

The Boice Report #29



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When Bad Things Happen—Emergency Responders

We live in a world of crisis and uncertainty. Bad things happen. Natural disasters are all too common, such as the devastation caused by Hurricane Katrina in 2005 and, more recently, Hurricane Sandy in 2012. Reactor accidents have had enormous consequences—[Chernobyl](#) in 1986 and [Fukushima](#) in 2011. And now we contend with terrorist actions such as the 11 September 2001 (9/11) commandeering of our passenger planes that crashed into the World Trade Center, the Pentagon, and a field in Pennsylvania (I'm friends with Todd Beamer's family) and the Boston Marathon bomber in 2013. We can't ignore or forget these terrors and we must plan for the unthinkable. "Who you gonna call" when an improvised nuclear device (i.e., atomic weapon) goes off in your backyard? Who's at the ready when the "Let's Roll" call goes out?



World Trade Center, New York, 9/11/2001
Photo courtesy of HPS member Naomi Harley, taken from her apartment window

Since 9/11 local, state, and federal governments have [increased efforts](#) to prevent terrorist acts and have developed [plans](#) to deal with the consequences of a major nuclear incident. The National Council on Radiation Protection and Measurements (NCRP) was one of the first off the blocks in developing guidance in the aftermath of a terrorist action involving nuclear materials ([NCRP Report No. 138](#) was prescient and published in October 2001). Today there remains a critical need for guidance in managing dosimetry issues after a major radiological emergency within our borders. NCRP recently partnered with the New York City (NYC) Department of Health and Mental Hygiene (DOHMH) in cooperation with state and federal agencies and initiated Scientific Committee 3-1 on [Guidance for Emergency Responder Dosimetry](#), which met in August 2014 ([photo on page 15](#)).

Why is dosimetry important? Radiological or nuclear terrorism can occur anywhere, at any time, and without warning. There is a critical lack of consistent guidance, standards, and regulations for managing dosimetry issues in the early phase of a radiological emergency. [Dose assessment](#) is needed for worker safety (the key issue), medical management (triage those you can treat, make comfortable those you can't), medical surveillance (for delayed effects in individuals), epidemiology (to study late-occurring health effects in populations), liability and compensation claims, and reassurance. [Biodosimetry](#) is also of import. Inconsistencies and confusing guidance on dosimetric issues might result in public safety agencies compromising their mission to save and sustain life in order to comply with legal dosimetry regulations.

Synopsis of meeting. The August 2014 meeting, held in the NCRP Bethesda offices, began with seven presentations: "Goals" (Steve Musolino and Adela Salame-Alfie), "Implementation Guidance for Responder Dosimetry" (Jeanine Prud'homme), "Radiological/Nuclear Terrorism Scenarios to 'Set the Stage'" (Brooke Buddemeier), "Tools to Address Large Mass Casualty Radiological and Nuclear Incidents" (Judy Bader), "Dose Reconstruction" (Helen Grogan), "Dosimetry Program of the New York City Fire Department" (Rich Schluack), and "Emergency Worker Dosimetry: A Small Town, Small State Perspective" (William Irwin). A roadmap was drawn for producing the NCRP guidance documents, assignments were made, and all left committed to this important work that no one wished would ever be put into operation.

Prequel. In December 2013 I met with the NYC DOHMH, local NYC police and firefighters, and state and Brookhaven professionals concerned about [radiological terrorism](#) and emergency preparedness. It was sobering to hear the firsthand accounts of the heartbreaks surrounding the collapse of the World Trade Center buildings, the loss of personal friends and colleagues, the horror of dealing with death (but trying to save lives), and the apocalyptic reality of a world falling down (and not a Revelation prophesy or vision). Recall the ominous words in 2009 of the released al Qaeda terrorist (and now leader of the Islamic State): [“I’ll see you guys in New York.”](#) There is no wonder [New York City is concerned](#)—bad things happen in the Big Apple and it is a target. Our NCRP efforts started here (i.e., urban concerns with sophisticated infrastructures), but we expanded to include guidance for all the nation, including rural areas, small towns, and any region that might be affected by acts of radiological or nuclear terrorism.

What are the committee goals? (1) Develop guidance on methods to minimize responder radiation exposure. (2) Evaluate existing regulations governing dosimetric records for emergency responders working during a radiation incident and recommend improvements. (3) Develop guidance for emergency dosimetry to measure dose received (external and internal), record dose over the chronological phases of the incident, and facilitate retrospective dose reconstructions. (4) Provide guidance on how to classify emergency responders—how to distinguish a radiation worker (Occupational Safety and Health Administration, Nuclear Regulatory Commission, or state radiation program regulations for occupational doses), an emergency worker (persons who routinely do not work in radiation environments but have a role in emergency response, such as firefighters, police, and bus drivers aiding with evacuations), hazardous waste operations personnel ([29 CFR 1910.120 HAZWOPER](#) standard), and Good Samaritans (volunteers who want to help).

The plan. An NCRP report will provide guidance on how to determine doses in instances where personal dosimetry is incomplete or not available and identify changes in how the recording of the dose will evolve as the nuclear incident transitions from the emergency phase (where the radiation environment is not well characterized and preplanning exposures are minimal) to the recovery phase (where the preplanning and supervision of exposures are performed to industry standards and in accordance with regulatory requirements). A second document will be issued as a commentary companion or statement derived from the content of the report, but focused on the operational implementation. This second document will be short, concise, brief, operational, and understandable. When the firefighters, police, bus drivers, and Samaritans are called to action, there is no time to read a 500-page report!

Bottom line. The NCRP report and commentary will provide comprehensive programmatic and operational guidance on the use of dosimetry during and after a major nuclear emergency.

Scientific Committee 3-1 on Emergency Response Dosimetry



Front row, left to right, Daniel Blumenthal (U.S. Department of Energy), Stephen Musolino (Brookhaven National Laboratory), Adela Salame-Alfie (New York State Department of Health), Ruth McBurney (Conference of Radiation Control Program Directors), and Brooke Buddemeier (Lawrence Livermore National Laboratory).

Back row, left to right, David Schauer (NCRP), John Boice (NCRP), Jeanine Prud’homme (Bureau of Environmental Emergency Preparedness & Response, New York City Department of Health and Mental Hygiene), Helen Grogan (Cascade Scientific), Tammy Taylor (Pacific Northwest National Laboratories), Judith Bader (U.S. Department of Health and Human Services), Richard Schlueck (Fire Department City of New York), and William Irwin (Vermont Department of Health)