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Division of Administrative Services
Office of Administration
Mailstop TWB-05-B01M
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Sir,

Following are the substance of the remarks that I made in Monroe, MI at the scoping event gathering public comments on January 14 directed to inform NRC's own environmental impact statement. These comments support **my opposition to the construction of the Fermi 3** nuclear reactor near Monroe, MI and to encourage you to call for a moratorium on the construction of all nuclear plants until the **many overwhelming dangers to health** cited below are resolved.

I. Recent Essential Facts on Health Hazards of Nuclear Generating Reactors

1. Thus U.S. National Academy of Sciences has confirmed in 2006, for the seventh time, conclusive evidence that **every exposure to radiation increases the risk to human health**. Radioactivity can damage tissues, cells, DNA and other vital molecules, potentially causing programmed cell death (apoptosis), genetic mutations, cancers, leukemias, birth defects and reproductive, immune, cardiovascular and endocrine system disorders.

2. Among the many environmental concerns surrounding nuclear power plants, there is one that provokes public anxiety like no other: the fear that **children living hear nuclear facilities face an increased risk of cancer**. In fact, the carcinogenic effects of radiation exposure are most severe among infants and children. Leukemia is most closely associated with exposures to toxic agents such as radiation, and has been most conclusively studied by scientists. In the U.S., **childhood leukemia incidence has risen 28.7%** from 1975 to 2004, according to CDC data, suggesting that more detailed studies on causes are warranted.

3. The November, 2008 issue of the *European Journal of Cancer Care* published a US **study of children living near nuclear plants**. The authors are epidemiologist Joseph Mangano, MPH MBA, Director of the Radiation and Public Health Project and Janette Sherman, MD, of the Environmental Institute at Western Michigan University. They analyzed leukemia deaths in children ages 0-19 in the 67 counties near 51 nuclear plants from 1957-1981. Nearly 25 million people live in these counties, and the 51 plants represent nearly half of the U.S. total. Using mortality statistics from the U.S. Centers for Disease Control and Prevention, Mangano and Sherman found that in 1985-2004, the change in local child leukemia mortality (v. the US) compared to the earliest years of reactor operations were:

- An increase of 13.9% near nuclear plants started 1957-1970 (the oldest plants, still operational).
- An increase of 9.4% near nuclear plants started 1971-1981 (newer plants).
- A decrease of 5.5% near nuclear plants started 1957-1981 and later decommissioned.

The 13.9% rise in mortality rates near the older plants suggests a potential effect of greater radioactive contamination near aging reactors, while the 5.5% decline near closed reactors suggests a link between less contamination and lower leukemia rates. The large number of child leukemia deaths in the study (1292) make the results statistically significant.

4. Before Mangano and Sherman's study, **a 2007 meta-analysis** was published in the *European Journal of Cancer Care* by researchers from the Medical University of South Carolina. That report **reviewed 17 medical journal articles on** child **leukemia rates near 136 reactors**, and found that **all 17 detected elevated rates**. These were nuclear sites in the UK, Canada, France, Germany, Japan, Spain and the USA. The incidence of **leukemia in children under 9 living close to the sites showed an increase of 14 to 21 per cent**, while **death rates from leukemia were raised by 5 to 24 percent**, depending on their proximity to the nuclear facilities (*European Journal of Cancer Care, vol 16, p 355).* This study updates, with largely consistent findings, an analysis conducted in the late 1980s by the National Cancer Institute (NCI). That analysis, mandated by Senator Edward M. Kennedy (D-MA), is the only attempt that US federal officials have made to examine cancer rates near US nuclear plants.

5. In addition are **two new KiKK studies** conducted by German researchers of the University of Mainz (KiKK is a German acronym for Childhood Cancer in the Vicinity of Nuclear Power Plants), whose results were published in 2008 in the International Journal of Cancer (vol 122, p 721) and the European Journal of Cancer (vol 44, p 275). These found higher incidences of cancers and a stronger association with nuclear installations than all previous reports. The main findings **reported a 60 percent increase in solid cancers and a 117 percent increase in leukemia among young children living near all 16 large German nuclear facilities** between 1980 and 2003. The most striking finding was that those who developed cancer lived closer to nuclear power plants than randomly selected controls. Children living within 5 kilometers of the plants were more than twice as likely to contract cancer as those living farther away. This finding has been accepted by the German government as definitive. This indicates **twice as many cases of leukemia among children living near nuclear power plants**.

   The **German federal agency for irradiation protection has called the study a significant argument against nuclear power**. "Given the particularly high risk of nuclear radiation for children, and the inadequacy of data on the emissions of nuclear power plants, we must take the correlation between distance of residence and high risk of leukemia very seriously," Wolfram Koenig, director of the agency, stated at a press conference.

   The Mainz findings are consistent with others in France and Britain. In France, one such study in 1997, and another in 2001, showed a higher incidence of leukemia among children living near nuclear power plants.

6. The **1997 French study**, led by Jean Francois Viel, Professor of public health at the France Comte University, 300 km east of Paris, found that **children** frequenting the beaches at Cotentin on the Atlantic coast **near the nuclear power plant of La Hague**, or living within a radius of 35 km of the plant, **suffered leukemia well above the national average**.

   Another **French study from 2001** by Alfred Spira, of the National Institute of Health and Medical Research, confirmed Viel's results. Spira, who had first rejected the results of Viel's study, later changed his opinion when he found a disproportionately high number of cases of leukemia among people below 25 years old and living with in 35 kilometers of La Hague. When the sample studied was narrowed to **children ranging from 5 to 9 years old, living within 10 km** of the nuclear facility, the cases of **leukemia** were **6.38 times the national average**.

7. A British study from 2002 confirmed an older one from 1990 showing that the incidence of **leukemia among children of workers at the Sellafield nuclear power 400 km north of London was twice the national average**. Investigation by Heather Dickinson and Louise Parker

from the Childrens' Cancer Research Unit at the University of Newcastle confirmed the earlier results. Using data from 1957 to 1991, the researchers found that children of wokers at Sellafield were more likely to suffer leukemia and non-Hodgkins lymphoma (NHL, a group of cancers affecting the white blood cells) than the national average. In their study, Dickinson and Parker conclude that the Sellafield workers' **children born** in Seascale (the village **near the Sellafield nuclear** reprocessing plant) **ran on average 15 times higher risk** of developing leukemia and NHL, and that the Sellafield workers' children outside Seascale ran twice the risk.

II. Discussion of Further Considerations

The **findings** reported **in the 1980s and 1990s regarding leukemia clusters** are again **being repeated**. A Report in 2004 by the Committee Examining Radiation Risks of Internal Emitters set up by the UK government points out that the models used to estimate radiation doses from sources emitted from nuclear facilities are riddled with uncertainty. For example, assumptions about how radioactive material is transported through the environment or taken up and retained by local residents may be faulty.

If radiation is indeed the cause of the cancers detected, how might local residents have been exposed? Most of the reactors in the KiKK study were pressurized water designs notable for their high emissions of tritium, the radioactive isotope of hydrogen. Last year, the UK government published a report on **tritium** that concluded that its **hazard risk should be doubled**. **Tritium is most commonly found incorporated into water molecules**, a factor not fully taken into account in the report. So this could make it even more hazardous.

As we begin to pin down the likely causes of elevated cancer rates, the new evidence of an association between increased cancers and proximity to nuclear facilities support the following: **Pregnant women and young children should be advised to move away** from them. Local residents should be advised **not to eat vegetables from their gardens**. **Governments** around the world that are considering construction of new reactors **should** be advised to **defer approval**.

III. Call for Moratorium on New Nuclear Plants Until:

There is here, and from many other sources, ample support for a moratorium on new nuclear plants until the following requirements are fulfilled:

1. There are more definitive answers obtainable through more pertinent scientific studies.
2. There are defined, EPA limits on safe radioactive levels in the air, water and soil.
3. There is a need for development of a new group of age-specific "reference persons" instead of what has been referred to as a "reference man" in defining the "acceptable" limits of exposure to radiation among pregnant women, children and other vulnerable groups.

I stand behind these arguments and encourage you to give full acknowledgement of the increased evidence for the need to protect our citizens from the increasing exposure to radiation in our environment.

Sincerely,

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