MONITORING MATTERS

One in three Americans lives within 50 miles of a nuclear power plant, yet the United States does not have a comprehensive nationwide radiation monitoring system to protect the public.

Without comprehensive monitoring to determine actual levels, it is impossible to enforce regulations which limit allowable levels of man-made radiation in the U.S. environment.

The Environmental Protection Agency (EPA) is charged with protecting citizens and the environment from all pollutants. The Nuclear Regulatory Commission (NRC) is charged with protecting public health and safety (and also the environment) from unsafe exposures to civilian ionizing radiation (radionuclides). Neither agency, not the EPA nor the NRC, provides modern, real-time comprehensive monitoring of radioactivity; and therefore, neither agency can fulfill its mission and enforce regulations limiting radionuclide exposures.

Both the EPA and NRC continue to use antiquated, averaged systems, which are untimely and incomplete. They do not fully monitor nor report levels of man-made radionuclides released into the U.S. environment; but they could, simply by upgrading to modern methods and technologies.

Current State of National Monitoring Programs

The NRC has transferred the responsibility of monitoring both routine and accidental reactor emissions to commercial reactor operators, and the operators are only required to report averaged quarterly emissions in annual reports. This is clearly 'the fox watching the hen house' using an outdated system. Local officials and Emergency service responders throughout the country are forced to rely on the operator to self-report radiation leaks.

Many reactor operators have existing real time radionuclide monitors in place (inside containment structures, at guard stations, and around perimeters), and some have monitors which cover wide-ranges surrounding the plants; but reactor operators are only required to record averaged radionuclide readings quarterly, then report the averaged levels annually to the NRC.

This inadequate exposure data, with public disclosure being delayed for a year, does not benefit the people exposed, and it does not reflect the state of today's technologies. It would cost very little (compared to the benefit in public confidence and safety) for operators to: 1.) link online with the real-time data already going to emergency services, 2.) add additional modern monitors that automatically upload real time data to the internet, and 3.) replace area dosimeters (that require manual removal of filters to then be sent to a laboratory for analysis) by upgrading to modern detectors capable of identifying and uploading the levels of hundreds of radionuclides online in real time. The existing NRC regulated monitoring system is antiquated.

The EPA system, called RadNet, is an open-data system that posts Alpha particulates in real time, but uses delayed laboratory results for its sampling of air, precipitation, drinking water and milk from 100 monitoring stations nationwide (and 40 mobile units). Unfortunately, the RadNet System is not reliable, operates inconsistently, and most of the thinly scattered monitoring stations are not located downwind of nuclear power reactors. RadNet does not show daily

spikes, its data is averaged, and the RadNet System is only a sampling system, not a comprehensive monitoring system. *(*http://www.epa.gov/radnet/about-radnet/index.html*)*

Some States have implemented their own radiation monitoring programs. One of the most comprehensive is in Nevada, due to its extensive history of above ground testing. Nevada's radiation monitoring system, known as the Community Environmental Monitoring Program *(*http://cemp.dri.edu.cemp/*),* is operated by the Department of Energy and the Desert Research Institute*,* which depends on volunteers – many of them high school science teachers – to visit its radiation monitoring stations, collect air filters, and bring them to a laboratory for testing.

Citizen efforts to monitor radiation in our environment have been growing since Fukushima. One group (RadiationNetwork.com) collects data from hundreds of private citizens nationwide who run geiger counters with data uploading automatically to a website in real time. Their online map also displays potential sources of radiation, including nuclear power reactors, testing sites and waste collection facilities. Other groups providing similar networks are located near Hanford, Washington, and San Onofre, California. Recently Woods Hole Institute began a citizen science monitoring program to help track radioactive plumes from Fukushima across the Pacific. In the three years since Fukushima, a group called Safecast (http://blog.safecast.org) has developed technology and extended volunteer citizen radiation mapping to 46 countries around the world. Yet the United States has an antiquated system of averaged and delayed data, rather than a coordinated cross-agency nationwide network of real time online radionuclide mapping.

Conclusion:

There is a clear lack of and need for comprehensive, national, real time radionuclide monitoring – coordinated by the responsible U.S. government agencies.

Instead of relying on outdated, antiquated averaging, mature technologies are now available to conduct accurate, expedient monitoring, compatible with internet mapping systems to follow radioactive plumes (like weather tracking), to 'connect the dots' – detect and possibly prevent rogue releases. As Homeland Security is well aware, small modern instruments (http://gs.flir.com/detection/radiation/handhelds/identifinder2) can detect and identify specific radionuclides, and solar powered units (http://medcom.com/radiation-monitors/monitoring-system/) can remotely survey levels of Alpha, Beta, Gamma, and xRays, – all online in real-time – vastly diminishing the threat of nuclear terrorism, if deployed in a nationwide online network. This is an established and affordable technology; yet U.S. agencies have not upgraded to implement a comprehensive, real time radionuclide monitoring program.

Part of the problem is jurisdictional accountability, which prevents compatible networking and leaves the public in danger, a problem that prevented safe evacuations away from the Fukushima plumes in Japan. The NRC limits its responsibility to commercial plant operators, only requiring averaged emission release level reports annually, and allowing gaps in the data and questionable averages to go unchallenged. The EPA has a RadNet network online, but only has thinly scattered monitors across the country reporting limited data inconsistently. In order to provide a national real time radiation network online, U.S. agencies need to coordinate and modernize.

MONITORING MATTERS

The 100 million Americans living within fifty miles of nuclear power plants deserve to know when and where they are being exposed to potentially toxic radioactive poisons. The technology is solid, and accurate information will increase public confidence and safety.

It is time for United States agencies, the EPA and NRC, to upgrade their antiquated monitoring requirements and equipment, and provide the public with transparent, verifiable, and comprehensive real time radionuclide monitoring online.

We propose U.S. agencies coordinate and upgrade to modern equipment for expediency, accuracy, and compatibility to 'connect the dots' and keep relevant agencies and the public informed of radionuclide levels nationwide.

Additional Recommendations:

Additionally, we propose the NRC require Public Health Alerts be posted when radioactive releases are scheduled and/or detected, with legal precedent being Connecticut Public Act 08-20: An Act Concerning Radiation Releases. There are other toxic spill alerts, smog alerts, even pollen alerts for U.S. citizens – yet no public health alerts for commercial ionizing radiation.

We also propose that the EPA and NRC add an emergency preparedness requirement that visible dye-markers be dispersed along with emergency radioactive plume releases. When radionuclide releases exceed permitted levels, a dye-release-valve can be activated to disperse visible tracers to travel with the gas or liquid release plume. Uranine florescent dyes, already used to trace water pollutants, were successfully tested as aerosol tracers making atmospheric pollutants visible up to eight miles in 1959. Advancements in dispersal technologies and dye compositions should make this straightforward safety feature far more effective today. Many studies have been done on more complex (hind-cast and network dependent) methods of plume detection, from computer modeling to post-incident Air Force and robot sensor tracking. However, we propose this economically sound and immediate solution (critically helpful to first-responders and the public), which is a simple system of direct dye dispersal at radionuclide release points.

Fukushima school children were evacuated directly under an invisible radioactive plume rather than away from it; and for natural gas, odor-markers were not required until an explosion killed 300 school children in Texas. We call on our government to remember those Texas families and the victims of Fukushima Dai-ichi who could not see the radioactive plume as they tried to escape it – and to require dye-markers for emergency radiation releases.

With both modern and simple technologies, we propose the U.S. use these straightforward methods to MAKE RADIATION VISIBLE and thereby increase the safety and confidence of its citizens – with public health alerts, emergency dye-markers, and real-time online monitoring.

MONITORING MATTERS, since environmental rules and regulations cannot be enforced without monitoring – and public health and safety cannot be protected.

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