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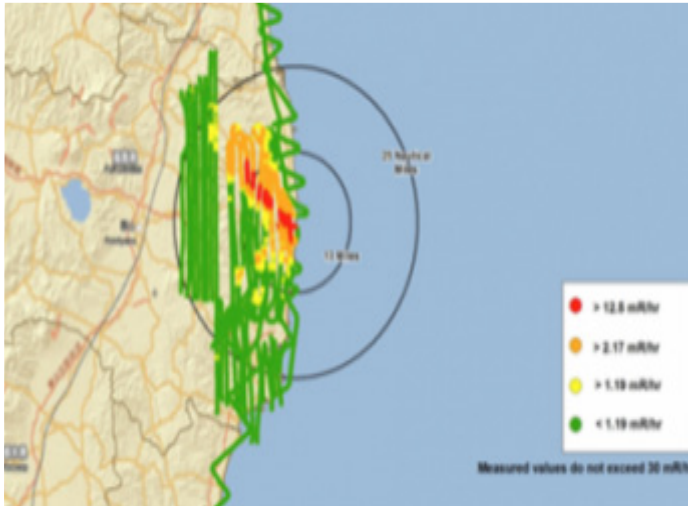
# REMAPPING DEBATE

Asking "Why" and "Why Not"

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## DOE actively misleads on risks of radiation exposure

**Original Reporting** | By Craig Gurian | Environment



March 23, 2011 — The U.S. Department of Energy yesterday released maps showing levels of radiation observed to have been released from the damaged Fukushima nuclear power plants in Japan, the accuracy of which Remapping Debate has no reason to doubt; more revealing, however, was [the explanatory material that DOE included in the slide show purportedly to put the data in context](#). On that front, it is clear that DOE was being misleading — selectively using and omitting information to downplay the general risk that radiation poses to the public in situations separate and apart from that which may be currently occurring in Japan.

The behavior is consistent with what Remapping Debate has found over the last several days of reporting: when asked about what level of radiation would be “of concern” in terms of potential medium- and long-term increases in adverse public health consequences, neither DOE, the Environmental Protection Agency, nor the Nuclear Regulatory Commission is prepared to answer directly and straightforwardly.

### Now you see it, now you don't

Thus, DOE's chart of “radiation doses explained” shows an NRC annual exposure limit of 5,000 millirems for nuclear plant workers and describes the EPA's “protective action guidelines” as recommending the implementation of protective measures when there is exposure of 1,000 millirems over four days. (DOE describes the average U.S. annual dose of radiation from natural and manmade sources as 620 millirems.)

DOE omits to mention that the recommendation of the National Council on Radiation Protection and Measurements — which was chartered by Congress in 1964 to study and report on radiation protection and measurements — in respect to annual effective dose limits for the public in the case of continuous or frequent exposure is only 100 millirems; NRRP further recommends that fetal exposure not to exceed 50 millirems in any single month.

DOE also fails to explain that EPA’s protective action guidelines specifically disclaim the use of those guidelines for the determination of a “safe” level of radiation: the guidelines “do not imply an acceptable level of risk for normal (nonemergency) conditions,” the guidelines themselves state. “They also do not represent the boundary between safe and unsafe conditions.” On the contrary, they represent a cost-benefit analysis that, for purposes of potential cancer and genetic effects, is mediated by considerations of what is “reasonably achievable” in emergency conditions. A decision that avoidance of a level of radiation exposure is not reasonably achievable in emergency circumstances — and thus does not warrant the use of overtaxed emergency resources — does not mean that the exposure is safe.

Finally, DOE’s reference to activation of protective action guidelines over the course of four days fails to mention that nuclear events don’t simply end in the manner of a fire being put out: intermediate- and long-term risks are created when radioactive materials are deposited in the environment.

According to Damon Moglen, Climate and Energy Project director at Friends of the Earth, “With Cesium and Iodine, one of the things we’ve got to be worried about is not just external doses; we have to be worried about inhalation and ingestion. And when we hear that water is contaminated, milk is contaminated, and green leafy vegetables are contaminated, we’ve just found the immediate pathway into the human body.”

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One of the unanswered questions: How much Cesium-137 per cubic meter of air would be “of concern” for the public?

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Indeed, EPA’s intermediate term protective action guidelines for food come into play at levels lower than the 1,000 millirems that DOE references.

## Cesium-137: the gift that keeps on giving

Questions about potential risk arise in connection with a variety of radioactive materials. Cesium-137, a gamma ray emitter, is certainly not the only problematic isotope that is released in a nuclear accident, but it is widely agreed that Cesium-137 is one of the truly bad actors. “Because of the gamma ray’s penetrating power and ability to travel great distances,” EPA acknowledges on its site, “it is considered the primary hazard to the general population during most radiological emergencies. In fact, when the term ‘radiation sickness’ is used to describe the effects of large exposures in short time periods, the most severe damage almost certainly results from gamma radiation.”

But unlike Iodine, with a relatively short half-life, Cesium-137 has a half-life of approximately 30 years. That means that, even in 60 years, 25 percent of the original radioactivity will be present. Thus, Cesium-137 is around— first to be inhaled, then to be ingested from contaminated food or water — for a long time. And, once ingested, it does not stop delivering radiation to the body.

## Questions for DOE, EPA, and NRC

Our reporting started with a review of a Mar. 18 joint press release from DOE and EPA. That press release was headlined, “Radiation monitors confirm that no radiation levels of concern have reached the United States.” The obvious question was, and is, what levels of radiation would be of concern. The press release didn’t say, although the agencies were happy to compare airborne concentrations of radioactive materials to levels of background sources of radiation.

EPA and DOE pointed to airborne concentration of Xenon-133, a radioactive gas, in becquerels per cubic meter of air. A becquerel is a measure of radioactive activity, specifically, the decay of one nucleus per second. Were Cesium-137 present in the air, that concentration could likewise be measured.

Remapping Debate was not interested in a recitation comparing existing airborne concentrations with background levels of radiation (since 1945, as it happens, those background levels, says Moglen, have been on a “constant upward slope,” in part, says Norman Kleiman, the director of the Eye Radiation and Environmental Research Laboratory at Columbia’s Mailman School of Public Health, because of increased use of medical imaging equipment, but also because of the continuing legacy of the fallout from atmospheric nuclear tests that ended four decades ago.)

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We were interested in how the government translates differing potential levels of airborne concentrations of Cesium-137 (that very bad, long-lasting actor) to the creation of a material increase in the risk of medium- and long-term health effects. A standard, in other words, that could be applied to any nuclear event.

And that is exactly what we asked DOE. That agency wouldn’t answer. It said such standards as existed were EPA’s standards, and that EPA should be consulted. DOE did continue to try to turn the discussion to reiterating that current emissions from the Japanese power plants were not of concern, and ultimately asked rhetorically in the face of repeated follow-up, “How much clearer can we be?”

So we made some suggestions by way of illustrating potential straightforward responses, including, “The radiation level that begins to be of concern to us is 5 times the normal background level” and “The radiation level that begins to be of concern to us is [fill in the blank] particles of Cesium-137 per cubic [fill in the blank].”

That just got us another referral to EPA. Ronald G. Fraass, the Director of EPA’s National Air and Radiation Environmental Laboratory who we contacted first, was obliged, he said, to refer us to EPA

headquarters. Repeated inquiries there did ultimately yield an email statement, but the statement was entirely unresponsive to the questions posed. Instead, as with the joint press release with DOE, the focus was on trying to explain that existing levels are not of concern.

EPA wouldn't even confirm that background levels of radiations have increased significantly since the 1940s, let alone provide the information requested on airborne concentration of Cesium-137 that raises concern, or whether the level of concern would be different for those on the ground as compared with that for airline travelers and personnel travelling while Cesium-137 was present at an elevated level in the jet stream.

Another follow-up yielded no reply, and the NRC gave no reply at all to the question of airborne concentration of concern.

## How low is low?

The Mailman School's Kleiman pointed to the NCRP standards as providing a very significant margin of safety. These are the standards that include a recommended cap of 50 millirems per month for fetal exposure.

It is not, however, universally agreed that those standards are sufficiently stringent.

For example, the fallout from the Chernobyl accident that was deposited in Sweden caused a maximum dose of 400 millirems in the first year, according to a 2008 study by a group of three researchers who were looking at the impact of prenatal exposure to Chernobyl fallout in that country.

Nevertheless, the researchers found that "students born in regions of Sweden with higher fallout performed worse in secondary school," and that, "From a public health perspective, our findings suggest that neural development is compromised at radiation doses currently considered safe."

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## "Trivialize, trivialize, trivialize"

EPA's "Radiation Risks and Realities" brochure begins with language indistinguishable from industry promotional materials from the 1950s: "It's natural and all around us. It comes up from the ground,

down through the atmosphere, and even from within our own bodies. It can be man-made too. But it's nothing new. It's been present since the birth of the planet. It's radiation, and radiation is, quite simply, part of our lives."

Why won't governmental agencies simply set forth risk without constantly trying to downplay it, Remapping Debate asked? Wouldn't doing so make genuine reassurances be more persuasive to the public? According to Moglin of Friends of the Earth, when it comes to setting forth domestic risks, the government is inclined to "trivialize at every juncture." He described the posture as "in a way acting towards people as if they're children and we can't have mature dialogue and discussion," adding, "That's why utter transparency and real time provision of information is essential."

Moglin included the need for information on U.S. military personnel who recently flew through radioactive plumes near Japan: "there are no numbers, and we were never told anything about external versus internal dose."

## **A threat level for radiation?**

Airborne concentration cannot predict with precision the amount of radiation contamination that will be deposited on a particular piece of land because of variables such as wind and rain.

None of the experts with whom we spoke, however, thought it was impossible or impractical to assign relative risk to different levels of airborne concentration. Ian Fairlie, a consultant on radioactivity including risks of internal emitters like Cesium-137, said he thought that there could be an easily-coded system for different levels of risk as a function of the number of becquerels of a contaminant per cubic meter of air.

"That's the kind of thing you want: you want something very simple, straightforward, that ordinary people can understand."

This content originally appeared at <http://remappingdebate.org/article/does-actively-misleads-risks-radiation-exposure?>