

From: Eleanor Gavin <[redacted]>
To: <VermontYankeeEIS@nrc.gov>
Date: Thu, Mar 8, 2007 6:45 PM
Subject: comment on draft SEIS report, Mailstop T-6D59

12/21/06
71 FR 76706

30

Box 215, East Charleston, VT 05833

PO

1-802-723-6621

March

8, 2007

Chief, Rules and Directives Branch
Division of Administrative Services
Mailstop T-6D59
U.S. Nuclear Regulatory Commission
Washington DC 20555

Dear Monsieur, le chef of Rules and Directives Branch,
Dear Mr. Richard L Emch, Jr. , Senior Project Manager, Office of NRR,
Dear Mr. Rani L. Franovich, Chief, Environmental Branch B, Division
of License Renewal, Office of NRR,

1. For your convenience, I attach my statement which was sent to you
by overnight mail from Northern Vermont at noon, March 5, 2007. I
hope it got in on time. I have since done more research on the web
and found a report about the levels in strontium 90 in teeth. If you
would like to hear a synopsis of this and more recent reports, please
go to: www.traprockpeace.org/tooth_fairy_project.html You will see
a sentence:

"Hear the interview, ready for radio use:
<http://www.traprockpeace.org/audio/mangano_radiation.mp3>MP3 audio -
18:56 minutes; 3.3 mb; or for dialup connections: Real Auto . Then
click on Real Auto:

2. Mr. Franowich, I gave my copy of the Institute for Energy and
Environmental Research most recent newsletter entitled "Science for
Democratic Action" If you want to read it on line, please to to:

<http://www.ieer.org/sdfiles/index.html>Volume 14, Number 4 (February 2007)

Special Issue: Healthy from the Start: Building Better Environmental
Health Standards [PDF 700kB] and especially see the excellent
article on Tritium

I am more and more convinced, the more time I spend
googling, that all the reactors in the world must find ways to
prevent tritium from escaping. Since the escapes were uncovered in
Illinois last summer, it is evident that this is a weak point that an
agency (the NRC) with mission to assure the safety and security of
nuclear power plants, must pursue vigorously. If there is no
adequate solution, these plants must not be relicensed and they
should all decommission as soon as the grid they support has found
through efficiency and alternative energies, ways to assure adequate
supply to the customers.

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RULES AND DIRECTIVES
BRANCH
USNRC

SUNSI Review Complete
Template = ADM-013

E-RIDS = ADM-03
Add = R. Emch
(RHC)

I have learned today that tritium can somehow combine with hydrogen so that it in effect becomes water and there is no way at that stage you can remove it and isolate it from the environment for the 12.3 half life and double that. In fact the true time it is ionizing, apparently, is around 250 years. I don't know how they figure that out..I will attach above if I can find it again.

Women, embryos, fetuses, babies, toddlers and young children have more total water (per mass unit) in their bodies than the 30 year old male. Up until recently, since tritium is a type of water, it was assumed that it would spread out equally in the body and thus the targeted ionization of cells in any specific organ of the body would be low. But it turns out that tritium goes to areas where the percent of water that fills any given space is the highest. All human life evolved from the sea. The ova and embryo are filled with water, the fetus floats in water. The tritium passes the placenta and enters these structures at one time or another of their development. Tritium isotopes have an affinity for the nuclei of cells and they lodge right near them, irradiating the DNA inside the nuclei. The DNA is damaged. Five to 10 years later the child can develop leukemia.

As for the Strontium 90, that too is rising around reactors as statistics show. It lodges in teeth and near bones. The marrow of bones produces the cells (T cells, etc) that form the Immune system. The Immune system is the bodies defense against colds, asthma, and cancer . if it is weakened, these diseases may be expressed. If the T Cell DNA is affected in other ways the person could contract one of the many horrible auto-immune diseases.

This opens the field very wide. Reactors are amazing things but unfortunately they are not cost effective and Wall Street knows this. They are beginning to make enough profit to pay for their decommissioning and safe storage of waste, etc. It seems right perhaps to have them run a bit longer, but only if you can be 100 percent sure that the emissions of Tritium, Strontium 90 and Cesium and other radioactive isotopes are prevented from being exhaled from the emission stacks. Is there a way you can do this?

3. Here is the part that could well pertain to the Vermont Yankee and Strontium 90. even though it is based on other reactors. (Dr. Joseph Mangano and associates have had 21 peer reviewed articles accepted in scientific journals including Lancet.)

I took the following from:

International Journal of Health
Services March, 2006

A SHORT LATENCY BETWEEN RADIATION EXPOSURE FROM NUCLEAR PLANTS AND
CANCER IN YOUNG CHILDREN

Joseph J. Mangano, MPH, MBA

I tried but could not cut and paste the graphs that went along with it.

"The second part of this report examines the effects of radioactive emissions, as detected in the bodies of children. The average Strontium-90 concentration in baby teeth was measured for over 4,000 American children, most residing near nuclear power plants. The ratio of Sr-90 per gram of calcium at birth in each baby tooth was measured in a radiochemistry laboratory, using a scintillation counting technique.

Average Sr-90 concentrations were analyzed by the birth year of the tooth donor, since much of the Sr-90 uptake in deciduous teeth occurs during pregnancy and early infancy. Temporal trends in Sr-90 averages were compared with trends in cancer incidence for children under age ten in counties near nuclear plants with the largest numbers of teeth. These plants include Suffolk County NY (near the Brookhaven National Laboratories); Monmouth and Ocean Counties NJ (near the Oyster Creek plant); and Putnam, Rockland, and Westchester NY Counties (near the Indian Point plant). The correlation between these two trends will be assessed using a Poisson regression analysis testing the hypothesis that they are related. Linear and quadratic correlations will be tested, using the actual value, square root, and fourth root of Sr-90 averages.

The specific methodology to calculate Sr-90 concentrations for each tooth has been described previously (66) (67). Teeth from Suffolk County were analyzed using a Wallac WDY 1220X Quantulus low-level scintillation spectrometer, while a Perkin-Elmer 1220-003 Quantulus Ultra Low-Level Liquid Scintillation Spectrometer was used for other teeth. In addition, the method used to clean teeth before testing differed between Suffolk and other teeth; a more sophisticated preparation for non-Suffolk teeth, plus use of a different counter, allowed more Sr-90 to be detected. However, results for each area are internally consistent, allowing Sr-90 patterns and trends to be analyzed.

Sr-90 results are compared with cancer incidence diagnosed in children age 0-9 who resided in counties near nuclear plants at the time of diagnosis. Cancer registries from the states of New Jersey and New York provided counts of incident cases, while the U.S. Census Bureau counts and inter-censal estimates for resident population were used. Three-year moving averages, rather than individual years, are used for both Sr-90 and cancer rates, to increase statistical power of the comparison.

RESULTS

1. Three Mile Island

In the 34 downwind (north and northeast) counties closest to of Three Mile Island, the SMR for cancer in children age 0-9 rose 23.8% (0.87 to 1.08) from 1979-1983 to 1984-1988, the periods 1-5 years and 6-10 years after the accident. The crude cancer mortality rate age 0-9 in the 34 counties increased 3.6%, compared to a national decline of 16.4%. Because the number of local deaths in each five-year period (127 and 135) was relatively small, the rise in SMR is of borderline significance at $p < .09$. (Table 4) While the SMR for leukemia fell from 0.95 to 0.88, the ratio for all other cancers combined rose from 0.83 to 1.17, statistically significant at $p < .03$.

Table 4

Change in Standard Mortality Ratio (SMR), Children Age 0-9
After the 1979 Accident, 1979-1983 vs. 1984-1988
34 Counties North/Northeast and Closest to Three Mile Island

SMR (Deaths)

Type of Cancer	1979-1983	1984-1988	% Change SMR	p-value
All Cancers Combined	0.87 (127)	1.08 (135)	+23.8	p<.09
Leukemia	0.95 (48)	0.88 (35)	-6.8	p<.90
All Other Cancers	0.83 (79)	1.17 (100)	+41.0	p<.03

Source: U.S. Centers for Disease Control and Prevention,
<http://wonder.cdc.gov>, underlying cause of death. Uses ICD-9 codes 140.0-239.9.

2. Chernobyl

From 1986-1990 to 1991-1995 (1-5 years and 6-10 years after the accident, the SMR for cancers age 0-9 in the 18 states with the most fallout from the Chernobyl accident rose from 0.97 to 1.06, a significant increase (p<.02). The crude cancer death rate age 0-9 declined 6.6% in the 18 states, compared to a reduction of 14.0% elsewhere in the U.S. The SMR rise for leukemia (0.90 to 1.01) exceeded that for all other cancers (1.00 to 1.07). Neither increase achieved statistical significance (p<.10 and p<.13). (Table 5)

Table 5

Change in Standard Mortality Ratio, Children Age 0-9
After the Chernobyl Accident (May/June 1986), 1986-1990 vs. 1991-1995
18 States With Sites With Highest Average I-131 Measurements

SMR (Deaths)

Type of Cancer	1986-1990	1991-1995	% Change SMR	p-value
All Cancers Combined	0.97 (1501)	1.06 (1466)	+8.7	p<.02
Leukemia	0.90 (434)	1.01 (422)	+11.5	p<.10
All Other Cancers	1.00 (1067)	1.07 (1040)	+7.0	p<.13

Source: U.S. Centers for Disease Control and Prevention,
<http://wonder.cdc.gov>, underlying cause of death. Uses ICD-9 codes 140.0-239.9.

3. Counties Near Nuclear Plants (startup before 1982)

The SMR for all cancers in children dying before their 10th birthday in the most populated 20 areas near nuclear power plants cited in the 1990 National Cancer Institute report increased, for 17 of the 20 areas, from 1-5 to 6-10 years after plant startup. Table 6 shows the total Standard Mortality Ratio rose from 0.99 to 1.18.

Because of the large number of deaths in each period (587 and 590), the change was statistically significant at p<.003. Only one of the 20 changes near individual plants (Shippingport) was statistically significant. The increase in SMR for leukemia (1.00 to 1.22) exceeded that for all other cancers (0.98 to 1.15). Both increases achieved statistical significance (p<.03 and p<.05, respectively).

Thank you for adding this comment to the one you received by mail. I thank you for all you do to keep the nuclear plants as safe as possible, and where found impossible, to decommission them and provide for the long term isolation from the environment, which basically means all contact with water and even in some instances air.

Sincerely,

Eleanor I. Gavin
RN retired,

PS..I am a mother and grandmother. I am the wife of Dr. Paul H. Gavin, retired nuclear engineer for Combustion Engineering/AseaBrownBoveri/Westinghouse, in Windsor, Connecticut.

PPS We are the parents of three Professors: civil and environmental engineering at Duke; researcher, in molecular biology in the field of immunology, specifically Rheumatoid Arthritis, at AmGen, in Seattle; and paleo-ecologist at the Univ. of Oregon in Eugene, OR. Our second son has Ryder's Syndrome, an auto immune disease and our third son's wife has cherubism, a genetic disease of the jaw bone which continues to grow and may need an operation if it presses on veins and nerves. Both these diseases, as far as we can find out, never existed in the parents or ancestors of these, our children. The couple with Cherubism will not have children because it was so hard for our daughter in law growing up and they do not want to inflict this on any human being. She is now an OB - GYN and enjoying caring for mothers and delivering babies. All three sons and their wives are interested in seeing the reactors being decommissioned unless the statistics can be ameliorated and unless they are allowed to have independent assessments of their engineering, their safety and their security on a regular basis. They and we understand that an Agency, must have guide lines, but this is a Democracy and people have a right to demand independent oversight, hear both sides and decide on their own if they want to see these old reactors to be pushed to 120% more power and to be pushed beyond their original licensing period.

PPPS That reminds me. Both Paul and I are curious what you mean when you said at the meeting in the Montpelier Pavillion Bldg. that the original licensing was made "short" i.e. 40 years for economic and anti-trust reasons, that they are really constructed to run for 60 years, on average.

PPPPS Our whole family is grateful for Paul's gainful employment in this area, which would not have been possible without the devotion and indefatigable efforts by nuclear engineers to exploit this type of energy, as responsibly as they could. But now we would like them to be put to bed as soon as possible. Maybe in a century or so there will be new way of handling ionizing radiation. Adult males do tolerate well a certain background level, but we are finding for -- women, ova, embryos, fetuses, babies, toddlers and children -- that going beyond that in a targeted area of the body, i.e. receiving low level beta radiation over a period of time is extremely dangerous and should be avoided at all costs. Women now have a 58% greater chance of coming down with cancer.. One of 8 women contract breast

cancer.. both of these are very substantial increases and they happened in a time span of a few decades, I believe. I think it is only over the past 4 decades that this kind of epidemiology has been done so assiduously.

I realize there are other factors, mainly hazardous substances, some are even natural, that depress the immune system and make a body more sensitive to cancer. I realize that people are getting radiation if they fly a lot. But all those areas have to be addressed too.

Mail Envelope Properties (45F0A01B.047 : 5 : 4167)

Subject: comment on draft SEIS report, Mailstop T-6D59
Creation Date Thu, Mar 8, 2007 6:44 PM
From: Eleanor Gavin <[REDACTED]>

Created By: [REDACTED]

Recipients

nrc.gov
 TWGWPO03.HQGWDO01
 VermontYankeeEIS

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Files	Size	Date & Time
MESSAGE	14627	Thursday, March 8, 2007 6:44 PM
TEXT.htm	19976	
A COMMENT ON NRC SEIS FOR RELICENSING.doc		42496
Docket No. PRM-5-1-11, NAS BEIR.doc	48640	
Illinois TRITIUM SUIT.doc	43520	
INDIAN POINT9WELLS TRITIUM SEARCH.doc	41984	
Illinois TRITIUM SUIT.doc	43520	
Mime.822	339296	

Options

Expiration Date: None
Priority: Standard
ReplyRequested: No
Return Notification: None

Concealed Subject: No
Security: Standard

Junk Mail Handling Evaluation Results

Message is eligible for Junk Mail handling
 This message was not classified as Junk Mail

Junk Mail settings when this message was delivered

Junk Mail handling disabled by User
 Junk Mail handling disabled by Administrator
 Junk List is not enabled
 Junk Mail using personal address books is not enabled

Block List is not enabled

PO Box 215
East Charleston, VT 05833
March 5, 2007

Chief, Rules and Directive Branch
Division of Administrative Services
Mailstop T-6D59
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Chief, Rules and Directive Branch,

The enclosed National Press Club Conference statement by Dr. Arjun Makhijani, of the Institute for Energy and Environmental Research, Takoma Park, MD -- and the Associated Press release by David Gram, covering the meeting that took place last week in Montpelier -- have been, along with BEIR VII, the sources for the statements I make below. I quote from them to support my comments.

Not up for consideration are issues ranging from the possibility and consequences of a terrorist attack on the plant -- to the -- wisdom of generating highly radioactive waste for an extra 20 years when the federal government has yet to open a site to dispose of it.

The above directly concerns the incarceration of radioactive isotopes that create havoc in the biosphere. Only if hermetically isolated for tens of thousands of years will these unstable isotopes be eligible to rejoin the vastly more numerous stable elements of which oceans and earth crust are made or else the background radiation will be too much for most living things.

Other quotes from the article:

Richard Emch, the NRC's environmental project manager for the Vermont Yankee review, repeatedly said the agency was looking for "new and significant information" relating to the safety of Vermont Yankee's electrical, mechanical and other systems, and environmental impacts, for example, to fish species in the Connecticut River.

Rep. Sarah Edwards, P-Brattleboro, said the failure of the federal government to come up with a long-promised site for high-level waste was a new development since Vermont Yankee was last up for license review in 1972. "Isn't this new and significant information?" she asked.

In an interview, NRC spokesman Neil Sheehan said if Vermont tried to block the license extension, it could risk litigation because federal law puts the NRC solely in charge of nuclear plant safety.

From a statement by Arjun Makhijani on the *Report Science for the Vulnerable and the Campaign to Include Women, Children and Future Generations in Environmental Health Standards*" National Press Conference, Washington, DC, 19 October, 2006 : *In 2005 the Committee to Assess Health Risks from Exposure to Low Levels of Ionizing Radiation (National Research Council of the National Academies) issued a report that concluded that women have a 52 percent greater chance than men of getting cancer*

from radiation exposure. Seven years ago, the Environmental Protection Agency had reached similar conclusions. Yet, much radiation protection regulation is still stuck in the past – its “reference” person is a man.

Please see the enclosed Makhijani statement and please review the detailed Institute for Energy and Environmental Research Science for Democratic Action (IEER SDA) newsletter. I gave up my only copy to Mr. Richard Emch, the NRC environmental project manager for the Vermont Yankee review, after the meeting with VT Legislators at the Pavilion Building in Montpelier, Vermont on Tuesday, February 27th. I have sent away for others to distribute at talks in the NorthEast Kingdom of Vermont and to attach to this comment.

My specific concern for this comment period is as follows: The National Research Council of the National Academies report has highly pertinent information about the effect of low level ionizing radiation on women, embryos, fetuses, and children. This information is also found in the BEIR VII report (Biological Effects of Ionizing Radiation, 7th report, issued October 18th, 2006. This information was not given its due by those who wrote the SEIS draft report for the VY relicensing process.

The NRC mission, as Mr. Neil Sheehan and Mr. Emch said, is nuclear plant safety and security. Sheehan stipulated that the NRC has been given the last word by the Federal Government to decide what is safe and what is not safe in the area of nuclear safety. If so, the NRC should explain in the report why it can ignore the science that proves that:

1. Low level ionizing radiation -- radiating over a long period of time in the area it lodges in body tissue -- causes cancer and can alter DNA in eggs and embryos.
2. Women, embryos, fetuses, toddlers and children are more susceptible to radiation exposure in general. Among the culprits is the low level ionizing radiation from unstable radioactive isotopes such as Strontium 90 and Tritium that are ingested and lodge in the body, in teeth, near bone marrow that builds immunity, and finally near the nucleii of female eggs and embryos.

The following facts are also relevant:

1. The off-gassing of nuclear power plants, including the Vermont Yankee, contain these and other radioactive isotopes that fall on the grass, get into milk and plants that humans and other mammals consume. Humans in turn consume the meat from some of those mammals who consumed contaminated plants. We are at the top of the food chain in most incidences. Though low level radiation from isotopes is the worst form of cancer-causing agents, other types of radiation also weaken the mammal's immune system, more specifically the militias of T Cells that can help combat the effects of this ionizing radiation. Human mammals sit in front of computers, televisions, fly in planes, and handle and ingest immune system depleting chemicals. All, over time, affect immune systems. Humans thus become much more likely not to have the T cells needed to combat the effect of ingested-and-lodged, ionizing, radioactive isotopes from the off-gassing of nuclear power plants such as the Vermont Yankee.

2. The incidence of breast cancer has increased in the last decades to one in every eight women. It is not surprising that this statistic resonates with the more recent statistic that women are 52 percent more likely to contract cancer than men.
3. Those who are economically challenged cannot afford organic food and supplemental vitamins and minerals that can boost immune system T cells and control nascent formation of cancerous cells. This fact should be considered in the environmental justice evaluations that are done in NRC Environmental Impact Statements. I would strongly recommend that all economically challenged people -- especially women and children -- living in the shadow of nuclear facilities should receive free immune booster supplements and extra allowances for certified organic food and milk, free from chemicals and radioactive isotopes. This should be kept up until 12.5 years have past after the decommissioning that region's reactor.
4. The Vermont Yankee does not have state-of-the-art filters in its 300 foot high smoke stack. Even if it did have them, it would still not be able to filter out tritium, a short-lived (half life -- 12.5 years) isotope that lodges near the nucleus of cells and radiates the DNA inside. This has been shown to cause aberrations in the DNA that result in miscarriage, deformities and it may be responsible for breast cancer developing during the life of that embryo/fetus. I do not have the most recent IEER SDA issue that explains this. Please see Mr. Emch's copy
5. If tritium can be somehow precipitated out of the gasses before emission and disposed of appropriately, this must be done. I do not have the IEER SDA issue that talks about this. Please see Mr. Emch's copy. I have tried to Google this but without much success.

Before it is relicensed, the Vermont Yankee should replace its filters with the most modern technology possible and also find a way to take out the tritium and have it isolated from the environment for its half life of 12.5 years and then some. This is because of the recent discovery of its affinity for the nucleus of the cell where it is able to modify the DNA.

Before it is relicensed, the Vermont Yankee should change its regulation criteria from "Reference Man" to "Reference Woman-Embryo-Fetus-Toddler-Child."

In paragraphs 5 and 6, Makhijani shows that the Connecticut Yankee Atomic Power Company was able to conserve the Reference Man, the young White male, as the "basic underlying document governing the regulations" (Please see #11(FRG11)). The NRC permitted the CY Atomic Power Company to argue that a *white male, 20-30 should be the basis for calculation, and that their "regulations prohibit considering doses to children" despite the fact "the plain language of the regulation itself does not restrict the terms 'critical group,' 'individual,' or 'human being' to mean any specific age, race, or gender.*

I take this to mean that the overall language of the fully written regulation uses non-specific words in talking about one person, people and groups of people but, when it comes to setting the regulation for the standard for acceptable levels of ionizing radiation, its template is age-race-gender specific. Pretty blatant segregation, one might contend. If it is to continue, the tax paying public deserves to hear a full explanation of NRC logic so they can decide whether or not this discrimination should prevail. This is

happening in a democratic country which is known world wide for hard-fought-for civil rights non-violent action victories.

Thank you for considering this comment and for doing all you can to allow as much transparency and independent oversight as needed to assure that the over 100 aging reactors seeking relicensing are safe to live down wind from and are secure from potentially highly-malignant elements such as terrorist attacks on the spent fuel.

Land has been lost to invaders. The U.S. DOE and the U.S. DOD have eliminated land from our nation for tens of thousands of years due to commercial and military development of nuclear power in one form or another. Let us make sure that swaths of Vermont, New Hampshire, Massachusetts and Connecticut land will not be added to those of Washington, Nevada, New Mexico, Idaho and Kentucky.

Sincerely,

Eleanor I. Gavin
RN, retired

I rec'd this on 1/22/2007, I have underlined what is important to me. Hope this helps but erase if hinders.

This docket does not address the spent fuel rods directly but they are the most terrible source of harm if there is a nuclear fire in the VT Yankee cooling pools. Even so, there is evidence in the baby teeth that strontium 90 radiation is again increasing. I say again because it was very high during the above ground testing of nuclear weapons:

ACT NOW: Please tell the NRC to approve a petition for rulemaking that would improve radiation protection standards at older reactors. Your comments are needed by February 5, 2007. Please see the Talking Points below for more detailed information to help in writing your comments.

FEDERAL REGISTER SUMMARY: The Nuclear Regulatory Commission (NRC) is publishing, for public comment, a notice of receipt of a petition for rulemaking which was filed with the Commission by Sally Shaw (of the NewEngland Coaliton on Nuclear Pollution) . The petition was published in the Federal Register on November 20, 2006, and has been assigned **Docket No. PRM-51-11. Include PRM-51-11 in the subject line.**

The petitioner requests that the NRC prepare a rulemaking that will require that the NRC reconcile its generic environmental impact statement for nuclear power plant operating license renewal applications with current scientific understanding of the health risks of low-level radiation, including but not limited to those discussed in the National Academy of Sciences Health Risks From Exposure to Low Levels of Ionizing Radiation: **Biological Effects of Ionizing Radiation (BEIR) VII Phase 2 Report.**

For background and summary of BEIR VII committee, see Monitor article at: <http://www.nirs.org/mononline/nm632.pdf>

SEND COMMENTS:

Please include PRM-51-11 in the subject line of your comments.

Mail: Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, ATTN: Rulemakings and Adjudications Staff.

E-mail to: SECY@nrc.gov. If you do not receive a reply e-mail confirming receipt of comments, please contact the NRC directly at (301) 415-1966.

Submit via website <http://ruleforum.llnl.gov>.

Fax to: Secretary, U.S. Nuclear Regulatory Commission at (301) 415-1101.

Find Federal Register notice [HERE](#):

<http://www.epa.gov/fedrgstr/EPA-IMPACT/2006/November/Day-20/i19568.htm>

TALKING POINTS:

Exercise Precaution:

1) Protect the most vulnerable: Tell the NRC to exercise precaution by accounting for more vulnerable populations in their standards. Since no level of radiation dose is safe (see BEIR VII quote below), the best precaution would be no exposure. However recognizing and regulating for vulnerable populations is a start.

"In BEIR VII, the cancer mortality risks for females are 37.5 percent higher. The risks for all solid tumors, like lung, breast, and kidney, liver, and other solid tumors added together are almost 50 percent greater for women than men, though there are a few specific cancers, including leukemia, for which the risk estimates for men are higher." (Summary estimates are in Table ES-1 on page 28 of the BEIR VII report prepublication copy, on the Web at <http://books.nap.edu/books/030909156X/html/28.html>.)

The BEIR VII report estimates that the differential risk for children is even greater. For instance, the same radiation in the first year of life for boys produces three to four times the cancer risk as exposure between the ages of 20 and 50. Female infants have almost double the risk as male infants. (Table 12 D-1 and D-2, on pages 550-551 of the prepublication copy of the report, on the Web starting at <http://books.nap.edu/books/030909156X/html/550.html>)." (excerpted from <http://www.ieer.org/comments/beir/beir7pressrel.html>)

2) Recognize "allowable" levels are not safe: Tell the NRC that their "allowable" levels of radionuclides are NOT conservative or protective enough. They are based only on the obsolete "standard man", a healthy, white male in the prime of life, and ignore the more vulnerable fetus, growing infant and child, the aged, those in poor health, and women who are, according to the BEIR VII report, 37- 50% more vulnerable than standard man to the harmful effects of ionizing radiation.

3) Consider radiation damage from inhaling or ingesting radionuclides: NRC does not consider the effects of internal radiation from ingested or inhaled alpha and beta emitters. The amount of polonium-210 that

recently killed a former Russian intelligence officer was considered by IAEA and NRC to be of the lowest possible risk because they failed to account for internal radiation damage.

4) Recognize there is no safe dose: Further, regarding low dose radiation, the BEIR VII panel has concluded, "it is unlikely that a threshold exists for the induction of cancers... Further, there are extensive data on radiation-induced transmissible mutations in mice and other organisms. There is therefore no reason to believe that humans would be immune to this sort of harm."

Demand that the NRC protect all members of the public from all types of excess radiation exposure from nuclear power and its fuel cycle, gamma, alpha, beta, neutron, particulate, fission products, noble gases, etc. and that measurement and monitoring should include all forms and pathways, not just gamma at the fence line. Argue that their radiation limits should include accidental releases as well as planned emissions.

BACKGROUND FROM FEDERAL REGISTER

Entergy Nuclear Operations, Inc. (Entergy) submitted an application for renewal of Operating License No. DPR-28 for an additional 20 years of operation at the Vermont Yankee Nuclear Power Station (VYNPS). The VYNPS is located in the town of Vernon, Vermont, in Windham County on the west shore of the Connecticut River immediately upstream of the Vernon Hydroelectric Station. The operating license for VYNPS expires on March 21, 2012. A notice of receipt and availability of the application, which included the environmental report, was published in the Federal Register on February 6, 2006 (71 FR 6102). Subsequently, the NRC published a "Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process" on April 21, 2006 (71 FR 20733). The NRC will prepare an EIS related to the review of the license renewal application.

The applicable NRC regulation, 10 CFR 51.95(c), required that the NRC, in determining whether to grant a renewal of a nuclear power plant operating license, prepare an environmental impact statement (EIS). The regulation provides that this EIS supplement the NRC's baseline, generic EIS issued in 1996, NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (May 1996)(GEIS).

Petitioner's Request

The petitioner requests that the NRC prepare a rulemaking that would require that the NRC reconcile its GEIS for nuclear power plant operating license renewal applications with the **National Academy of Sciences (NAS) Health Risks From Exposure to Low Levels of Ionizing**

Radiation: BEIR VII, Phase 2 which was released in 2005. AND OTHER RECENT SCIENCE! The petitioner asserts that the GEIS relies upon an earlier NAS report, the BEIR V, which was released in 1990. According to the NAS Web site, the BEIR VII updates the information contained in the BEIR V and draws upon new data in both epidemiologic and experimental research.

The petitioner requests that NRC consider the NAS BEIR VII report as new and significant information and recalculate certain conclusions set forth in the GEIS, including early fatalities, latent fatalities and any injury projections based on this information.

"Our lives begin to end the day we become silent about things that really matter."

~MLK

Press Release

For Immediate Release
Contact: **Melissa Merz**
312-814-3118
877-844-5461 (TTY)
mmerz@atg.state.il.us

March 16 , 2006

MADIGAN, GLASGOW FILE SUIT FOR RADIOACTIVE LEAKS AT BRAIDWOOD NUCLEAR PLANT LEAKS OF TRITIUM-LACED WASTEWATER DATE TO 1996

Chicago – Attorney General Lisa Madigan and Will County State’s Attorney James Glasgow today filed a lawsuit against the owner and operators of the Braidwood Nuclear Generating Station in Will County for the facility’s releases of wastewater containing tritium into the groundwater beneath the facility and the groundwater outside the boundary of the plant. The first leak allegedly occurred a decade ago.

The Village of Godley is located southwest of the nuclear plant, while the Village of Braidwood is approximately two miles north.

The eight-count complaint, filed today in Will County Circuit Court, names as defendants Exelon Corporation, a Pennsylvania corporation based in Chicago; Commonwealth Edison Company (ComEd), an Illinois corporation; and Exelon Generation Corporation, LLC, of Kennett Square, Pennsylvania. Exelon Generation and ComEd produce and distribute nuclear power for their parent, Exelon Corporation. Com Ed was the owner and operator of the Braidwood station until 2000, when Exelon assumed those duties.

Operations at the Braidwood nuclear plant generate tritium, a radioactive isotope of hydrogen that can replace non-radioactive hydrogen atoms in ordinary water to form tritiated water. Small amounts of tritium are commonly found in most surface water; however, higher concentrations are found in water used by nuclear power plants. Health experts say human exposure to tritium increases the risk of developing cancer.

According to Madigan’s and Glasgow’s suit, Exelon released tritiated water at eight separate locations on the defendants’ property. Three distinct releases occurred in 1996, 1998 and 2000, and three other releases occurred at unknown times, from the facility’s blowdown line, an underground pipe that carries wastewater, including tritiated water, approximately four and one-half miles from the power plant directly to the Kankakee River. An additional release occurred at an unknown time in the area near and to the west of the station and an eighth release occurred March 13 near the tritiated water temporary storage area at the plant.

Braidwood’s blowdown line is located on property owned by the defendants, but runs adjacent to private and public property, including a forest preserve and nature area.

Madigan’s and Glasgow’s lawsuit alleges that the eight leaks contributed to water pollution and that six of the releases were the result of inadequate maintenance and operation of vacuum breakers along the blowdown line. Vacuum breakers allow air into the line to prevent the formation of a vacuum within the pipe. In alleging water pollution in their lawsuit, Madigan and Glasgow alleged that tritiated water entered the vacuum breaker housing and flowed into the groundwater and upward through a manhole onto the surrounding land.

"When releases occur, it is absolutely critical that all parties, including state and local officials, employees and those who live in the surrounding area, are notified as soon as possible," Madigan said. "The potential hazards associated with the nuclear industry demand such a response."

"The method of operations put in place at the Braidwood Nuclear Plant since 1996 by Commonwealth Edison and their parent company as of 2000, Exelon, clearly placed their profit margin first with a callous disregard for the health, safety and welfare of the local residents. Exelon was well aware that tritium increases the risk of cancer, miscarriages and birth defects and yet they made a conscious decision not to notify the public of their risk of exposure," Glasgow said. "This lawsuit is critical to enjoin Exelon from releasing any additional tritium into the groundwater and to mandate an effective remediation of the serious damage that has already been done."

Glasgow continued, "As always, Attorney General Madigan has made available the resources of her office readily to work with my office in the filing of this most critical action on behalf of the residents of Will County. This action will go a long way in providing the residents of Godley and Braidwood with a level of confidence that our offices are going to prosecute these serious violations of the Illinois Environmental Protection Act to the fullest extent of the law."

"Since the IEPA learned in late 2005 about the tritium releases from Exelon, we have been aggressively investigating the nature and extent of the groundwater problems," said Illinois Environmental Protection Agency Director (IEPA) Director Doug Scott. "We have also made every effort to respond to public concerns and we will continue to be involved as long as there is need."

The IEPA investigated the case and referred it to Madigan's office in March 2006 after samples taken by the defendants in December 2005 indicated elevated levels of tritium contained in the groundwater at various locations outside the property boundary of the nuclear plant, including a private well allegedly contaminated by the 1998 release.

The timeline for the alleged leaks of tritiated water is as follows:

- * 1996: an estimated 40,000-gallon release of tritiated water from vacuum breaker number 1 (VB1), the closest to the nuclear reactor and adjacent to a ditch which flows north, around the reactor and then south toward Godley. Water from the release flowed on the surface, entered the ditch and remains in the groundwater around VB1.

- * 1998: an estimated three million gallon-release from VB3 resulted in tritiated water ponding on the surface, which the defendants allegedly left to evaporate and soak into the groundwater where it remains.

- * 2000: an estimated three million gallon-release from VB2. According to the suit, the defendants recovered some of the released water, but an unknown amount remains in the groundwater near the area it was released.

- * Dates unknown: releases from vacuum breakers 4, 6 and 7, which impacted three additional areas. The release from vacuumbreaker 4("VB 4") resulted in tritium contamination, in excess of 20,000 pCi/L (picocuries per Liter), of groundwater within property owned by the Will County Forest Preserve District.

- * Date unknown: release of tritiated water in the area near and to the west of the station.

- * March 13, 2006: Tritium released from tritiated water temporary storage area.

In addition, as a result of the leaks from VB3 in 1998 and VB2 in 2000, a plume of tritiated water is present near the vacuum breakers and has extended through the groundwater to the north through a surface pond and into groundwater north and west of the Braidwood property.

The lawsuit alleges that all of the defendants also discharged non-radioactive contaminants such as sewage without a state National Pollutant Discharge Elimination System (NPDES) permit into surface and groundwater off site.

The complaint further alleges that tritiated water was released on March 13, 2006, from a containment area surrounding a number of tanks the defendants are using to store tritiated water, causing a threat to groundwater. Because of the problems with their equipment that caused the earlier leaks, the defendants currently are storing the tritiated water in these tanks instead of discharging the water into the Kankakee River. Finally, the complaint alleges that the defendants created and maintained a public nuisance through the releases and the other alleged non-compliance.

As a remedy for the alleged water pollution, Madigan's and Glasgow's suit seeks an injunction ordering the defendants to:

1. Cease use of the blowdown line for the discharge of tritiated water until further order of the Court;
2. Prevent further migration of any contaminants released in the groundwater at and near the facility in accordance with a plan acceptable to the court;
3. Implement measures to prevent the release of any contaminant from the facility in accordance with a plan acceptable to the court;
4. Fully characterize the nature and extent of all soil and groundwater contamination caused by the releases, including identifying background contaminant levels and the future flow of contaminant plumes in groundwater in accordance with a plan acceptable to the court;
5. Immediately provide a potable drinking water source to all people affected by the violations in an amount and quality sufficient to meet their daily needs, and in accordance with a plan acceptable to the court; and
6. Eliminate any threat to the use of groundwater by citizens in the area impacted by releases from the plant.

The suit also seeks the maximum civil penalty of \$50,000 for the water pollution violation and an additional \$10,000 for each day the violations continue. Madigan and Glasgow also seek the maximum civil penalties for additional allegations that include exceeding groundwater standards.

The lawsuit specifically names ComEd in two counts for allegedly violating its NPDES permit by not reporting until December 2005 the alleged leaks that took place in 1996, 1998 and 2000. Such incidents must be reported to state and federal authorities within 24 hours. The complaint also names ComEd for its alleged failure to contain and remove the tritiated water from the areas impacted by the 1996 and 1998 leaks. Each of these counts seeks a maximum civil penalty of \$10,000 per violation and an additional \$10,000 for each day the violations continue.

Division Chief Matthew Dunn, Bureau Chief RoseMarie Cazeau, Assistant Attorney General Christopher Perzan and Environmental Counsel Ann Alexander are handling the case for Madigan's Environmental Enforcement Division.

-30-

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News Archives **The Record Review, Dec. 28, 2005**

Since August, officials at the **Indian Point Nuclear Power Plants** have been trying to locate a leak of water containing tritium, a radioactive form of hydrogen and one of the many radionuclides released by nuclear power plants.

Entergy Nuclear Northeast, owner of the Buchanan plants, has almost completed digging nine wells that they hope will characterize the level of tritium contamination at the site of the plants. Earlier this month water sampled from a well near the Unit Two spent fuel pool was highly contaminated with tritium. The 40-foot-deep pool stores used radioactive fuel assemblies.

The tritium levels near the spent fuel pool measured 600,000 picocuries per liter of water, which is **30 times the drinking water limit of 20,000 picocuries of tritium per liter set by the Environmental Protection Agency (EPA)**.

According to **Neil Sheehan**, spokesman for the Nuclear Regulatory Commission (NRC), the leak was believed to be coming from the spent fuel pool. Divers were sent into the pool in October to examine what they thought were cracks in the pool wall.

"There were three flaws in the pool, and they used a vacuum box device to see if they were leaking, and they determined they weren't," said Mr. Sheehan. "They are still going to repair [the flaws] as a precaution. We are continuing to check the pool."

Three new wells were dug adjacent to the Unit Two reactor building this week. Mr. Sheehan said that only one of those wells was above the EPA limit; one measured 142,000 picocuries per liter, and the others were 42,300 and 63,900 picocuries per liter.

"Wells closest to the Hudson River yielded either just below the EPA drinking water limit or slightly above," said Mr. Sheehan. "We are trying to paint a picture of the extent of the tritium contamination." Phillip Musegaas, policy analyst for Riverkeeper, a Tarrytown-based advocacy group monitoring the Hudson River, reservoirs, and aquifers, said his group is concerned about contaminated water moving toward the river. "Our main concern is that there is no plume of tritiated water under the plant," said Mr. Musegaas. "We are trying to find out if there's a body of water either moving toward the river or going into the groundwater." Geological documentation from the original Indian Point licensing material shows that the **plant is situated on a bowl-shaped depression**, according to Mr. Musegaas. "All the on-site groundwater generally moves toward the river," he said. "That lessens the risk of a plume of water moving north towards Peekskill or Buchanan. The NRC agrees with us that the groundwater flows from the northwest to southeast in a downward angle toward the river." Mr. Sheehan said that there was no indication that the tritiated water was getting into the groundwater. But health effects of tritium in the water is a concern. In June the National Academies of Science released their **seventh report, "Biological Effects of Ionizing Radiation,"** on the health risks from exposure to low levels of ionizing radiation. The report confirmed, as it did in previous reports over the last 25 years, that there is **no safe level of exposure to radiation and even very low doses can cause cancer.**

The report also confirmed that tritium is **carcinogenic and mutagenic**, and human beings can be **exposed to tritium through inhalation, absorption, or drinking contaminated water**. Rapidly growing cells such as fetal tissue, genetic materials, and blood-forming organs are particularly sensitive to the effects of tritium.

The risk numbers in the report indicate that about 1 in 100 members of the public would get cancer if exposed to **100 milli-rads per year for a 70-year lifetime**. **An average chest X-ray delivers about 10 millirads**. The U.S. Government considers 500 millirads per year safe if you live outside a nuclear power plant. Tritium is known to have a **12.3-year half-life**.

"You need to understand that when they say it has a 12.3-year half-life it doesn't mean it's gone in 12.3 years; it means **only half** of it's gone," said **Dan Hirsch of the Committee to Bridge the Gap**, a nuclear watchdog group that studies the effects of radiation. "It doesn't mean that all of it's gone in 25 years. **It takes approximately 250 years for it to decay to negligible levels.**"

Water carries tritium and disperses into the water table. Mr. Hirsch said tritium moves more rapidly than other radionuclides. **"If it's the water of the spent fuel pool that has the leak, that will cause tritium to be found some distance away."**

According to the layout of the power plant, **the well near Unit Two measuring 600,000 picocuries per liter is the farthest from the Hudson River.**

Entergy spokesperson Jim Steets said that there's no evidence that the tritium is traveling toward the river. "It's still early to come to any conclusions," he said. "We are gathering information which can lead you in one direction and then in another direction." The reason for the different directions could be that site geology is mostly bedrock. According to Mr. Hirsch, tracing tritium in wells dug in bedrock becomes very complicated. "When you have fractured bedrock as the means of migration, it becomes very hard to pinpoint a plume," he said. "You can put a well one place and not find it, put a well next to it and find it. You can have higher concentrations further away from the source. It's not a nice neat plume. It can get very complicated to determine how far it's gone, how wide it is, how deep it is, or where it came from."

Mark Cox, the NRC senior resident at Indian Point Two, said that the initial plan was to dig nine wells. "We are still working to get those nine initial wells in," he said. "Based on results from those nine wells we will determine whether we do an increase in scope or go ahead and treat the water." **The typical remediation techniques are pumping the water out and getting the water to a monitored location, said Mr. Cox. But Mr. Hirsch said tritium remediation is very difficult.** "It's impossible to remove tritium," he said. "Most contaminants are either dissolved or suspended in the water. **If it's suspended, you can filter it out; if it's dissolved you can run it through things like charcoal ion resins.**"

!!! But because tritium combines with oxygen to form a liquid it actually **is** the water, **!!!** said Mr. Hirsch. "It's nothing you can filter out, nothing you can readily remove. You can get it out by breaking the water apart with electrolysis, which is immensely expensive. There may be some other technique, but it's vastly more difficult to deal with than any other contaminant."

There are other, heavier isotopes in the spent fuel pool, like strontium 90 and cesium 137, that don't travel with water as well. "These are also very bad radionuclides," said Mr. Hirsch. "But at least you can remove them from water." **(Paul, this is probably the crux on which reactors will have to be decommissioned, unless they can assure that there will be no further release of tritium.)**

This week, results became known from water sampled from stormwater drains near the plant's discharge canal. The canal feeds diluted water into the Hudson River. "One of the stormwater drains had a reading above the EPA limit (20,000 picocuries), which was 37,000 picocuries per liter," said Mr. Sheehan. "The other was 12,000 picocuries."

"Storm drains don't discharge directly into the discharge canal," he said. "There is a dilution effect, so by the time the water reaches the mouth of the river it is mixed with a greater volume of water."

Mr. Sheehan was unable to say when the storm drains were previously monitored. (Paul, this may be why, since the tritium scandal last year around the Illinois reactor, the word is out that all reactors may be releasing too much tritium)

"These levels are conservative estimates," said Entergy's Mr. Steets. "We routinely discharge tritium into the discharge canal, and it measures about four-hundredths of one percent, or .04 percent of the normal discharges of tritium."

Mr. Sheehan said the NRC was planning a public meeting sometime in Januar, 2006 about the tritium. "By then we should have results from all nine wells," he said. "We are looking to wrap up the special inspection in December. In light of the fact that we are still drilling wells and taking samples, we would rather wait until Entergy has a better sense of the contamination and where they are going with it."

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