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Comment On: NRC-2010-0080-0009

NUREG-0654/FEMA-REP-1, Rev. 1, Supplement 3, Guidance for Protective Action Recommendations for General Emergencies; Draft for Comment

Document: NRC-2010-0080-DRAFT-0040

Comment on FR Doc # 2010-11842

Submitter Information

3/08/2010

Name: Jill Lipoti, PhD

Address:

PO Box 424

Trenton, NJ, 08625-0424

Organization: NJ Department of Environmental Protection

Government Agency Type: State

Government Agency: NJDEP

75 FR 10524

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General Comment

The attached document is submitted on behalf of the State of New Jersey Department of Environmental Protection. A hard copy has also been sent.

Attachments

NRC-2010-0080-DRAFT-0040.1: Comment on FR Doc # 2010-11842

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State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

Division of Environmental Safety and Health
PO Box 424
Trenton, New Jersey 08625-0424
Tel: (609) 633-7964
Fax: (609) 777-1330
August 4, 2010

BOB MARTIN
Commissioner

Ms. Cindy Bladey, Chief
Rulemaking and Directives Branch
Division of Administrative Services
Office of Administration
Mail Stop: TWB-05-B01M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Docket ID NRC-2010-0080

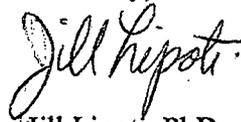
Dear Ms. Bladey:

The New Jersey Department of Environmental Protection has reviewed in detail the proposed changes to NUREG-0654/FEMA-REP-1, Rev. 1, Supplement 3, "Guidance for Protective Action Recommendations for General Emergencies"; Draft for Comment published in Federal Register / Vol. 75, No. 44 / Monday, March 8, 2010. On April 14, 2010, I wrote to Chairman Jazko expressing a number of concerns related to the timing of the implementation of the guidance and references contained within the document. Subsequent to that letter, the NRC made available NUREG/CR-6953, Vol. III. "Review of NUREG-0654, Supplement 3, 'Criteria for Protective Action Recommendations for Severe Accidents. Technical Basis for Protective Action Logic Diagram.'" The NJ DEP appreciates the timely action NRC took to address some of the concerns raised in my letter. However, not all of my concerns were addressed in the NRC response. Therefore, those specific issues will again be included in the NJ DEP's formal comments along with additional comments related to the draft guidance.

The NJ DEP appreciates the opportunity to provide feedback and comments on NUREG-0654/FEMA-REP-1, Rev. 1, Supplement 3, "Guidance for Protective Action Recommendations for General Emergencies. The proposed changes will certainly have a significant impact on the process the state and licensees use to develop Protective Action Recommendations. The proposed guidance represents a paradigm shift that will require re-educating key state, county and local decision makers and assessment staff. I understand that NRC and FEMA are in agreement with the technical basis, logic and intent of the methodology described in the document. Therefore, the NJ DEP believes that both NRC and FEMA should have a proactive role in the implementation process by providing support to offsite response organizations and licensees that request assistance in the interpretation and application of the methods described.

The following pages provide the comments and suggestions the NJ DEP would like the NRC to consider before finalizing the guidance document. If you have any questions or concerns regarding the comments provided please feel free to contact Mr. Patrick Mulligan at (609) 984-7701.

Sincerely,

A handwritten signature in cursive script that reads "Jill Lipoti".

Jill Lipoti, PhD

c: Paul Baldauf, Assistant Director, RPRP
Patrick Mulligan, Manager, BNE

Comment #1

In late 2004, the U.S. Nuclear Regulatory Commission (NRC) initiated a project with Sandia National Laboratories to analyze the relative efficacy of alternative protective action recommendation (PAR) strategies in reducing consequences to the public from a spectrum of nuclear power plant core melt accidents. The study results, documented in NUREG/CR-6953, "Review of NUREG-0654, Supplement 3, 'Criteria for Protective Action Recommendations for Severe Accidents,'" Volumes 1 and 2, (NRC, 2007a and NRC, 2008), (hereafter referred to as the PAR Study), show that shelter-in-place and staged evacuation can be more protective to public health and safety than radial evacuation, providing a technical basis for improving NRC PAR guidance.

There are three significant points related to the PAR study that impact the implementation of this guidance. First, the PAR study was based upon a hypothetical site with generic weather and a population of about 80,000 people based on 100 residents per square kilometer in the 10-mile plume exposure pathway emergency planning zone (EPZ). The applicability of the proposed guidance and the findings of the PAR study are applicable only to the extent that site specific considerations match the assumptions of the PAR study. The further the population density and demographics get from the model case the less applicable the findings. Under the site specific applicability, OROs and licensees will need the flexibility to make deviations from the guidance to match their local conditions.

Second, while the phone survey may be generally applicable across the nation, it may not be generally applicable at a specific site. State, county, local and tribal emergency response personnel are engaged regularly with the residents and stakeholders in the EPZ. OROs may have information or knowledge from interactions with the public that is contrary to the findings of the phone survey. In these cases, it would be appropriate to use this information in the development of site specific PARs even if it was contrary to the findings of the NRC PAR study. The implementation of Supplement 3 should allow latitude in implementation of the guidance to account for local variances.

Finally, state, county, local and tribal decision making may vary greatly depending on what organization is responsible. Further, there may be political considerations and standard practices, perhaps mandated by law, that require the development of protective actions and decision making that will not comply with the proposed guidance. Supplement 3 should address how these special considerations will be handled. It may be quite possible that OROs and licensees may not be able to reach agreement on a standard PAR logic diagram because of these conditions. NRC should provide guidance for such situations.

Comment #2

The NUREGs (NUREG/CR-6953, Volumes 1, 2, and 3) that support Supplement 3 make general assumptions regarding uniform population distribution and density. It also considers limited accident scenarios and plume modeling to support the findings that form the technical basis of the proposed guidance in Supplement 3. As stated in Comment #1, the applicability of the

guidance is limited to the extent to which the site specific conditions correspond to the hypothetical site in the model.

Further, dose reduction and plume exposure assumptions used in the study are limited to the extent to which the model accurately predicts radiological source term and atmospheric dispersion. Plume exposure models are useful tools to estimate potential doses to the public from exposures that result from radiological releases. The flaw in using dose modeling is that assessment staff and decision makers become overly confident that the model predictions will accurately predict outcomes of radiological releases. The NRC clearly states in its own documents that models that predict environmental consequences within a factor of three (3) are identical and those that are within a factor of ten (10) show good correlation. Clearly this indicates that models are not all that accurate and great care should be given to using the predictions for decision making.

Using dose modeling predictions to make PARs rather than plant specific parameters could conceivably result in protective actions that are not sufficiently conservative to the public. Conversely, they may lead to the development of PARs that are overly conservative and put the general public at greater risk. In the development of protective actions, there should be a balanced application of plant specific criteria and parameters along with the consideration of dose predictions to develop PARs. Direct field measurement is the only method to accurately validate public exposure and protective actions need to be implemented as far in advance of a plume arrival as possible to ensure public health and safety is protected. This argument is particularly important related to the position the NRC has taken in Supplement 3 on PAR upgrades for wind shifts. The guidance indicates that the decision to upgrade the PAR based on changes in meteorological conditions should be based on dose projections only. Plant conditions need to be included in the consideration of PAR upgrades in addition to what is known about source term in containment or being released through an effluent pathway. PAR upgrades for changing meteorological condition based on dose projections only could result in PARs that are not sufficiently protective of the public.

Comment #3

Supplement 3 uses the State-of-the-Art Reactor Consequence Analysis (SOARCA) as a reference document and uses the finding of that study in the section "Implementation of Guidance". The finalization and application of that study will have a significant impact on the PAR logic diagram provided in this draft of Supplement 3. The ensuing discussion describes the study and what that impact will likely be for the development of PARs.

The NRC established a study of severe accident phenomenology and consequences by the Sandia National Laboratory known as the State-of-the-Art Reactor Consequence Analysis (SOARCA). This multi-year study is nearing the point at which it will undergo independent peer technical review and then a separate technical review by the Advisory Committee on Reactor Safeguards (ACRS). Early findings from the SOARCA have been presented in various forums, including the NRC's Regulatory Information Conference (RIC) in March 2009 and the Workshop on implementation of Severe Accident Management (SAM) Measures convened in October 2009 by the Organization for Economic Cooperation and Development (OECD).

The preliminary results reported on at the March 2009 RIC and the OECD Workshop provided valuable insights into the findings of the SOARCA. It appears that the findings are materially important to the content of the proposed Supplement 3 to NUREG-0654. The SOARCA findings are of such significance that it is particularly prudent for NRC to take them into consideration in the development of any revisions to NUREG-0654 and its supplements. Clearly the SOARCA findings are preliminary and subject to change. However, the SOARCA findings are of particular relevance to Supplement 3 because they have the potential for substantially modifying the nature of emergency planning for nuclear power reactors and because those findings are likely to be issued in the relatively near term.

One of the more significant implications of the findings to date is that there is no large early release event commonly referred to as the Large Early Release Fraction (LERF). This is important because the proposed changes to protective action strategies in the draft Supplement 3 do assume a large early release (left hand side of the logic diagram). Additional implications for the proposed changes to Supplement 3 include the SOARCA findings that accident progressions generally are far slower than found in the accident models currently in use. This finding has implications for the extent to which protective actions are appropriate.

While the final outcome of the SOARCA is not known, it is reasonable to conclude based on what is already known that the study will have significant implications for radiological emergency planning. It would be imprudent to make changes to Supplement 3 that would be contradicted or at least substantially modified if the NRC adopts the SOARCA. Because the issuance of a final SOARCA report is anticipated in the foreseeable future, the interests of public health and safety are better served by delaying the issuance of the changes in this draft Supplement 3 until the Commission has the opportunity to study and act on the SOARCA.

Comment #4

In each of the public presentations the NRC provided, the NRC has indicated that the initiating event that constitutes a rapidly progressing severe accident would be "self-revealing". Volume 3 of the PAR study was released recently and provides the technical basis for the severe accident scenario that gives rise to the left side of the PAR logic diagram. The technical basis does not provide any details of the accident sequence or source term that would constitute a rapidly progressing severe accident nor would the NRC provide any further details when questioned. It is understood that the details cannot be provided because of security related issues and that is appropriate.

However, we do not believe that the decision triangle or Note 1 referenced clarifies the accident scenario the NRC believes is self-revealing. The NRC needs to understand that control room operators are not the only users of the PAR logic diagram. There are many state, county, local and tribal organizations that perform independent accident assessments and provide independent PARs to decision makers. As written, we do not believe there is sufficient information provided in the guidance to assure that the event will be self-revealing to all users. The language in this section needs to be very clear so that all users understand what constitutes an affirmative response to this decision point.

Further, based on the observations in Comment #3, the findings of SOARCA will likely eliminate the need to address this question. If the $1e-7$ per year frequency cutoff is acceptable for use in the significance determination process and accidents with a lower frequency are not considered meaningful for regulatory decision making (NUREG-1420), then such a frequency cutoff is appropriate for use in developing protective action strategies. Specifically, the rapidly progressing severe accident has a frequency less than $1e-7$ and should be removed from consideration in protective action logic schemes, eliminating the left hand side of the Supplement 3 logic diagram.

Comment #5

In Section 2.3, "Precautionary Protective Actions at Site Area Emergency", the NRC makes several recommendations that are beyond the scope and intent of the document with regard to offsite agencies. Many state, county, local and tribal emergency response plans provide for protective measures to be taken in advance of the General Emergency to allow resources to be mobilized and perhaps populations moved in order to facilitate evacuation if the event should progress. We disagree with the recommendation that decision makers need to discuss the implementation of these actions with the licensee before proceeding.

The NRC points out in the guidance that Site Area Emergencies rarely occur. However, when they occur, SAEs are serious events and precautionary measures that mobilize resources are prudent for serious events. If Emergency Action Level methodologies for nuclear reactors warrant a declaration of a site area emergency that is overly conservative that is a fatal flaw in the EAL and not in the preparation for that level of emergency. By definition, the SAE has a potential for radiological release that is not likely to exceed the Protective Action Guides offsite. That criteria alone provides a valid reason for offsite organizations to prepare and take actions that put them in a better position to affect an immediate and comprehensive evacuation plan if conditions continue to deteriorate. These actions should not be predicated on the ability of the licensee to discern whether the SAE is a precursor to a more significant event. That will not always be self-revealing. We recommend the NRC remove any recommendations in the guidance regarding licensee input to precautionary protective actions. It is not appropriate and beyond the scope of NRC regulatory authority.

Comment #6

Section 4, "Radiological Assessment Based PAR", is a concern. The section discusses expanding PARs beyond five miles or upgrading PARs based on changing wind directions. The discussion focuses mainly on the application of dose projections for expanding or upgrading PARs. Basing changes to PARs solely on dose projections is a mistake. Dose models are not accurate. Even modeling based on plant effluent data is suspect and should never be used as the sole indicator of potential offsite impacts unless absolutely necessary.

Further, by definition of the GE, conditions exist that provide a reasonable potential for protective action guides to be exceeded beyond the site boundary. While it is reasonable to assume that containment is expected to remain intact, it was also reasonable to assume both

reactor coolant and fuel clad would remain intact as well. Accident sequences that progress to the GE indicate that there has been a significant loss of control of plant safety functions that has resulted in the loss of at least two fission product barriers and the potential loss of the third. It is not reasonable to assume (without the release of supporting studies like SOARCA) that the accident will be mitigated or the containment will remain intact. Therefore, under such circumstances, it would not be prudent to base the development of PAR upgrades solely on unreliable and inaccurate models or field measurements that may or may not decrease over time.

As long as accident conditions meet the initiating thresholds for a GE, plant conditions should be a factor in the development of the PARs regardless of whether an initial PAR was issued and it is an upgrade based on wind conditions.

Comment #7

Heightened Preparedness is introduced into this document as a protective action. It is defined in the glossary and used in the PAR logic diagram. It is not a protective action and has not been a term used historically in nuclear emergency preparedness. Most state, county, local and tribal emergency response organizations take the actions and provide the information that is included in the Supplement 3 discussion of heightened preparedness. There are a myriad of terms used locally that residents and responders know, understand and have been accustomed to using that produce the same results as those proposed under the heightened preparedness term in Supplement 3. Responders and the public know and understand exactly what to do in that situation using the terminology and information they have been provided in advance. Introducing a new term for the same level of action could be confusing and could adversely impact response efforts.

While it would be desirable to standardize the term that is used for these actions across the country, it is not desirable to accomplish this through this particular guidance document. It is not a true protective action recommendation therefore does not belong in Supplement 3. For the same reason, it would not be appropriate to include it with EPA-400. If a change is to be made, there should be more discussion regarding introducing this concept in open stakeholder forums. This effort should be lead by FEMA and supported by both NRC and EPA if it is to be pursued.

Comment #8

Supplement 3 is a technical document for determining protective actions and the appendix included with the draft guidance is a communications plan. While the appendix does include good background information and useful insights, it does not belong in Supplement 3. There are other more appropriate regulatory venues for this information.

Further, the appendix has different information from that which is contained in Section 1.E of FEMA Radiological Emergency Preparedness Program (REP) Manual (Draft), dated May 8, 2009. FEMA also utilizes Section III of the Draft FEMA REP Manual to evaluate ORO response in the area of public information. Both sections of the FEMA REP manual as it is currently written, fail to adequately address the new information contained in the appendix to Supplement 3.

Based on the above information, the appendix should be removed from Supplement 3. FEMA should, as appropriate, incorporate the appendix information into Section 1.E and Section III of the Draft FEMA REP Manual. This information should also be coordinated with the radiological risk and communications NUREG currently in development by NRC.

Comment #9

On Page iii of the Abstract section the document states, "this updated Supplement 3 to NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, (NRC, 1996), supersedes previous guidance on the development of protective action recommendation (PAR) logic for nuclear power plant accidents. This statement should be modified to indicate that it only supersedes previous NRC guidance and include the specific guidance that it is replacing. This document does not supersede EPA 400-R-92-001 "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" and that should be clearly stated at the beginning of the document. The EPA guidance remains a viable alternative method for offsite response organizations to use as a technical basis for the development of protective actions for nuclear power plants.

Comment #10

The guidance suggests that nuclear power plant licensees and the offsite response organizations (OROs) responsible for implementing protective actions discuss and agree to various elements and criteria of the PAR logic diagram contained in the attachment to this supplement. The guidance document does not address the possibility that the licensee and ORO may not reach an agreement consistent with the methodology outlined in Supplement 3. Each nuclear power plant site is unique with respect to the make up of the EPZ, designation of emergency response planning areas and the policies governing decision making that there will be a great degree of variability in the construct of the site specific PAR logic diagram. In order for OROs and licensees to reach agreement there will need to be a large degree of flexibility with the interpretation and application of the methods described in Supplement 3. The NRC should make clear in this or some other section how such cases will be reviewed and approved.

Comment #11

The proposed NRC guidance changes the philosophy of the logic used for making protective action recommendations. The current version does not provide the option for shelter-in-place in the development of protective actions except where impediments to evacuation exist or in the case of a release of a known short duration. Since the implementation of Supplement 3 in 1996, the public has been advised that evacuation is the preferred method for protecting the public for all plant accident scenarios. The proposed guidance indicates that shelter-in-place is preferable (i.e., more protective under certain conditions) and should be considered.

Regardless of the validity of the technical basis and the site specific considerations, this represents a significant paradigm shift in the development of protective actions. State and local

offsite agencies will have the daunting task of re-educating decision makers and the public on protective actions for nuclear power plants. In order to accomplish this task, it is critical that the NRC be involved in the implementation of the guidance along with state, local and onsite staff.

The following are suggestions for the implementation process and outreach:

1. The NRC and FEMA should participate in the development discussions with state and local planners for site specific PAR logic diagrams so that they can provide input and guidance on consistent application of the logic. Further, for sites that will need to take exceptions to the guidance, the NRC should provide feedback on whether the exceptions are acceptable and appropriate for the site before the site specific guidance is implemented. FEMA should be involved in the discussions as well because of their role as the agency responsible for the evaluation of protective action decisions for state and local jurisdictions.
2. Following the development of protective action logic diagrams for each site, the NRC and FEMA should be present for meetings and briefings for state and local decision makers. Some state and local agencies will need assistance from NRC in presenting the technical basis for the changes in the development of protective actions.
3. There are likely to be many questions from the public and other interest groups regarding the change in philosophy in the development of protective actions. The NRC should be involved in developing a public outreach program with state, local and site staff in order to educate the public on the basis for the changes in protective action decision making.
4. The NRC should develop a generic FAQ sheet highlighting the major shifts in philosophy for the revised guidance and post it to the agency's web page.

Comment #12

NUREG-0654 is the basis document for emergency response planning for onsite and offsite organizations. It has been widely recognized by both NRC and FEMA that a comprehensive revision to NUREG-0654 is long overdue. Despite the need to revise the basis document, both NRC and FEMA have made decisions to make significant changes to supplemental guidance documents that are based on NUREG-0654. Going forward with the revision to NUREG-0654, both NRC and FEMA should be mindful of the changes already made to FEMA and NRC guidance documents so that they remain consistent.

Significant changes to federal guidance documents require tremendous efforts at the state and local level to identify portions of plans and procedures that require revision. Once revisions to plans and procedures are completed and reviewed for accuracy and completeness, there is another significant effort to train emergency response personnel and implement the revisions. NRC and FEMA must recognize the resources required to make and implement guidance changes at the state and local level. The future revisions made to NUREG-0654 should not

impact actions already implemented based on updates to the FEMA REP Program Manual and NUREG-0654, Supplement 3.

In addition, the impact on state and local government agencies would be substantially lessened if the new guidance documents currently in development (FEMA REP Program Manual, NUREG-0654 and Supplement 3) were implemented together rather than in a piecemeal fashion so that change management could be performed at one time. This would also provide for consistency among the guidance documents.

However, states have asserted that nuclear emergency response plans are reviewed frequently and updated as necessary and appropriate given changing conditions in localities and changing federal direction.

Comment #13

Final implementation of the draft Supplement 3 requires the use of site specific evacuation time estimate. Specifically, the 90% evacuation information required to implement the guidance may not be available for all nuclear power plant sites in their current ETEs. Emergency preparedness regulation changes related to ETEs will require that this value be calculated. It is therefore important that a holistic implementation, which includes implementation of the ETE rulemaking, implementation of this Supplement 3 and data availability from the 2010 census, be considered.

Further, beyond the availability of the necessary data to develop site specific PARs based on Supplement 3 guidance is the time required to make changes to plans and procedures, train state, county, local and tribal decision makers and test through drills and exercises. NRC and FEMA should discuss the implementation process with licensee and OROs in order to determine the appropriate time required for implementation including training and testing.

Comment #14

The guidance should clearly state that guidance does not intend for sites to create new ERPAs to reflect 2 mile, 5 mile and 10 mile planning areas. State, county, local and tribal organizations are not expected to create or modify ERPAs based on this guidance.

Comment #15

A one hour time period should not be prescribed for discussions between the licensee and OROs on whether or not the sheltering PAR for a hostile action event should be changed (second bullet in logic diagram note 8). It is anticipated that such communications will be ongoing through the Incident Command Structure during a hostile action event. The hostile action related impediment may be removed in less than one hour or, conversely it may take more than one hour to remove the impediment. In either case, we do not believe that the one hour time period should be arbitrarily selected and applied in this Supplement 3 document.

Comment #16

It is not clear in the document nor from the public meetings how the NRC and FEMA will evaluate PAR logic diagrams during exercises. This would be particularly important if it is necessary to take significant deviations from the guidance because of site specific conditions or state, county, local or tribal political considerations that cannot be reasonably altered. Stakeholders expect that NRC and FEMA should clearly state how site specific PAR diagrams will be reviewed and approved. State government expects that there will be a formal process to ensure that application of the guidance is uniform across all regions (NRC and FEMA). The correctness of the site specific PAR logic diagram should never be an issue during evaluated exercises. The process should preclude any finding that the logic diagram is not consistent with guidance.

Comment #17

The NJ DEP has reviewed the alternate method proposed by NEI for the development of site specific PAR logic diagrams. We believe that their proposal provides a useful tool in working through the considerations for developing a site specific PAR. For those sites that do not correlate well to the hypothetical model in the guidance, the method proposed by NEI would be very helpful as a starting point for OROs and licensees. We recommend that NRC consider the merit of the methods proposed by NEI and provide an endorsement as an alternate means to develop PAR logic diagrams.