



NUCLEAR INFORMATION AND RESOURCE SERVICE

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STATEMENT OF MICHAEL MARIOTTE, EXECUTIVE DIRECTOR NRC MEETING ON EMERGENCY PLANNING, SEPTEMBER 13, 2012

We appreciate the NRC's interest in emergency planning and the need to improve the existing inadequate emergency evacuation and planning regulations. But I am somewhat puzzled about this scoping meeting: NRC has not, to the best of my knowledge, proposed any changes to these regulations. But we have.

We have proposed serious and meaningful improvements to the existing emergency planning regulations. Our petition for rulemaking, supported by thousands of people across the U.S., should form the basis for any changes the NRC is considering to emergency planning regulations.

Our recommendations are clear-cut and, by expanding the existing emergency planning zones and requiring emergency exercises that encompass concurrent or initiating natural disasters—providing vital training to emergency personnel--would extend an essential layer of protection to millions of Americans.

Dominique French of NIRS will go into more detail about the specifics of our petition and its rationale.

I want to focus today on two issues:

*the inappropriate use of computer codes and simulations about accident consequences in emergency planning regulation;

*our changing understanding of the risks of radiation exposure, as well as the public's changing expectations about the level of protection expected from nuclear accidents since emergency planning regulations were first promulgated in response to the Three Mile Island accident more than 30 years ago.

Inappropriate use of computer simulations

Computer simulations of accident causes and consequences have an important function: they can identify and alert regulators to weaknesses or vulnerabilities in specific reactor designs and

thereby cause improvements in designs. They can identify and alert regulators to the probable paths and source terms of radiation releases in the event systems fail, potentially leading to more effective emergency response.

But what computer simulations, such as the NRC's recent SOARCA process, cannot do—especially in the context of emergency response planning—is substitute for real-life experience.

And we have had, over the past 30 years, far too much real-life experience that has had a direct bearing on emergency response planning.

Let's face it, on March 10, 2011, the odds of a nuclear accident involving multiple explosions of reactor buildings, multiple simultaneous meltdowns, and multiple threats to fuel pools, would have been considered so infinitesimally insignificant that such a scenario would never have shown up in a computer simulation such as SOARCA. But it happened.

25 years earlier, it's unlikely any computer simulations predicted that operators would deliberately disable essential safety systems and then try to run tests on an essentially unstable reactor. Yet that's what happened at Chernobyl.

Today's computer simulations probably would and do consider the component failures at Three Mile Island, and possibly the operator errors as well. But they didn't predict the accident before 1979, when such an accident was officially considered "incredible." Real life has a way of changing assumptions that are programmed in to computer simulations.

The point is that computer simulations such as SOARCA can never encompass the full gamut of the limitless possibilities that real life can, and does, deliver, nor the scenarios of the future that may currently be beyond our imagination. Maybe now, computers—and regulations—can be reprogrammed to account for the effects of a massive earthquake and tsunami on an unprepared nuclear reactor complex. But that isn't likely to be the cause of the next nuclear disaster: more likely, it will be something that is currently considered so infinitesimally small that, like Fukushima on March 10, 2011, it isn't even being considered at all.

Yet that is precisely the kind of thing emergency evacuation and planning regulations—the last defense to protect the public after all else fails—must address, must be prepared for, must be effective against.

Real-life experience matters. At Fukushima, real-life fortunately gave the Japanese a break. Fully 80% of the airborne radiation released by the Fukushima accident went directly east over the Pacific Ocean and never threatened land. Of course, we are already hearing some nuclear apologists argue that the consequences of Fukushima aren't so great, or no one has died so they say, or radiation levels are lower than someone might have expected. But, think about that real-life for a moment. If the wind had been blowing from the melting Fukushima reactors steadily toward Tokyo with the same intensity it was blowing toward the Pacific Ocean and 500% more

radiation had been deposited over that densely-populated area than actually was, no one would be trying to downplay the effects of Fukushima. It wouldn't be possible, and Japan would most likely no longer be an industrial power in the world. It would be a nation scrambling for sheer survival.

It should go without saying, of course, that relying on favorable wind patterns is not an acceptable emergency response technique.

Our changing understanding of the risks of radiation exposure, as well as the public's changing expectations about the level of protection expected from nuclear accidents

The NRC's emergency planning regulations, including the 10-mile Emergency Planning and evacuation zone, were promulgated after the 1979 Three Mile Island nuclear accident, during which pregnant women and children—a few thousand people--within five miles of the reactor were advised by very Pennsylvania's governor to evacuate. The actual evacuation, of course, involved hundreds of thousands of people from as far away as many dozens of miles from the reactor.

In adopting its emergency planning regulations, and in denying a petition to expand the emergency planning zone following the 1986 Chernobyl disaster, the NRC decided that a 10 mile planning and evacuation zone is sufficient to protect the public from acute effects of radiation exposure—in other words, to prevent instant deaths--from a large, fast-moving but relatively short release of radiation, a spurt if you will.

And indeed, 10 miles may be a sufficient planning basis for that type of accident, to protect against acute exposure for large, fast-moving releases.

But, as real-life has shown, real nuclear accidents are not necessarily short nor fast-moving. Both Fukushima and Chernobyl spewed massive amounts of toxic radiation for days; in Fukushima's case, for months (indeed, a year and a half later, Fukushima is still releasing unacceptable levels of radiation).

And, since 1979, two other things have happened. Our understanding of the effects of radiation have improved, and in tandem with that, the public is no longer content (if indeed, it ever was) with protection against only acute exposure and instant death. Rather, government protection and regulation against environmental threats of all kinds, not just radiation, must be oriented toward protection against many other adverse consequences, such as cancers and other disease, economic losses, displacement, and the like.

In short, emergency planning and evacuation regulations that exist only to prevent instant, or early, deaths among the population are not good enough and will not achieve support among the public. These regulations must, to the extent possible, prevent exposure to radiation levels that

can cause potentially crippling or fatal disease such as cancer, even if that disease may not manifest itself for years or even decades.

At the same time, the American public has learned, through the National Academy of Sciences Biological Effects of Radiation Committee (BIER-VII) that there is no such thing as a “safe” level of radiation exposure. Any exposure holds some risk, and the risk rises with the level of exposure. Moreover, women are 50% more susceptible to radiation than men, and children are even more susceptible than women. Yet NRC and EPA radiation exposure standards are antiquated--based on exposure to the “average man,” rather than to the most vulnerable among us as would be appropriate, since there is no way, of course, to limit radiation exposure only to the least vulnerable.

The American people expect to be protected against radiation levels that would cause instant or early death. But they also expect to be protected against radiation levels—which are more likely—that could cause cancer or other diseases. And those levels can easily be projected, probably even under some SOARCA scenarios, far beyond 10 miles. And whether or not they can be projected by computer simulations, they have existed in real life. Real life matters far more than any computer simulations.

Earlier this week, we learned of the first confirmed case of thyroid cancer among Fukushima victims. This is certainly the first of very many. At Chernobyl, of course, there have been thousands of such cases. Projections of Chernobyl fatalities range widely—from a few thousand according to the World Health Organization to a million or more asserted by former Soviet scientists and researchers. NIRS co-released a major study in 2006, along with the Greens in the European Parliament, that projected 30,000-60,000 deaths from Chernobyl, and we continue to stand behind that study. We believe Fukushima victims will also climb into the thousands, even though there are no known instances of immediate or early death due to radiation exposure.

The American people simply will not accept being left—being abandoned essentially—in areas where they could receive radiation exposures after a nuclear accident that could cause thyroid cancer and other cancers and diseases. Especially since, with adequate evacuation, those diseases could be prevented. And I certainly would not want to be the government official who tried to tell them that it just isn't that important to evacuate because, after all, the government has determined the radiation levels they're being exposed to won't kill them immediately—it'll take some time. That would be doing a heckuva job, Brownie....

Now, some might argue that if the need is not necessarily to evacuate to prevent acute exposure levels, but rather chronic exposure levels, then the need for speedy evacuation, emergency exercises, and the like is not so great. If there is more time to evacuate, then it could more properly be called a re-location, and be done in a more deliberate fashion.

Except that, in real-life, the largest releases do tend to come early; even if they may not have been immediately life-threatening at Fukushima, they were significant. The Fukushima levels

were certainly high enough in the first hours and days to cause greatly increased risk of cancer and other disease, and had the wind been blowing toward populated areas rather than the Pacific Ocean, would have been high enough to adversely affect a very large population. Without planning, without knowing evacuation routes, without training, such an accident in a highly populated area—such as Indian Point, or San Onofre, or Limerick, or any of dozens more reactor sites—would lead not only to mass chaos and panic, but to publicly-unacceptable levels of consequences.

The NRC's job is to prevent that. When reactor safety systems fail—and they obviously do in real-life—emergency planning and response is the last line of defense. Right now, that line isn't good enough, it isn't strong enough, to meet the needs of the American people. It's time to improve the regulations, time to improve the real-life response to meet the demands placed by real-life situations. Don't try to tell the American people that computers have projected that radiation releases in nuclear accidents will be so low that emergency evacuation may not be necessary, that emergency planning rules can be weakened. The American people saw real nuclear reactors explode on their TV screens, and they know radiation is dangerous. They know that real-life is far more complex than computer games, and that reality is far more dangerous than computer-generated scenarios. The American people know better. And they know the NRC should know better too.