

**Radiation and Public Health Project**

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RULES AND DIRECTIVES  
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July 14, 2006

Dear Sir/Madam:

Please accept the following comments, and consider them when preparing the Supplemental Environmental Impact Statement regarding the proposed license renewal of the Oyster Creek Nuclear Generating Station.

I direct the Radiation and Public Health Project (RPHP) research group, which specializes in the study of health risks posed by nuclear weapons and reactors. Our members, who are scientists and health professionals, have published 22 medical journal articles and written 5 books on the topic since 1994.

I and my colleagues find the recent Generic Environmental Impact Statement for Oyster Creek to be deficient in assessing health risk of extending the reactor's license for 20 years. The assumption that environmental releases of radioactivity do not pose a health risk because amounts are below federally permitted levels is presumptive, and does not constitute sound public health policy. Actual/historical effects of environmental releases should be thoroughly studied and the public informed of any potential or actual health risk before the license extension is considered.

The assumption that low dose radiation exposure was harmless has been contradicted for several types of exposure:

- Pelvic X-rays to pregnant women were performed regularly until studies (starting with Dr. Alice Stewart's work in the 1950s) showed that such exposures raised risk of cancer to the fetus during childhood.
- A 1997 National Cancer Institute study estimating as many as 212,000 Americans developed thyroid cancer from exposure to radioactive iodine was the first admission by the federal government that bomb tests had harmed Americans.

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- In a 2000 report, the U.S. Energy Department made its first admission that occupational exposures to nuclear weapons facility workers resulted in elevated cancer risk.

In the case of Oyster Creek, there is considerable data to suggest that emissions from the plant have entered the environment and human bodies, and are a potential co-factor in local cancer rates.

1. Emissions. Oyster Creek has historically released much higher levels of environmental radioactivity compared to other U.S. nuclear reactors. From 1970 to 1993, it emitted a total of 77 curies of Iodine-131 and particulates into the air, the highest of any U.S. reactor. (Data from Radioactive Materials Released from Nuclear Power Plants, annual report 1993. NUREG/CR-2907).

In 2003, the last year for which data is available, Oyster Creek ranked high among U.S. reactors for the following isotopes (data are taken from the NRC Radiation Exposure Information and Reporting System on effluents, available at [www.reirs.com/effluent/EDB\\_rptLicenseeReleaseAmtsQuery.asp](http://www.reirs.com/effluent/EDB_rptLicenseeReleaseAmtsQuery.asp), and expressed in total microcuries:

Strontium-90	62.3	1 <sup>st</sup> highest
Strontium-89	6233	2 <sup>nd</sup> highest
Barium-140	8672	2 <sup>nd</sup> highest
Iodine-131	10770	9 <sup>th</sup> highest
Krypton-85m	21100000	4 <sup>th</sup> highest
Krypton-87	81900000	2 <sup>nd</sup> highest

2. Environmental Radioactivity. Levels of environmental radioactivity near Oyster Creek are much higher than in areas far from nuclear plants (i.e., Waretown, one mile from the plant, vs. Trenton, 50 miles distant). The information is taken from annual measurements in drinking water from 1984-2003 from the U.S. Environmental Protection Agency program known as Environmental Radiation Ambient Monitoring System (<http://oaspub.epa.gov/enviro/erams>), and expressed in average picocuries per liter.

Strontium-90	Waretown .0553	Trenton .0264
Gross Alpha	Waretown .925	Trenton .088
Gross Beta	Waretown 2.015	Trenton 1.523

Thus, gross alpha levels are more than ten times higher in Waretown, Strontium-90 is more than two times higher, and gross beta is 32% higher.

3. In-Body Radioactivity. Since 1998, RPHP has conducted a study of Strontium-90 in baby teeth, the only study of in-body levels near U.S. nuclear plants. The study, which is patterned after a similar study of bomb test fallout by Washington

University in the 1960s, has tested nearly 5,000 teeth for concentrations of this isotope. Five peer-reviewed medical journal articles have been published on study findings, giving the study recognition from the scientific community.

In New Jersey, over 600 teeth have been tested, many from Ocean and Monmouth Counties, which are closest to and downwind from Oyster Creek. From 1986-89 to 1994-97, the average picocuries of Sr-90 per gram of calcium in teeth at birth rose nearly 50% in recent years:

Births from 1986-89 2.51 pCi/g Ca (n=44)  
 Births from 1994-97 3.76 pCi/g Ca (n=31)

This finding, which duplicates that found near six other U.S. reactors, nullifies the contention of some critics that all Sr-90 in teeth are from bomb tests of the 1950s and the 1960s. Discussion of other sources of Sr-90 and why it is likely that much of the Sr-90 represents ongoing emissions from nuclear plants can be found in Mangano JJ et al. An unexpected rise in strontium-90 in US deciduous teeth in the 1990s. The Science of the Total Environment 2003;317:37-51.

4. Local Cancer Rates. Infants and children are especially susceptible to the harmful effects of radiation. In 2003, the U.S. Environmental Protection Agency published a report estimating that exposures to persons under age two are 10 times as harmful as similar exposures to adults.

According to the New Jersey cancer registry, Ocean and Monmouth Counties have a rate of cancer diagnosed in children under age ten in 1981-2000 that is 24% higher than the U.S. rate (significant at p<.001). A total of 523 local children were diagnosed over the two decades. U.S. data is from the SEER data base of nine U.S. states and cities.

	Cases 0-9	Pop. 0-9	Cases/100,000
Monmouth/Ocean	523	2,720,723	19.22
U.S.			15.50

In addition, the rate of cancer deaths among Monmouth and Ocean County children age 0-9 has steadily risen in the past two decades, while state and national rates have fallen. Data are from the National Center for Health Statistics, available at <http://wonder.cdc.gov>, underlying cause of death.

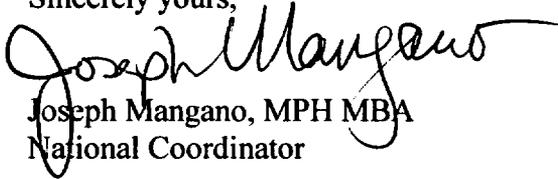
5 Year Period	Deaths 0-9	Avg.Pop 0-9	Deaths/100,000
1980-84	21	114,346	3.67
1985-89	26	126,415	4.11
1990-94	29	141,374	4.10
1995-99	34	153,988	4.42

Change 1980-84 to 1995-99	
Monmouth,Ocean counties	+20.2%
New Jersey	- 22.9%
U.S.	- 35.4%

While these four areas are presented separately here, RPHP has examined potential links between Oyster Creek radioactivity and cancer. In our most recent journal article, we found that trends in average Sr-90 in baby teeth Monmouth and Ocean county children were followed by similar trends in cancer incidence rates age 0-9 in the two counties, with a five-year latency. Findings were duplicated near the Brookhaven and Indian Point nuclear facilities in New York. Thus, RPHP has found a statistical link between Sr-90 in local teeth and cancer risk. More work needs to be done, but this evidence should be taken seriously. (Data published in Mangano JJ. A short latency between radiation exposure from nuclear plants and cancer in young children. International Journal of Health Services 2006;36(1):113-35).

In conclusion, I and my colleagues urge the NRC to thoroughly examine potential health risks from Oyster Creek using available data – rather than just presuming that permissible doses are safe – before making a decision on the 20 year license extension for Oyster Creek.

Sincerely yours,

  
Joseph Mangano, MPH MBA  
National Coordinator