and the assumption that seismic-induced ATWS events are not recoverable. For purposes of the SAMA evaluation, Entergy performed a reevaluation of the seismic CDF, as discussed below. For IP2, as a result of an IPEEE recommendation, the CCW surge tank hold-down bolts were upgraded. This effectively eliminated the contribution from the failure of the CCW surge tank, reducing the seismic CDF for IP2 from 1.46×10^{-5} per year to approximately 1.06×10^{-5} per year. For IP3, no seismic improvements were recommended. However, Entergy reevaluated the seismic PSA to reflect updated random component failure probabilities and to model recovery of onsite power and local operation of the turbine-driven AFW pump. This reduced the seismic CDF for IP3 from 4.4×10^{-5} per year to 2.65×10^{-5} per year. These reduced CDF values were used in developing the external events multipliers in the SAMA benefit analysis, as discussed later.

Table G-4a. IP2 Seismic Scenarios and Their Contribution to Seismic CDF

Seismic Scenario Description	CDF (per year) Frequency	CDF (per year) Percent Contribution
Failure of CCW, primarily caused by failure of surge tank hold-down bolts	4.2×10^{-6}	29
Failure of the turbine building frame and consequential failure of control building	3.5×10^{-6}	24
Collapse of IP1 super heater stack onto control building	3.0×10^{-6}	21
Loss of 480 V emergency power	1.3×10^{-6}	9
Loss of service water (seismic failure of service water pumps)	1.3×10^{-6}	9
Seismic-induced loss of offsite power	4.4×10^{-7}	3
Other	7.4×10^{-7}	5
Total Seismic CDF from Dominant Scenarios	**1.46×10^{-5}**	**100**

Table G-4b. IP3 Seismic Scenarios and Their Contribution to Seismic CDF

Seismic Scenario Description	CDF (per year) Frequency	CDF (per year) Percent Contribution
Loss of 480-V ac electric power with consequential RCP seal LOCA	1.9×10^{-5}	43
Loss of CCW with consequential RCP seal LOCA	1.0×10^{-5}	23
Loss of offsite power with seismic failures of the RHR heat exchangers, the condensate stage tank, containment instrument racks, and AFW	9.2×10^{-6}	21
Surrogate element (represents screened out, rugged components and structures, where failure leads to core damage)	3.5×10^{-6}	8
Seismic-induced ATWS	2.2×10^{-6}	5
Total Seismic CDF from Dominant Scenarios	**4.4×10^{-5}**	**100**

The IPEEE fire analyses employed a combination of PRA with the EPRI's fire-induced vulnerability evaluation methodology. The evaluation was performed in four phases:

(1) Qualitative screening;

(2) Quantitative screening;

(3) Fire damage evaluation screening;

(4) Fire scenario evaluation and quantification.

Each phase focused on those fire areas that did not screen out in the prior phases. The final phase involved using the IPE model for internal events to quantify the CDF resulting from a fire-initiating event. Each fire area that remained after screening was then treated as a separate initiating event and was propagated through the model with the appropriate model modifications. The CDF for each area was obtained by accounting for the frequency of a fire in a given fire area; the conditional core damage probability associated with that fire scenario in the fire area, including, where appropriate, the impact of fire suppression; and fire propagation. The potential impact on containment performance and isolation was evaluated following the core damage evaluation. The total fire CDF from the IPEEE was estimated to be 1.8×10^{-5} per year for IP2 (Con Ed 1995) and 5.6×10^{-5} per year for IP3 (NYPA 1997).

In Section 4.21.5.4 of the ER, Entergy noted that conservative assumptions were used in the IPEEE fire analyses, including overestimation of the frequency and severity of fires; conservative treatment of open, hot short, and short-to-ground circuits; and assumption of a plant trip for all fires. For purposes of the SAMA evaluation, Entergy performed a reevaluation of the fire CDF, as discussed below.

For IP2, Section E.1.3.2 of the ER notes that the IP2 IPEEE fire model had the following known conservatisms:

- The main feedwater and condensate systems were assumed to be unavailable in all scenarios, even when their power source was not affected by the fire scenario.
- The pressurizer PORV block valves were assumed to be in the limiting position (open or closed) to maximize the impact of the fire.
- All sequences involving RCP seal LOCAs were assumed to lead to complete seal failure.

For the purpose of the SAMA evaluation, Entergy reevaluated the dominant IPEEE fire sequences (sequences with CDF contributions greater than 1×10^{-7} per year) to reduce the conservatisms associated with main feedwater and condensate unavailability and PORV block valve assumptions and to reflect updated modeling associated with RCP-seal LOCAs. In response to a RAI, Entergy explained that other portions of the fire analysis methodology and modeling were not revised as part of the SAMA update. Entergy also noted that preliminary fire analysis results were inadvertently included in the ER and provided a corrected, revised IP2 fire CDF value of 8.4×10^{-6} per reactor year (Entergy 2008a). These revised results are included in Table G-5a and were used in developing the external events multiplier in the SAMA benefit analysis.

Similarly, for IP3, Section E.3.3.2 of the ER notes that the IP3 IPEEE fire model had known conservatisms in estimating the fire ignition frequency (e.g., an air compressor ignition

frequency did not take into account that the compressor would operate only for a total of about 5 days per year). Also, at the time of IPEEE, the automatic suppression systems in some plant areas were placed in "manual" mode because of concerns with seismic interactions. Subsequently, some fire suppression systems were extensively modified so that the suppression mode could have been returned to "automatic." As part of the update for the purpose of SAMA evaluations, Entergy performed a reanalysis of the fire CDF and provided a revised IP3 fire CDF value of 2.55×10^{-5} per year (Entergy 2007). These revised results are included in Table G-5b and were used to develop the external events multiplier in the SAMA benefit analysis.

Table G-5a. IP2 Fire Areas and Their Contribution to Fire CDF

Fire Area	Area Description	CDF (per year)	
		IPEEE	Fire Reanalysis
1A	Electrical tunnel/pipe penetration area	9.2×10^{-7}	6.6×10^{-7}
2A	Primary water makeup area	1.1×10^{-6}	5.1×10^{-7}
11	Cable spreading room	4.3×10^{-6}	2.0×10^{-6}
14	Switchgear room	3.8×10^{-6}	1.4×10^{-6}
15	Control room	7.1×10^{-6}	3.0×10^{-6}
74A	Electrical penetration area	1.1×10^{-6}	7.3×10^{-7}
6A	Drumming and storage station	1.5×10^{-9}	1.5×10^{-9}
32A	Cable tunnel	9.6×10^{-8}	9.6×10^{-8}
1	CCW pump room	2.2×10^{-9}	2.2×10^{-9}
22/63A	Service water intake	7.5×10^{-9}	7.5×10^{-9}
23	AFW pump room	6.2×10^{-9}	6.2×10^{-9}
Total Fire CDF from Major Fire Areas		**1.8×10^{-5}**	**8.4×10^{-6}**

Table G-5b. IP3 Fire Areas and Their Contribution to Fire CDF

Fire Area	Area Description	CDF (per year)	
		IPEEE	Fire Reanalysis
14	480-V switchgear room	3.5×10^{-5}	1.3×10^{-5}
11	Cable spreading room	6.8×10^{-6}	5.3×10^{-6}
15	Control room	3.7×10^{-6}	3.7×10^{-6}
14/37A	480-V switchgear room/south turbine building	4.5×10^{-6}	1.8×10^{-7}
10	Diesel generator 31	2.1×10^{-6}	2.0×10^{-6}
102A	Diesel generator 33	1.9×10^{-6}	4.7×10^{-9}

Fire Area	Area Description	CDF (per year) IPEEE	CDF (per year) Fire Reanalysis
60A	Upper electrical tunnel	7.1×10^{-7}	7.1×10^{-7}
101A	Diesel generator 32	3.4×10^{-7}	5.2×10^{-9}
7A	Lower electrical tunnel	2.8×10^{-7}	2.8×10^{-7}

Table G-5b (continued)

Fire Area	Area Description	CDF (per year) IPEEE	CDF (per year) Fire Reanalysis
23	AFW pump room	2.3×10^{-7}	2.3×10^{-7}
37A	south turbine building elevation 15 ft	3.8×10^{-8}	3.8×10^{-8}
17A	primary auxiliary building (PAB) corridor	3.2×10^{-8}	3.2×10^{-8}
Total Fire CDF from Major Fire Areas		**5.6×10^{-5}**	**2.6×10^{-5}**

For high-wind and tornado events, the ER noted that IP2 structures and systems predate the 1975 Standard Review Plan (SRP) criteria. Therefore, a detailed PRA was developed as part of the IPEEE analysis to address the impact of high-wind events at IP2. The equipment of concern includes that located within sheet metal clad structures (e.g., the gas turbine and EDG components) and equipment in the yard, including the condensate storage tank (CST) and service water pumps. The CDF for high-wind events was estimated in the IPEEE to be 3.03×10^{-5} per year. In Section E.1.3.3.1 and E.1.4.3 of the ER, Entergy noted that its planned removal of the gas turbines from service would reduce the probability of recovering power from the offsite gas turbine location (as modeled in the PRA), but as shown by a sensitivity analysis this impact would be offset by the increased reliability and ruggedness of the new IP2 SBO/Appendix R diesel generator relative to that of the gas turbines. Accordingly, Entergy used the IPEEE high-wind CDF of 3.03×10^{-5} per year in determining the external event multiplier for IP2, as discussed later.

The IP3 structures and systems also predate the SRP criteria, but the IPEEE found the estimated CDF for high-wind events to be below the 1×10^{-6} per year screening criterion (from NUREG-1407). This conclusion is based in part on the assumption that high water levels are maintained in the condensate storage and city water storage tank, thus preventing significant wind load and pressure differential damage to the tanks that provide water to the AFW system (NYPA 1997). Because of the low CDF value, the IP3 external-event multiplier does not explicitly account for risks associated with high-wind and tornado events.

The IP2 and IP3 IPEEE submittals examined a number of other external hazards, including external flooding, ice formation, and accidents involving hazardous chemicals, transportation (e.g., accidental aircraft impacts), or nearby industrial facilities. These evaluations followed the screening and evaluation approaches specified in Supplement 4 to GL 88-20 (NRC 1991). No risks to the plant from external floods, ice formation, or accidents involving hazardous chemicals, transportation, or nearby facilities, were identified that might lead to core damage with a predicted frequency in excess of 1×10^{-6} per year (Con Ed 1995, NYPA 1997). For IP3, scenarios involving hydrogen explosions within the turbine building, the pipe trench between the PAB and containment, the hydrogen shed area in the containment access facility, and the pipe chase on the 73-ft elevation of the northeast corner of the PAB were identified that, in total, could result in core damage with an estimated frequency slightly above 1×10^{-6} per year. As a result, Phase II SAMA 53 was identified to evaluate the change in plant risk from plant modifications to install an excess flow valve to reduce the risk associated with hydrogen explosions inside the turbine building or PAB. Entergy noted that the risks from deliberate

aircraft impacts were explicitly excluded, since this was being considered in other forums, along with other sources of sabotage.

Based on the aforementioned results, Entergy estimated that the external event CDF is approximately 2.8 and 4.52 times that of the internal-event CDF for IP2 and IP3, respectively. For IP2, this factor was based on an internal event CDF of 1.79×10^{-5} per year, a seismic CDF of 1.06×10^{-5} per year, a fire CDF of 8.4×10^{-6} per year, and a high-wind CDF contribution of 3.03×10^{-5} per year. For IP3, this factor was based on an internal-event CDF of 1.15×10^{-5} per year, a seismic CDF of 2.65×10^{-5} per year, and a fire CDF of 2.55×10^{-5} per year. Accordingly, the total CDF from internal and external events would be approximately 3.8 times the internal-event CDF for IP2 and 5.5 times the internal event CDF for IP3.

In the SAMA analysis submitted in the ER, Entergy increased the benefit that was derived from the internal-event model by a factor 3.8 and 5.5 to account for the combined contribution from internal and external events for IP2 and IP3, respectively. For SAMA candidates that address only a specific external event and have no bearing on internal-event risk (e.g., IP2 SAMA 66—Harden EDG Building Against High Winds), Entergy derived the benefit directly from the external-event risk model and then increased the benefit by the multipliers identified earlier. This resulted in a bounding benefit for the SAMA candidates addressing a specific external event. The NRC staff agrees with the licensee's overall conclusion concerning the impact of external events and concludes that the licensee's use of a multiplier of 3.8 and 5.5 for IP2 and IP3, respectively, to account for external events is reasonable for the purposes of the SAMA evaluation. This is discussed further in Section G.6.2.

The NRC staff reviewed both the general process used by Entergy to translate the results of the Level 1 PSA into containment releases and the results of the Level 2 analysis, as described in the ER and in response to the NRC staff's RAIs (Entergy 2007, Entergy 2008a). The containment designs and the Level 2 analyses are similar for IP2 and IP3. The NRC staff notes that, after reviewing information provided by Entergy, the current Level 2 PSA models are based on the IPE models, with updates to reflect changes to the plant and modeling techniques, including a 3.3 percent and 4.8 percent power uprate for IP2 and IP3, respectively; inclusion of additional PDSs to improve the Level 1–Level 2 PSA interface; and updated accident progression and source term analyses using a later version of the MAAP computer code.

The Level 1 core damage sequences are placed into one of 57 PDS bins that provide the interface between the Level 1 and Level 2 analyses. The PDSs are defined by a set of functional characteristics for system operation that are important to accident progression, containment failure, and source-term definition. The Level 2 models use a single CET with functional nodes representing both systemic and phenomenological events. The CET is used to determine the appropriate release category for each Level 2 sequence. CET nodes are evaluated using supporting fault trees and logic rules.

Entergy characterized the releases for the spectrum of possible radionuclide release scenarios using a set of nine release categories, defined based on the timing and magnitude of the release and whether the containment remains intact, fails, or is bypassed. The frequency of each release category was obtained by summing the frequency of the individual accident progression CET endpoints binned into the release category. The release characteristics for each category were obtained by frequency weighting the release characteristics for each CET endstate contributing to the release category. The source-term release fractions for the CET

endstates were estimated based on the results of plant-specific analyses of the dominant CET scenarios using the MAAP (Version 4.04) computer program. The release categories and their frequencies and release characteristics are presented in Tables E.1-10 and E.3-10 of the ER.

During the review of the Level 2 analysis, the NRC staff could not determine the modeling approach used to assess the likelihood of a thermally induced SGTR (TI-SGTR) following core damage in the current IP2 and IP3 PSAs. Entergy explained that TI-SGTR events are considered in the Level 2 analyses for two conditions:

(1) High reactor cooling system (RCS) pressure and steam generators dry (no secondary-side cooling);

(2) High RCS pressure and steam generators initially dry, with recovery of secondary-side cooling before challenging the steam generator tubes.

The first condition applies to transient event sequences in which RCS pressure is at the pressurizer PORV setpoint at the time of core damage. No credit is taken for recovery of secondary-side cooling in these sequences. Entergy states that a TI-SGTR probability of 0.01 is used for this case, based on Table 2-1 of NUREG/CR-4551, Volume 2, Revision 1, Part 1, which shows a distribution that ranges from $1x10^{-5}$ to 0.1208 and a mean value of 0.018. The second condition applies to SBO sequences in which RCS pressure is at the pressurizer PORV setpoint at the time of core damage. Entergy states that a TI-SGTR probability of $5x10^{-4}$ is used for this SBO case, based on the expectation that the steam generators will not dry out until after battery depletion and that secondary-side cooling and other mitigating system functions could be recovered before that time. The value is stated as being derived from the transient case value of 0.01 combined with the human error probability of $5.2x10^{-2}$ for failure to align AFW following ac power recovery. Entergy explained that a stuck-open main steam safety valve or other secondary-side depressurization event is required to create the large differential pressure needed for the conditional TI-SGTR probabilities assumed above and that the Level 2 analyses conservatively did not account for the probability that these additional failures do not occur (Entergy 2008b). A sensitivity analysis that increases the probability of the TI-SGTR was developed at the staff's request and is described in Section G.6.2.

The NRC staff's reviews of the Level 2 IPEs for IP2 and IP3 concluded that the analyses addressed the most important severe accident phenomena normally associated with large dry containments and identified no significant problems or errors (NRC 1995, NRC 1996). It should be noted, however, that the current Level 2 models are revisions to those of the IPE. The Level 2 PSA models were included in the WOG peer reviews mentioned previously. The changes to the Level 2 models to update the methodology and to address the peer review recommendations are described in Sections E.1.4 and E.3.4 of the ER (Entergy 2007) and in response to an RAI concerning peer review findings related to the Level 2 PSA model (Entergy 2008a).

In the RAI response, Entergy provided a detailed discussion of all the changes that resulted from the incorporation of the WOG peer review of the Level 2 PRA. For IP2, the licensee indicated that there were two Level C F&Os related to the Level 2 analysis. One issue dealt with treatment of containment failure from energetic events (e.g., direct containment heating, hydrogen combustion, in-vessel steam explosions, and ex-vessel steam explosions). The other issue related to treatment of a stuck-open main steam safety valve following an SGTR core

damage event. Entergy indicated that all peer review recommendations associated with the WOG review were incorporated in Revision 0 of the IP2 PSA (3/2005).

For IP3, Entergy indicated that there were six F&Os from the WOG peer review team related to the Level 2 analysis:

- One F&O was related to the containment strength that was considered for a plant-specific containment structural analysis.
- One Level A F&O recommended that the LERF definition include the release of iodine as well as cesium and tellurium.
- Two Level B F&Os were related to justification for the value used for ex-vessel explosions, and an overestimation of the "Alpha mode"-induced containment failure probability.
- One Level C F&O recommended crediting repair and recovery of systems that affect containment performance.
- One Level D F&O was related to documentation.

Entergy indicated that all Level A and B F&Os were resolved and that changes were incorporated as necessary in Revision 1 of the IP3 PSA (6/2001). Entergy also stated that the Level C and D F&Os were addressed, as appropriate, in the next revision of the model (Revision 2, 2/2007).

Based on the NRC staff's review of the Level 2 methodology, the fact that the Level 2 model was reviewed in more detail as part of the WOG peer review and updated to address peer review findings, and Entergy's responses to the RAIs, the NRC staff concludes that the Level 2 PSAs for IP2 and IP3 are technically sound and provide an acceptable basis for evaluating the benefits associated with various SAMAs.

As indicated in the ER, the estimated IP2 and IP3 reactor core radionuclide inventories used in the MACCS2 input are based on the current core configuration and a power level of 3216 megawatt thermal (MWt). The information was derived from Westinghouse Electric Company, Core Radiation Sources to Support IP2 Power Uprate Project, CN-REA-03-4 (3/7/2005), and Westinghouse Electric Company, Core Radiation Sources to Support IP3 Stretch Power Uprate (SPU) Project, CN-REA-03-40 (5/19/2005). In response to an RAI, Entergy confirmed that the current core design and operational practice are consistent with this analysis and that there are no planned future changes to reactor power level or fuel management strategies that would affect the reactor core radionuclide inventory used in the MACCS2 analysis (Entergy 2008a).

The NRC staff reviewed the process used by Entergy to extend the containment performance (Level 2) portion of the PSA to an assessment of offsite consequences (essentially a Level 3 PSA). This included consideration of the source terms used to characterize fission product releases for the applicable containment release categories and the major input assumptions used in the offsite consequence analyses. The MACCS2 code was used to estimate offsite consequences. Plant-specific input to the code includes the source terms for each release category and the reactor core radionuclide inventory (both discussed above), site-specific meteorological data, projected population distribution within an 80-kilometer (50-mile) radius for the year 2035, emergency evacuation modeling, and economic data. This information is provided in Sections E.1.5 and E.3.5 of the ER for IP2 and IP3, respectively (Entergy 2007).

As described in Sections E.1.5.2.6 and E.3.5.2.6 of the ER, meteorological data for a 5-year period from January 2000 to December 2004 were obtained from the Indian Point onsite meteorological monitoring system. The 5-year data included 43,848 consecutive hourly values of wind speed, wind direction, precipitation, and temperature. Missing data were estimated using data substitution methods. These methods include substitution of missing data with valid data from the previous hour and with data collected from other elevations on the meteorological tower. The data for the 5-year period were averaged to provide a data file consisting of one year of hourly readings representative of site meteorology. This data file was used as input to the MACCS2 code for the SAMA analysis reported in the ER.

Subsequent to issuance of the DSEIS, a problem with the process used to numerically average the site-specific meteorological data was identified. Entergy determined that the method used to average the wind direction data was faulty and resulted in a lower frequency of winds blowing toward the south than actually observed. Since a majority of the population near Indian Point is in the southern semicircle of the 50-mile radius, this error resulted in a smaller population dose and a smaller offsite economic cost than would be expected using the corrected method. Accordingly, the dose and economic impacts of a severe accident and the estimated benefits of candidate SAMAs would be larger than was reported in the ER (Entergy 2009).

To address the meteorological data error's impact on the SAMA evaluation, Entergy performed a separate MACCS2 analysis for each of the five single years of meteorological data. Entergy compared the results and selected the year that resulted in the largest population dose (year 2000) as the representative year for use in the SAMA analysis. This approach circumvents the problem associated with averaging wind directions, and is consistent with the intent of the ER to provide results for representative site meteorology. Entergy updated the population dose and offsite economic cost values for each containment release mode, and the estimated benefits for each SAMA based on the meteorological data for year 2000. The correction in meteorological data resulted in approximately a factor of 4 increase in population dose and offsite economic cost values, and resulted in several additional SAMAs becoming potentially cost-beneficial (Entergy 2009). This is discussed further in Section G.6.1. The NRC staff concludes that the updated approach taken for collecting and applying the meteorological data in the SAMA analysis is reasonable and acceptable. This is discussed further in section G.2.3.

The population distribution which the licensee used as input to the MACCS2 analysis was estimated for the year 2035 based on information from the New York Statistical Information System from 2000 to 2030, the New Jersey Department of Labor and Workforce Development from 2000 to 2025, the Connecticut State Data Center from 2000 to 2020, and the Pennsylvania State Data Center from 2000 to 2020. These data were used to project county-level resident populations to the year 2035 using regression analysis. The 2035 transient population was assumed to be the 2004 transient-to-permanent population ratio multiplied by the extrapolated permanent population. The 2004 transient data were obtained from State tourism agencies. The NRC staff notes that Entergy's projected 2035 population within a 50-mile radius of IP2 and IP3 reported in Tables E.1-12 and E.3-12 of the Entergy ER (19.2 million people) is approximately 15 percent greater than the 50-mile population obtained from NRC SECPOP2000 code (16.8 million) for the year 2003 (NRC 2003). This represents an average annual growth rate of 0.4 percent, which comports with Entergy's estimated growth rates reported in Section 2.6.1 of the ER. The NRC staff considers the methods and assumptions for estimating population reasonable and acceptable for the purposes of the SAMA evaluation.

Entergy did not credit evacuation either as part of the base-case analysis or for estimating the benefit from SAMA cases. Entergy assumed a "no evacuation scenario" to conservatively estimate the population dose. In response to an NRC staff RAI, Entergy clarified that the "no evacuation scenario" assumes that individuals within the 10-mile evacuation zone continue normal activity following a postulated accident without taking emergency response actions such as evacuation or sheltering. Relocation actions within a 50-mile radius of the plant are still modeled in the "no evacuation scenario." As such, individuals within hot spots or high-radiation areas anywhere within the 50-mile zone are assumed to be relocated outside the 50-mile zone until long-term protective actions reduce radiation levels (Entergy 2008a). As used in the MACCS2 code, "evacuation" refers to the prompt movement of the population out of an affected region (e.g., certain sectors of the EPZ) during the emergency-phase time period immediately following an accident, in accordance with the emergency evacuation plan. "Relocation" refers to the movement of the population out of an affected region (e.g., within hot spots or high radiation areas) during the intermediate phase or long term phase based on longer-term dose considerations. The NRC staff concludes that the evacuation and relocation assumptions and analysis are generally conservative and acceptable for the purposes of the SAMA evaluation.

Much of the site-specific economic data was obtained from the 2002 Census of Agriculture (USDA 2002). These include the value of farm and nonfarm wealth. Other data, such as population relocation cost, daily cost for a person who is relocated, and cost of farm and nonfarm decontamination were obtained from the Code Manual for MACCS2 (NRC 1997c). The data from the MACCS2 Code Manual were inflation-adjusted using the consumer price index corresponding to the year 2005. Information on regional crops was obtained from the 2002 Census of Agriculture. Crops for each county were mapped into the seven MACCS2 crop categories.

MACCS2 requires an average value of nonfarm wealth (identified as VALWNF in MACCS2). The county-level nonfarm property value was used as a basis for deriving VALWNF and resulted in a value of $163,631 per person. This does not explicitly account for the economic value associated with tourism and business. In the ER, Entergy assessed the impact of including tourism and business losses using a sensitivity case. This sensitivity case assumed a loss of $208,838 per person in the affected region, as opposed to $163,631 per person in the base case. The NRC staff questioned the basis for the modified VALWNF value ($208,838 per person) and the rationale for treating the loss of tourism and business in a sensitivity case rather than in the baseline analysis (NRC 2007). In response, Entergy described the basis for the modified VALWNF value and explained that the impact of lost tourism and business was not modeled in the baseline analysis because the level of tourism and business activity can be re-established in time. Nevertheless, Entergy provided the results of a revised uncertainty analysis using the modified VALWNF value (Entergy 2008a). As a result, three additional potentially cost-beneficial SAMAs were identified (SAMAs 9 and 53 for IP2 and SAMA 53 for IP3). In response to an RAI, Entergy indicated that these SAMAs have been submitted for engineering project cost-benefit analysis to obtain a more detailed examination of their viability and implementation costs (Entergy 2008b). As described in Section G.6.2, the NRC staff has adopted the case incorporating lost tourism and business as its base case, given that it may take years to re-establish the level of tourism and business activity following a severe accident.

In the draft SEIS, the NRC staff reached a preliminary conclusion that the methodology used by Entergy to estimate the offsite consequences for IP2 and IP3 provides an acceptable basis from

which to proceed with an assessment of candidate SAMAs. A further assessment of the methodology was subsequently performed by the NRC staff of issues raised in a petition by New York State (NYS) to intervene in the license renewal proceeding. As described below in Section G.2.3, the NRC staff reaffirms its original conclusion that the methodology used by Entergy to estimate the offsite consequences for Indian Point, as amended in Entergy's SAMA re-analysis (Entergy 2009), provides an acceptable basis from which to proceed with an assessment of candidate SAMAs.

G.2.3 Review of Issues Related to NYS Contentions 12 and 16

On November 30, 2007, New York State (NYS) filed a petition to intervene in the Indian Point license renewal proceeding, in which it filed various contentions, including two contentions challenging Entergy's SAMA analysis, asserting that the analysis was flawed based, in part, on its use of certain input data for the MACCS2 code and the ATMOS air dispersion module. The Atomic Safety Licensing Board (Board) admitted NYS Contentions 12 and 16 related to the SAMA analysis on July 31, 2008.

On February 27, 2009, NYS filed Amended Contentions 12A and 16A, challenging the NRC staff's evaluation and preliminary conclusions regarding Entergy's SAMA analysis as set forth in the DSEIS. On June 16, 2009, the Board admitted amended contentions NYS 12A and 16A, and consolidated them with original contentions NYS 12 and 16. As admitted by the Board, NYS Contention 12/12A challenges whether specific inputs and assumptions related to clean-up and decontamination costs are correct for the area surrounding Indian Point, and NYS Contention 16/16A challenges: (1) whether the population projections used by Entergy are underestimated, (2) whether the ATMOS module in MACCS2 is being used beyond its range of validity (beyond thirty-one miles), and (3) whether use of MACCS2 with the ATMOS module leads to non-conservative geographical distribution of radioactive dose within a fifty-mile radius of Indian Point.

On March 11, 2010, NYS filed Amended Contentions 12B and 16B, challenging various aspects of Entergy's December 2009 SAMA Reanalysis – which, using revised meteorological data, had produced revised estimates of offsite population doses and economic costs, and revised SAMA analysis results (including six additional potentially cost-beneficial SAMAs). On June 30, 2010, the Board admitted NYS Contentions 12B and 16B (in part), and consolidated them with NYS Contentions 12/12A and 16/16A. *Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), LBP-10-13, 71 NRC ___ (2010), slip op. at 10, 14-15.

In reviewing the issues raised in these contentions, the NRC staff obtained the technical assistance of Sandia National Laboratory (Sandia). The NRC staff and Sandia performed a comprehensive review of relevant documents and references, including the ER, the draft SEIS, the MACCS2 input decks for Indian Point and associated documentation, the NYS contentions and supporting documents and references, the Board's rulings on the contentions, and other relevant filings in the adjudicatory proceeding. A summary of the staff's assessment of the issues raised in the admitted contentions is provided below.

Clean-up and Decontamination Costs (NYS Contention 12/12A/12B)

NYS Contention 12/12A/12B argues that the size of the particles dispersed from a severe reactor accident would be comparable to those released in nuclear weapons tests, smaller than the particle size considered in MACCS2, and that it will be more expensive to decontaminate

and clean-up a suburban/urban area in which small-sized radionuclide particles have been dispersed. NYS defines large-sized particles as ranging in size from "tens to hundreds of microns" and defines small particles as ranging in size from "a fraction of a micron to a few microns".

The staff and Sandia reviewed the inputs and assumptions regarding particle size distribution and decontamination costs used in the SAMA analysis, and determined that the particle size utilized in the analysis was reasonable and acceptable. In this regard, in the MACCS2 input files (atmbi2NS.inp and atmbi3NS.inp), Entergy used a dry deposition velocity value of 0.01 meters per second (m/s) for all aerosol particles. A deposition velocity of 0.01 m/s corresponds to approximately a 5 to 10 micron radius particle, based on gravitational settling of small spheres in dilute laminar flow fields. Thus, the MACCS2 dispersion does not assume that the dispersion will consist of large-sized radionuclide particles as NYS contends. While smaller (or larger) particle sizes could have been used in the analysis, the particle size utilized in the analysis was relatively small, is consistent with the accepted SAMA analyses performed for other nuclear power plants, and is acceptable. With respect to the estimated decontamination costs used in Entergy's MACCS2 SAMA analysis, the staff found that Entergy's estimated decontamination costs were reasonable and acceptable, as described below.

In the MACCS2 input files, Entergy used decontamination cost parameters that were typically higher than the MACCS2 Sample Problem A values by a factor of 1.7. (Sample Problem A values were primarily developed for the Surry plant analysis in NUREG-1150 and represent best estimate information for that site and time.) As described in the ER, the values were obtained by adjusting the generic Sample Problem A economic data with the consumer price index of 195.3, which accounts for inflation between 1986 and 2005. Farm and nonfarm values for Indian Point were based on site-specific data and were not extrapolated from Sample Problem A. NYS suggests that in place of the "outdated" decontamination cost figures used by Entergy, the methodology described in a Sandia document, SAND96-0957, "Site Restoration: Estimation of Attributable Costs from Plutonium-Dispersal Accident" should be used in establishing decontamination values for input to MACCS2. The NRC staff does not consider the methodology for clean-up of a nuclear weapons accident relevant to clean-up following a nuclear power plant (NPP) accident. Nonetheless, at the staff's request, Sandia performed a comparison of the decontamination cost factors derived from the Site Restoration study to those used in the SAMA analysis. The approach to the cost comparison included identifying basic considerations of each type of accident (e.g., contaminants, half life of contaminants, and health and safety considerations), identifying the decontamination methods required, and comparing the Site Restoration study cost values (as applied to the urban area of New York City) to those used in Entergy's analysis.

Sandia noted that the primary constituent in weapons grade plutonium, Pu239, is an alpha emitter, whereas the primary contaminant from an NPP accident, Cs137, is a gamma emitter. As such, Pu239 is more difficult and expensive to characterize and verify in the field than gamma emitters like Cs137. Furthermore, Pu239 is primarily an inhalation hazard with half-life of 24,000 years, whereas Cs137 is primarily an external health hazard with half-life of about 30 years. The need for evacuating the public is much greater with plutonium because if inhaled, the health consequences can be severe.

Both the Site Restoration study and the MACCS2 model consider the extent of decontamination required in determining decontamination costs. This is typically expressed as a

decontamination factor (DF) which represents the ratio of the contamination level before and after clean-up. The Site Restoration study provides cost estimates for remediation of light contamination (DF=2 to 5), moderate contamination (DF=5 to 10), and heavy contamination (DF>10). Appendix F of the Site Restoration study describes the decontamination methods for light, moderate, and heavy contamination by plutonium. For the Indian Point MACCS2 model, Entergy provided decontamination cost input values for two levels of remediation, specifically, a DF of 3 and a DF of 15. Sandia considered the decontamination activities described in the Site Restoration study together with the differences in health hazards posed by Pu239 versus Cs137, and concluded that the activities required to support clean-up of moderate plutonium contamination align more closely with clean-up activities for heavy cesium contamination. Sandia performed the comparison of decontamination cost values on this basis.

Sandia conservatively limited its cost comparison to urban areas (non-farmland) because urban areas are more costly to decontaminate than farmland, and because farmland makes up a very small percentage of land area within the Indian Point area, with most counties having less than 1 percent farmland. To further simplify the cost analysis and provide a comparison of the highest cost areas, the cost comparison was performed only for New York City, which includes five counties (the Bronx, Kings, New York, Queens, and Richmond). The population density of New York City is about 12,000 persons/km^2.

As described above, the decontamination activities for moderate plutonium contamination are most directly comparable to the decontamination activities for heavy cesium contamination. The Site Restoration study (Table 6-2) provides an estimated cost of $178.4 million/$km^2$ for clean-up of moderate plutonium contamination in urban areas, or $14,900 per person when expressed on a per capita basis for New York City. In contrast, a cost of $13,824 per person was used in Entergy's MACCS2 analysis for decontamination of heavy cesium contamination. Thus, the decontamination cost from the Site Restoration study ($14,900 per person) is not significantly different than the value used by Entergy in the SAMA analysis ($13,824 per person). If the Site Restoration study values were escalated to 2005 dollars, as were the values used in the SAMA analysis, the difference would be greater, but would still be within a factor of about 2, The differential dollar cost attributable to this difference would vary depending upon the size of the area (i.e., the number of people) that would need to be evacuated. Thus, using the Site Restoration study values, decontamination could cost more than was estimated in Entergy's analysis; however, it could also cost less than Entergy estimated, inasmuch as the SAMA analysis assumed the dispersal of "heavy contamination." Considering the uncertainties inherent in such predictions, Entergy's decontamination cost estimates appear reasonable and acceptable. Further, Entergy's decontamination cost estimates are consistent with those used in accepted SAMA analyses performed for other nuclear power plants.

Population Projections (NYS Contention 16/16A/16B)

NYS Contention 16/16A/16B argues that Entergy's projections of the 2035 population living within the 50-mile radius of Indian Point underestimate the potential exposed population. The staff and Sandia reviewed Entergy's baseline and projected population values and its population projection methodology, and developed independent estimates of the baseline and projected population. Entergy obtained population estimates directly from State agency reports for periods ranging from 2000 to 2020 and 2000 to 2030, depending on the State data available. Entergy projected total permanent populations to the year 2035 for 25 of the 28 counties that are within or encroach upon the limit of 50 miles from Indian Point using linear extrapolation.

Entergy used areal weighting, which assumes a constant population distribution over the area assessed (i.e., in each of the 160 cells within the 16 sectors and radial rings representing the 50-mile radius surrounding the IP site), to establish fractional population within 50 miles of Indian Point. Entergy then adjusted this permanent population projection upward to account for the presence of the transient (tourist) population as estimated from available tourist information. For the remaining three counties, including New York (Manhattan), Rockland, and Westchester counties, Entergy used polynomial regression for projecting the population. A polynomial regression appears to have been used for these counties because State data shows a decrease in the population of these counties. The population for these counties was projected by the State to increase from 2000 to 2020 and then decrease from 2020 to 2030 resulting in a peak population in 2020. Because there is a peak within the projection period, Sandia agreed that use of a polynomial projection to the year 2035 is a more appropriate approach than a linear projection for these counties. Entergy estimated the year 2000 permanent population within the 50-mile radius of Indian Point to be 16,914,178. Entergy projected the permanent population out to 2035 to be 18,879,657, an increase of 12.43 percent. The population Entergy used in its SAMA analysis was 19,228,714, which accounts for the transient population, as described above.

Sandia performed an independent assessment of the population data within a 50-mile radius of Indian Point using the SECPOP2000 computer program. The population data in SECPOP2000 is based on 2000 U.S. Census Bureau data. The population for the year 2000 estimated by SECPOP2000 is 16,800,272; this compares very closely with Entergy's year 2000 estimate of the permanent population within the 50-mile radius (16,914,178).

Sandia also performed two analyses of projected population growth to the year 2035, and determined that Entergy's projected population growth was reasonable. The first evaluation was based on the US Census Bureau's projected growth from 2000 to 2008 for the Northeast region of the US. During these 8 years, the projected growth is 2.344 percent; based on this number, the annualized growth rate for the Northeast region of the country is 0.2900 percent. Assuming a constant growth rate between the years 2000 and 2035 results in an estimated growth of 10.67 percent. This estimate is lower than the Entergy value of 12.43 percent. The second evaluation used the same year 2000 population for the 28 counties surrounding Indian Point as used by Entergy, but used a simpler method than Entergy for extrapolating out to 2035. The annualized growth rate was calculated starting from the 2000 census values to the final (latest) year projected by each of the states. Assuming this growth rate to continue through 2035, the estimated growth for the 28 counties is 15.98 percent. This value is larger than Entergy's projected growth of 12.43 percent, but the difference is small. Thus, the two evaluations performed by Sandia bound the Entergy projection for population growth.

Finally, Sandia performed a separate population projection for the five counties comprising New York City. For New York, Queens, and Richmond Counties, Sandia projected slightly higher populations than Entergy. For Bronx and Kings Counties, Entergy projected higher populations. The difference between the Sandia and Entergy population projections for all 5 counties is only 0.39 percent. The NRC staff concludes that Entergy's population data and projected population growth analysis provide reasonable (and slightly conservative) population values for its SAMA analysis.

Validity of ATMOS Model (NYS Contention 16/16A/16B)

NYS Contention 16/16A/16B argues that the ATMOS air dispersion module utilized in the MACCS2 code is being used beyond its range of validity (beyond thirty-one miles), which could affect the validity of decontamination cost estimates for areas beyond that range. The NRC staff and Sandia National Laboratory addressed this issue in detail, in the NRC staff's October 13, 2009 response to a NYS motion for partial summary disposition. In brief, the NRC staff and Sandia considered the State's concern, and concluded that ATMOS air dispersion module provides an acceptable means for estimating potential plume travel and dispersion in a probabilistic statistical analysis, and is acceptable for use with the MACCS2 code, in which a probabilistic analysis is performed for a large number of meteorological trials, which are subject to hourly variation. Further, this conclusion is supported by a comparison of the results produced by MACCS2 analyses using the ATMOS module with the results of analyses performed with other codes.

ATMOS is a Gaussian plume model within MACCS2 that treats plume segments under different weather conditions based on hourly changes from the site meteorological data. The meteorological data considered for each segment include wind speed, direction, stability class, and precipitation. Once a plume is formed, the direction does not change; however, the wind speed, stability class, and precipitation rate can change hour-by-hour based on the meteorological data.

The MACCS2 code considers, among other things, phenomena related to atmospheric transport and deposition under time-variant meteorology, short- and long-term mitigative actions, potential exposure pathways, deterministic and stochastic health effects, and economic costs. The MACCS2 code samples the meteorological data from an entire year and uses wind rose data to account for the plume traveling through all 16 compass sectors to ensure that all the potential plume paths are accounted for in the calculations. This ensures that likely impacts for the entire area within a 50-mile radius have an accurate statistical model for likelihood of a plume reaching that area and its expected concentration. The MACCS2 model generates average or expected values of metrics of interest considering all of the relevant dose pathways, including the food and water pathway, and covering essentially a lifetime of exposure to a contaminated environment.

Questions regarding the adequacy of averaging metrics of interest over numerous weather sequences have been studied in detail. This included a detailed code comparison completed in 2004 with the objective of determining if the average atmospheric transport and dispersion results from codes such as MACCS2 are sufficiently accurate that more complex models are not required. In that study, results from the MACCS2 code were directly compared to those from the LODI (Lagrangian Operational Dispersion Integrator) code and the RASCAL 3.0 (Radiological Assessment System for Consequence Analysis, Version 3.0) code.

LODI is a state-of-the-art, three-dimensional (3D) advection dispersion code that uses a Lagrangian stochastic Monte Carlo method. LODI is coupled to ADAPT (Atmospheric Data Assimilation and Parameterization Technique), which provides time-varying, 3D fields of mean winds, turbulence, pressure, temperature, and precipitation based on observed meteorology. LODI is an element of the National Atmospheric Release Advisory Center (NARAC) emergency response modeling system at Lawrence Livermore National Laboratory (LLNL) which is a national support and resource center for planning, real-time assessment, emergency response,

and detailed studies of incidents involving the spread of hazardous material accidentally or intentionally released into the atmosphere.

RASCAL 3.0 is used by the NRC for emergency response applications where a rapid response is required. The NRC evaluates accident conditions using RASCAL and compares results to those produced by NARAC during an accident. RASCAL 3.0 contains atmospheric transport and dispersion components that are intermediate in complexity between MACCS2 and ADAPT/LODI. RASCAL employs time-varying, two-dimensional meteorological fields of wind, stability, and precipitation based on surface-level meteorological observations as input to a Lagrangian trajectory transport model and a Gaussian puff dispersion model. While the dispersion portions of RASCAL 3.0 are similar to those of MACCS2, the transport portions are significantly different. The capabilities of RASCAL 3.0 are similar to those of the dispersion models CALPUFF and AERMOD, which were recommended by NYS.

As documented in NUREG/CR-6853, "Comparison of Average Transport and Dispersion Among a Gaussian, a Two-Dimensional, and a Three-Dimensional Model," this comparison shows that MACCS2 provides results consistent with those from the more complex plume models at distances up to 100 miles. This is well beyond the 50-mile radius considered in the SAMA analysis. The MACCS2 predictions for average, time-integrated, ground-level air concentrations (which directly relates to inhalation and cloudshine doses), and for average deposition (which directly relates to groundshine and ingestion pathway doses) were very comparable to predictions made by the state-of-the-art NARAC codes, ADAPT/LODI, at all distances. The direct comparison to state-of-the-art codes demonstrates that MACCS2 is well within its range of validity when used to perform SAMA analyses.

Geographical Distribution of Radioactive Contamination and Dose (NYS Contention 16/16A/16B)

NYS Contention 16/16A/16B also argues that use of MACCS2 with the ATMOS module leads to a non-conservative geographical distribution of radioactive dose and radionuclide contamination within a 50-mile radius of Indian Point, which could affect the validity of dose and contamination cost estimates within that area. The staff and Sandia considered the State's concerns regarding ATMOS, and concluded that ATMOS provides an acceptable plume model for the calculation of doses and radioactive contamination in a SAMA analysis. In response to this concern, Sandia assessed the impact of using a Gaussian plume model on accident consequences, and evaluated the population distribution and meteorological data used in Entergy's SAMA analysis.

The Gaussian plume model used in ATMOS assumes that the plume travels in a straight line. For Indian Point, this would minimize the distance the plume would travel in reaching the highest population areas, which are near the periphery of the 50-mile radius. The Gaussian plume model provides further conservatism under variable terrain conditions. Specifically, when variable terrain features such as river embankments or mountains intervene between a source and an observation point, these features would tend to disperse and dilute the plume as it is forced to move around obstacles. The plume model conservatively estimates that the plume travels in a straight line over or through the obstacle, thereby resulting in larger accumulated radiological doses and higher estimates of economic consequences in areas farther from the plant.

Although there are large geographic variations of population density within 50 miles of Indian Point, the evaluation of population distribution shows that the largest populations are located at

the furthest distances within the 50-mile radius surrounding the site (i.e., in the New York City metropolitan area located about 30 to 50 miles south [SSE to SSW] of the Indian Point site). The shorter path of travel associated with the Gaussian plume model, together with the dominant wind direction being toward New York City (discussed below), ensures that a conservatively large amount of contaminant reaches the areas with higher population density in the MACCS2 analysis. Accordingly, use of the ATMOS module would result in a conservative geographical distribution of radioactive dose within a 50-mile radius of Indian Point relative to other atmospheric transport models.

Sandia reviewed the MACCS2 input files used in the Entergy baseline analysis to determine whether input parameter selection might contribute to non-conservative geographical distribution of radioactive dose within the 50-mile radius of Indian Point. Most of the input parameters used by Entergy in the MACCS2 analyses were standard choices consistent with Sample Problem A that is distributed with the MACCS2 code. The following input choices were specifically reviewed by Sandia:

- Meteorology – In the SAMA analysis described in the ER, Entergy averaged meteorological data for a 5-year period to provide a data file consisting of one year of hourly readings representative of site meteorology. After the staff raised questions concerning the weather data used in the analysis, Entergy submitted an updated MACCS2 input file which uses a single weather year with conservative data and corrects the wind rose data. The use of a single year's data is consistent with regulatory guidance; further, the wind direction in the updated file is predominantly to the south (toward New York City), consistent with information reported elsewhere for Indian Point (e.g., in annual effluent reports between 1999 through 2002). Thus, the staff's concern regarding wind direction has been resolved in the updated analysis.

- Population – The population values in the MACCS2 input files are consistent with the values reported in the ER. The population values were also found to be consistent with the US Census data as discussed above. The 2035 projected population value of 19,228,712 used by Entergy was reviewed and found to be reasonable. Sandia confirmed that Entergy's population projections for New York City, which is in the dominant downwind plume direction, are reasonable. Further, Entergy's use of populations accounting for tourists was found to be reasonable and to provide a slightly higher estimated cost.

- Dry Deposition Velocity – The dry deposition velocity of 0.01 m/s corresponds to a relatively small particle size. Within the plume model, small particle sizes will travel greater distances than large particle sizes. Therefore, smaller particle sizes would favor deposition at the higher population locations farther from the site, and would likely result in greater population dose and greater decontamination costs because the areas farther away from the plant are more densely populated urban areas which have higher decontamination costs. While smaller or larger particle sizes could have been used in the analysis, the particle size that Entergy used is reasonable and acceptable.

- Plume representation – Releases to the environment were modeled as a single Gaussian plume in the SAMA analysis. While Entergy's analysis utilized a single plume, MACCS2 has the ability to divide the plume into a number of plume segments. Use of additional plume segments would likely result in some variation in wind direction,

dispersing the radiation and resulting in lower peak doses to the public. For purposes of a SAMA analysis, however, the results of a single isolated meteorological data trial is not at issue; rather, the analysis should model the results of numerous meteorological trials that provide a mean dispersion over the entire 50-mile radius. Such modeling necessarily includes variations in wind direction. The end result of conducting multiple meteorological trials is the calculation of a mean atmospheric transport, which describes the expected amount and timing of the contaminant release reaching any area within a 50-mile radius. This calculation allows for the determination of the mean effect on dose and economic costs for each modeled event that could occur at some time in the future under unknown weather conditions. The NRC staff notes that a SAMA analysis is not meant to provide a prediction of the contamination for any specific weather event; rather, it provides a mean result for a type of event under the mean potential circumstances. The use of a single Gaussian plume in each trial in the SAMA analysis provides a reasonable and acceptable approach for this purpose.

- Spatial grid – The MACCS2 analysis considered consequences with a 50-mile radius of the Indian Point site. This is consistent with NRC guidance for regulatory analysis as provided in NUREG/BR-0184.
- Decontamination costs – Decontamination costs were based on Sample Problem A and adjusted for inflation using the consumer price index factor. A comparison of Entergy's input values with those derived from the Site Restoration study shows the values are in reasonable agreement.
- Emergency evacuation – The emergency phase evacuation was not modeled in the Entergy analysis. Entergy claims that this is more conservative than using the radial evacuation approach applied in Sample Problem A. The emergency evacuation treatment is not expected to significantly affect the SAMA results (e.g., total population dose and offsite economic cost risk) because these metrics are typically driven by doses/deposition well beyond the 10-mile emergency planning zone.

Based on the NRC staff's and Sandia's review, the ATMOS module and MACCS2 input parameters used by Entergy are reasonable and acceptable, and do not result in a non-conservative geographical distribution of radioactive dose and contamination within a 50-mile radius of Indian Point.

Summary

The NRC staff, with the assistance of Sandia National Laboratory, evaluated the concerns raised in NYS Contentions 12/12A/12B and 16/16A/16B. Based on this review, the staff concludes that the issues raised in these contentions do not alter the staff's conclusions, set forth in the DSEIS, regarding the acceptability of Entergy's SAMA analysis. Accordingly, the NRC concludes that Entergy's use of the MACCS2 code, including the inputs and ATMOS module used to estimate offsite consequences for Indian Point, as amended in Entergy's SAMA re-analysis, provides an acceptable methodology for use in the assessment of candidate SAMAs.

G.3 Potential Plant Improvements

This section discusses the process for identifying potential plant improvements, an evaluation of that process, and the improvements evaluated in detail by Entergy.

G.3.1. Process for Identifying Potential Plant Improvements

Entergy's process for identifying potential plant improvements (SAMAs) consisted of the following elements:

- The review of the most significant basic events from the current, plant-specific PSA;
- The review of potential plant improvements identified in the IP2 and IP3 IPE and IPEEE;
- The review of Phase II SAMAs from license renewal applications for nine other pressurized water reactors;
- The review of dominant contributors to seismic and fire events in the current seismic and fire analyses;
- The review of other NRC and industry documentation discussing potential plant improvements.

Based on this process, an initial set of 231 candidate SAMAs for IP2 and 237 candidate SAMAs for IP3, referred to as Phase I SAMAs, was identified. In Phase I of the evaluation, Entergy performed a qualitative screening of the initial list of SAMAs and eliminated SAMAs from further consideration using one of the following criteria:

- The SAMA is not applicable at IP2 and IP3 because of design differences.
- The SAMA has already been implemented at IP2 and IP3.
- The SAMA is similar in nature and could be combined with another SAMA candidate.

Based on this screening, 163 IP2 SAMAs and 175 IP3 SAMAs were eliminated, leaving 68 unique SAMAs for IP2 and 62 unique SAMAs for IP3. The remaining SAMAs, referred to as Phase II SAMAs, are listed in Tables E.2-2 and E.4-2 of the ER (Entergy 2007). In Phase II, a detailed evaluation was performed for each of the remaining SAMA candidates, as discussed in Sections G.4 and G.6 below. To account for the potential impact of external events, the estimated benefits based on internal events were multiplied by a factor of 3.8 for IP2 and 5.5 for IP3, as previously discussed.

G.3.2. Review of Entergy's Process

Entergy's efforts to identify potential SAMAs focused primarily on areas associated with internal initiating events but also included explicit consideration of potential SAMAs for seismic and fire. The initial list of SAMAs generally addressed the accident sequences considered to be important to CDF from functional, initiating event, and risk-reduction worth (RRW) perspectives at IP2 and IP3 and included selected SAMAs from prior SAMA analyses for other plants.

Entergy provided a tabular listing of the PSA basic events, sorted according to their RRW for CDF (Entergy 2007). SAMAs affecting these basic events would have the greatest potential for reducing risk. Entergy used an RRW cutoff of 1.005, which corresponds to about a 0.5-percent change in CDF, given the 100 -percent reliability of the SAMA. This equates to a benefit of approximately $7,000 for IP2 and IP3 (based on a total benefit of about $1.3 million for each unit

for eliminating all severe accidents caused by internal events). Entergy also provided and reviewed the LERF-based RRW events down to an RRW of 1.005. Entergy correlated the top CDF and LERF events with the SAMAs evaluated in Phase I or Phase II and showed that, with a few exceptions, all of the significant basic events are addressed by one or more SAMAs (Entergy 2007). Of the basic events of high-risk importance that are not addressed by SAMAs, each is closely tied to other basic events that had been addressed by one or more SAMAs.

Entergy considered the potential plant improvements described in the IPE and IPEEE in the identification of plant-specific candidate SAMAs for internal and external events. As a result of the IPE, four major procedural/hardware improvements were identified for each unit. The IP2 enhancements are to (1) upgrade IP2 gas turbine black-start capability, (2) install an additional EDG building fan, (3) monitor changes in the operating position of PORV block valves, and (4) implement periodic testing of all the EDG building fans. The IP3 enhancements are to (1) revise emergency operating procedures (EOPs) to instruct operators to align the backup city water supply to the AFW pumps, should the CST outlet valve fail as indicated by a low-suction-flow alarm, (2) revise the alarm response procedure for a high AFW pump room temperature, to direct operators to open the rollup door to the AFW pump room for ventilation, (3) install a switchgear room high-temperature alarm and implement an associated procedure to direct operators to block open doors to the 480-V ac switchgear room, and (4) revise EOPs to emphasize the need to align the safe-shutdown equipment to MCC 312A during events involving the loss of all 480-V ac safeguard buses while offsite power is available, as well as during fire-related events. These improvements have all been implemented and therefore were not considered further in the SAMA analysis.

As a result of the IPEEEs, several improvements were identified for external events. The IP2 enhancements are to (1) replace the hold-down bolts for the CCW surge tank with higher tensile strength bolts, (2) add surveillance of the control building drain flapper valve flow, (3) add weather stripping to doors between the transformer area and the switchgear room, and (4) add screens on the 480-V switchgear room equipment. The IP3 enhancements are to (1) restore the carbon dioxide (CO_2) suppression system to automatic mode within the switchgear room, (2) reroute the EDG exhaust fans and the auxiliary cables so that a fire in a single EDG cell would not affect multiple EDGs, and (3) install an excess flow valve to reduce the risk associated with hydrogen explosions inside the turbine building or PAB. With the exception of the last item, all of these improvements have been implemented and therefore were not considered further in the SAMA analysis. As noted in Section E.3.3.3 of the ER, IP3 SAMA 53 (install an excess flow valve to reduce the risk associated with hydrogen explosions) was proposed as a result of the IPEEE analysis and retained for the Phase II evaluation.

Several concerns were raised in the IPEEE regarding the seismic-induced failures of fire protection equipment (primarily for IP3). As mentioned above, these seismic-fire interactions were judged to be of little risk significance (NRC 2001). One plant improvement identified in Table 2.4 of NUREG-1742 (NRC 2002) addressed the potential spurious operation of the EDG room's CO_2 system and subsequent shutdown of the EDG ventilation system during a seismic event. Entergy subsequently installed a quality assurance Category I, seismic class I actuation permission auxiliary control panel for CO_2 discharge into the EDG building. Since shutdown of EDG ventilation caused by spurious operation of the CO_2 system during a seismic event is not considered in the seismic PSA model, the seismic CDF was not affected by this modification.

As noted in Section E.1.3.3.1 of the ER, the IP2 CDF for SBO events with gas turbines unavailable could be reduced by (1) aligning the IP3 Appendix R diesel to IP2, (2) installing an IP2 Appendix R diesel, (3) upgrading the EDG building for high winds, and (4) protecting the alternate power source from tornadoes and high winds. However, with the exception of the third item, these modifications were not evaluated as candidate SAMAs because a modification to replace the existing gas turbines with an IP2 SBO/Appendix R diesel generator capable of being used to recover power to the vital buses following an SBO was planned for the near future. The planned modification included provisions for aligning the IP3 Appendix R generator to IP2 and for protecting the new alternate power source from tornadoes and high winds.[1]

For a number of the Phase II SAMAs listed in the ER, the NRC staff found that information provided did not sufficiently describe the proposed modifications or other considerations that might have been taken into account in estimating the benefit and implementation cost. Therefore, the NRC staff requested, and the licensee provided, more information on certain proposed modifications listed for the Phase II SAMA candidates (NRC 2007, Entergy 2008a).

For several SAMA candidates, the NRC staff questioned if lower cost alternatives could have been considered, including:

- The implementation of improved instrumentation and procedures to help cool down and depressurize the RCS before RWST depletion.
- The implementation of a procedure for recovery of the steam dump to condenser from the unaffected steam generator.
- The implementation of a procedure for recovery of the main feedwater valve/condensate post-SI actuation.
- The purchase or manufacture of a "gagging device" that could be used to close a stuck-open steam generator safety valve on an SGTR before core damage occurred.
- The reactivation of the IP3 postaccident containment venting system (a system that is still active on IP2 but was deactivated on IP3).

In response, Entergy indicated that most of the low-cost alternatives to aid in the mitigation of an SGTR (four out of the five alternatives dismissed above) have been already implemented and provided specific reasons why the cost of these alternative SAMA candidates would be high enough that the decision on the final SAMA selection would not have been affected. However, the alternative associated with the gagging device was found to be potentially cost beneficial (Entergy 2008a, Entergy 2008b). The evaluation of these SAMAs is discussed further in Section G.6.2.

The NRC staff notes that the set of SAMAs submitted is not all inclusive, since additional, possibly even less expensive, design alternatives can always be postulated. However, the NRC staff concludes that the benefits of any additional modifications are unlikely to exceed the benefits of the modifications evaluated and that the alternative improvements would not likely cost less than the least expensive alternatives evaluated, when the subsidiary costs associated with maintenance, procedures, and training are considered.

[1] Installation of this diesel was made a condition of acceptance of the License Renewal Application (LRA) for review. The diesel was installed and operated prior to 4/30/2008. See Entergy letter NL-08-074, Indian Point, Units 2 and 3, Amendment 4 to LRA April 30, 2008 (ML 081280491).

The NRC staff concludes that Entergy used a systematic and comprehensive process for identifying potential plant improvements for IP2 and IP3 and that the set of SAMAs evaluated in the ER, together with those identified in response to the NRC staff inquiries, is reasonably comprehensive and therefore acceptable. The search included reviewing insights from the plant-specific risk studies and reviewing plant improvements considered in previous SAMA analyses. While explicit treatment of external events in the SAMA identification process was limited, the NRC staff recognizes that the prior implementation of plant modifications for seismic and fire events, and the absence of external-event vulnerabilities, reasonably justifies examining primarily the internal-event risk results for this purpose.

G.4 Risk-Reduction Potential of Plant Improvements

Entergy evaluated the risk-reduction potential of the remaining 68 IP2 and 62 IP3 SAMAs. The SAMA evaluations were performed using realistic assumptions with some conservatism. On balance, such calculations overestimate the benefits and are conservative.

For all of the SAMAs, Entergy used model requantification to determine the potential benefits. The CDF and population-dose reductions were estimated using the latest version of the IP2 and IP3 PSA models. The changes made to the models to quantify the impact of the SAMAs are detailed in Tables E.2-2 and E.4-2 of the ER (Entergy 2007). Table G-6 lists the assumptions considered to estimate the risk reduction for each of the evaluated SAMAs, the estimated risk reduction in terms of the percentage of reduction in CDF and population dose, and the estimated total benefit (present value) of the averted risk. The estimated benefits reported in Table G-6 reflect the combined benefit for both internal and external events and the correction of the meteorological data error discussed previously. The determination of the benefits for the various SAMAs is further discussed in Section G.6.

The NRC staff questioned the assumptions used in evaluating the benefits or risk-reduction estimates of a number of SAMAs provided in the ER (NRC 2007). For example, the NRC staff requested information regarding the plant features or modeling assumptions that result in the CCW pumps having limited risk importance. In response, Entergy stated that both units are unique in that the capability exists to initiate backup cooling to key components in the event the primary CCW cooling function is lost. The use of backup city water cooling to the charging pumps enables continued seal injection and therefore reduces the likelihood of an RCP seal LOCA. In IP2, city water backup or primary water can be used to cool the safety injection and residual heat removal (RHR) pumps. In IP3, city water backup is available to cool RHR Pump 31. Also, CCW is not required in either plant during the injection phase of the response to a LOCA. The NRC staff considers the explanation of the plant features, as clarified, to be reasonable and therefore acceptable for the purposes of the SAMA evaluation.

For a number of the Phase II SAMAs listed in the ER, the description of the improvement and the associated analyses appeared either inconsistent between the two units or were unclear. Therefore, the NRC staff asked the applicant to provide more detailed descriptions of the modifications for several of the Phase II SAMA candidates (NRC 2007). In response, Entergy provided additional information on those SAMA candidates that further explained the SAMA modifications and the differences between units that account for the different analysis assumptions for each unit (Entergy 2008a). Entergy also provided further clarifications and discussion regarding the analysis assumptions and their bases. As an example, the licensee

clarified a major difference in operation of a turbine-driven AFW pump between the two units that affects the disposition of several SAMA candidates. In its response, Entergy indicated that the units respond differently upon depletion of the station batteries. IP2 has pneumatic level and pressure instruments that allow operators to monitor key parameters and effectively control AFW flow after the batteries are depleted, whereas IP3 does not have this instrumentation. Although it is still possible for the operators to manipulate AFW flow, the current IP3 model does not credit this manual operation.

In the SAMA analysis submitted in the ER, Entergy increased the benefit that was derived from the internal-event model by factors of 3.8 and 5.5 to account for the combined contribution from internal and external events for IP2 and IP3, respectively. The NRC staff agrees with the licensee's overall conclusion concerning the impact of external events and concludes that the licensee's use of a multiplier of 3.8 and 5.5 for IP2 and IP3, respectively, to account for external events is reasonable for the purposes of the SAMA evaluation. This is discussed further in Section G.6.2.

For SAMA candidates that only address a specific external event and have no bearing on internal-event risk (e.g., IP2 SAMA 66—Harden EDG Building Against High Winds), Entergy derived the benefit directly from the external-event risk model and then increased the benefit by the multipliers identified earlier. The NRC staff notes that the use of multipliers for these SAMAs (conceptually, to account for additional benefits in internal events) is unnecessary, since these SAMAs have no bearing on internal events. However, use of the multipliers adds conservatism to the benefit estimate for these SAMA candidates.

IP3 SAMA 53 (install an excess-flow valve to reduce the risk associated with hydrogen explosions) was identified to reduce the risk associated with hydrogen explosions inside the turbine building or PAB. The proposed plant modification involves the installation of a nonelectric excess-flow valve. The benefit of this SAMA is also calculated in a bounding manner. As discussed in Section G.6.2, this SAMA was found to be potentially cost beneficial, based on revised analyses submitted in response to an NRC request.

The NRC staff has reviewed Entergy's bases for calculating the risk reduction for the various plant improvements and concludes that the rationale and assumptions for estimating risk reduction are reasonable and generally conservative (i.e., the estimated risk reduction is higher than what would actually be realized). Accordingly, the NRC staff based its estimates of averted risk for the various SAMAs on Entergy's risk reduction estimates.

G.5 Cost Impacts of Candidate Plant Improvements

Entergy estimated the costs of implementing the candidate SAMAs through the application of engineering judgment and use of other licensees' estimates for similar improvements. The ER stated that the cost estimates conservatively did not include the cost of replacement power during extended outages required to implement the modifications, nor did they include contingency costs associated with unforeseen implementation obstacles. The cost estimates provided in the ER also did not account for inflation, which is considered another conservatism.

The NRC staff reviewed the bases for the licensee's cost estimates. For certain improvements, the NRC staff also compared the cost estimates to estimates developed elsewhere for similar improvements, including estimates developed as part of other licensees' analyses of SAMAs for

operating reactors and advanced light-water reactors. The NRC staff reviewed the costs and found them to be reasonable and generally consistent with estimates provided in support of other licensees' analyses.

Table G-6. Final Potentially Cost-Beneficial SAMAs for IP2 and IP3 [1]

SAMA	Assumptions	% Risk Reduction		Total Benefit ($)		Cost ($)
		CDF	Population Dose	Baseline [2] (Int + Ext Events)	Baseline With Uncertainty	
IP2 SAMAs						
9 - Create a reactor cavity flooding system.	Eliminate containment failure caused by concrete-core interaction.	0	47	6.3M	13M	4.1M[3]
21 - Install additional pressure or leak monitoring instrumentation for ISLOCA.	Eliminate ISLOCA events.	0.8	11	2.1M	4.4M	3.2M[3]
22 - Add redundant and diverse limit switches to each containment isolation valve.	Reduce ISLOCA frequency by 50 percent.	0.4	6	1.1M	2.3M	2.2M[3]
28 - Provide a portable diesel-driven battery charger.	Eliminate failure of local operation of the turbine-driven AFW pump during SBO scenarios.	5	9	1.4M	2.9M	938K[3]
44 - Use fire water system as backup for steam generator inventory.	Eliminate failure of the turbine-driven AFW pump and local operation of AFW during SBO.	33	14	2.4M	4.9M	1.7M
53 - Keep both pressurizer PORV block valves open.	Eliminate failure of PORV block valves to open.	18	3	660K	1.4M	800K
54 - Install flood alarm in the 480-V ac switchgear room.	Reduce control building flooding initiator frequencies by a factor of 3.	20	39	5.6M	12M	200K
56 - Keep RHR heat exchanger discharge MOVs normally open.	Eliminate failure of RHR heat exchanger discharge MOVs to open.	2	0.2	49K	100K	82K
60 - Provide added protection against flood propagation from stairwell 4 into the 480-V ac switchgear room.	Eliminate flood initiated by a break in fire protection piping in stairwell 4.	5	9	1.3M	2.7M	216K
61 - Provide added protection against flood propagation from the deluge room into the 480-V ac switchgear room.	Eliminate flood initiated by a break in the 10-inch fire protection piping in the deluge room at elevation 15 feet.	10	19	2.8M	5.8M	192K

Table G-6 (continued)

SAMA	Assumptions	% Risk Reduction		Total Benefit ($)		Cost ($)
		CDF	Population Dose	Baseline [2] (Int + Ext Events)	Baseline With Uncertainty	
62 - Provide a hard-wired connection to an SI pump from ASSS power supply.	Eliminate failure to align ASSS power to SI and charging pumps following loss of power from 480V buses.	3	6	850K	1.8M	1.5M[3]
65 - Upgrade the ASSS to allow timely restoration of seal injection and cooling.	Eliminate control building flooding initiators.	20	39	5.6M	12M	560K
IP3 SAMAs[4]						
7 - Create a reactor cavity flooding system.	Eliminate containment failures due to core-concrete interactions	0	24	5.0M	7.3M	4.1M[3]
18 – Route the discharge from the MSSVs through a structure where spray water would condense the stream and remove fission products.	Reduce SGTR accident source terms by a factor of 2.	0	11	4.8M[5]	15M[5]	12M[3]
19 – Install additional pressure or leak monitoring instrumentation for ISLOCAs.	Eliminate ISLOCA events	1	7	2.1M	3.1M	2.8M[3]
52 - Open city water supply valve for alternative AFW pump suction.	Eliminate loss of the normal suction path to the AFW system.	1	1	250K	360K	50K
53 - Install an excess flow valve to reduce the risk associated with hydrogen explosions.	Eliminate hydrogen ruptures inside the turbine building.	2	2	500K	720K	228K
55 – Provide the capability of powering one SI pump or RHR pump using the Appendix R bus (MCC 312A).	Eliminate operator failure to align MCC 312A.	16	18	4.1M	5.9M	1.3M
61 - Upgrade the ASSS to allow timely restoration of seal injection and cooling.	Eliminate control building flooding initiators.	17	20	4.4M	6.3M	560K

SAMA	Assumptions	% Risk Reduction		Total Benefit ($)		Cost ($)
		CDF	Population Dose	Baseline [2] (Int + Ext Events)	Baseline With Uncertainty	
62 - Install flood alarm in the 480-V ac switchgear room.	Eliminate control building flooding initiators.	17	20	4.4M	6.3M	197K

[1] The information was reproduced by combining the information from ER Tables E.2-2 and E.4-2 and Entergy's SAMA re-analysis (Entergy 2009).

[2] Reported benefit values account for risk reduction in both internal and external events and include the economic impact of lost tourism and business following a severe accident. The values do not account for analysis uncertainties.

[3] The cost estimate is based on a revised value provided in Entergy's SAMA re-analysis (Entergy 2009)

[4] SAMA 30 was identified as cost beneficial in the ER. However, an error in the original benefit calculation was discovered subsequent to submittal of the ER, as described in Entergy's response to RAI 5g (Entergy 2008a). Reported values in Table G-6 reflect correction of the calculational error. SAMA 30 is no longer cost beneficial after corrections.

[5] The benefit estimate is based on revised TI-SGTR sensitivity study results provided in Entergy's SAMA re-analysis (Entergy 2009).

The NRC staff questioned the high cost estimate ($800,000) for changing the pressurizer PORV block valves from normally closed to normally open in conjunction with IP2 SAMA 53 (NRC 2008a). In response, Entergy clarified that a modification had been previously implemented allowing closure of the block valves when operating pressure is less than 2235 pounds per square inch gauge (psig). If the reactor coolant pressure increases to 2300 psig, the current circuitry alarms and sends a signal to open the block valves. The SAMA would reverse this operating approach and may require adding or changing the auto-open feature to a lower value. Entergy provided a breakdown of the estimated cost, which included a $236,000 contingency cost. As Section 4.21 of the ER states that contingency costs are excluded, the staff requested clarification of this apparent inconsistency. In response, Entergy stated that the site-specific implementation cost estimates include some contingency costs to account for the high degree of uncertainty associated with the preliminary cost estimates and that, given the bounding nature of the benefit analysis, it is reasonable to include contingency costs in these estimates. To eliminate the confusion between Section 4.21 of the ER and the stated practice above, Entergy revised Section 4.21, eliminating the contingency exclusion clause (Entergy 2008b). Considering that this SAMA has been added to the list of potentially cost-beneficial SAMAs (see Section G.6), the staff finds the cost estimate for SAMA 53 to be acceptable. In addition, no other improvement cost estimates were identified as outliers. Therefore, the impact of including contingency costs does not appear to be consequential.

As part of Entergy's SAMA re-analysis (using corrected meteorological data), Entergy subjected a subset of the SAMAs to more comprehensive and precise cost estimating techniques – specifically, those SAMAs that appeared to be cost-beneficial based on the new benefit estimate and the original implementation cost estimate. For two IP2 SAMAs (IP SAMAs 17 and 40) and four IP3 SAMAs (IP3 SAMAs 17, 20, 40, and 50), the updated (increased) cost estimate resulted in the SAMA becoming non-cost-beneficial (i.e., the SAMA would be cost-beneficial based on the cost estimate reported in the ER, but not cost-beneficial based on the revised cost estimate). For each of these SAMAs, the NRC Staff requested that Entergy provide the basis for the revised cost estimate and a breakdown of the cost estimate in terms of the major cost factors. Entergy provided this additional information by letter dated January 14, 2010 (Entergy 2010). As stated in the response, the revised cost estimates were developed using Entergy's standard process for developing conceptual-level project cost estimates utilizing spreadsheets containing 2009 rates for material, labor, insurance, fees, etc. Also, Entergy determined that one SAMA that was previously identified as potentially cost beneficial was no longer cost beneficial based on correction of an error in the ER (IP3 SAMA 30) (Entergy 2008b, Entergy 2009).

The NRC staff reviewed this additional cost information to determine the degree to which the revised cost estimates and their constituent costs comport with the nature, magnitude and complexity of each change. The NRC staff notes that the associated modifications all involve either major plant modifications (e.g., erecting a barrier to protect the containment liner, installing secondary side guard pipes) or changes to safety-related systems, structures, or components (e.g., increasing secondary side pressure capacity, enhancing the RCS depressurization capabilities). In addition to hardware costs, the modifications would require extensive design work and safety analysis calculations, including seismic analyses, thermal analyses, and analyses for piping or penetration interferences. The cost estimates reported in previous SAMA analyses for similar modifications are typically on the order of $1M or more. Entergy's cost estimates are consistent with these values. The NRC staff also notes that for

each of these SAMAs the revised cost estimates are at least 50 percent greater than the revised benefit estimates even when the benefit estimates are increased to account for uncertainties. Accordingly, Entergy's revised cost estimates appear reasonable, and result in an appropriate determination that these candidate SAMAs are not cost-beneficial.

The NRC staff concludes that the cost estimates provided by Entergy are sufficient and appropriate for use in the SAMA evaluation.

G.6 Cost-Benefit Comparison

Entergy's cost-benefit analysis and the NRC staff's review are described in the following sections.

G.6.1. Entergy's Evaluation

The methodology used by Entergy was based primarily on the NRC's guidance for performing a cost-benefit analysis (i.e., NUREG/BR-0184, "Regulatory Analysis Technical Evaluation Handbook" (NRC 1997a). The guidance involves determining the net present value for each SAMA according to the following formula:

Net Value = (APE + AOC + AOE + AOSC) - COE, where

APE = present value of averted public exposure ($)

AOC = present value of averted offsite property damage costs ($)

AOE = present value of averted occupational exposure costs ($)

AOSC = present value of averted onsite costs ($)

COE = cost of enhancement ($)

If the net value of a SAMA is negative, the cost of implementing the SAMA is larger than the benefit associated with the SAMA, and it is not considered cost beneficial. Entergy's derivation of each of the associated costs is summarized below.

NUREG/BR-0058 has recently been revised to reflect the agency's policy on discount rates. Revision 4 of NUREG/BR-0058 states that two sets of estimates should be developed—one at 3 percent and one at 7 percent (NRC 2004). Entergy performed the SAMA analysis using 7 percent and provided a sensitivity analysis using the 3 percent discount rate in order to capture SAMAs that may be cost-effective using the lower discount rate, as well as the higher, baseline rate (Entergy 2007). This analysis is sufficient to satisfy NRC policy in Revision 4 of NUREG/BR-0058.

Averted Public Exposure (APE) Costs

The APE costs were calculated using the following formula:

APE = Annual reduction in public exposure (Δperson-rem/year)

x monetary equivalent of unit dose ($2000 per person-rem)

x present value conversion factor (10.76 based on a 20-year period with a 7 percent discount rate)

As stated in NUREG/BR-0184 (NRC 1997a), the monetary value of the public health risk after discounting does not represent the expected reduction in public health risk caused by a single accident. Rather, it is the present value of a stream of potential losses extending over the remaining lifetime (in this case, the renewal period) of the facility. Thus, it reflects the expected annual loss caused by a single accident, the possibility that such an accident could occur at any time over the renewal period, and the effect of discounting these potential future losses to present value. For the purposes of initial screening, which assumes elimination of all severe accidents caused by internal events, Entergy calculated an APE of approximately $474,000 for IP2 and $527,000 for IP3 for the 20-year license renewal period. Based on Entergy's SAMA re-analysis (using corrected meteorological data), these values increase to $1.88M for IP2 and $2.04M for IP3.

Averted Offsite Property Damage Costs (AOC)

The AOCs were calculated using the following formula:

AOC = Annual CDF reduction

x offsite economic costs associated with a severe accident (on a per-event basis)

x present value conversion factor

For the purposes of initial screening, which assumes all severe accidents caused by internal events are eliminated, Entergy calculated an annual offsite economic cost of about $45,000 for IP2 and $53,000 for IP3 based on the Level 3 risk analysis. This results in a discounted value of approximately $483,000 for IP2 and $568,000 for IP3 for the 20-year license renewal period. Based on Entergy's SAMA re-analysis (using corrected meteorological data), these values increase to $2.28 million for IP2 and $2.81 million for IP3.

Averted Occupational Exposure (AOE) Costs

The AOE costs were calculated using the following formula:

AOE = Annual CDF reduction

x occupational exposure per core damage event

x monetary equivalent of unit dose

x present value conversion factor

Entergy derived the values for AOE from information provided in Section 5.7.3 of the regulatory analysis handbook (NRC 1997a). Best estimate values that provided for immediate occupational dose (3300 person-rem) and long-term occupational dose (20,000 person-rem over a 10-year cleanup period) were used. The present value of these doses was calculated using the equations provided in the handbook, in conjunction with a monetary equivalent of unit dose of $2000 per person-rem, a real discount rate of 7 percent, and a time period of 20 years to represent the license renewal period. For the purposes of initial screening, which assumes all severe accidents caused by internal events are eliminated, Entergy calculated an AOE of approximately $7,000 for IP2 and $4,000 for IP3 for the 20-year license renewal period.

Averted Onsite Costs

Averted onsite costs (AOSC) include averted cleanup and decontamination costs and averted power replacement costs. Repair and refurbishment costs are considered for recoverable accidents only and not for severe accidents. Entergy derived the values for AOSC based on information provided in Section 5.7.6 of NUREG/BR-0184, the regulatory analysis handbook (NRC 1997a).

Entergy divided this cost element into two parts—the onsite cleanup and decontamination cost, also commonly referred to as averted cleanup and decontamination costs (ACC), and the replacement power cost (RPC).

ACCs were calculated using the following formula:

ACC = Annual CDF reduction

x present value of cleanup costs per core damage event

x present value conversion factor

The total cost of cleanup and decontamination subsequent to a severe accident is estimated in NUREG/BR-0184 to be $\$1.5 \times 10^9$ (undiscounted). This value was converted to present costs over a 10-year cleanup period and integrated over the term of the proposed license extension. For the purposes of initial screening, which assumes all severe accidents caused by internal events are eliminated, Entergy calculated an ACC of approximately $208,000 for IP2 and $133,000 for IP3 for the 20-year license renewal period.

Long-term RPCs were calculated using the following formula:

RPC = Annual CDF reduction

x present value of replacement power for a single event

x factor to account for remaining service years for which replacement power is required

x reactor power scaling factor

Entergy based its calculations on the value of 1071 megawatt electric (MWe) and scaled up from the 910 MWe reference plant in NUREG/BR-0184 (NRC 1997b). Therefore, Entergy applied a power-scaling factor of 1071/910 to determine the RPCs. For the purposes of initial screening, which assumes all severe accidents caused by internal events are eliminated, Entergy calculated an RPC of approximately $166,000 for IP2 and $107,000 for IP3, and an AOSC of approximately $374,000 for IP2 and $240,000 for IP3 for the 20-year license renewal period.

Using the above equations and corrected meteorological data, Entergy determined that the total present dollar-value equivalent associated with completely eliminating severe accidents caused by internal events is approximately $4.5 million at IP2 and $5.1 million at IP3. Use of a multiplier of 3.8 for IP2 and 5.5 for IP3 to account for external events increases the present dollar value to $17 million for IP2 and $28 million for IP3 and represents the present dollar value associated with completely eliminating the risk of severe accidents caused by all internal and external events at IP2 and IP3, respectively.

Entergy's Results

If the implementation costs for a candidate SAMA exceeded the calculated benefit, the SAMA was considered by Entergy not to be cost beneficial. In the baseline analysis (using a 7 percent discount rate) and the sensitivity analysis (using a 3 percent discount rate) contained in the ER, Entergy identified 10 potentially cost-beneficial SAMAs (five for IP2 and five for IP3). Based on consideration of analysis uncertainties, Entergy identified two additional potentially cost-beneficial SAMAs for IP2 in the ER (IP2 SAMAs 44 and 56).

In response to an NRC staff request, Entergy provided the results of a revised uncertainty analysis in which the impact of lost tourism and business was accounted for in the baseline analysis (rather than as a separate sensitivity case). The revised uncertainty analysis resulted in the identification of two additional potentially cost-beneficial SAMAs for IP2 (IP2 SAMAs 9 and 53) and one additional potentially cost-beneficial SAMA for IP3 (IP3 SAMA 53), as reported in the DSEIS.

Based on the SAMA re-analysis (using corrected meteorological data), Entergy identified three additional potentially cost-beneficial SAMAs for IP2 (IP2 SAMAs 21,22, and 62) and three additional potentially cost-beneficial SAMAs for IP3 (IP3 SAMAs 7, 18, and 19).

In sum, the potentially cost-beneficial SAMAs for IP2 are the following:

- SAMA 9 – Create a reactor cavity flooding system to reduce the impact of core-concrete interaction from molten core debris following core damage and vessel failure.
- SAMA 21 – Install additional pressure or leak monitoring instrumentation to reduce the frequency of interfacing system loss of coolant accidents.
- SAMA 22 – Add redundant and diverse limit switches to each containment isolation valve. This modification would reduce the frequency of an interfacing system loss of coolant accident.
- SAMA 28 – Provide a portable diesel-driven battery charger to improve dc power reliability. A safety-related disconnect would be used to charge a selected battery. This modification would enhance the long-term operation of the turbine-driven AFW pump on battery depletion.
- SAMA 44 – Use fire water as a backup for steam generator inventory to increase the availability of the steam generator water supply to ensure adequate inventory for the operation of the turbine-driven AFW pump during SBO events.
- SAMA 53 – Keep both pressurizer PORV block valves open. This modification would reduce the CDF contribution from loss of secondary heat sink by improving the availability of feed and bleed.
- SAMA 54 – Install a flood alarm in the 480-V ac switchgear room to mitigate the occurrence of internal floods inside the 480-V ac switchgear room.
- SAMA 56 – Keep RHR heat exchanger discharge valves, motor-operated valves 746 and 747, normally open. This procedure change would reduce the CDF contribution from transients and LOCAs.
- SAMA 60 – Provide added protection against flood propagation from stairwell 4 into the 480-V ac switchgear room to reduce the CDF contribution from flood sources within stairwell 4 adjacent to the 480-V ac switchgear room.

- SAMA 61 – Provide added protection against flood propagation from the deluge room into the 480-V ac switchgear room to reduce the CDF contribution from flood sources within the deluge room adjacent to the 480-V ac switchgear room.
- SAMA 62 – Provide a hard-wired connection to a safety injection (SI) pump from the alternate safe shutdown system (ASSS) power supply. This modification would reduce the CDF from events that involve loss of power from the 480V vital buses.
- SAMA 65 – Upgrade the alternate safe shutdown system (ASSS) to allow timely restoration of RCP-seal injection and cooling from events that cause a loss of power from the 480-V ac vital buses.

The potentially cost-beneficial SAMAs for IP3 are the following:

- SAMA 7 – Create a reactor cavity flooding system. This modification would enhance core debris cooling and reduce the frequency of containment failure due to core-concrete interaction.
- SAMA 18 – Route the discharge from the main steam safety valves through a structure where a water spray would condense the steam and remove fission products.
- SAMA 19 – Install additional pressure or leak monitoring instrumentation to reduce the frequency of interfacing system loss of coolant accidents.
- SAMA 52 – Institute a procedure for opening the city water supply valve for alternative AFW system pump suction to enhance the availability of the AFW system.
- SAMA 53 – Install an excess flow valve to reduce the risk associated with hydrogen explosions inside the turbine building or PAB.
- SAMA 55 – Provide the capability of powering one safety injection pump or RHR pump using the Appendix R diesel (MCC 312A) to enhance RCS injection capability during events that cause a loss of power from the 480-V ac vital buses.
- SAMA 61 – Upgrade the ASSS to allow timely restoration of RCP-seal injection and cooling from events that cause a loss of power from the 480-V ac vital buses.
- SAMA 62 – Install a flood alarm in the 480-V ac switchgear room to mitigate the occurrence of internal floods inside the 480-V ac switchgear room.

In response to an NRC staff inquiry regarding estimated benefits for certain SAMAs and lower cost alternatives, one additional potentially cost-beneficial SAMA was identified (regarding a dedicated main stream safety valve gagging device for SGTR events in both units) (Entergy 2008b), and one SAMA that was previously identified as potentially cost beneficial was found no longer cost beneficial based on correction of an error in the ER (IP3 SAMA 30) (Entergy 2008a, Entergy 2009). The potentially cost-beneficial SAMAs and Entergy's plans for further evaluation of these SAMAs are discussed in more detail in Section G.6.2.

G.1.2 Review of Entergy's Cost-Benefit Evaluation

The cost-benefit analysis performed by Entergy was based primarily on NUREG/BR-0184 (NRC 1997a) and was implemented consistent with that guidance.

SAMAs identified primarily on the basis of the internal events analysis could provide benefits in certain external events, in addition to their benefits in internal events. To account for the additional benefits in external events, Entergy multiplied the internal event benefits for each internal event SAMA by an amount equal to the ratio of the sum of the internal and external event CDF to the internal event CDF. This ratio is approximately 3.8 for IP2 and 5.5 for IP3. Potential benefits in external events were estimated in this manner, since the external-event models are generally less detailed than the internal-event models and do not lend themselves to quantifying the benefits of the specific plant changes associated with internal-event SAMAs. For example, the benefits of a procedural change associated with an important internal event sequence cannot be readily assessed using the seismic-risk model if that operator action or system is not represented in the seismic-risk model. The use of a multiplier on the benefits obtained from the internal events PSA to incorporate the impact of external events implicitly assumes that each SAMA would offer the same percentage reduction in external-event CDF and population dose as it offers in internal events. While this provides only a rough approximation of the potential benefits, such an adjustment was considered appropriate, given the large risk contribution from external events relative to internal events and the lack of information on which to base a more precise risk reduction estimate for external events. In view of the remaining conservatism in the external events CDF, and the licensee's further evaluation of the impacts of the use of a multiplier on the SAMA screening (as part of the uncertainty assessment discussed below), the NRC staff agrees that the use of these multipliers for external events is reasonable.

For SAMA candidates that only address a specific external event and have no bearing on internal-event risk, Entergy derived the benefit directly from the external-event risk model and then increased the benefit by the multipliers identified earlier. The NRC staff notes that the use of multipliers for these SAMAs (conceptually, to account for additional benefits in internal events) is unnecessary, since these SAMAs have no bearing on internal events. However, use of the multipliers adds conservatism to the benefit estimate for these SAMA candidates.

Entergy considered the impact that possible increases in benefits from analysis uncertainties would have on the results of the SAMA assessment. In the ER, Entergy presents the results of an uncertainty analysis of the internal-event CDF for IP2 and IP3, which indicates that the 95th percentile value is a factor of 2.1 times the mean CDF for IP2 and 1.4 times the mean CDF for IP3. Entergy assessed the impact on the SAMA screening if the estimated benefits for each SAMA were further increased by these uncertainty factors. For purposes of this assessment, Entergy applied a multiplier of 8 to the internal-event benefits for each unit to account for both internal and external events, with analysis uncertainty. The multiplier of 8 slightly exceeds the product of the external-event multiplier and the uncertainty factor for each unit (i.e., 3.80x2.10=7.98 for IP2, and 5.53x1.40=7.73 for IP3) and adds a small amount of additional conservatism. Although not cost beneficial in the baseline analysis, Entergy included any additional SAMAs identified as potentially cost beneficial in the uncertainty analysis within the set of potentially cost-beneficial SAMAs that it intends to examine further for implementation.

Entergy also provided the results of additional sensitivity analyses in the ER, including use of a 3 percent discount rate, use of a longer plant life, and the consideration of economic losses by tourism and business (which were not included in the baseline analysis). These analyses did not identify any additional potentially cost-beneficial SAMAs beyond those already identified through the uncertainty analysis.

The NRC staff questioned the rationale for treating the loss of tourism and business in a sensitivity case rather than in the baseline analysis (NRC 2007). Incorporation of tourism and business losses within the baseline analysis could result in identification of additional cost-beneficial SAMAs, particularly when the baseline benefits are multiplied to account for uncertainties. In response, Entergy explained that the impact of lost tourism and business was not modeled in the baseline analysis because the level of tourism and business activity can be reestablished in time. Nevertheless, Entergy provided the results of an additional uncertainty case showing the impact of lost tourism and business combined with analysis uncertainty. This uncertainty case resulted in the identification of two additional potentially cost-beneficial SAMAs for IP2 (IP2 SAMAs 9 and 53) and one additional potentially cost-beneficial SAMA for IP3 (IP3 SAMA 53). Given that it may take years to reestablish the level of tourism and business activity following a severe accident, the NRC staff has conservatively adopted the case incorporating lost tourism and business as its base case and has reflected the results of that case in Table G-6.

In responding to an NRC RAI, Entergy identified and corrected an error in the benefit analysis for IP3 SAMA 30 (provide a portable battery charger for monitoring instrumentation necessary to allow manual operation of the turbine-driven AFW pump), which results in this SAMA no longer being potentially cost beneficial. As indicated in ER Section E.4.3, the benefit of this SAMA was estimated based on the assumption that the SAMA would increase the time available to recover offsite power before local operation of AFW is required from 2 hours to 24 hours, and would also reduce internal switchgear room floods by 5 percent (which bounds the benefit of using a portable diesel-driven battery charger in switchgear flood events). According to Entergy, the original analysis inadvertently reduced the contribution from internal switchgear room floods by more than 5 percent (Entergy 2008a). Entergy's reevaluation of the benefits for this SAMA, consistent with the intended bounding case, resulted in a reduction in the baseline benefit to about $146,000, including the impacts of lost tourism and business and analysis uncertainties (Entergy 2008a), and $309,000 using the same assumptions and corrected site meteorological data (Entergy 2009). The revised benefit estimate using corrected site meteorology is reflected in Table G-6. The NRC staff notes that the benefit associated with several other SAMA candidates that could increase the time available to recover offsite power before local operation of AFW is required from 2 hours to 24 hours (e.g., IP3 SAMA 24 (provide additional dc battery capacity) was estimated at about $51,000, including the impacts of lost tourism and business and analysis uncertainties. Therefore, a revised benefit estimate of $146,000 (before correcting site meteorological data) for IP3 SAMA 30, which also includes the additional benefit from reducing the contribution of internal switchgear room floods by 5 percent, appears reasonable. In the ER, Entergy indicated that the implementation cost associated with IP3 SAMA 30 (i.e., $494,000) was specifically estimated for IP3. The proposed plant modification involves purchasing, installing, and maintaining a diesel-driven generator to charge the 125-V dc batteries. Safety-related quick-disconnects would be used to charge the selected battery. The diesel generator would be installed in a weather enclosure outside the turbine or control building, requiring fire barrier penetration sealing. Calculation of cable size, as well as procedure development and training, would be required (Entergy 2007). In view of the scope of these modifications and the fact that the modifications involve a safety-related dc system, the estimated costs appear reasonable. As part of Entergy's SAMA re-analysis (using corrected meteorological data) Entergy provided an updated site-specific cost estimate of $938,000 for SAMA 30 based on more comprehensive and precise cost estimating techniques (Entergy

2009). However, the NRC staff notes that SAMA 30 would not be cost-beneficial regardless of which cost estimate is used. Accordingly, the NRC staff agrees that this SAMA would not be cost beneficial for IP3.

The NRC-sponsored severe accident analyses performed subsequent to the time of the IPE suggest that the probability of a TI-SGTR, given a core-damage event with high primary-side pressure and a depressurized, dry secondary side, may be higher than the value used in the IP2 and IP3 PSAs. In response to an NRC request, Entergy provided the results of a sensitivity study in which it increased the conditional TI-SGTR probability from 0.01 (used in the baseline analysis) to 0.25, which is comparable to the values reported in NUREG-1570 (NRC 1998). Entergy identified the candidate SAMAs potentially affected by the TI-SGTR assumption and reassessed the benefits for these SAMAs, subject to the increased conditional failure probability and the impact of analysis uncertainties. Entergy identified no additional cost-beneficial SAMAs as a result of this reassessment. Entergy also noted that the IP2 and IP3 steam generators have only 0.19 percent and 0.12 percent of the tubes plugged for IP2 and IP3, respectively, and would be classified as "pristine," in accordance with the Westinghouse criteria for categorizing steam generator tube integrity. With no observed corrosion, Entergy concludes—and the NRC staff concurs—that this sensitivity study is conservative relative to the application of the NUREG-1570 results for pristine generators (Entergy 2008b).

As part of Entergy's SAMA re-analysis, Entergy revisited this sensitivity study using corrected site meteorological data. Due to the higher offsite consequences in the re-analysis, additional SAMAs were identified as potentially impacted by the TI-SGTR assumption (relative to the original study) and were re-evaluated. Based on the re-evaluation, one additional SAMA was found to be potentially cost-beneficial for IP3 (IP3 SAMA 18) (Entergy 2009).

The NRC staff noted that for certain SAMAs considered in the ER, there may be alternatives that could achieve much of the risk reduction at a lower cost. The NRC staff asked the licensee to evaluate several lower cost alternatives to the SAMAs considered in the ER, including SAMAs that had been found to be potentially cost beneficial at other PWR plants. These alternatives were (1) implementation of improved instrumentation and/or procedures to aid in the mitigation of a SGTR, (2) implementation of a procedure for recovery of steam dump to condenser from the unaffected steam generator to aid the mitigation of a SGTR, (3) implementation of a procedure for recovery of the main feedwater/condensate after safety injection actuation to aid in the mitigation of a SGTR, (4) reactivation of the IP3 postaccident containment venting system, and (5) purchase or manufacture of a "gagging device" that could be used to close a stuck-open steam generator safety valve on a faulted steam generator before core damage occurs (NRC 2007a, NRC 2007b). Entergy provided a further evaluation of these alternatives, as summarized below.

- Improve SGTR instrumentation and/or valve procedures. Operator actions to cool and depressurize the RCS to cold shutdown conditions following a SGTR before depleting RWST inventory are already contained in EOPs. EOPs also direct plant personnel to initiate RWST makeup, given a low RWST level without a corresponding increase in the containment recirculation sump water level, or if the ruptured steam generator narrow-range level indication is high.

- Institute a procedure for recovery of steam dump to condenser. Procedures for recovery of steam dump to condenser from the unaffected steam generator are currently available at both units.
- Recover main feedwater/condensate. For IP2, the operators are currently directed to attempt to establish a secondary heat sink with AFW, main feedwater, or condensate, should the AFW system initially not function or subsequently fail during implementation of the EOPs. For IP3, procedural guidance currently exists for re-establishing condensate flow, but there is no guidance to use main feedwater following a loss of the secondary heat sink. Thus, the development of guidance on aligning main feedwater for secondary heat removal was evaluated as a potential SAMA for IP3.
- Reactivate the IP3 containment venting system. IP3 has three alternate methods of containment depressurization and combustible gas control. These methods are backflow to the steam ejector line, containment pressure relief line, and the containment purge system. All of the venting functions require similar operator actions. Given these various alternatives, failure to vent would be dominated by human error and would not be substantially reduced by providing an additional means of venting.

With regard to the steam generator safety gagging device, which was found to be potentially cost beneficial at another pressurized-water reactor seeking license renewal, Entergy provided a separate assessment of the benefits and implementation costs. Entergy estimated the benefit associated with successfully gagging a stuck-open main steam safety valve following an SGTR by assuming all early steam generator isolation failures and all TI-SGTRs would be eliminated. The total benefits were estimated to be about $2.9 million for IP2 and $4.4 million for IP3 (Entergy 2008b). Based on Entergy's SAMA re-analysis (using corrected meteorological data), these values would increase to about $13 million for IP2 and $19 million for IP3 (Entergy 2009). The implementation cost, including purchasing and storing a dedicated gagging devise, revising procedures, and providing training, was estimated to be about $50,000 for each unit. As such, the results indicate that this SAMA is potentially cost beneficial for both units. Entergy indicates that this additional SAMA has been submitted for an engineering project cost-benefit analysis for a more detailed examination of its viability and implementation cost (Entergy 2008b). The NRC staff concurs with Entergy's findings regarding these alternative SAMAs because the NRC staff finds the additional information provided by Entergy for the aforementioned alternative SAMAs to be technically sound.

The NRC staff notes that all of the 12 potentially cost-beneficial SAMAs for IP2 (IP2 SAMAs 9, 21, 22, 28, 44, 53, 54, 56, 60, 61, 62 and 65) and eight potentially cost-beneficial SAMAs for IP3 (IP3 SAMAs 7, 18, 19, 52, 53, 55, 61, and 62), identified in either Entergy's baseline analysis or supplemental analyses provided in response to the NRC requests, as well as the additional SAMA regarding a dedicated gagging device for SGTR events (applicable to both units), are included within the set of SAMAs that Entergy will consider further for implementation. The NRC staff concludes that, with the exception of the potentially cost-beneficial SAMAs discussed above, the costs of the other SAMAs would be higher than the associated benefits (i.e., no additional SAMAs appear to be cost-beneficial).

G.7 Conclusions

Entergy compiled a list of 231 candidate SAMAs for IP2 and 237 SAMAs for IP3, based on a review of the most significant basic events from the current plant-specific PSA, insights from the plant-specific IPE and IPEEE, and a review of other industry documentation. An initial screening removed SAMA candidates that (1) were not applicable at IP2 and IP3, (2) were already implemented or their intent had been met, or (3) were similar in nature and could be combined with another SAMA candidate. Based on this screening, 163 IP2 and 175 IP3 SAMAs were eliminated, leaving 68 IP2 and 62 IP3 candidate SAMAs for evaluation.

For the remaining SAMA candidates, more detailed evaluation was performed as shown in Table G-6. The cost-benefit analyses in the ER showed that five IP2 and five IP3 SAMA candidates were potentially cost beneficial in either the baseline analysis or sensitivity analysis using a 3 percent discount rate. Entergy performed additional analyses to evaluate the impact of parameter choices and uncertainties on the results of the SAMA assessment. As a result, four additional IP2 SAMAs and one additional IP3 SAMA were identified as potentially cost beneficial. In addition, a SAMA regarding a dedicated gagging device for SGTR events was identified as potentially cost beneficial for both units. Correction of an error in the benefit analysis for IP2 SAMA 30 resulted in it no longer being considered cost beneficial. Subsequent to issuance of the DSEIS, in response to NRC Staff questions, Entergy identified an error in the Indian Point site meteorology file used to calculate offsite consequences of severe accidents, and submitted a SAMA re-analysis based on corrected meteorological data (Entergy 2009). The SAMA re-analysis resulted in identification of three additional potentially cost beneficial SAMAs for IP2 (IP2 SAMAs 21, 22, and 62) and three potentially cost beneficial SAMAs for IP3 (IP3 SAMAs 7, 18, and 19). Entergy has indicated that all 12 potentially cost-beneficial SAMAs for IP2 (IP2 SAMAs 9, 21, 22, 28, 44, 53, 54, 56, 60, 61, 62, and 65) and eight potentially cost-beneficial SAMAs for IP3 (IP3 SAMAs 7, 18, 19, 52, 53, 55, 61, and 62), as well as the additional SAMA regarding a dedicated gagging device for SGTR events, will be considered further for implementation at IP2 and IP3.

The NRC staff reviewed the Entergy analysis and concludes that the methods used and the implementation of those methods were sound. The treatment of SAMA benefits and costs support the general conclusion that the SAMA evaluations performed by Entergy are reasonable and sufficient for the license renewal submittal. Although the treatment of SAMAs for external events was somewhat limited, the likelihood of there being cost-beneficial enhancements in this area was minimized by improvements that have been realized as a result of the IPEEE process and inclusion of a multiplier to account for external events.

The NRC staff concurs with Entergy's identification of areas in which risk can be further reduced in a cost-beneficial manner through the implementation of the identified, potentially cost-beneficial SAMAs. Given the potential for cost-beneficial risk reduction, the NRC staff agrees that further evaluation of these SAMAs by Entergy is warranted. However, these SAMAs do not relate to adequately managing the effects of aging during the period of extended operation. Therefore, they need not be implemented as part of license renewal pursuant to Title 10 of the *Code of Federal Regulations*, Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants" (10 CFR Part 54).

G.8 References

Consolidated Edison (Con Ed). 1992. Letter from Stephen B. Bram to U.S. NRC, Subject: Generic Letter 88-20, Supplement 1: Individual Plant Examination (IPE) for Severe Accident Vulnerabilities—10 CFR 50.54, IP2 and IP3 Unit No. 2, August 12, 1992.

Consolidated Edison (Con Ed). 1995. Letter from Stephen E. Quinn to U.S. NRC, Subject: Final Response to Generic Letter 88-20, Supplement 4: Submittal of Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities, IP2 and IP3 Unit No. 2, December 6, 1995.

Entergy Nuclear Operations, Inc. (Entergy). 2007. Letter from Fred Dacimo to U.S. NRC, Subject: IP2 and IP3 Energy Center Licensee Renewal Application, NL-07-039, April 23, 2007. ADAMS Accession No. ML071220512.

Entergy Nuclear Operations, Inc. (Entergy). 2008a. Letter from Fred R. Dacimo to U.S. NRC, Subject: Reply to Request for Additional Information Regarding License Renewal Application—Severe Accident Mitigation Alternatives Analysis, NL-08-028, February 5, 2008. ADAMS Accession No. ML080420264.

Entergy Nuclear Operations, Inc. (Entergy). 2008b. Letter from Fred R. Dacimo to U.S. NRC, Subject: Supplemental Reply to Request for Additional Information Regarding License Renewal Application—Severe Accident Mitigation Alternatives Analysis, NL-08-086, May 22, 2008. ADAMS Accession No. ML081490336.

Entergy Nuclear Operations, Inc. (Entergy). 2009. Letter from Fred Dacimo to U.S. NRC, Subject: License Renewal Application – SAMA Re-analysis Using Alternate Meteorological Tower Data, NL-09-165, December 11, 2009. ADAMS Accession No. ML093580089.

Entergy Nuclear Operations, Inc. (Entergy). 2010. Letter from Fred Dacimo to U.S. NRC, Subject: License Renewal Application – Supplement To SAMA Re-Analysis Using Alternate Meteorological Tower Data, NL-10-013, January 14, 2010. ADAMS Accession No. ML100260750.

New York Power Authority (NYPA). 1994. Letter from William A. Josiger to U.S. NRC, Subject: IP2 and IP3 3 Nuclear Power Plant Individual Plant Examination for Internal Events, June 30, 1994.

New York Power Authority (NYPA). 1997. Letter from James Knubel to U.S. NRC, Subject: IP2 and IP3 3 Nuclear Power Plant Individual Plant Examination of External Events (IPEEE), September 26, 1997.

Nuclear Regulatory Commission (NRC). 1990. "Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants." NUREG-1150, Washington, DC, December 1990. ADAMS Accession No. ML040140729.

Nuclear Regulatory Commission (NRC). 1991. Generic Letter 88-20, Supplement 4, "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities," June 28, 1991.

Nuclear Regulatory Commission (NRC). 1995. Letter from Jefferey F. Harold to William J. Cahill, Jr., Subject: Staff Evaluation of IP2 and IP3 Nuclear Generating Unit No. 3—Individual Plant Examination (TAC No. M74423), December 11, 1995.

Nuclear Regulatory Commission (NRC). 1996. Letter from Barry Westreich to Stephen E. Quinn, Subject: Staff Evaluation of IP2 and IP3 Nuclear Generating Unit No. 2—Individual Plant Examination (TAC No. M74422), August 14, 1996.

Nuclear Regulatory Commission (NRC). 1997a. "Regulatory Analysis Technical Evaluation Handbook." NUREG/BR-0184, Washington, DC, January 1997.

Nuclear Regulatory Commission (NRC). 1997b. "Individual Plant Examination Program: Perspectives on Reactor Safety and Plant Performance." NUREG-1560, Washington, DC, December 1997.

Nuclear Regulatory Commission (NRC). 1997c. "Code Manual for MACCS2: Volume 1, User's Guide." NUREG/CR-6613, Washington, DC, May 1998.

Nuclear Regulatory Commission (NRC). 1998. "Risk Assessment of Severe Accident-Induced Steam Generator Tube Rupture." NUREG-1570, Washington, DC, March 1998.

Nuclear Regulatory Commission (NRC). 1999. Letter from Jefferey F. Harold to A. Alan Blind, Subject: Review of IP2 and IP3 Nuclear Generating Unit No. 2—Individual Plant Examination of External Events (IPEEE) Submittal (TAC No. M83631), August 13, 1999.

Nuclear Regulatory Commission (NRC). 2001. Letter from George F. Wunder to Michael Kansler, Subject: Review of Individual Plant Examination of External Events—IP2 and IP3 Nuclear Generating Unit No. 3 (TAC No. M83632), February 15, 2001. ADAMS Accession No. ML 010080273.

Nuclear Regulatory Commission (NRC). 2002. "Perspectives Gained From the Individual Plant Examination of External Events (IPEEE) Program," Volume 1 & 2, Final Report. NUREG-1742, Washington, DC, April 2002.

Nuclear Regulatory Commission (NRC). 2004. "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission." NUREG/BR-0058, Washington, DC, September 2004. ADAMS Accession No. ML042820192.

Nuclear Regulatory Commission (NRC). 2007. Letter from Jill Caverly to Entergy, Subject: Request for Additional Information Regarding Severe Accident Mitigation Alternatives for IP2 and IP3 Nuclear Generating Unit Nos. 2 and 3 Licensee Renewal (TAC Nos. MD5411 and MD5412), December 7, 2007. ADAMS Accession No. ML073110447.

Nuclear Regulatory Commission (NRC). 2008. Letter from Bo M. Pham to Entergy, Subject: Request for Additional Information Regarding the Review of the License Renewal Application for IP2 and IP3 Nuclear Generating Unit Nos. 2 and 3 (TAC Nos. MD5411 and MD5412), April 9, 2008. ADAMS Accession No. ML080880104.

Nuclear Regulatory Commission (NRC). 2010. Atomic Safety and Licensing Board. LBP-10-13. 71 NRC ___ (2010). slip op. at 10, 14-15.

U.S. Department of Agriculture (USDA). 2002. "Census of Agriculture." Accessed at: http://www.nass.usda.gov/census/ on April 26, 2005.us/ on April 26, 2009.

Appendix H

U.S. Nuclear Regulatory Commission
Staff Evaluation of
Environmental Impacts of Cooling System

Appendix H

U.S. Nuclear Regulatory Commission Staff Evaluation of Environmental Impacts of Cooling System

H.1 Environmental Impacts of Cooling System

Environmental issues associated with the operation of a nuclear power plant during the renewal term are discussed in the U.S. Nuclear Regulatory Commission (NRC) document, NUREG-1437, Volumes 1 and 2, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (hereafter referred to as the GEIS) (NRC 1996, 1999).[(a)] The GEIS includes a determination of whether the analysis of the environmental issues could be applied to all plants and whether additional mitigation measures would be warranted. Issues are then assigned a generic (Category 1) or site-specific (Category 2) designation. As set forth in the GEIS, generic issues are those that have the following characteristics:

(1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristics.

(2) A single significance level (i.e., SMALL, MODERATE, OR LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal).

(3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

No additional plant-specific analysis is required for generic issues unless new and significant information is identified. Site-specific issues do not have all the above characteristics, and a plant-specific review is required.

This appendix addresses the issues that are listed in Table B-1, Appendix B, Subpart A, of Title 10 of the *Code of Federal Regulations* (CFR), Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," and that are related to the operation of the cooling systems of Indian Point Nuclear Generating Unit Nos. 2 and 3 (IP2 and IP3) during their renewal term. Section H.1 addresses the impingement of fish and shellfish applicable to the IP2 and IP3 cooling systems. Section H.2 addresses the entrainment of fish and shellfish applicable to the IP2 and IP3 cooling systems. Section H.3 addresses the combined effects of impingement and entrainment, and Section H.4 discusses cumulative impacts. Finally, Section H.5 lists the references for Appendix H. Category 1 and Category 2 issues that are not applicable to IP2 and IP3, because they are related to plant design features

or site characteristics not found at IP2 and IP3, are listed in Appendix F. As stated in Section 4.1 of this SEIS, the applicant submitted corrected impingement and entrainment data following publication of the draft SEIS. The NRC staff considered those data as well as comments NRC received regarding the draft SEIS in preparing this appendix.

H.1.1. Impingement of Fish and Shellfish

Impingement occurs when organisms are trapped against cooling water intake screens or racks by the force of moving water. Impingement can kill organisms immediately or gradually, by exhaustion, suffocation, injury, or exposure to air when screens are rotated for cleaning. The potential for injury or death is generally related to the amount of time an organism is impinged, its susceptibility to injury, and the physical characteristics of the screenwash and fish return system that is employed. Studies of impingement losses associated with the operation of IP2 and IP3 cooling systems were conducted annually from 1975 to 1990. Before the installation of modified Ristroph screen systems in 1991, impingement mortality was assumed to be 100 percent. Beginning in 1985, studies were conducted to evaluate whether the addition of Ristroph screens would decrease impingement mortality for representative species. The final design (Version 2), as reported in Fletcher (1990), appeared to reduce impingement mortality, based on a pilot study, in comparison to the existing (original) system in place at IP2 and IP3 (Table H-1). The impingement survival estimates reported in Fletcher (1990) were not validated, however, after the new Ristroph screens were installed at IP2 and IP3 in 1991.

Table H-1 Assumed Cumulative Mortality and Injury of Selected Fish Species after Impingement on Ristroph Screens

Species	Percent Dead and Injured
Alewife	62
American Shad	35
Atlantic Tomcod	17
Bay Anchovy	23
Blueback Herring	26
Hogchoker	13
Striped Bass	9
Weakfish	12
White Catfish	40
White Perch	14

Source: Fletcher 1990.

H.1.1.1. Summary of Impingement Monitoring Studies

The former owners of IP2 and IP3 conducted impingement monitoring between 1975 and 1990 using a variety of techniques. Between January 1975 and June 1981, fish were collected and sorted during a daily intake screen washing between 0800 and 1200 hours (hr). In July 1981 and continuing through October 1990, fish were collected during intake screen washings between 0800 and 1200 hr on selected days determined from a stratified random design intended to reduce the overall sampling effort without affecting data use and utility. Between October and December 1990, IP2 was sampled every Tuesday, and IP3 was not sampled because of a plant outage. During all collections, the wash water was circulated to draw a portion of the fish and debris into the forebay, where it was drained through a sluice containing a 1-millimeter (mm) (0.375-inch [in.]) square mesh screen. Collection efficiency was estimated in 1974, 1975, and 1977 at IP2. The results of these studies suggested that the collection efficiency was highly variable (ranging from 2 percent to 45 percent based on the recovery of dyed fish) and averaged 29 percent (Con Edison 1976, Con Edison 1979). Collection efficiency at IP3 in 1976 and 1977 ranged from 58 percent to 86 percent recovery of dyed fish with an average of 71 percent (Con Edison 1977, Con Edison 1979). The difference in the collection efficiency at the two units was associated with the differences in the type of screens (fixed versus traveling screens) and the method used for screen washing. To estimate the total number of fish impinged, the total number of fish collected was multiplied by an adjustment factor representing the inverse of the collection efficiency. From 1975 to 1978, adjustment factors of 3.5 and 1.4 were used for IP2 and IP3, respectively (Con Edison 1980).

Analysis of variance and the correlation of environmental and IP2 and IP3 operation variables were employed to explain the variation in collection efficiency. Early studies suggested that collection efficiency increased during periods of low water temperature. In 1979, the adjustment factor became a function of the time of year, based on the increase in collection efficiency when water temperatures were less than 15°C (59°F). Thus, cool water adjustment factors of 2.1 and 1.2 were adopted to estimate the number of fish impinged at IP2 and IP3, respectively, during January through April, November, and December. For May to October, the adjustment factor was 3.8 for IP2 and 1.5 for IP3. In 1981, the collection efficiency was estimated with a regression relationship with temperature:

$$\text{IP2 efficiency} = E_2 = -0.00945\ (\text{Temperature } ^\circ\text{C}) + 0.54708$$

$$\text{IP3 efficiency} = E_3 = -0.00792\ (\text{Temperature } ^\circ\text{C}) + 0.71640 \text{ (Con Edison 1984).}$$

These regression relationships were updated in 1982, and screen-specific adjustments were devised from studies conducted in 1985 and 1986 (Table H-2).

Impingement monitoring designs changed through time (Con Edison 1980, Con Edison 1984, Con Edison and NYPA 1986, Con Edison and NYPA 1987, Con Edison and NYPA 1988, Con Edison and NYPA 1991) as follows. In 1979, the daily variation in impingement counts was analyzed to determine its effect on the precision and accuracy of reduced sampling plans. Starting in July 1981, a sampling plan employing a seasonally stratified random sample developed from these results was used for all further impingement studies except the last quarter of 1990. Instead of sampling daily, IP2 and IP3 were sampled a total of 110 days per year (a 30-percent sampling fraction with approximately 92-percent accuracy) (Con Edison 1984). Days were selected at random within four calendar strata defined by similar water temperatures and variance in the number of fish impinged (January–March, April–June, July–September, and October–December). The number of days sampled per stratum was

proportional to the number of days available and the variance in impingement for all taxa combined (Table H-3) (Con Edison 1984). The number of days allocated to strata was updated in 1985 to take advantage of current data trends and again in 1990 because of known plant outages. Even though IP2 and IP3 had different numbers of samples allocated to each stratum, sampling was conducted on the same day at both units to the extent possible.

During 1981, the New York State Department of Environmental Conservation (NYSDEC) required daily sampling when total impingement counts were greater than 10,000 fish. Daily sampling was required to continue until the total was below 10,000 fish. Because these sampling dates were not part of the stratified design, they were used in place of random dates that were associated with unplanned unit outages. Outages were defined as circulating pump outages and were not necessarily associated with cessation of power generation. In 1981, randomly selected days that fell on planned outages were not replaced. From 1982 to October 1990, to minimize the effect of planned and unplanned outages on the selected days for collection, a randomly selected replacement day within the given stratum was sampled. In October 1990, a systematic sampling design was employed that required sampling at IP2 each Tuesday. No sampling was conducted at IP3 from October 1990 to December 1990 because of an extended outage.

Sampling for blue crabs began in April 1983 and continued though December 1990. Sampling was conducted on all days of plant operation. The total number of impinged crab and their total weight were obtained for each sampling. In addition, the carapace width, total weight, and observed condition were recorded for each collected individual.

Table H-2 Estimates of Collection Efficiency Based on Temporal Averages, Regressions as a Function of Temperature, and Specific Screens

Year	IP2 Conventional Screen	IP3 Conventional Screen	Ristroph Screen Version[1]
1975–1978	29 percent	71 to 73 percent	None installed
1979–1980	Jan.–April = 48 percent May–Oct. = 26 percent Nov.–Dec. = 48 percent	Jan.–April = 83 percent May–Oct. = 66 percent Nov.–Dec. = 83 percent	None installed
1981	$E_2 = -0.00945\ T + 0.54708$	$E_3 = -0.00792\ T + 0.71640$	None installed
1982–1985	$E_2 = -0.00871\ T + 0.51858$	$E_3 = -0.00792\ T + 0.71640$	None installed

Table H-2 (continued)

Year	IP2 Conventional Screen	IP3 Conventional Screen	Ristroph Screen Version[1]
1986	E_2 = -0.00871 T + 0.51858	E_3 = -0.00792 T + 0.71640	Jan.–Mar. = 70.8 percent Apr.–June = E_2 or E_3 July–Aug. = 18.7 percent Sept. = 29.6 percent Oct.–Dec. = E_2 or E_3
1987–1990	E_2 = -0.00871 T + 0.51858	E_3= -0.00792 T + 0.71640	Jan.–Mar. = 74.4 percent Apr.–June = E_2 or E_3 July–Aug. = 18.7 percent Sept. = 29.6 percent Oct.–Dec. = E_2 or E_3

[1] Number of Ristroph Screens at IP2. In 1986, a Ristroph Screen was installed on Intake Bay 26.
E_2 – Collection Efficiency at IP2.
E_3 = Collection Efficiency at IP3.
T = Temperature in degrees C.

Sources: Con Edison 1980, Con Edison 1984, Con Edison and NYPA 1986, Con Edison and NYPA 1987, Con Edison and NYPA 1988, Con Edison and NYPA 1991.

Table H-3 Number of Days Allocated to Each Quarter Based on the Stratified Random Sampling Design

Stratum	Dates	Total Days	Allocation to IP2 in 1981; 1982–84; 1985–89; and 1990	Allocation to IP3 in 1981; 1982–84; 1985–89; and 1990
Winter	Jan. 1–Mar. 31	90	N/A[a]; 30; 23; 23	N/A; 27; 35; 35
Spring	Apr. 1–June 30	91	N/A; 10; 8; 8	N/A; 18; 20; 20
Summer	July 1–Sept. 30	92	11; 11; 11; 11	31; 31; 31; 31
Fall	Oct. 1–Dec. 31	92	59; 59; 68; 13	34; 34; 24; 0

[a] N/A = Not Applicable, the reduced sampling began July 1, 1981 (Con Edison 1984).
Sources: Con Edison 1984, Con Edison and NYPA 1986, Con Edison and NYPA 1987, Con Edison and NYPA 1988, Con Edison and NYPA 1991.

For all impingement studies, fish were sorted and counted completely if either the identified species was white perch, striped bass, or tomcod, or the total number collected for a given species was less than 100 individuals (with heads). All other sorted samples were enumerated by subsampling and weighing to four general length classes. This information was used to determine the total sample size. To estimate the number of fish impinged, the estimated daily counts (taken before July 1981) were multiplied by the collection efficiency adjustment factor (Con Edison 1984). During the period of stratified random sampling (July 1981–1990), the

mean of the estimated number of fish counted within a stratum was multiplied by the collection efficiency adjustment factor and the number of days of plant operation (Con Edison 1984).

H.1.1.2. Historic Assessment of Impingement Impacts

As discussed in the previous section, numerous studies have been conducted to evaluate the effects of impingement associated with the Indian Point cooling systems. Studies have also been conducted to evaluate the trends of fish populations in the Hudson River. Entergy Nuclear Operations, Inc. (Entergy, or the applicant) and NYSDEC have used the results of these studies to evaluate the potential for adverse effects associated with the operation of the Indian Point cooling systems. The results of these assessments are described below. Nongovernmental groups and members of the public have also evaluated publicly available information and data associated with the Hudson River and have expressed the opinion that many species of fish in the river are in decline and that the entrainment of juvenile and adult fish at Indian Point is contributing to the decline, destabilization, and ultimate loss of these important aquatic resources.

Applicant Assessment

In the draft environmental impact statement (DEIS) (CHGEC 1999) and environmental report (ER) for license renewal (Entergy 2007), the applicant acknowledged that some impinged fish survive and others die. Mortality can be immediate or occur at a later time (latent or long-term mortality), and mortality rates depend on the species, the size of the fish, the water's temperature and salinity, the design of the screens, the water velocity through the screen, the length of time the fish was impinged, and the design and operation of the fish return system. Impingement effects were examined by evaluating conditional mortality rates (CMRs) and trends associated with population abundance for eight selected taxa representing 90 percent of those fish species collected from screens at IP2 and IP3, including striped bass, white perch, Atlantic tomcod, American shad, bay anchovy, alewife, blueback herring, and spottail shiner. Estimates of the CMR, defined as the fractional reduction in the river population abundance of the vulnerable age group caused by one source of mortality only, were assumed to be the same as or lower than that which occurred in past years, caused by the installation of Ristroph screens and fish return systems at IP2 and IP3. For species exhibiting low impingement mortality (e.g., striped bass, white perch, and Atlantic tomcod), future impingement effects were expected to be substantially lower than they were before the installation and use of the present protective measures.

Central Hudson Gas and Electric Corporation (CHGEC) (1999) concluded that the maximum expected total impingement CMR was 0.004 for white perch and less for all other taxa. The ER (Entergy 2007) stated that the results of in-river population studies performed from 1974 to 1997 had not shown any negative trend in overall aquatic river species populations attributable to plant operations: