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NCRP PROGRAM AREA COMMITTEE 3: NUCLEAR AND RADIOLOGICAL SECURITY AND SAFETY

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Abstract

The National Council on Radiation Protection and Measurements (NCRP) Program Area Committee (PAC) 3 covers the broad subject of nuclear and radiological security and safety and provides guidance and recommendations for response to nuclear and radiological incidents of both an accidental and deliberate nature. In 2017, PAC 3 Scientific Committee 3–1 completed the development of Guidance for Emergency Responder Dosimetry and began development of a companion commentary on operational aspects of that guidance. PAC 3 members also organized the technical program for the 2017 Annual Meeting of NCRP on "Assessment of National Efforts in Emergency Preparedness for Nuclear Terrorism: Is There a Need for Realignment to Close Remaining Gaps." Based on discussions and presentations at the annual meeting, PAC 3 is working to develop a commentary on the subject that could serve as a roadmap for focusing our national efforts on the most pressing needs for preparing the nation for nuclear and radiological emergencies. PAC 3 is also engaged in active discussions exploring the landscape of priority issues for its future activities. An important consideration in this discussion is the extent of NCRP's present and potential future resources to support the work of its scientific committees.

Keywords

National Council on Radiation Protection and Measurements; accidents; handling; dosimetry; nuclear weapons

INTRODUCTION

Radiological and nuclear terrorism remains a national security concern not only in the United States but around the world. The National Council on Radiation Protection and Measurements (NCRP) Program Area Committee (PAC) 3 provides guidance and recommendations for response to nuclear and radiological incidents of both an accidental and deliberate nature. The main objectives of PAC 3 are to:

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- identify important steps to be taken in the interdiction of, preparedness for, and effective responses to possible acts of nuclear and radiological terrorism;
- define performance requirements, instrumentation, and testing criteria for security surveillance systems;
- develop operational strategies and optimization procedures for early, intermediate, and late-phase responses to a radiological incident or nuclear incident; and
- recommend effective methods for protecting against, mitigating, and treating traumatic injuries and long-term health and psychological effects of radiation exposure.

RECENT ACTIVITIES

The NCRP draft report on *Guidance for Emergency Responder Dosimetry*, prepared by Scientific Committee 3–1 (SC 3–1), chaired by Adela Salame-Alfie and Steve Musolino, was completed and distributed for Council review. The comments were addressed, the document was approved, and it is now in process of being prepared for publication. This report provides guidance on how to determine doses in instances where personal dosimetry is incomplete or not available and identifies changes in how the recording of the dose will evolve as the event 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.

SC 3–1 will continue work under the same leadership to produce a commentary to serve as a companion document. This commentary will be based on the content of the SC 3–1 report but focus on the operational implementation. The scope will cover programmatic and operational issues faced by state and local organizations.

PAC 3 members also led the preparationfor the technical program presented at the 2017 NCRP Annual Meeting, “Assessment of National Efforts in Emergency Preparedness for Nuclear Terrorism: Is There a Need for Realignment to Close Remaining Gaps?” Several members of PAC 3 served as co-chairs and members of the program committee or chaired the technical sessions at the meeting. This was a collaborative effort that involved Council members from other PACs as well as national experts from outside NCRP who served both on the program committee and as chairs of technical sessions. The program committee wanted this meeting to take an introspective look at the advances that had taken place in the last 15 y, focusing on several key areas of preparedness, and ask the following questions:

- What are the remaining critical gaps in our ability to effectively respond to nuclear/radiological incidents?
- Are we doing enough to address these gaps?
- Are there areas where we have done enough and additional work will only achieve minimal, incremental gains?

- Do we need to realign our national efforts?

The chairs and presenters for each session worked as a small working group in preparation for this annual meeting to coordinate what they presented as a team at the meeting. The quality and quantity of questions asked after each session reflected the degree of audience engagement at this meeting.

Members of PAC 3 also met in person prior to the annual meeting to discuss several topics of interest. The 2017 PAC 3 meeting agenda included an overview of U.S. Department of Homeland Security (DHS) Science and Technology Radiological/Nuclear Response and Recovery (RNRR) research and development programs by Ben Stevenson. The RNRR's three main goals are (1) improve incident management, (2) support responders, and (3) minimize community impact. He provided an overview of the 16 projects currently being worked on:

- Gross Decontamination App
- Radiological Dispersal Device Planning Support in Urban Areas Security Initiative (UASI) Cities
- TurboFRMAC (Federal Radiological Monitoring and Assessment Center) Expansion & Support
- Radiation Detection Pilot–Grand Central Terminal
- Radiological Operations Support Specialist (ROSS) Program Development
- Radiological/Nuclear Responder Support
- Improvised Nuclear Device Decision Making and Virtual Gaming
- Radiation Detection Pilot–Gamma Pix
- Development of Organic Radiochromic Compound
- Emergency Dosimetry Guidance
- Fast Running Urban Dispersion Model
- Preventive Radiological & Nuclear Detection (PRND) Equipment for Consequence Management
- Development of ROSS Tools
- International Rad/Nuc Tools Analysis
- Characterizing and Tracking Plume Signatures with Radar
- Waste Estimation Support Tool (WEST) Expansion and Public Works Evaluation

Brooke Buddemeier and Bill Irwin expanded on a specific element of the ROSS program, the development of a reference toolkit that would help the ROSS understand key guidance on issues such as zone determination, responder protective measures, and contamination screening. The last topic set the stage for a presentation by Caleigh Samuels, a doctoral student at Georgia Institute of Technology who was invited to participate in the PAC meeting and present her work on the scientific basis for external contamination screening criteria.

This was followed by a presentation from Gladys Klemic on how portal monitors need to be arranged during a mass screen event to optimize throughput.

Several PAC members commented on the importance of the DHS Science and Technology activities and were very impressed with the rapid progress and how well the individual projects complemented each other and addressed many of the national shortcomings previously identified by the PAC.

Lastly, the leadership of PAC 3 was transitioned in March of 2017. Tammy Taylor, who served as PAC chair since March 2015, will continue as a member as well as serve on the NCRP Board of Directors, while Armin Ansari will co-chair PAC 3 with Brooke Buddemeier. The new members of PAC 3 include Gladys Klemic, John Lanza, Mike Noska, and Frieda Fisher-Tyler.

ONGOING AND FUTURE ACTIVITIES

There are three ongoing activities associated with PAC 3. These activities are described below:

1. After successful completion of SC 3–1 report, *Guidance for Emergency Responder Dosimetry*, this committee is turning its attention to drafting a companion commentary on the same topic, focusing on the operational aspects and implementation of this guidance. To that end, it is likely that new member(s) who have an operational perspective will be asked to join this committee to assist with developing content of this commentary.
2. A new committee will be formed to draft a commentary based on the discussion at the 2017 annual meeting, addressing the gaps and issues identified and on the recommendations to meet those urgent preparedness needs. The commentary is anticipated to serve as a roadmap for focusing national efforts on the most pressing needs for preparing the nation for nuclear and radiological emergencies. It is anticipated that session co-chairs from the annual meeting will participate in drafting of this commentary and that the commentary will be completed by the end of calendar year 2018.
3. PAC 3 is actively engaged in discussions, exploring the landscape of priority issues the PAC can provide guidance and recommendations for in relation to response to nuclear and radiological incidents of both an accidental and deliberate nature. Informing this discussion are:
    - The technical presentations from the 2017 annual meeting of the NCRP;
    - Previous work by PAC 3 identifying topical areas relevant to NCRP and/or PAC 3;
    - Issues identified in Gotham Shield Exercise (April 2017), which involved near simultaneous detonations of improvised nuclear devices in the United States and Canada;

- Ongoing work at various state and federal agencies; and
- NCRP resources and collaboration with members of other PACs.

In any discussion of future activities, PAC 3 will consider priority needs as well as NCRP's present and potential future resources to support the work of its scientific committees in specified technical areas. Some of the issues under consideration include:

- Respiratory protection for emergency workers who are NOT first responders (these include workers and volunteers at public shelters or community reception centers, bus drivers, etc.);
- Registry and long-term follow-up of affected populations after a nuclear/radiological disaster;
- Responding to a mass casualty nuclear/radiological incident;
- Contamination screening action levels for members of the public after a radiation emergency;
- Mitigation of short and long-term psychological effects of radiation exposure;
- Use of smart phone as a radiation detector in emergency situations;
- Hospital inventory of equipment; and
- Media toolkit for use in radiation emergencies.

CONCLUSION

PAC 3 has a broad range of issues in a technical and scientific area that is of utmost national significance. NCRP's role is to assist by providing guidance and recommendations where they are needed. To that end, NCRP PAC 3 is responsive to the needs of the nuclear/radiological emergency preparedness and response community and draws from national expertise from inside and outside the Council as needed to provide the best scientific and technical advice and recommendations. There are many gaps identified, as discussed at the 2017 Annual Meeting of the NCRP. The challenge is to prioritize the work of the PAC members, considering the nation's needs as well as resources that could be available to support the work of NCRP's scientific committees.

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