CONFERENCE OF RADIATION CONTROL PROGRAM DIRECTORS, INC.

BOARD OF DIRECTORS

POSITION

Relating to: Naval Nuclear Propulsion Program Areas of Planning Attention

The CRCPD Board adopted the following position on June 3, 2011, based on a proposed position by the CRCPD E-37 Committee on Naval Nuclear Propulsion and discussions with E-37 Committee members.

The U.S. Naval Nuclear Propulsion Program (NNPP) homeports, routinely services, or locates (for prototype plants) NNPP reactor plants in, or in close proximity to, eleven states. State and local emergency response programs in these states have an interest in the consequences within their jurisdictional areas of potential radiological incidents involving these reactors, as they do for commercial power reactors operated in, or in close proximity to, their jurisdictional areas. This position provides CRCPD's concurrence in a recommendation by the NNPP concerning the potential impact of radiological incidents involving NNPP reactors on civilian populations in the vicinity of their operation.[1]

The NNPP is the federal agency responsible for recommending the appropriate emergency planning to state and local officials for NNPP reactors. The U.S. Nuclear Regulatory Commission (NRC) performs a similar role for commercial reactors. The NRC addresses basic emergency planning requirements for reactors under its jurisdiction in 10 CFR 50, Appendix E. Emergency Planning Zones (EPZs) for commercial nuclear power reactors are further addressed in NRC NUREG-0654/FEMA-REP-1. Due to design, operational, and jurisdictional differences, commercial nuclear power reactor EPZs are not appropriate for NNPP reactor plants. The differences in design and operation of NNPP reactor plants compared to commercial nuclear power plants result in a much smaller potential impacted area from a radiological incident involving an NNPP reactor plant compared to a commercial nuclear power plant.[2]

In place of EPZs, the NNPP has designated Areas of Planning Attention (APAs) to assist state and local officials in assessing the need for any preplanning in the vicinity of NNPP reactor plants. The APAs extend ½ mile around each location where U.S. nuclear-powered warships are normally berthed or NNPP prototypes are located. Detailed, conservative analyses performed by the NNPP conclude that the early phase Protective Action Guides specified by the Environmental Protection Agency (EPA) and Food and Drug Administration will not be exceeded beyond the APA for radiological incidents involving NNPP reactor plants.[3, 4]

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[1] Neither the NNPP recommendation nor CRCPD concurrence in that recommendation should be interpreted as constraining on responsible state and/or local officials with regard to decisions on appropriate emergency planning outside of NNPP facilities.

[2] The NNPP reactor plants have lower power ratings than commercial nuclear power plants. Further, U.S. nuclear powered warships typically operate at low power or are shut down in or near port because power levels are directly linked to propulsion requirements, and prototype reactor plants are typically operated at low power as a result of their training mission. As a result, the amount of radioactivity potentially available for release from the reactor of a U.S. nuclear powered warship in port or from a land-based prototype is less than about one percent of that for a typical commercial nuclear power reactor. In addition, NNPP reactors are designed to withstand battle shock conditions, and the shipboard reactors sit in an unlimited source of water that can be used for emergency cooling and can be moved away from a nearby population if necessary.

[3] The analyses performed by the NNPP to develop the APA are equivalent to those performed by the NRC and EPA in NUREG-0396/EPA 520/1-78-016 for the development of the early phase EPZ, but are updated for subsequent changes in NRC analysis methodology and EPA and FDA Protective Action Guides, and reflect NNPP reactor plant specific design attributes. Both analyses examine accident scenarios using assumptions in reactor plant design and operations that are much more severe than would be realistically expected in order to generate a conservative estimate for potential release source term and downwind consequences. The NNPP analyses show that the smaller size and lower power history of NNPP reactors compared to commercial nuclear power plants alone would justify the reduction from the NRC/FEMA 10-mile EPZ for commercial power plants to the Navy's ½-mile APA.

The NNPP findings are consistent with the conclusions of the National Academies of Sciences (NAS) in their report on Distribution and Administration of Potassium Iodide in the Event of a Nuclear Incident.[5] In that report, NAS concluded that stockpiling or distributing potassium iodide to the public surrounding naval bases due to the operation of U.S. nuclear-powered warships is not necessary because of design and operational features that limit the likelihood of occurrence and the radiological impacts of credible naval reactor accidents.

The CRCPD E-37 Committee on Naval Nuclear Propulsion has reviewed the Navy's ½-mile APA and concurs in the incorporation of the NNPP APA concept in state and local emergency plans where U.S. nuclear powered warships are home ported or routinely serviced, or where NNPP prototypes are located.

The concurrence is based on: 1) the recommendation provided by the NNPP as the responsible federal agency for operational and safety aspects of the NNPP's reactors and the potential impact of any radiological incident; 2) detailed classified briefings by NNPP to States where U.S. nuclear powered warships are home ported or routinely serviced, and prototype plants are located, concerning the technical bases for the ½-mile APA; 3) the fact that the analyses performed by the NNPP to develop the ½-mile APA are equivalent to those performed by the NRC and EPA for commercial nuclear plants, and used the same atmospheric modeling programs that are currently used by NRC and most states; and 4) the National Academy of Sciences' findings concerning the lack of need for stockpiling potassium iodide for the public for an NNPP radiological incident.

Alice Rogers, P.E.
CRCPD Chairperson

Approved by the CRCPD Board of Directors June 3, 2011.

[4] There are some cases where the APA includes limited areas beyond the boundaries of NNPP facilities. In those cases, the NNPP works with state and local officials concerning emergency plans for these limited areas, and has found that state and local officials have concluded that existing all-hazards emergency response plans for responding to natural and industrial disasters are adequate to protect the public in these limited areas.

[5] National Academy of Sciences. (2004). Distribution and Administration of Potassium Iodide in the Event of a Nuclear Accident. Washington, D.C.: National Academies Press.