**Department of Energy**
Washington, DC 20585

April 11, 2006

Rules Docket Clerk
Office of the General Counsel
Federal Emergency Management Agency
Room 840
500 C Street, SW.
Washington DC 20472
Attention: Docket Number DHS-2004-0029, Z-RIN 1660-ZA02

Dear Sir or Madam:

The U.S. Department of Energy (DOE) has reviewed the Department of Homeland Security Notice, "Preparedness Directorate; Protective Action Guides for Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents," published in the January 3, 2006, *Federal Register* (71 FR 174). DOE participated in the development of this guidance and supports the interagency consensus recommendations. We believe the guidance provides the necessary framework for implementation of protective actions following an RDD or IND incident. Enclosed are consolidated comments and recommendations from an agency-wide review of the *Federal Register* Notice. The comments generally relate to the need for additional guidance, particularly for response to an IND; clarification or explanation of certain terms or recommendations; and recommendations and concerns related to consistency.

DOE appreciates the opportunity to comment on the draft guidance and looks forward to continuing to participate in its completion and in the development of any supplemental guidance.

Sincerely,

Andrew Wallo
Director
Office of Air, Water and Radiation
Protection Policy and Guidance

Enclosure

cc: Craig Conklin, DHS

**Enclosure**

**United States Department of Energy**
**Comments on**
**"Application of Protective Action Guides (PAGs) for Radiological Dispersal Devices (RDD) and Improvised Nuclear Device (IND) Incidents"; Notice**
**(71 FR 174; January 3, 2006)**

The Department of Energy (DOE) supports the guidance provided in the subject document and believes it represents an appropriate framework for providing protective action guidance for responding to an RDD and IND. The Department's comments generally address three themes: the need for additional guidance for responding to an IND incident and PAGs implementation; the need to clarify or explain certain terms used in the document; and a recommendation to update the appendices to be consistent with organization and terms used in the National Response Plan and its Nuclear/Radiological Incident Annex.

1. Page 182, Section (d)(3)(i) and Table 1. Although the subject PAGs can address response for most RDD incidents and parts of an IND incident (the impacted areas miles from the center of the incident), supplemental guidance is needed to address the more highly contaminated areas impacted by an IND. Modeling shows that dose rates in the rems/hour for distances up to tens of miles from the epicenter could exist for nominal *(5-10kT IND)* incident and accumulative doses of 300 rem or greater in the first 24 hours for distances over 5 miles from the epicenter. The 1-5 rem shelter-in-place and evacuation PAGs do not provide planners or decision makers with an appropriate response approach for situations where the affected parties already have received tens or even hundreds of rems or where the projected dose with either sheltering or evacuation is over 100 rem. Similarly, the PAGs for the early phase of an IND incident should address the probable need for emergency responders to enter areas substantially exceeding the nominal occupational level of 5 rem (or even the Appendix 1 25 rem response guideline) in order to extricate/evacuate individuals who would otherwise receive potentially fatal radiation doses. This is, to some degree, addressed in Appendix 1, but decision makers need more guidance for an IND situation. It is recommended that, to the extent possible, realistic assumptions should be used when making radiation dose projections, so that the final results are representative of actual conditions, as Appendix 1 suggests. Over estimating dose could result in delay of life-saving actions and deaths of individuals who could have been rescued. Some DOE reviewers also felt that for IND incident response, it may also be appropriate to increase the worker response guideline for life-saving from 25 rem to the NCRP recommended 50 rem for emergency actions or even 100 rads. These or other levels could still meet the primary objective of controlling doses to avoid acute effects but with a smaller margin of safety which these reviewers felt was justified by the risk to victims who might not receive life-saving care at the lower guideline.

2. Page 183, Section (d)(3)(i). Additional guidance would also be useful for application of the relocation PAG for an IND event. Since this PAG is based on an averted dose (the projected dose that could be received if the protective action is not taken) and does not apply to accumulated dose, careful consideration of the efficacy of recommending large-scale evacuations or relocations from areas in which the majority of dose has already been received should be taken. For example, for an IND event, a 2 rem dose exposure area could extend to distances approaching 100 miles from the event and cover several hundred square miles. Individuals in some of these areas could receive doses in excess of 2 rem in hours or days; however, the dose rate drops rapidly and subsequent additional dose would accumulate much more slowly. Hence, an action to relocate individuals would avert much less than 2 rem even though the accumulated dose exceeds 2 rem. In consideration of these issues, it is strongly recommended that additional information/guidance be provided that clearly indicates the PAGs are applied to avertable dose not accumulated dose.

3. Page 183, Section (d)(3)(ii) and Table 1. The intermediate phase PAGs include explicit guidelines for food and drinking water interdiction, as well as, relocation guidelines based on doses received from airborne/ground contamination. Neither Table 1, nor any discussion in the draft guidance, makes it clear that these PAGs are to apply independently to the affected pathway or media. It is recommended that this be explicitly stated, e.g., in a footnote to Table 1. Also, the discussion on the late phase PAG should explicitly state what exposure pathways need to be considered, e.g., ground contamination, resuspension, foodstuffs, drinking water, etc. There should also be guidance for foodstuffs consumed by "local" populations as well as for foodstuffs transported for consumption by populations not subject to any other impacts. It is also recommended that references be provided for recommended/accepted methodologies, e.g., RESRAD codes, for performing the pathway analyses necessary to determine release/clearance criteria under the late phase PAG

4. Page 183, Section (d)(3)(iii) We support the concept of optimization for determining late phase PAGs. However, given the goal of developing the initial optimization plan/process within six months of the incident, it is strongly recommended that additional guidance, or references to existing optimization processes, be provided with examples or case studies involving use of decision-making techniques such as cost/benefit or multi-attribute analyses for consideration of the full range of social, economic, technical capability, and health and safety issues associated with response and recovery from an event of nuclear terrorism. This would be especially useful for major RDD and IND incidents which involve large affected areas and significant social and economic impacts.

5. Page 183, Section (d)(3)(iii). While the draft guidance states that "a pre-established numerical guideline is not recommended" for the late phase PAG, it was recommended by most DOE reviewers that consideration be given to discussing some bounding values for the cleanup phase. One can presume given the 0.5 rem relocation guide that doses following cleanup will need to be below this level and, that for small RDD incidents cleanups, will likely achieve close to background levels. Nevertheless, it would be useful

to have case studies or examples that show cleanup ranges that might be considered for a large RDD and IND.

6. Page 184, Section (f) (iii). The implementation of the PAGs is to be supported by operational guidelines that can be readily used by decision makers and responders in the field. An example of a radiation level for control of access to radiation areas during the response of 2 mR/hr was cited in the guide. This value was developed for operation situations and may not be appropriate for an RDD or IND situation. It is recommended that as the operational guidelines are developed, other levels such as the 10 mR/hr value recommended by National Council on Radiation Protection and Measurements (NCRP) Report No. 138 be considered.

7. Page 184, Appendix 1. Some DOE reviewers were concerned that the term "occupational exposure" would create confusion between doses received as part of an emergency response and those that a radiation worker receives as part of normal operations. They were concerned that normal occupational dose limits might be confused with response worker guidelines and recommended that care be taken to ensure the concepts are clearly differentiated. It was noted that there has historically been a "gray area" in defining emergency dose limit levels and the guidance has not addressed when the "emergency" ends. Although the draft guidance defines emergency activity phases, these reviewers recommended the discussion in *Generic Procedures for Assessment and Response During a Radiological Emergency* (IAEA 2000) as a source of a clearly stated description.

8. Page 186, Table 1B. The first footnote for Table 1B states that "For potential doses > 10 rems, special medical monitoring programs should be employed, and exposure should be tracked in terms of the unit of whole body absorbed dose (rad) rather than total effective dose equivalent (TEDE) (rem)." However Table 1B provides the Response Worker Guidelines for lifesaving or protection of large populations in terms of "25 rems." Some reviewers felt this could cause confusion and questioned why the response worker guideline was not expressed in terms of rads. It is recommended that the footnote or the table's supporting text note that while the guidelines are projected doses and appropriately given in terms of rems, monitoring programs required when the projected dose exceeds 10 rem TEDE should measure rad in order to not underestimate the risk from dose levels that may cause acute effects. DOE reviewers also questioned the basis for a 10 rem trigger for additional monitoring. Although this level is common for normal operations, given conditions and priorities, for emergencies it would seem appropriate to consider a higher threshold for this additional monitoring recommendation – possibly 25 or even 50 rem should be considered.

9. Page 192, Appendix 3 (i). The draft protection action guidance was developed in parallel with the National Response Plan (NRP) and approved before the NRP was final. As a result, some terms in this section do not appear to be consistent with the newer NRP language. It is recommended that, before the PAGs are completed, they be carefully reviewed to ensure the terminology used is consistent with the NRP and the

Nuclear/Radiological Incident Annex (NRIA). In particular, the terms used to indicate the makeup of the teams that will initiate the recovery and site restoration planning process should be clarified and made consistent with the language used in the NRP and NRIA. Examples included Decision Team "head of the lead Federal agency," Recovery Management Team "Federal lead technical agency" and Technical Working Group "Federal lead technical agency assigned responsibility for performing cleanup." Discussion should be added to relate these individuals, for example, to the "Senior Federal Official for the Coordinating Agency as defined in the NRIA. This additional discussion and consistency is to ensure that Federal agencies understand what their responsibilities are and are prepared to carry them out.

10. Page 195, Appendix 4, Section f. In the "Release of Property from Radiologically Controlled Areas," the discussion states that release criteria during response and recovery operations should be "similar to those likely to define late phase goals." However, these release criteria will be needed during intermediate phase activities, long before late phase goals would likely have been determined, particularly for major RDD and IND incidents. Accordingly, it is strongly recommended that "default" release criteria in the form of operational guidelines be provided which are to, the extent appropriate, based on existing standards. Some reviewers suggested that such "default" clearance release criteria be based on risk/dose-based standards (e.g., ANSI N13.12-1999), *Surface and Volume Radioactivity Standards for Clearance*, instead of detection-based standards. Additional guidance should be provided regarding release of materials (e.g., personal effects) and possible adjustment of such release criteria to account for any "augmented background" in areas impacted by the RDD or IND incident, but outside radiologically controlled areas.

11. This draft guidance is intended for use by Federal agencies, and as appropriate, State and local governments, emergency responders, or the "incident commander" at the time of RDD or IND incident" to order protective actions. With such a wide applicability it is likely that this guidance will be used by organizations and individuals with limited familiarity, experience, or resources relative to impacts of radiological incidents, radiological emergency response, or appropriate training. It is recommended that references and links to sources of information/supplemental guidance be provided. Such references and links could be provided to supplement the operational guidelines web site cited in the *Federal Register Notice* (https://www.energy.gov/oe/listings/federal-register-notices) or on others such as the DHS disaster help web site ( Only Chrome) https://www.dhs.gov/disaster-assistance .