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.

More Protective Radiation Standards Are Needed To Protect Our Region Until Limerick Closes

➢ 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, There Are Alarming Cancer Statistics in Montgomery County 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.

- **Childhood Cancer – Alarming Statistics**

  - **71% Increase in Childhood Cancer Deaths** (Ages 1 to 14)- Montgomery County. 1980's to 90s - Surrounding counties, state, and nation went down

  - **92.5% Above National Average** – (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.
  - **128% Increase** – 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
  - **39.2% Higher** – (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 By Age** (diagnosed 1995-1999) - Compared to the National Average

Age	% HIGHER than U.S.
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**
  - **Almost Doubled in Montgomery County in a 5 year period - 1995 to 1999**
  - **In Pottstown,** (Limerick Nuclear Power Plant mailing address), Brain Cancer Rates Are **Significantly Higher Than State Average** 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 **Malignant Tumors** are **far higher than the state average**, 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/beir7pressrel.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

Necessary Actions For Protecting The Most Vulnerable Populations In NRC Radiation Standards

1. Protect the most vulnerable by accounting for more vulnerable populations in NRC standards.

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

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. High Cancer Rates Near Reactors. 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. Underestimation of Risk. 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. Miscalculation of Dose. 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. Elevated Risk to Fetus and Infant. 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. New Findings on Fetal/Infant Susceptibility. 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).

6. 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. New Findings of Nuclear Worker Risks. 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. New Findings on Short Latency Period. 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. New Findings on In-Body Radioactivity. 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.