

# **Status of NRC Sponsored Study of Protective Action Recommendations**

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## EP Planning Basis Review

- **Staff reviewed NPP EP planning basis in light of 9/11 – completed 9/2003**
- **Basis remains protective but enhancements identified**
- **Need to review PAR guidance for adequacy identified**
- **Briefed Nuclear Regulatory Commission on status of NPP EP – 9/2003**



## Commission Direction

- “Continue to evaluate the NRC protective action recommendation guidance to assure that it continues to reflect our current state of knowledge with regard to evacuation and sheltering. Update the guidance, as necessary.”



## **Protective Action Recommendation (PAR)** **Study**

- NPP EP programs (supported by state/local plans) are intended to reduce dose to the public during a radiological emergency
- To ensure NRC PAR guidance continues to support this purpose, review Supplement 3 to NUREG-0654/FEMA-REP-1



## **PAR Study Scope**

- Spectrum of nuclear plant accidents
- Improvements in Evacuation Time Estimate (ETE) technologies
- Additional sheltering strategies
- Additional evacuation strategies
- Fast breaking accident scenarios

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# Objective

Investigate if reduction in dose may be accomplished through use of alternative protective actions

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# Technique

Establish source terms to be used

- Review spectrum of accidents
- NUREG-1150
- Improvements in accident understanding since NUREG-1150
- Bound spectrum of accidents



# Spectrum of Accidents

## **1980 SOC for the EP regulations states:**

“The Commission recognizes that no single accident scenario should form the basis for choice of notification capability for offsite authorities and the public. Emergency plans must be developed that will have the flexibility to ensure response to a wide spectrum of accidents... will range from immediate notification of the public (...15 minutes) to the more likely events where there is substantial time....”



# Technique

- Dose analyses for rapidly developing accidents
- Dose analyses for more slowly developing accidents
- Dose analyses for accidents without containment failure
- Four source terms used



# Technique

- Test various PAR regimens against the Supp 3 standard (radial keyhole evacuation)
- Absolute consequences not assessed
- Relative consequences for the alternative PAR against the standard



## Hypothetical Test Site

- Standard US meteorology
- Generic EPZ with about 80,000 people
- Varied Evacuation Time Estimate (ETE) from 4-10 hours
- Varied travel speed

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## Alternative PAR Regimens

- Shelter in place (SIP) for various times – (within current regimen, but limited use)
- Preferred sheltering for various times (in large public buildings, etc.)
- Lateral evacuation (crosswind)
- Staged evacuation (evacuation nearby, initially shelter others)



## Technique

- Calculate relative dose savings for each source term and each regimen
- Compare to dose of standard regimen



## Technique

- Discussed alternative regimens that may save dose with volunteer state EP personnel
  - Practicality of implementation
  - Cost-benefit of implementation
  - Realism



## Technique

- Reviewed existing EP-sociological research
  - Use of alternative regimens
  - Likely public reaction
  - Emergency information needs
  - ID other sociological factors for consideration



## Results

- Radial evacuation remains the major element of PAR strategy
- SIP is more protective than evacuation for rapidly developing releases if followed by evacuation after plume passage
- Appropriate PAR is dependent upon the ETE
- Staged evacuation reduces consequences



## Results

- Consequences increase as ETE times increase
  - strategies that reduce ETE reduce consequences
- Precautionary preparation efforts at the Site Area Emergency level are prudent
- Preferred Sheltering is not practical
- Lateral evacuation may be considered



## Next Steps

- Additional study of likely public reaction to protective action decisions
  - Focus groups
  - Survey of EPZ populations



## Next Steps

- Considering whether to conduct focus groups
- Telephone survey would include random sample from EPZs nationally



## Next Steps

- Input to NRC's EP Review
- No changes to Supp 3 are imminent
- DHS would be involved in the process
- Expect any changes to provide for a stakeholder comment period



## Next Steps

- Envision State, local and other stakeholder involvement
- Provide to the Commission for consideration of potential policy change
- Any change would be at the direction of the Commission



# Questions?

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