

<b>United States Nuclear Regulatory Commission Official Hearing Exhibit</b>	
<b>In the Matter of:</b>	Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Units 2 and 3)
	<b>ASLBP #:</b> 07-858-03-LR-BD01
	<b>Docket #:</b> 05000247   05000286
	<b>Exhibit #:</b> RIV000086-00-BD01
	<b>Admitted:</b> 10/15/2012
	<b>Rejected:</b>
<b>Other:</b>	<b>Identified:</b> 10/15/2012
	<b>Withdrawn:</b>
	<b>Stricken:</b>

RIV000086

Submitted: December 22, 2011

**TOP TEN LESSONS LEARNED:**

- The discovery of the source of leakage has not been immediately identified, self revealing, or definitive in a 3 Unit facility with multiple spent fuel pools, multiples RWSTs, multiple sumps, pipes, and other sources of tritium since initial leakage identification in Sept 2005.
- We suspect that the Unit 2 SFP has been a leak contributor. However the Unit 2 Spent Fuel, without tell tale drains monitoring system has made leak detection difficult on an interactive or historical basis.
- The camera inspections, and physical repair of a spent fuel pool has been difficult and requires engineering approval as it is still in use, full of fuel, has boroflex interactions, and the clearance between the pool wall sides and bottom range from 1.5-3 inches.
- We did not have a robust groundwater monitoring program in place that would have identified tritium in groundwater, or storm drain systems, until a leak was visually observed. We had 17 existing wells that could have provided early indications if we had performed this evaluation earlier.
- When tritium was detected on routine sampling of storm drains, the information was not effectively reviewed.
- We clearly underestimated the large manpower impacts to Chemistry, RP, Rad Waste, Engineering, Licensing, Facilities groups, Communications departments, and senior management personnel.
- We incurred significant impact to training and resource time management for In-house NEM groups on how to take, sequence, and document water samples from monitoring wells and other offsite monitoring locations. Additionally we experienced large equipment impacts to purchase new (dedicated) sampling equipment including dedicated pumps, hoses, measuring devices, for each well.
- Cross-contamination events caused by field sampling equipment contamination (pumps), and offsite laboratory equipment contamination (tritium racks) caused stakeholder distrust as to the accuracy of sampling process.
- Poor plant storm drain drawings, and degraded material conditions led to confusion on inter-relationships, and transport characteristics of each storm drain and how they interacted with the Hudson River or discharge canal.
- We initially underestimated the degree and management time commitments of regulatory and stakeholder oversight and interest including conference calls, split sampling exercises and “full court press” from regulators and stakeholders.

PS: Number 11 which covers 1-10 is: “ Hire a good geologist...”

**From:** Mayer, Don  
**Sent:** Friday, March 24, 2006 11:42 AM  
**To:** Hinrichs, Gary <ghinric@entergy.com>  
**Cc:** Ventosa, John <jventos@entergy.com>  
**Subject:** Public Meeting Readiness

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Gary-

Planned activities to identify and correct the fuel pool leak and to investigate other sources are likely questions to be expected by D. Lochbaum on 3/28.

I expect the both myself and John from an engineering view will be asked these type of questions.

Pls provide talking points on the latest status of

- Estimated leak detection sensitivity from potential leakage sources such as RWSTs, Fuel Pools, and other items as reflected by the NRC "14 questions"
- What is the present schedule for the inspection of the u2 fuel pool walls and floor.
- Dye testing sequence and schedule
- Status of storm drain inspections and repair considerations as appropriate

Our goal needs to be able to articulate our diligence in finding and repairing the leak(s) that are causing the problems we are experience with gnd water contamination. (Underscore words are from recent Sam Collins statement to stakeholders).

Don

**From:** Christopher Snee <csnee@gza.com>  
**Sent:** Wednesday, September 28, 2005 4:42 PM  
**To:** mbarvenik@gza.com  
**Subject:** Re: Indian Point Nuke  
**Attach:** Marble extracts.doc

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Matt

Attached is a melange of information from the various reports for this project - I don't expect it to make any grammatical sense. I have split them into Manhattan Schist and Inwood Marble. We have probably more understanding and insight into this rock than any one else because of the 2nd Avenue geotech program. If "they" want to solve their problem they will need this expertise. We can probably save someone a lot of time and effort as we have developed techniques of spotting the key indicators of problematic geology in the ground - assuming that there isn't a major transformation in the geology.

Good luck

----- Original Message -----

**From:** Matthew Barvenik  
**To:** csnee@gza.com  
**Sent:** Wednesday, September 28, 2005 12:27 PM  
**Subject:** RE: Indian Point Nuke

Hi Chris,

Thanks for the info the other day. The job # is 17869.00 task 9. Could you do me another favor. Could you cut out the sections that describe the bedrock geology from the data reports and send if to me (e-mail or ftp site)? - I was looking for our copies of the reports and Terese told me that the north and central reports probably have the most relevant data pursuant to the Manhattan schist and the inwood formations. I may want to reference some sections of the reports. The plant is about 25 miles up the Hudson from Manhattan so the rock I have may be significantly different than what you found. But at this point, we have no real data and I need to come up with some "what if" scenarios by tomorrow and your info demonstrates that we (being you) have a boat load of expertise for this formation which will help us move to the next stage where we are likely to get to drill some holes, as well as get the existing info from plant construction that exists somewhere. If you get the chance in the near future, it would also be good if you could look at what other geologic mapping you may have to get some indication of how close the rock at Indian Point would "match" that of 2nd Ave.

Thanks  
mjb

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-Proud participant & supporter of the Pan Mass Challenge-

IPEC00130549

-----Original Message-----

**From:** Matthew J. Barvenik [mailto:mbarvenik@gza.com]

**Sent:** Saturday, September 24, 2005 8:55 AM

**To:** 'csnee@gza.com'

**Subject:** Indian Point Nuke

Hi Chris,

Have a little issue I some how got involved with. Seem that the Indian Point Nuke (Buchanan, NY) may have a bit of a leak in their fuel rod storage pool. Even if it turns out that there really isn't a leak, the issue clearly got Bill and Hillary's attention and they are pissed (they have a house in the 10 mile "your screwed zone"), were apparently out at the plant yesterday while we were there and threatening Congressional hearings.

Anyway, the issue is two fold: 1) how to figure out if the pool leaked or not and, 2) if it did, where is the water going given the proximity of the Hudson River, but also the existence of some drainage structures. The issue I need a little help on is some specific experience with the bedrock (Manhattan Formation - phyllite and schist and the Inwood Formation - limestone, dolostone, marble) that I think you are very familiar with. The critical issue is the likely (we have no actual data) anisotropy of the hydraulic conductivity of the rock. Do you have any idea if this data exists for this area, and if not, what it is for these deposits where you studied them and how likely is the data to be "transferable"? Please give me a call or e-mail as soon as you can - the Clintons are concerned.

Thanks

mjb

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IPEC00130550

**From:** Lavera, Ron  
**Sent:** Thursday, January 26, 2006 6:38 AM  
**To:** Bob Evers <bever90@cc--exs02.prod.energery.com>; Christopher English <cenqli2@energery.com>; David Smith <dsmith4@energery.com>; Don Leach <DLeach@energery.com>; Don Mayer <DMayer1@energery.com>; Donald Croulet <dcroule@energery.com>; Dragos Nuta <dnuta@energery.com>; ERNEST PRICE <EPRICE2@energery.com>; Gary Hinrichs <ghinric@energery.com>; Hank Santis <hsant90@energery.com>; James Peters <jpeter3@energery.com>; Joe Kulaga <JKulaga@energery.com>; John Skonieczny <jskonie@energery.com>; Kathy McMullin <KMcmull@energery.com>; Kenneth Morin <kmori91@energery.com>; Michael Durfee <mdurf90@energery.com>; Michael Rutkoske <mrutkos@energery.com>; Paul Deeds <pdeeds@energery.com>; Richard Colville <rcolvil@energery.com>; Richard Drake <RDrake@energery.com>; Robert Oliveira <boliveira@amnucins.com>; Ron Lavera <RLavera@energery.com>; Ronald Sachatello <rsach90@energery.com>; T. R. Jones <tjones2@energery.com>; Thomas Burns <tburns1@energery.com>  
**Subject:** FW: 2.206 petition on contaminated water leakage  
**Attach:** 20060125-tritium-petition.pdf

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I just received this

Ron

\*\*\*\*\* URGENT FYI -- TRITIUM IN GROUNDWATER \*\*\*\*\*

The latest development in the saga is that David Lochbaum and the Union of Concerned Scientists has petitioned the NRC for action on the topic of tritium in groundwater.

I am forwarding this "as is" from my counterpart in Progress Energy. They are taking the issue of tritium in groundwater VERY SERIOUSLY.

In my mind, this will end up being one of the biggest points of contention in license extension efforts, as well as any NUSTART initiatives for new plant construction.

Ken Sejkora

-----Original Message-----

From: Barley, Gregory [<mailto:Gregory.Barley@pgnmail.com>]  
Sent: Wednesday, January 25, 2006 4:05 PM  
To: Sejkora, Kenneth  
Subject: FW: 2.206 petition on contaminated water leakage

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From: Bach, Chip  
Sent: Wed 1/25/2006 1:52 PM  
To: Hughes, Lee; Barley, Gregory; Alexander, Donna; Snead, Paul; Johnson, Jerry

Cc: Duncan, Bob (HNP)  
Subject: FW: 2.206 petition on contaminated water leakage

Ground water tritium is getting bigger and bigger. As discussed at our last conf call, we will need to have some heartfelt discussion on this at our peer group meeting. I am adding this topic to our "Environmental Stewardship" plant initiative for the year.

-----Original Message-----  
From: Noll, Bill  
Sent: Wednesday, January 25, 2006 12:26 PM  
To: Bach, Chip; Stoddard, Dan  
Subject: FW: 2.206 petition on contaminated water leakage

We need to be proactive and see if this fits in the Environmental Stewardship plan.

-----Original Message-----  
From: Baucom, Chuck  
Sent: Wednesday, January 25, 2006 12:11 PM  
To: Lucas, Jan; Noll, Bill; Moyer, John; Stoddard, Dan; Church, Chris  
Subject: FW: 2.206 petition on contaminated water leakage

Passed along for your information and awareness. Also, you are aware that we are tracking some SFP leakage items on the Site Priority List.

-----Original Message-----  
From: McCabe, Brian  
Sent: Wednesday, January 25, 2006 10:29 AM  
To: Beller, Leonard; Baucom, Chuck; Corlett, Dave; Infanger, Paul E.; Hinnant, Scotty; Burton, Chris; Donahue, Joe; Stiles, Harold; Garner, Rick; Heffner, Ken; Kimble, Rick; Gannon, Neil  
  
Subject: FW: 2.206 petition on contaminated water leakage

Good morning folks. Last week I sent you an email indicating that Dave Lochbaum had informed me that UCS intended to issue a petition (2.206) today. He was cryptic in the subject of the petition, but indicated that Progress Energy would be effected by the petition.

This morning, he sent me an advance copy of the petition he submitted to Luis Reyes (see attached). It pertains to spent fuel pool leakage into the environment (ground). It describes 7 contaminated water leakage events around the industry. No Progress Energy plants are identified in the 2.206 petition. However, it should be noted that Jim Warren of NC WARN is one of several co-petitioners. The petition asks for, among other things, NRC action to ensure that other spent fuel pools

around the industry do not have undetected leakage.

Brian

Brian C. McCabe  
Corporate Regulatory Affairs Manager  
Nuclear Generation Group  
Progress Energy  
(919) 546-4579  
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-----Original Message-----

From: Dave Lochbaum [<mailto:dlochbaum@ucsusa.org>]  
Sent: Wednesday, January 25, 2006 9:23 AM  
To: Luis Reyes  
Cc: Scott Burnell  
Subject: 2.206 petition on contaminated water leakage

Dear Mr. Reyes:

Attached is an electronic copy of a 2.206 petition. The original hard copy of the petition is in the mail to you.

This petition is submitted by a large coalition of organizations and individuals spanning the United States in response to a troubling series of "surprises" about longstanding, undetected leaks of radioactively contaminated water into the ground around nuclear facilities licensed by the NRC. The most recent "surprise" was reported just last month at the Braidwood nuclear plant in Illinois and is said to involve the leak of several million gallons of contaminated water - some of which appears to have migrated off the site and into nearby drinking water wells.

The petition requests the NRC to issue Demands for Information to other NRC licensed facilities to determine if there are any other "surprises" waiting to be detected.

Thanks,

Dave Lochbaum  
Director, Nuclear Safety Project  
Union of Concerned Scientists  
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Washington, DC 20006-3962  
(202) 223-6133 (office)  
(202) 331-5430 (direct line)  
(202) 223-6162 (fax)