



**INSTITUTE FOR ENERGY AND ENVIRONMENTAL RESEARCH**

6935 Laurel Avenue, Suite 201  
Takoma Park, MD 20912

Phone: (301) 270-5500  
FAX: (301) 270-3029  
e-mail: [ieer@ieer.org](mailto:ieer@ieer.org)  
<http://www.ieer.org>

For further information:  
Arjun Makhijani (301) 270-5500 or (301) 509-6843

**NEWS RELEASE**

**for use after 11am EST Wednesday, January 7, 2009 teleconference**  
**To receive the call-in number and code, contact IEER 301-270-5500, [ieer@ieer.org](mailto:ieer@ieer.org)**

**NEW REPORT: U.S. RADIATION PROTECTION REGULATIONS HEAVILY RELY ON “REFERENCE MAN,” WHITE, MALE, ADULT STANDARD But Women and Children Often Get Higher Doses and Are at Greater Cancer Risk**

***EPA tells Sen. Obama and Chairman Waxman it “does not believe in continued use of Reference Man” but has made no regulatory changes***

*Takoma Park, Md., January 7, 2009:* A major new study released today shows that U.S. radiation exposure regulations and compliance assessment guidelines often fail women and children because they are based on “Reference Man,” a hypothetical 20 to 30 year old “Caucasian male”.

At least three federal agencies -- the Environmental Protection Agency (EPA), Nuclear Regulatory Commission (NRC) and Department of Energy (DOE) -- still use Reference Man in radiation dose regulations and compliance assessment, including the Clean Air Act and some safe drinking water rules, despite evidence that it fails to adequately protect many groups.

“The use of Reference Man standard is pervasive in U.S. radiation protection regulations and compliance guidelines,” said Arjun Makhijani, Ph.D., author of the report and president of the Institute for Energy and Environmental Research (IEER). “This is wrong because it often fails to adequately protect groups other than young, adult white males. Children, for instance, frequently get larger, and hence more dangerous, doses of radiation from the same environmental conditions. Moreover they often have a higher risk of cancer per unit of dose. In such cases, they suffer a double whammy – greater dose and greater risk per unit of dose. Reference Man needs to be replaced with a framework that better protects all members of the public.”

Dr Makhijani noted that women are 52 percent more likely to get cancer from the same amount of radiation dose compared to men. Children are at even greater risk than adults. A female infant has about a seven times greater chance of getting cancer than a 30-year old male for the same radiation exposure. Pregnant women and the developing fetus are particularly vulnerable to radiation exposure. Yet, non-cancer reproductive effects are generally not part of the U.S. regulatory framework for radiation protection.

In May 2008, then-Senator Barack Obama and House Oversight and Government Reform Committee Chairman Henry Waxman sent a letter to the EPA asking about the agency's use of "Reference Man." In its response, EPA stated that it "does not believe in the continued use of Reference Man," but admitted that it is still being used in some guidelines. But it also made the sweeping statement that "current standards and guidance are protective."

"This is not a hypothetical problem -- it affects real people," said Cynthia Sauer, who lived with her husband and three young daughters near two nuclear power plants in Illinois. "I became aware of and concerned about the use of Reference Man in radiation standards after my daughter was diagnosed with brain cancer." Mrs. Sauer's 7-year old daughter was among other cancer-stricken children in the area.

"I started asking questions when I read about the leaks at the Dresden and Braidwood nuclear power plants that released more than six million gallons of radioactive waste into our groundwater," Mrs. Sauer said. "Government agencies could not answer my question as to what levels were safe for a 7-year-old, 40-pound girl. The fact is, current standards are not protecting the most vulnerable members of our society and this must be changed."

The report recommends that compliance with radiation protection always be estimated by calculation doses for those most at risk and calls for a significant reduction in the maximum allowable dose to the general public from 100 millirem per year to 25 millirem per year. It also recommends a revamping of EPA's guidance documents to reflect doses received by males and females of all ages.

"If the EPA truly 'does not believe in continued use of Reference Man,' as it said in its letter, then it should carefully examine the continued use of this model and change the regulations and compliance assessment guidance documents," said Dr. Makhijani. "We hope that the incoming Obama administration, with its commitment to health and environmental protection, will do so with dispatch. The NRC and DOE also need to make significant changes."

Other recommendations of the report include tightening of radiation protection for women in radiation workplaces who declare their pregnancies and the development and publication of official federal guidance on *in-utero* dose estimation methods, including in the early stage of pregnancy.

The IEER report provides policy guidance for the incoming Obama Administration and Congress. It is currently being considered by the Transition Team along with House leaders.

--30--

IEER's "Reference Man" recommendations, the full report (46 pages) and the correspondence between Senator Obama and Chairman Waxman and the Environmental Protection Agency regarding Reference Man are available at [www.ieer.org](http://www.ieer.org) (the specific URL is [www.ieer.org/reports/referenceman.pdf](http://www.ieer.org/reports/referenceman.pdf)).