RADIATION DOSE

"PERMISSIBLE" DOES NOT MEAN SAFE

NRC and Exelon Make The Unsubstantiated Claim That Limerick's Routine Radiation Releases Are Safe. That Is Not Only Illogical, It Can't Be Proven With Science. There Is No Valid Research or Science Showing Limerick's Continuous Radioactive Releases Are Safe.

NRC and Exelon Claims Are Disputed By Unbiased Independent Research. Exposure To Additive, Cumulative, and Synergistic Radiation Releases From Limerick Nuclear Plant Are Clearly NOT Safe.

According To Physicians For Social Responsibility And The National Academy of Sciences 2005 BEIR VII Report:

THERE IS "NO SAFE DOSE"

Every Effort Must Be Taken For Prevention, Including Closing Limerick Nuclear Plant As Soon As Possible For Precaution.

- Limerick Nuclear Plant Routinely Releases Radiation Into Our Air And Water. Limerick's Radiation Gets Into The Soil, Sediment, Food, Wildlife, Fish, and People.
- Harmful Health Impacts Are Additive, Cumulative, and Synergistic. Residents Of Our Region Are Continuously Exposed To All Radionuclides Released From Limerick Nuclear Plant (Possibly Over 100), Through All Routes Of Exposure.
- All Monitoring, Testing, and Reporting Is Done By Exelon, The Company With A Vested Interest In The Outcome, That Has Shown It Can't Be Trusted To Provide Full and Accurate, Timely Disclosure.
- There Is NO Independent Continuous Monitoring And Reporting For All Radionulides Released From Limerick Nuclear Plant Operations. While The Threats Are Clear, It Would Be Too Costly To Do The Year-Long Comprehensive, Independent Monitoring For All Radionuclides Released Into Our Air and Water, Routinely and Accidentally.
- Cancer and Other Serious Illnesses Can Be Triggered By Continuous Exposure To Limerick's Routine Radiation Releases. There Have Already Been Skyrocketing Cancer Rates Around Limerick After Limerick Started Operating.

The Nuclear Regulatory Commission (NRC) Is Charged With The Grave Responsibility Under The Energy Reorganization Act of 1974, To Protect Public Health and Safety Related To the Operation of Commercial Nuclear Reactors. NRC Fails Miserably In That Mission.

Instead, NRC Is Involved In A Dangerous Cover-Up; Dismissing and/or Distorting The Harmful Effects of Radioactivity From Limerick and Other Nuclear Plants.

"BACKGOUND" RADIATION - DANGEROUS DECEPTION

NRC Deceptively Asserts That Radiation Levels Detected Below "Background" Are Safe.

Gross NRC Misrepresentation

SHAMEFUL NRC DECEPTION: NRC's 3-16-11 Press Release Below, Deceptively and Illogically Suggests Announcing DRASTIC INCREASES In "Background" Radiation Levels Is Protective Action.

REALITY: NRC's Announcement Of Higher Radiation "Background" Levels Does NOT Protect Anyone. Quite The Opposite.

- In Fact, Higher "Background" Radiation Levels Will Allow Exelon To Deceptively Hide Harms From Limerick Nuclear Plant's Routine Radioactive Releases Even More.
- Exelon's Yearly Radiological Monitoring Report To NRC For Limerick Nuclear Plant Will Now Be Even More Deceptive. Exelon Only Reports On Radiation Levels Detected "ABOVE BACKGROUND" For Water, Soil, Sediment, Vegetation, Milk, and Fish. Drastically Raising "Background" Radiation Will Give The Public A False Perception About Impacts From Actual Radiation Released From Limerick Nuclear Plant.

NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION

Office of Public Affairs Telephone: 301/415-8200 Washington, D.C. 20555-0001 E-mail: opa.resource@nrc.gov Site: www.nrc.gov Blog: http://public-blog.nrc-gateway.gov

No. 11-050 March 16, 2011

NRC PROVIDES PROTECTIVE ACTION RECOMMENDATIONS - BASED ON U.S. GUIDELINES Under the guidelines for public safety that would be used in the United States under similar circumstances, the NRC believes it is appropriate for U.S. residents within 50 miles of the Fukushima reactors to evacuate.

Among other things, in the United States protective actions recommendations are implemented when projected doses could exceed 1 rem to the body or 5 rem to the thyroid. A rem is a measure of radiation dose. The average American is exposed to approximately 620 millirems, or 0.62 rem, of radiation each year from natural and manmade sources. In making protective action recommendations, the NRC takes into account a variety of factors that include weather, wind direction and speed, and the status of the problem at the reactors.

In response to nuclear emergencies, the NRC works with other U.S. agencies to monitor radioactive releases and predict their path. All the available information continues to indicate Hawaii, Alaska, the U.S. Territories and the U.S. West Coast are not expected to experience any harmful levels of radioactivity.

Raising "Background" Radiation

To 620 Millirems Per Year - From 360 Millirems Per Year

March 16, 2011 - Shortly After Japan's Nuclear Plants Started Releasing Massive Radiation Into The Air, Water, Soil, and Vegetation

Instead of taking protective action to inform people of actual radiation risks after the Japan nuclear catastrophe and informing people about how they might reduce their risks,

> NRC legally sanctioned drastic increases in so-called "Background" radiation levels, as if to assert that higher levels of radiation were now safe.

"BACKGROUND" RADIATION LEVELS.

Chernobyl and Japan Nuclear Disasters Led To DRASTIC INCREASES:

Pre-Chernobyl:	80 to 100	Millirems Per Year
After Chernobyl:	360	Millirems Per Year
After Japan:	620	Millirems Per Year

History of Radiation Dose Limits:

- ✓ Natural Radiation Was Originally 60-80 Millirems Per Year
- ✓ 1964 It Was Raised to 80-100 Millirems Per Year (Secret Fallout by Ernest Stemglass Pg. 213)
- ✓ After Chernobyl It Was Raised to 360 Millirems Per Year
- By 2009, Americans Were Receiving Radiation Doses Each Year That Doubled Yearly Radiation Dose Levels From The 1980s (Reported May 5th, 2009) <u>http://nukefree.org/news/USradiationdosehasdoubled</u>
- Americans (on average) receive more than twice as much radiation each year as in the 1980s, (according to National Council on Radiation Protection and Measurements).

Raising Radiation "Background" Avoids Full and Accurate Disclosure On Radiation Threats and Harms From Limerick Nuclear Power Plant.

Exelon Is Only Required To Report On Radiation Levels Detected Above An Arbitrary "Background" Level, Now Drastically Increased. Drastically Inflated Arbitrary "Background" Levels Allow Limerick's Radiation Releases And Harmful Health Impacts To Be Further Disguised By Exelon and NRC.

Limerick Nuclear Plant's Yearly Radiological Monitoring Report From Exelon to NRC:

- ✓ NRC Allows Exelon To Report Only On Radionuclides Detected Or Estimated By Exelon for Limerick, That Are "ABOVE BACKGROUND" Levels, Now Drastically Increased After The Fukushima Meltdowns.
- ✓ Logically, we could be further deceived about actual threats to public health from Limerick's regular releases of radiation into our air, water, soil, sediment, food, fish and to us and our children each year.
- ✓ For Exelon or NRC to conclude there is NO harm or little harm to the population around Limerick, is a false and irresponsible assertion, <u>not</u> based on facts or accurately measured radiation exposure. That illogical self-serving assertion also ignores the fact that residents are continuously exposed over time to multiple radionuclides from Limerick and multiple routes of exposure.

Exelon should be required to actually measure (NOT CALCULATE OR ESTIMATE) actual Limerick releases into our air and water, for every radionuclide associated with Limerick's operations (OVER 100) and report on actual releases into our air and water for each ABOVE ZERO, NOT Above Background.

The level of each radionuclide permitted by NRC totally ignores independent scientists who admit there
is NO SAFE DOSE.



RADIATION-NO SAFE DOSE

WASHINGTON - June 29, 2005

The 2005 National Academy of Sciences BEIR VII STUDY, funded by the EPA, found that the smallest radiation dose has the potential to cause increased risk to humans.

A Report From The National Academies' National Research Council says: **"A preponderance of scientific evidence shows that even low doses of ionizing radiation are likely to pose some risk of adverse health effects."**

Specifically, the committee's thorough review of available biological and biophysical data supports a "linear, no-threshold" (LNT) risk model, which says that <u>the smallest dose of low-level ionizing radiation has the potential</u> to cause an increase in health risks to humans.

In the past, some researchers have argued that the LNT model exaggerates adverse health effects, while others have said that it underestimates the harm. The preponderance of evidence supports the LNT model, this new report says.

"The scientific research base shows that there is no threshold of exposure below which low levels of ionizing radiation can be demonstrated to be harmless or beneficial," said committee chair Richard R. Monson, associate dean for professional education and professor of epidemiology, Harvard School of Public Health, Boston. The study committee defined low doses as those ranging from nearly zero to about 100 millisievert (mSv)

"The health risks – particularly the development of solid cancers in organs – rise proportionally with exposure. At low doses of radiation, the risk of inducing solid cancers is very small. As the overall lifetime exposure increases, so does the risk."

The report is the seventh in a series on the biological effects of ionizing radiation.

The report was sponsored by the U.S. departments of Defense, Energy, and Homeland Security, the U.S. Nuclear Regulatory Commission, and the U.S. Environmental Protection Agency. The National Research Council is the principal operating arm of the National Academy of Sciences and the National Academy of Engineering. It is a private, nonprofit institution that provides science and technology advice under a congressional charter.

- NRC conveniently ignores harmful impacts from additive, cumulative, and synergistic radiation doses from Limerick's releases day after day, year after year, from many routes of exposure, such as air, water, soil, vegetation, fish, and milk.
- ✓ In addition, risk is different for each person. Fetuses, infants, children, and those already with cancer and other serious diseases and disabilities are far more at risk from Limerick's radiation releases.
- Until there is independent and continuous monitoring for at least a year, directly on all radionuclides released from Limerick Nuclear Plant, to identify levels of all routine releases and spikes, until those monitoring results are analyzed for long-term health harms including for additive, cumulative, and synergistic doses, then NO ONE can accurately determine the true extent of health harms from Limerick Nuclear Plant.

Radiation Monitoring Tactics By The Nuclear Industry Avoid Full and Accurate Disclosure. NRC Puts On Blinders!

- ✓ Radiation samples are only taken periodically. Limited samples avoid spikes from accidents.
- ✓ Radiation releases are too often estimated or calculated and can be easily manipulated.
- ✓ Data is averaged to dilute results.

NRC's Absurd Assertion

- 5-18-11 At a meeting in Limerick, NRC's Paul Krohn asserted that nuclear disasters did not cause increases announced in background levels after those disasters. How can we believe anything NRC says?
 - Instead, Krohn said, "a lot of that is ...cosmic rays. Background increased by living changes add to what people receive each went to about 620 from about 300."
 (Experts say Terrestrial and cosmic Natural Radiation Is only about 60-80 mr/year with variations)

NRC's Negligent Responses

Only after being sharply challenged by residents, NRC's Richard Barkley responded,
 ✓ "NRC didn't assert it was safer. That's just reality."

Just as deceptive and inaccurate were Lisa Regner's unsubstantiated claims 9-22-11 at the public hearing in Pottstown, for Limerick's Updated Environment Impact Statement.

NRC's Lisa Regner Inaccurately Claimed:

- 1. Radiation released at Limerick was at such low levels there were no harmful consequences. ACE Response:
 - ✓ First, there is no continuous comprehensive independent monitoring on all routes of exposure to know how high the levels are for each radionuclide released from Limerick.
 - Second, any level released can harm health, especially vulnerable populations, like fetuses, infants, children, and those already with cancer and other diseases and disabilities.
- 2. Only low levels of tritium were in Limerick's continuous radioactive discharges into the Schuylkill River. ACE Response:
 - Exelon's own monitoring for Limerick Nuclear Plant disproves her claim that it's only tritium. Other radionuclides discharged are in water, fish, and sediment.
 - ✓ There is no proof of the levels of tritium since there is no continuous independent monitoring for tritium from the discharge pipe into the river.
- 3. Regner inaccurately claimed NRC tests for radiation.

ACE Response:

- ✓ 5-18-11, an NRC employee admitted NRC NEVER did testing at Limerick. After hearing that, Regner tried to substantiate her unverified conclusions based on DEP testing.
- ✓ ACE has caught DEP in dangerous deception about radiation since 1997. ACE has absolutely no respect for DEP or confidence in any testing.
- ✓ Examples of DEP statements proven to be inaccurate: DEP claimed radiation would not travel with landfill gas, that no radiation was emitted into the air, that stronitum-90 could not be emitted into air. All DEP's statements were proven wrong.

DEP's Absurd Denial - 5-18-11 DEP's representative illogically claimed there were no changes in radiation levels of our environment since Limerick started operating in 1985 and continuously released radiation.

- ✓ DEP's Claim Is NOT CREDIBLE. For one thing, it ignores accumulation of radionuclides with long half-lives in all routes of exposure.
- ✓ Limerick continuously released radiation, including long-lived radionuclides, into our environment since 1985. Some radionuclides have long half-lives. Additive and cumulative releases had to raise background levels after decades of releases.

NRC HAS CONSISTENTLY IGNORED OR DENIED HEALTH RISKS POSED BY NUCLEAR REACTORS

1. NRC has a conflict of interests in its decisions on nuclear plant threats and harms.

- Many NRC staff formerly worked at reactors they regulate, or will next work at a nuclear plant.
- Many NRC officials after leaving NRC hope to land much higher-paying jobs working for the nuclear industry they regulate. Most won't do anything to jeopardize that.
- 90% of its funds come from fees from the very companies NRC is supposed to regulate. "NRC is like a prep school for many of NRC officials, because they know they've got a good shot at landing much higher-paying work with the people they're supposed to be keeping in line," Mr. Mulley said. "They're not going to do anything to jeopardize that."
- 2. "NRC Lost All Credibility on Radiation, Cancer, and Nuclear Plants." See ACE Document
 - Many cancer studies in the U.S. and Europe confirm increased cancers around nuclear plants, especially in children.
 - While still in complete denial of obvious links, in 2009 NRC called for a study of cancer near U.S. nuclear plants, obviously intended to dispute the body of studies already showing a link.
 - NRC's illogical and continued denial of documented harms biases NRC in any study they do.
 - Comments made by NRC in Limerick 5-14-11 (Documented with video), show NRC refuses to look for obvious links between nuclear plants and cancer, and instead denies them.

3. NRC has consistently denied actual routine radiation releases are harmful radiation releases, regardless of the National Academy of Sciences BEIR VII report saying there is "NO SAFE LEVEL of EXPOSURE.

- NRC has NO health or medical experts on its staff.
- NRC's unsubstantiated conclusions not only ignore the BEIR VII report scientists, they are based on outdated, biased information from the nuclear industry that has a vested interest in the outcome.

4. NRC has no credibility in its denial of harms from routine radiation emissions from nuclear plants.

- NRC admitted it never did its own radiation monitoring, testing, or reporting to prove how much radiation is routinely emitted or accidently released from Limerick (5-14-11 Video).
- NRC's unsubstantiated denials are based on industry biased, even potentially manipulated industry data, reports and conclusions.
- 5. NRC ignored or opposed any studies indicating health risks from reactors. For example, it included an 8-page critique of a study of Strontium-90 in 5,000 baby teeth near U.S. reactors, results of which were published in 5 medical journals.
- 6. With no requirement of examining disease and death rates near reactors, since 1998, the NRC has approved 71 of 71 applications to extend licenses for 20 years.
- 7. With no requirement to show local health hasn't been harmed, since 1993, the NRC has approved 123 of 123 applications to upgrade (expand) reactors.
- 8. The NRC has never ordered a U.S. reactor shut, even the damaged Three Mile Island reactor (the company closed it voluntarily).

NRC Fails To Protect Public Health

Limerick's Routine Radiation Emissions Are NOT Safe, As Falsely Claimed By NRC and Exelon.

NRC Covers Up Reality To Save The Nuclear Industry Money

- NRC Denies Harms
- NRC Ignores Risks
- NRC Lowers Risk Estimates
- NRC Weakens Regulations
- NRC Delays Protective Action
- NRC Makes Unsubstantiated Conclusions That Perpetuate and Increase Harms
- NRC Provides Exemptions When Regulations and/or Standards Are Violated

• **Radiation Exposure Limits Were Irresponsibly Weakened** By The Bush Administration's EPA - An Action Sought By NRC And DOE

 Drastic Hikes Were Permitted In Drinking Water, Air, and Soil January 15, 2009 - Right Before The Bush Administration Departed http://www.committeetobridgethegap.org/radiation.html.

• Drinking Water - EPA Radically Increased Permissible Radiation Limits In The Safe Drinking Water Act.

Safe Drinking Water Act

New Standards Would Permit Radionuclide Concentrations Up To 7 Million Times Higher Than Current Radiation Standards

Examples - PERMISSIBLE RADIATION INCREASES IN WATER Strontium-90 - Nearly 1000-Fold Increase Iodine-131 - 3000 to 100,000-Fold Increase Nickel-63 - Nearly 25,000 Increased

What Does This Mean To Drinking Water In Our Region?

- Schuylkill River Limerick Nuclear Plant discharges radioactive wastewater into this major source of drinking water 24 hours a day, 365 days a year (over 5 billion gallons each year). Limerick's waste water contains a broad range of radionuclides. Astronomical permissible limits allow Exelon to irresponsibly assert there is no health threat because Limerick meets permissible limits.
- 2) Radioactive Groundwater Limerick leaks into groundwater under the site have led to a broad range of radionuclides detected in 15 of 15 monitoring wells at the Limerick site. Many residential wells are within a short distance from Limerick. Radioactive levels can rise dramatically in residents' drinking water and still irresponsibly be called safe.

Some Inside EPA Spoke Up To Protect Public Health.

RADIATION EXPOSURE DEBATE RAGES INSIDE EPA

Plan to Radically Hike Post-Accident Radiation in Food & Water Sparks Hot Dissent

Public Employees for Environmental Responsibility News Release (www.peer.org) April 5, 2010

Washington, DC — A plan awaiting approval by the U.S. Environmental Protection Agency that would dramatically increase permissible radioactive releases in drinking water, food and soil after "radiological incidents" is drawing vigorous objections from agency experts, according to agency documents released today by Public Employees for Environmental Responsibility (PEER). At issue is the acceptable level of public health risk following a radiation release, whether an accidental spill or a "dirty bomb" attack.

The radiation arm of EPA, called the Office of Radiation and Indoor Air (ORIA), has prepared an update of the 1992 "Protective Action Guides" (PAG) governing radiation protection decisions for both short-term and long-term cleanup standards. Other divisions within EPA contend the ORIA plan geometrically raises allowable exposure to the public. For example, as Charles Openchowski of EPA's Office of General Counsel wrote in a January 23, 2009 e-mail to ORIA:

"[T]his guidance would allow cleanup levels that exceed MCLs [Maximum Contamination Limits under the Safe Drinking Water Act] by a factor of 100, 1000, and in two instances 7 million and there is nothing to prevent those levels from being the final cleanup achieved (i.e., it's not confined to immediate response of emergency phase)."

Another EPA official, Stuart Walker of the Office of Superfund Remediation and Technology Innovation, explains what the proposed new radiation limits in drinking water would mean: "It also appears that drinking water at the PAG concentrations...may lead to subchronic (acute) effects following exposures of a day or a week. In a population, one should see some express acute effects...that is vomiting, fever, etc."

"This critical debate is taking place entirely behind closed doors because this plan is 'guidance' and does not require public notice as a regulation would," stated PEER Counsel Christine Erickson. Today, PEER sent EPA Administrator Lisa Jackson a letter calling for a more open and broader examination of the proposed radiation guidance. "We all deserve to know why some in the agency want to legitimize exposing the public to radiation at levels vastly higher than what EPA officially considers dangerous."

The internal documents show that under the updated PAG a single glass of water could give a lifetime's permissible exposure. In addition, it would allow long-term cleanup limits thousands of times more lax than anything EPA has ever before accepted. These new limits would cause a cancer in as much as every fourth person exposed.

PEER obtained the internal e-mails after filing a lawsuit this past fall under the Freedom of Information Act (FOIA) but the EPA has yet to turn over thousands more communications. "EPA touts its new transparency but when it comes to matters of controversy the agency still puts up a wall," added Erickson, who filed the FOIA suit. "Besides the months of stonewalling, we are seeing them pull stunts such as ORIA giving us rebuttals to other EPA documents they have yet to release."

Following are the official U.S. government regulatory agency assessments:

U.S. Environmental Protection Agency

"Based on current scientific evidence, any exposure to radiation can be harmful (or can increase the risk of cancer). In other words, it is assumed that no radiation exposure is completely risk free.³

"[T]here is no level below which we can say an exposure poses no risk. ... Radiation is a carcinogen. It may also cause other adverse health effects, including genetic defects in the children of exposed parents or mental retardation in the children of mothers exposed during pregnancy.⁴

"Current evidence suggests that any exposure to radiation poses some risk, i.e. there is no level below which we can say an exposure poses no risk."⁵

U.S. Department of Energy

"[T]he effects of low levels of radiation are more difficult to determine because the major effect is a very slight increase in cancer risk. However, U.S. Government regulations assume that the effects of all radiation exposures are cumulative and should be limited as much as reasonably possible."⁶

U.S. Nuclear Regulatory Commission

"[T]he radiation protection community conservatively assumes that any amount of radiation may pose some risk for causing cancer and hereditary effect, and that the risk is higher for higher radiation exposures. A linear no-threshold dose-response relationship is used to describe the relationship between radiation dose and the occurrence of cancer. ... any increase in dose, no matter how small, results in an incremental increase in risk."⁷

U.S. Department of Health and Human Services

"Ionizing radiation is invisible, high-frequency radiation that can damage the DNA or genes inside the body. "Some patients who receive radiation to treat cancer or other conditions may be at increased cancer risk. ... it is possible that there is a small risk associated with this exposure.

"... children whose mothers received diagnostic X-rays during pregnancy. ... were found to have increased risks of childhood leukemia and other types of cancer, which led to the current ban on diagnostic X-rays in pregnant women."⁸

National Academy of Sciences

The National Academy of Sciences' 7th study on the effects of radiation exposure declared that any exposure, regardless of how small, may cause the induction of cancer. BEIR-VII also dismissed as baseless the industry-sponsored sham "hormesis" theory that some radiation exposure is good for you.⁹ Committee Chair Richard Monson of Harvard's School of Public Health said, "The scientific research base shows that there is no threshold of exposure below which low levels of ionized radiation can be demonstrated to be harmless or beneficial."¹⁰

National Council on Radiation Protection

"... every increment of radiation exposure produces an incremental increase in the risk of cancer."11

1. Philip Hilts, "Higher Cancer Risk Found in Low-Level Radiation," New York Times, Dec. 20, 1989.

2. Ian Fairlie & Marvin Resnikoff, "No dose too low," The Bulletin of the Atomic Scientists, Nov/Dec 1997, p. 54

3. U.S. EPA, "Ionizing Radiation Series," No.2, Air & Radiation, 6601J, EPA 402-F-98-010, May 1998.

4. U.S. EPA, "Radiation: Risks & Realities," Air & Radiation, 6602J, EPA 402-K-92-004, Aug. 1993.
5. *Ibid.*

5. *Ibid.*

6. U.S. Dept. of Energy, DOE/NE-0074, "Understanding Radiation," p. 8 & 9.

<http://www.ne.doe.gov/pdfFiles/UNDERRAD.PDF>.

7. U.S. NRC, "How Does Radiation Affect the Public?" www.nrc.gov/what-we-do/radiation/affect.html.

8. U.S. Dept. of Health & Human Services, "Cancer and the Environment: Ionizing radiation," p. 10. <<u>www.cancer.gov/images/Documents /5d17e03e-b39f-4b40-a214-e9e9099c4220/ Cancer%20and%</u> 20the%20Environment.pdf>.

9. National Academy of Sciences, "Health Risks from Exposure to Low Levels of Ionizing Radiation: BEIR VII, Phase 2," Committee to Assess Health Risks from Exposure to Low Levels of Ionizing Radiation, National Research Council, June 29, 2005.

10. Associated Press, "Study: No Radiation Level Safe," June 29, 2005.

11. National Council on Radiation Protection, "Evaluation of the Linear-Non-threshold Dose-Response Model for Ionizing Radiation," NCRP report 136, Bethesda, MD, June 4, 2001, cited in *Science for Democratic Action*, IEER, June 2005. **Nukewatch**, 740A Round Lake Road, Luck, WI 54853,

(715) 472-4185 <<u>http://www.nukewatch.com/</u>>mailto:nukewatch1@lakeland.ws

RADIATION CLEAN-UP STANDARDS - DRASTICALLY WEAKENED

Radiation Clean-Up Standards Were Changed.

> They Are Thousands Of Times More Lax Than Previous Radiation Clean-Up Standards.

Public Health Was Overridden by Economic Considerations. Rather than specify clean-up standards to protect health,

> Weakened "Benchmarks" allow radiation doses so immensely high that 1 in 4 can get cancer.

What Lax And Weakened Radiation Clean-Up Standards Mean To People Around Limerick.

Exelon Can Avoid Safe Clean Up From Limerick Nuclear Power Plant's Radioactive Emissions Into Air, Water, and Soil. Vegetation, Food, Milk, and Fish Can Remain Highly Radioactive, Further Jeopardizing Public Health In Our Region.

IN THE EVENT OF A LIMERICK MELTDOWN OR MAJOR RADIATION RELEASE FROM LIMERICK, WE WILL NOT BE PROTECTED.

While no agency is taking responsibility for attempting to clean up after a nuclear disaster, all agencies ignore or miss the fact that nuclear "accidents" NEVER end. Will they ever admit that a nuclear plant worst case scenario is likely to be just too bad to clean up?

Agencies Struggle To Craft Offsite Cleanup Plan For Nuclear Power Accidents November 10, 2010

http://insideepa.com/Inside-EPA-General/Inside-EPA-Public-Content/agencies-struggle-to-craft-offsitecleanup-plan-for-nuclear-power-accidents/menu-id-565.html

EPA, the Nuclear Regulatory Commission (NRC) and the Federal Emergency Management Agency (FEMA) are struggling to determine which agency -- and with what money and legal authority -- would oversee cleanup in the event of a large-scale accident at a nuclear power plant that disperses radiation off the reactor site and into the surrounding area.

The effort, which the agencies have not acknowledged publicly, was sparked when NRC recently informed the other agencies that it does not plan to take the lead in overseeing such a cleanup and that money in an industry-funded insurance account for nuclear accidents would likely not be available, according to documents obtained by *Inside EPA* under the Freedom of Information Act (FOIA). (<u>Request Part 1</u>, <u>Request Part 2</u>)

In her response to *Inside EPA*, Pettaway did not include any of this information or acknowledge that the three agencies were actively studying the issue, however. Pettaway said only that questions regarding whether and how EPA would cleanup after a nuclear power plant incident were "based on hypothetical situations/scenarios" and that EPA could not "give an assessment on something that [was] hypothetical."

Determining Cleanup Standards

Whether EPA can assert its Superfund authorities over a cleanup after a nuclear power plant accident is significant not just from the standpoint of securing funding for the cleanup, but also in determining what cleanup standards would apply to the situation.

Walker tells Southerland that if EPA appears to be endorsing non-Superfund cleanup approaches in discussions with the other agencies, policy concerns similar to those surrounding EPA's controversial draft guide for responding to all nuclear emergencies -- known as the protective action guidance (PAG) for radiological incidents -- would arise. With the PAG, officials in EPA's Superfund, water and legal offices raised concerns that the document could set a negative precedent weakening the agency's cleanup and drinking water standards because it included guidelines dramatically less stringent than traditional EPA regulations.

WE CAN'T BELIEVE THE NUCLEAR INDUSTRY'S SELF-SERVING MONITORING AND REPORTING.

Evidence Below Suggests When They Don't Like Radiation Data, They Don't Report It. The Excuse - Equipment Failure. Industry and Government Monitoring Are Plagued By CONFLICTS of INTEREST.

Examples:

- 95% of Fukushima Radiation Detectors Stopped Working Three Hours After The Nuclear Disaster Started March 11, 2011.
 - ✓ 22 out of the 23 monitors stopped sending data. COINCIDENCE? PROBABLY NOT!
 - ✓ 3 months later, we learned radiation emissions were twice as bad as reported.
- Limerick Nuclear Plant's Yearly Radiation Monitoring Reports From Exelon To NRC -Show repeated claims of equipment failure, some for long periods.
- TMI During critical periods of time throughout the TMI event, radiation monitors were not functioning or their detection limits were being exceeded by an unknown amounts. The monitors at TMI were wrecked, the stack monitors were saturated and went off scale.. one thermoluminescent dosimeter in the northwest quadrant, where the wind was blowing, showed very high readings. they discounted it by calling it the "northwest anomaly". So they have no idea how much radiation escaped at TMI. In federal court, the judge threw out the class action health damages suit, saying not enough radiation escaped to cause any health damage.
- Turkey Point During Hurricane Andrew in 1992, the Turkey Point rad monitors and meteorological monitoring equipment were destroyed. There was no way to prove or disprove radiation leakage.
- Brown's Ferry Monitoring Data Public document room records show EVERY time there were higher than normal readings, the diagnosis was always, MONITORS MALFUNCTIONED.

Getting Full, Accurate, and Timely Disclosure On Radiation Releases and Risks Is Imperative For Precaution and Prevention.

Unless there is full and accurate disclosure on radiation releases and risks from accidents and meltdowns, the public will not take action for protection and the nuclear industry will not spend the money for precaution in preventing radiation releases and meltdowns.

The Injustice of Unnecessary Radiation Poisoning Of Our Environment and Us, As A Result Of Nuclear Plant Operations, Can and Must Be Stopped Now.

- The Astronomical Unnecessary Costs Are Avoidable, For The Consequences Of Nuclear Power's Routine and Accidental Radiation Releases, Not To Mention Devastating Public Costs For A Meltdown (About \$1 Trillion [NRC Estimate] Just For A Limerick Nuclear Plant Disaster).
- Costs Can Be Reduced By Closing Nuclear Plants, In Terms Of Unnecessary Suffering, Health Care Costs, Clean-Up Costs, Lost Productivity, and Lost Property Value.

In Order To Transition To Safer Alternatives To Minimize Suffering and Costs, NRC Officials Must Start To Have The Courage and Integrity To Acknowledge Obvious Harms.

- NRC officials must start to consider the vast body of independent research showing links between nuclear plant radiation releases, cancer, and other diseases and disabilities.
- NRC must stop remaining in denial of a body of documented independent research.
- NRC must stop efforts to weaken radiation protection standards using industry biased unsubstantiated conclusions to protect nuclear industry interests and profits.
- NRC should stop making intentionally misleading comparisons between continuous nuclear plant radiation releases and exposure to gamma rays from x-rays and planes.
- NRC should stop lying about "Background" Radiation. Drastic Increases in "estimated background" are NOT largely from Terrestrial and Cosmic Natural Radiation. Independent experts say Natural Radiation is only about 60-80 Millirems per year, NOT anywhere close to the newly increased 620 Millirems per year, announced 3/21/11 right after Fukushima.

Health and Lives Are At Stake

NRC Officials Must Speak Up To Protect Public Health.

Limerick Relicensing Would Increase Health Threats!

Evidence Suggests If NRC Relicenses Limerick, Far More People Will Needlessly Get Sick and Die From Limerick's Additive, Cumulative, and Synergistic Routine Radiation Releases.

ACE Believe Limerick Relicensing Would Be A Clear Violation of NRC's Mission To Protect Public Health Under the Energy Reorganization Act of 1974.

<u>More Protective Radiation Standards Are Needed</u> <u>To Protect Our Region Until Limerick Closes</u>

NRC Was Petitioned To Require More Protective Radiation Standards At Older Nuclear Power Plants Like Limerick.

January 29, 2007

ACE Urged Elected Officials and Residents To Comment To the Secretary of NRC On Unprotective Radiation Standards, Based On Evidence Of Harm Near Limerick Nuclear Plant And The Details In The ACE 1-26-07 Letter To NRC.

June 2005, The National Academy of Science released a report called, The Biological Effects of Ionizing Radiation (BEIR VII), clearly stating there is no safe level of radiation exposure.

Yet to date, NRC failed to require more protective radiation standards for the radiation released every day into the air and water during routine operations at nuclear power plants.

Living near a nuclear power plant, such as Limerick Nuclear Power Plant, is an added risk for cancer and leukemia, immune system damage, infant mortality, and a broad range of other serious illnesses.

Current radiation standards are clearly unprotective, when the BEIR VII report confirms there are no safe levels. Current radiation standards, based on "Standard Man" (an average healthy adult man), clearly jeopardize more vulnerable populations.

Requiring more protective radiation standards would be a start, and a crucial precautionary step in protecting fetuses, children, women, the elderly, and those already sick, from the threat of the radiation released every day from nuclear power plants such as Limerick. Evidence shows low doses over time can be just as harmful as one high level dose.

Increasing cancer rates in Montgomery County, especially in children, and especially in communities near Limerick Nuclear Power Plant suggest more protective radiation standards are imperative. Information on rising cancers, etc., which ACE attached with our comments to NRC will arrive in the mail.

1-26-07 ACE wrote to NRC urging them to protect public health, especially fetuses, children, women, the elderly, and those already with cancer and other illnesses in our region around Limerick Nuclear Power Plant.

The Alliance For A Clean Environment

1189 Foxview Road Pottstown, PA 19465 (610) 326-6433

January 26, 2007

Secretary, U.S. Nuclear Regulatory Commission

Rulemakings and Adjudications Staff. Washington, DC 20555-0001

SECY@nrc.gov. Phone (301) 415-1966. Fax (301) 415-1101. Submit via website http://ruleforum.llnl.gov.

Subject: More Protective Radiation Standards - PRM-51-11

Federal Register notice http://www.epa.gov/fedrgstr/EPA-IMPACT/2006/November/Day-20/i19568.htm

The Alliance For A Clean Environment (ACE) is a grass roots environmental group with members in the tri-county area surrounding the Limerick Nuclear Power Plant. We urge NRC to approve the petition for rulemaking that would provide more protective radiation standards at older reactors.

For twelve years we have been gathering evidence in an attempt to understand why there is a health crisis in communities in our area. We have documented and are attaching information on alarming elevated cancer rates in Montgomery County (home of the Limerick Nuclear Power Plant), elevated infant and neonatal mortality, and learning disabilities.

- 1. Cancer incidence increased in Montgomery County since Limerick Nuclear Power Plant went on line in the mid 1980s, for many of the kinds of cancers associated with radiation exposure, such as; Thyroid Cancer Increased by 128%, Breast Cancer 61%, and Leukemia 48%. (1985-86 to 1996-97) PA Cancer Registry Data
- 2. Childhood cancer deaths (ages 1 to 14) increased by 71% in Montgomery County, while going down in surrounding counties, PA and the U.S. Childhood cancer rates are 92.5% higher than the national average in six communities near the nuclear plant, including one in Chester and one in Berks County.
- **3.** Elevated infant and neonatal mortality are far higher than the state average, and even higher than Philadelphia and Reading (according to state data).
- **4.** Learning disabilities are documented to be double state increases at 94% (1990 to 2000) in Montgomery County.

Children in the shadow of Limerick Nuclear Power Plant are documented to be suffering and dying in record numbers. Statistics are alarming. Childhood cancer statistics are significantly higher near Limerick Nuclear Power Plant than across the state, nation, and tri-county.

- More precautionary radiation standards for fetuses and children are imperative. Children in the region of Limerick Nuclear Power Plant need and deserve radiation standards that will protect them, as do all children who are unfortunate enough to live around nuclear power plants or other sources of radiation emissions.
- NRC's radiation standards still ignore the unique vulnerability of children. Radiation regulations used by NRC are still based on the "Standard Man" (an adult healthy male). This is irresponsible, tragic, and unacceptable. NRC radiation regulations also fail to protect women, people already sick, and the elderly. It is long past time for NRC radiation standards to be more reflective of current science and reality.

Evidence is clear and compelling that children are the ignored victims of outdated and unprotective radiation standards still used by NRC for regulating nuclear power plants.

For example:

- Since Limerick Nuclear Power Plant first went on line in the mid 1980's, the statistics above show far higher rates of cancer, leukemia, infant and neonatal mortality. Other environmentally related illnesses have also been rising.
- Lessons of Chernobyl show children were the most vulnerable to radiation exposure, even in small doses, and that children exposed to radiation suffer from higher rates of certain childhood cancers, especially leukemia and thyroid cancer, and have a greater likelihood of developing breast cancer as adults.

- Dramatic increases are well documented in these same cancers (thyroid cancer, leukemia, and breast cancer) since Limerick Nuclear Power Plant first went on line in the mid 1980s.
- Increases in other childhood cancers have been found near nuclear operations in the Navaho Nation, Brookhaven, New York, and nuclear power stations in Oyster Creek, New Jersey and Clinton, Illinois.
- Increases in down syndrome are found near Yankee Rowe power station in Massachusetts.
- Studies show ionizing radiation is also linked to immune system damage, heart defects, and diabetes in children.
- Evidence shows that after closings of nuclear power plants in the U.S., infant death and childhood cancer rates are reduced.

The American Academy of Pediatrics has identified reasons children are most vulnerable. They stated that children have higher minute ventilation or a higher concentration of tiny capillaries in the lungs, leading to greater radioactivity exposure from the same amount of radioactive material. They also said children are extra sensitive to the DNA-damaging effects of radioactive energy.

The cumulative weight of evidence from the three large releases of radiation (Chernobyl, TMI, and Savannah River), confirm that infants and children are most sensitive to damage from low levels of ionizing radiation. (See Attachment)

A Moral And Ethical Responsibility To Protect Future Generations

Evidence of harm to fetuses and children is overwhelming. We urge NRC, the agency with the mission to protect the public from nuclear power plant radiation, to now take crucial precautionary action for more protective radiation standards that will prevent unnecessary harm to all fetuses and children around nuclear plants.

Costs of Preventable Childhood Cancer, Illness, and Disability: The Price We Pay

- Costs, both physical and financial, for unnecessary and preventable lifelong disease and disability are obviously astronomical and avoidable. Links between radiation exposure and a broad range of childhood illness, disease, and disability should no longer be disputed by anyone.
- Financial costs to owners of nuclear plants for providing more protective measures regarding nuclear power plant radiation releases would pale by comparison to the costs society pays for preventable childhood cancer, illness, and disability.

Since Limerick Nuclear Power Plant went on line in the mid 1980s, <u>There Are Alarming Cancer Statistics in Montgomery County</u> And Even Worse In Communities Near Limerick Nuclear Power Plant. (See Attachments)

- Alarming Increases In Many Cancers after Limerick Nuclear Power Plant went on line in Montgomery County, home of Limerick Nuclear Plant. (PA Cancer Registry Statistics)
 - **Cancer Death Rate (1995 to 2004) FAR Higher** In 13 Townships and Boroughs Near Limerick Nuclear Power Plant, compared to the rest of Montgomery County.
- <u>Childhood Cancer Alarming Statistics</u>
 - <u>71% Increase in Childhood Cancer Deaths</u> (Ages 1 to 14)- Montgomery County. 1980's to 90s Surrounding counties, state, and nation went down
 - <u>92.5% Above National Average</u> (Ages 0 to 19) 1995 to 1999 in communities close to Limerick Nuclear Power Plant showing an upward trend from 30% higher than the national average in the late 1980s to 60% higher in early 1990s

- Thyroid Cancer Absolutely Soared In Montgomery County since Limerick went on line.
 - **About 75% Higher than the U.S. Rate** 1998,1999, and 2000, Montgomery County's Thyroid Cancer Rate - Thyroid Cancer Incidence is rising across the nation which increases the significance of these shocking increases in Montgomery County.
 - <u>**128% Increase**</u> Montgomery County 1985-86 to 1996-97 A broad range of thyroid problems have also been reported in alarming numbers.
 - Thyroid Cancer Incidence in PA is highest in counties closest to the concentration of nuclear power plants, and in the predominant wind direction from them.
- Leukemia Significantly Higher Montgomery County and 6 borough/township area near Limerick
 - 40% above other parts of the tri-county area for at least 15 years Total of 106 cases from 1985-99
 - 48% Increase in Montgomery County (1985-86 to 1996-97)
 - Almost double the state average (1985 to 1994).
- Breast Cancer Significantly Higher In Montgomery County (See Attachments)
 - 61% Increase 1985-86 to 1996-97 Rising Incidence
 - **<u>39.2% Higher</u>** (1995-1999) Female Breast Cancer Compared to the Nation and Tri County 6 Municipalities – 1995 to 1999, in just five years, a total of 263 women were newly diagnosed with Breast Cancer. Among young adult women the most frequently diagnosed cancer, by far, is breast cancer. Considering that breast cancer is a national epidemic, this is cause for precaution.
 - Female Breast Cancer <u>By Age</u> (diagnosed 1995-1999) Compared to the National Average Age % HIGHER than U.S.

7190	
0-29	+ 15.3 %
30-44	+ 51.4 %
45-64	+ 39.3 %
65+	+ 28.6 %

- Breast cancer is an epidemic across the nation. There is major cause for concern when breast cancer rates in communities near Limerick Nuclear Power Plant are 51.4% higher in young women 30 to 44, and higher in every other age group. Breast cancer links to radiation exposure are well established.
- Breast Cancer went up in the Philadelphia area after Limerick Nuclear Power Plant started, while going down when a nuclear power plant closed in San Francisco.
- Brain Cancer
 - <u>Almost Doubled</u> in Montgomery County in a 5 year period 1995 to 1999
 - <u>In Pottstown, (</u>Limerick Nuclear Power Plant mailing address), Brain Cancer Rates Are <u>Significantly Higher Than State Average</u> Or Any Municipality Within 12 Miles.
 - Brain/Central Nervous System Cancer 32.5% HIGHER than Tri-County 38.3% HIGHER than U.S.
- State data shows that <u>Malignant Tumors</u> are <u>far higher than the state average</u>, and even far higher than Philadelphia and Reading. (See graph)

Whether radiation releases are accidental or allowed is irrelevant. Limerick Nuclear Power Plant's allowable levels of planned radiation releases from routine operations, as well as

unplanned radiation releases from leaks and accidents could be a major factor in the alarming cancer and tumor increases in the areas near Limerick Nuclear Power Plant.

The BEIR VII Report provides a link - "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 broad range of nuclear power's ionizing radiation has been shown to attack many parts of the body - the thyroid, lungs, liver, spleen, kidneys, ovaries, bone, muscle, and skin. (See Chart)

• In Montgomery County, home of Limerick Nuclear Power Plant, in addition to alarming increases in thyroid, leukemia, and breast cancers listed above, there are other alarming cancer increases in other organs from the chart above. For example: Montgomery County Increases 1985-86 to 1996-97 - Kidney Cancer increased 96% and Skin Cancer increased 72%.

A long list of studies by independent experts has long provided evidence that there is no safe dose of radiation so low that the risk of a malignancy is zero. (See Attachment)

Massive independent research over the past 20 years provides compelling evidence that exposure to radiation at any level can increase the risk of damage to tissues, cells, and DNA, leading to risk of cancer, leukemia, birth defects, genetic mutations, reproductive disorders, cardiovascular disorders, endocrine system disorders, and immune system damage. There is evidence that specific kinds of ionizing radiation from nuclear power plants is linked to damage of specific organs in the body. **(Identified On Attached Chart Above)**

 Many rising cancers in Montgomery County are in parts of the body (listed on the attached chart) shown as impacted by specific kinds of ionizing radiation from nuclear power plants.

NRC's Irresponsible Dismissal Of BEIR VII Conclusions Cause Lack of Trust And Harm

ACE has encountered a casual, dismissive attitude about radiation standards and exposure risks from NRC employees. June, 2005, the BEIR VII committee of scientists concluded no level of radiation dose is safe, yet ten months later, at an NRC annual meeting on Limerick Nuclear Power Plant in Limerick, an NRC employee stated NRC would wait hours or days to warn the public of accidents at Limerick, depending on the increased radiation level released. It is difficult to understand why NRC employees have made conclusions and statements to us which deny evidence of harm. That is both unfortunate and absolutely unacceptable. It is difficult to have confidence in NRC employees who make claims which defy both science and logic.

NRC employee used irresponsible deception to discount the BEIR VII report.

Fetuses and children are far more at risk from radiation levels permitted to be released at Limerick.

Our question concerned elevated cancers, infant mortality, and other childhood disability around Limerick and their relationship to NRC's outdated, unprotective radiation standards based on the average male, not fetuses and children.

- An NRC employee claimed BEIR VII scientists did not recommend more protective standards in their June, 2005 report and therefore, current standards are protective. Video of this inexplicable comment is available upon request. That NRC response was illogical, irresponsible, and deceptive.
 - Why would the National Academy of Science report recommend any level as safe above ZERO, when their report said there is no safe level?

- The NRC employee also stated that Limerick Nuclear Power Plant's radiation emissions were well below "acceptable standards", a statement he cannot prove.
 - This statement ignores the BEIR VII report claiming no level was safe.
 - There is no attempt to account for the additive, cumulative, and synergistic harmful health impacts of all the kinds of radiation released from Limerick.
 - Exelon, the company with a vested interest in the outcome, is doing all the monitoring, testing, and reporting. Considering what has happened at Exelon's nuclear plants in Chicago, it is difficult to have complete trust in radiation emitted into our water, air, and soil here. In addition, it appears Exelon is not required to test, monitor, or report on all the kinds of radiation associated with nuclear power plants.
 - Without site specific independent and comprehensive testing of our, air, water, soil, or the bodies of our children, to know exactly how much of what kinds of radiation exposure people around Limerick are exposed to regularly (not to mention accidental releases), the NRC employee irresponsibly claimed Limerick's radiation releases were not causing a threat to our children based on levels released by Limerick.
 - There are no NRC studies to show levels of radiation in the bodies of our children.
 - The Radiation and Public Health Project collected teeth of children in our area to measure for Strontium-90 radiation, and found high levels of Stronitum-90 in the teeth of children around Limerick Nuclear Power Plant. See Attachments – RPHP Reports and Graphs)
- BEIR VII Report estimates the differential risk for children. 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, http://books.nap.edu/books/030909156X/html/550.html)." (excerpted from http://www.ieer.org/comments/beir/pressrel.html)
- To truly protect children and other vulnerable populations, NRC radiation standards should be ZERO. Exposure at any level above zero should be unacceptable to NRC based on the body of evidence of harm and the BEIR VII Report.
 - However, it is a start if NRC demands far more precautionary regulations based on recognition of the unique impacts of radiation exposure to vulnerable populations, especially children. Clearly, more protective radiation standards are long overdue and crucial for the future health of our children.
 - Inexplicably, to date, NRC failed to provide more protective radiation standards that would be more precautionary of children, fetuses, and the more vulnerable such as those already sick. Harm from radiation exposure at any level can no longer be disputed and should NOT be denied or ignored by NRC. Ignoring and/or denying the reality continues to unnecessarily jeopardize the public, especially fetuses, children, and those already sick.
 - Hopefully, with more protective regulations, NRC employees will start to take radiation exposure more seriously and make more responsible comments and decisions regarding radiation health impacts to the public, especially fetuses and children.

Protecting The Public From Radiation Emissions Into Their Air, Water, Soil, And Bodies

From Routine Releases and Accidental Radiation Releases At Nuclear Power Plants Should Be A Moral And Ethical Obligation For NRC

<u>Necessary Actions For Protecting The Most Vulnerable Populations</u> <u>In NRC Radiation Standards</u>

- 1. Protect the most vulnerable by accounting for more vulnerable populations in NRC standards.
- Recognize "allowable" levels are not safe. NRC's "allowable" levels of radionuclides are NOT conservative or protective enough for vulnerable fetuses, growing infants and children, the elderly, and those in poor health. They are based only on the obsolete "standard man", a healthy, white male. They also ignore 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 inaccurately considered by IAEA and NRC to be of the lowest possible risk because NRC 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 logical reason to believe that humans would be immune to this sort of harm."
- 5. Recognize that the public is exposed to additive, cumulative, and synergistic radiation doses, far greater than the exposure threat from just one dose of one kind of radiation at a time as evaluated under current standards. Evidence suggests the public can no longer afford to accept radiation standards which are based on illusion. It is long past time to stop ignoring the magnitude of the potential health impacts from additive, cumulative, and synergistic doses of all radiation exposures, especially to those who are unfortunate enough to live around nuclear power plants.
- 6. NRC should 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.
- 7. NRC should recognize that low levels of radiation exposure over time can be just as harmful as one high level dose, and make more responsible decisions to immediately warn the public based on any radiation release above normal.
- 8. Radiation limits should include accidental nuclear power plant releases, as well as the planned everyday radiation emissions from routine operations.
- 9. Recognize that it is far more costly to the public, than it is for the nuclear industry, if NRC allows nuclear power plants to avoid spending what is necessary to provide all available filtering and monitoring technologies for their radiation emissions into our air, water, soil, and eventually our bodies.
- 10. Recognize that prevention is key, due to the fact that some radionuclides that are released into the air, water, and soil and their by-products can continue to damage human health for millions of years. Costs for more protective filtering and monitoring technologies pale by comparison to public's costs if NRC fails to require available prevention technologies. NRC should not succumb to the nuclear industry's quest to reduce economic costs, including deferring maintenance which can increase the radiation

released – and the risks. For what are the true costs to the public if NRC fails to take more protective action now?

Petitioner's Request

ACE commends and is thankful that the petitioner is requesting NRC to 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.

• However, we urge NRC to require more protective radiation standards for all older nuclear power plants to protect fetuses, children, the elderly, and those already sick around Limerick Nuclear Power Plant and others.

For A Safer Healthier Future ACE URGES NRC To Exercise Precaution

We appreciate this opportunity to provide NRC with comments. We hope that as NRC Commissioners you will consider each of our comments, as though your children and grandchildren or other family members were living in the shadow of Limerick Nuclear Power Plant.

ACE President, Dr. Lewis Cuthbert

Below Is Verification Of ACE Concerns Expressed To NRC From The Science and Environmental Health Network.

Date: 2/2/2007 11:16:07 AM *To:* <u>secy@nrc.gov</u> *Subject:* More Protective Radiation Standards - PRM-51-11

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

Submitted via email: secy@nrc.gov.

Re: More Protective Radiation Standards - PRM-51-11 <u>Federal Register notice</u> <u>http://www.epa.gov/fedrgstr/EPA-IMPACT/2006/November/Day-20/i19568.htm</u>

Dear Rulemakings and Adjudications Staff:

I am writing on behalf of the Science and Environmental Health Network ("SEHN"), a national non-profit organization dedicated to protecting public health and the

environment. SEHN urges NRC to approve the petition for rulemaking that would provide more protective radiation standards at older reactors.

Current standards for radiation are not sufficiently protective of human health. In making environmental decisions, SEHN advocates a precautionary stance, including consideration of the most vulnerable populations: fetuses, infants and children; women in their reproductive years; and those with compromised immunity, among others.

SEHN supports the work of the Alliance For A Clean Environment (ACE), a grass roots environmental group with members in the tri-county area surrounding the Limerick Nuclear Power Plant. We urge the Commission to listen deeply to the knowledge and concerns of the people who live with the Plant in their midst – and experience the devastating health effects of radiation among their families and neighbors. For these families, rulemaking by the NRC is not an academic exercise, but a very matter of life and death.

We thank you for considering our comments, and look forward to your decision.

Sincerely,

Ted Schettler, MD, MPH Science Director

Radiation Standards - Comments to NRC From RPHP

Comments on NRC Radiation Standards Joseph J. Mangano MPH MBA Radiation and Public Health Project February 5, 2007 Submitted via email – http://ruleforum.llnl.gov

The U.S. Nuclear Regulatory Commission (NRC) should update its standards at aging nuclear power plants to better protect local residents, especially the most vulnerable, i.e. fetuses, infants, children, the elderly, and those suffering with an immune compromising disorder. The NRC needs to base its standards on recent scientific discoveries by official organizations in the U.S. and abroad that contradict previously held beliefs, including

- releases from reactors are greater than previously believed
- the very young are more susceptible to radiation
- latency from exposure to cancer manifestation may be shorter in certain populations
- rates of cancer and other diseases near reactors are higher than expected

The following contains summaries of these new findings that the NRC should consider:

1. <u>High Cancer Rates Near Reactors</u>. There have been many descriptive studies in the medical literature in the past decade that document elevated rates of cancer

near nuclear facilities. Many of these analyses focus on cancer in children, who are more susceptible to the biochemical effects of radiation exposure. They include

- At least 11 studies showing elevated childhood cancer rates near different facilities in the United Kingdom
- Articles indicating elevated childhood leukemia rates near reprocessing sites in Europe (Dounreay, Sellafield, La Hague, and Krummel)
- A 2003 study showing childhood cancer rates exceeding the national rate near each of 14 U.S. nuclear plants studied
- 2. <u>Underestimation of Risk</u>. In 2004, the Committee Examining Radiation Risks of Internal Emitters (CERRIE), a blue ribbon panel convened by the British Environmental Minister, concluded that risks from radiation exposure to humans may have been underestimated by as many as 10 times. A minority of CERRIE members projected this underestimate to be as many as 100 times. The CERRIE based its conclusions on a variety of new findings in radiation biology such as the "bystander effect" in which a cell harmed by radiation may affect otherwise healthy cells in the vicinity.
- 3. <u>Miscalculation of Dose</u>. In 2003, the European Committee on Radiation Risk (ECRR) produced a report that directly challenged the prevailing understanding of dose. The ECRR, which arose from criticisms of the International Commission on Radiation Protection (ICRP) dose model presented at a European Parliament workshop, used over 500 professional references to support its conclusions, most of them recent. The ICRP model is lacking, states the ECRR report, because of recent discoveries in biology, genetics, and cancer research suggesting the ICRP model of cellular DNA is not a good basis for risk analysis. Thus, the maximum permissible dose to the public should be no more than 0.1 millisievert (mSv), rather than the ICRP "safe" dose of 100 mSv.
- 4. <u>Elevated Risk to Fetus and Infant</u>. In 2003, the U.S. Environmental Protection Agency issued draft paper EPA/630/R-03/003. It concludes that harm from radiation exposure is considerably higher in young persons than in adults (children age 2-16 have three times the risk, while children under age 2 have ten times the risk). This paper officially acknowledges that use of risk models based on "average" humans minimizes risk to those who are especially vulnerable.
- 5. <u>New Findings on Fetal/Infant Susceptibility</u>. Since 1956, when Dr. Alice Stewart demonstrated that prenatal pelvic X-rays yielding a dose as low as 10-20 mSv significantly raised the risk of cancer deaths by age ten, the risk radiation poses to the fetus and infant has been a focus of research but largely ignored by standard setting bodies. In the most recent document the ICRP stated that below 100 milligrays, lethal effects to the fetus are "infrequent" (100 mGy equals 100 mSv). The following are among the more recent studies to identify radiation risks to the fetus and infant (other than childhood cancer):

- The October 23, 1999 *Lancet* published research showing that every additional 100 mSv of radiation exposure to external ionizing radiation before conception added a 25% risk of a child being stillborn.
- An article in the January 2004 *British Medical Journal* documented that males irradiated for cutaneous hemangioma under 18 months had a progressively lower attendance rate in high school, documenting lower rates even at doses of under 20 mSv.
- The April 28, 2004 *Journal of the American Medical Association* presented a study associating risk of low weight births with prenatal dental radiography at a dose of over 0.4 mGy (0.4 mSv).
- New Findings on Bomb Fallout Risks. In 1991, U.S. public health officials had not admitted that fallout from 1945-1963 atmospheric nuclear weapons tests caused any harm. However, the release of a 1997 report by the National Cancer Institute estimated that Iodine-131 from tests – still considered low dose exposure - caused between 11,000 and 212,000 Americans to develop thyroid cancer. No acknowledgement of this landmark research study was made by the NRC.
- 7. <u>New Findings of Nuclear Worker Risks</u>. In 2000, the U.S. Department of Energy released a report summarizing many research studies, and concluding that workers at American nuclear weapons plants suffer from disproportionately high rates of various cancers. Congress subsequently passed a law entitling affected workers to compensation. Again, the NRC made no note of this important development and its implications for radiation safety standards.
- 8. <u>New Findings on Short Latency Period</u>. Much has been recently learned about risk to humans exposed to Chernobyl fallout. Perhaps the most striking finding has been the short latency between exposure and onset of thyroid cancer in children (as little as four years), and leukemia in infants (under one year). In the latter case, areas far from Chernobyl (Germany, Greece, Scotland, U.S., Wales) were affected, even though exposures were much lower than near the plant.
- 9. <u>New Findings on In-Body Radioactivity</u>. Beginning in the 1990s, the first studies of in-body (baby teeth) radioactivity of humans exposed to reactor emissions have been published. Studies in Germany, Greece, and the Ukraine showed elevated levels of Strontium-90 after Chernobyl. Another showed Plutonium-239 levels decreasing with distance from the Sellafield plant. Another showed Strontium-90 highest in counties near 7 U.S. nuclear plants, and rising since the late 1980s. These studies, all documented in the medical literature, constitute the research community's "gold standard" for dose estimates, but were first ignored, then opposed by the NRC, which has yet to conduct or commission such a study.

The importance of NRC standards cannot be emphasized enough. Since 1991, the number of nuclear power reactors worldwide has grown to 439, the amount of highly radioactive waste generated by these reactors has soared, and medical uses of radiation have proliferated. Moreover, the terrorist threat since the September 11, 2001 attacks

make potential harm from radiation exposure even greater, in the event a reactor is attacked, a nuclear weapon strike is launched, or a "dirty bomb" is used.

The overriding theme of these recommendations should be the so-called Precautionary Principle, which states that if consequences of an action are unknown but have potential for negative consequences, it is better to avoid that action. In the health field, this belief has existed since the Hippocratic principle of "first do no harm" of over 2,000 years ago. The series of assumptions that radiation exposure carries no risk that were later reversed by empirical research – for pelvic X-rays to pregnant women, atomic bomb test fallout, and occupational exposures in nuclear weapons plants – suggests strongly that the NRC re-evaluate health risks of low-dose exposures, and lower the current limits.

RESIDENTS EXPRESS CONCERN ABOUT LIMERICK NUCLEAR PLANT'S RADIOACTIVE RELEASES INTO OUR AIR AND WATER AND ABOUT NRC'S FAILURE TO REQUIRE MORE PROTECTIVE RADIATION STANDARDS

July, 2006 Letter to the Editor From: Donna Cuthbert ACE Vice President

Residents have expressed deep concern to members of the Alliance For A Clean Envioronment about the potential harmful health impacts of Limerick Nuclear Power Plant's toxic brew of routine radiation emissions into our air and the Schuylkill River.

The Nuclear Regulatory Commission (NRC) determines what levels of radiation Limerick can release into our air and discharge into the river, but allows Exelon to do most of its own monitoring, testing, and reporting, with little independent verification.

A video of the July 13, 2006 Limerick meeting, deepened concern more than ever, for many families living in this region, especially for their children. NRC appears to fail to take radiation's health threats seriously.

July 13, NRC stated they may wait hours or even days to alert the public to evacuate after an accidental release of radiation at Limerick Nuclear Power Plant. Have they learned nothing from the consequences of waiting for 3 days to alert the public after the Three Mile Island accident? Or from the BEIR VII report?

The National Academy of Science report, the Biological Effects of Ionizing Radiation (BEIR VII) report, issued June 2005, states there is no safe level of radiation. Still, instead of working to further minimize our region's risk from Limerick's radiation emissions, NRC appears to be attempting to simply minimize concern.

NRC's denial of serious health threats from radiation exposure unnecessarily jeopardizes public health. NRC needs to start to value public health more than the interests of the nuclear industry. It doesn't serve the public's interest if NRC fails to immediately inform the region's families of unplanned radiation releases from the Limerick Nuclear Power Plant, whether it is from an accident or terrorist attack.

The public needs and deserves more protective standards and immediate notification of any accidental radiation release from Limerick.

I also encourage everyone in this region to contact federal officials and request an investigation into NRC's policies and procedures on permissible radiation limits, and their failure to revise outdated, unprotective standards.