



US NRC
Protective Action
Recommendation Study

National Radiological Emergency
Preparedness Conference

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Introduction

- Staff recommended a review of protective action recommendation (PAR) guidance
- Commission directed that the study proceed
- Sandia study began in late 2004

Background

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.”

Background

Key technical elements of EP planning basis:

- Reactor accident probability is within the bounds of the Commission's Safety Goals (they are unlikely)
- Accidental radiological releases (including security events) are no greater than identified in WASH-1400 (EPZ basis)
- Radiological releases from accidents are no faster than those identified in WASH-1400, i.e., 30 minutes. (notification basis)

PAR Study Objective

Investigate if the use of alternative protective actions can reduce public dose during severe accidents

Analyses

- Rapidly developing releases
- More slowly developing releases
- Accidents w/o containment failure

Source Terms

- Reflect EP Planning Basis (large early release)
- NUREG-1150 source terms

Alternatives Tested

- Shelter in place 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)

Stakeholder Input

- Discussed alternative PARs with State EP personnel
 - Practicality of implementation
 - Cost-benefit
 - Applicability to physical site
- Today's Breakout Session

Recommendations

- Revise NUREG-0654, Supplement 3
- Evacuation remains major element
- Consider early and staged evacuation
- Precautionary actions at Site Area
Emergency are prudent
- Consider action regarding strategies that
reduce evacuation times in order to
reduce consequences

Sociological Review (Focus Groups)

- People will generally do what they are asked (key is trust and consistent information)
- The effectiveness of notification influences decisions
- Emergency responders will report for duty and are confident in their training
- Infrastructure may not have kept up with evacuation demand

Recommendations

- Enhance usefulness of ETEs
 - Develop ETE for each potential protective action
 - Improve quality of ETEs
- Planning for special needs groups not in special facilities should be enhanced

Recommendations

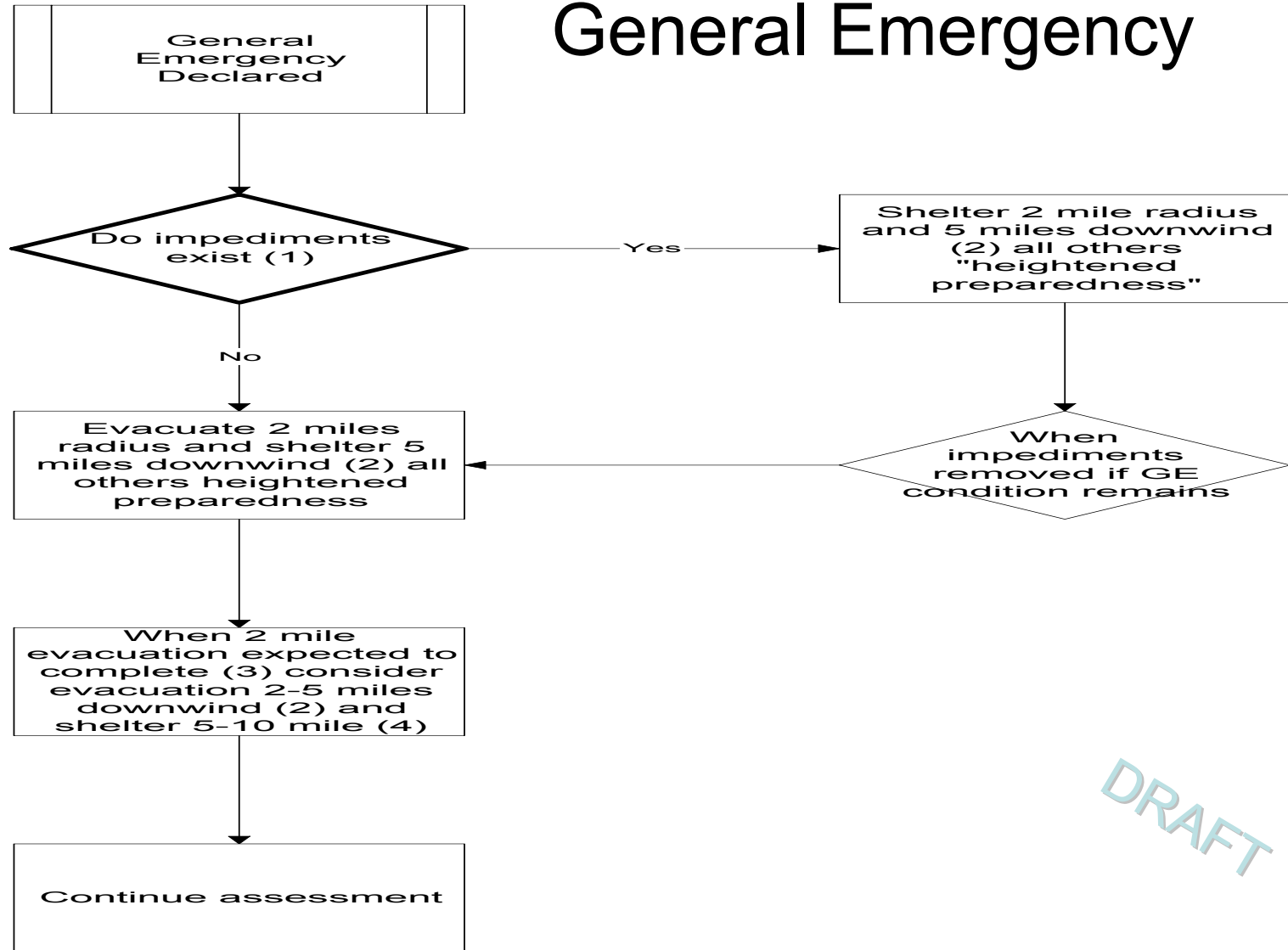
- Shelter in place followed by evacuation is more protective than standard PAR for large early release at sites with longer evacuation times
- Sheltering of special needs individuals followed by evacuation can reduce consequences.
- Enhancements to emergency communication with the public were identified

Next Steps

- NRC will work with FEMA to facilitate making changes
- Gather stakeholder feedback
- Develop draft guidance
- Formal review and comment
- Issue guidance

Draft Proposed Changes to NUREG-0654

General Emergency



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Note 1 Impediments

- Evacuation support not yet in place (preplan activation time)
- Security event (preplan response with offsite response organizations)
- Initial classification is General Emergency or the General Emergency is declared after another classification but before offsite response organization activation
- General Emergency with rapid loss of containment integrity and 2 mile radius evacuation time > 3 hours (perform site specific analysis to verify)
- Weather or other impediments to safe public evacuation
- KI should also be recommended where emergency plans include the use of KI

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Note 2 Evacuation Area

- Downwind sector(s) and adjacent sectors
- Site specific wind persistence analysis and preplanning with offsite response organizations may indicate the need to include additional sectors with recommendation

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Note 3 Time to Evacuate

- Do not make additional recommendations before evacuation time estimate for 2 mile zone, but the recommendation is not dependent on verification of progress or 100% completion of initial evacuation

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Note 4 Additional Recommendations

- General Emergency condition still exists and plant conditions not mitigated or
- Release is probable or occurring and dose projections show guidelines likely to be exceeded beyond 2 miles

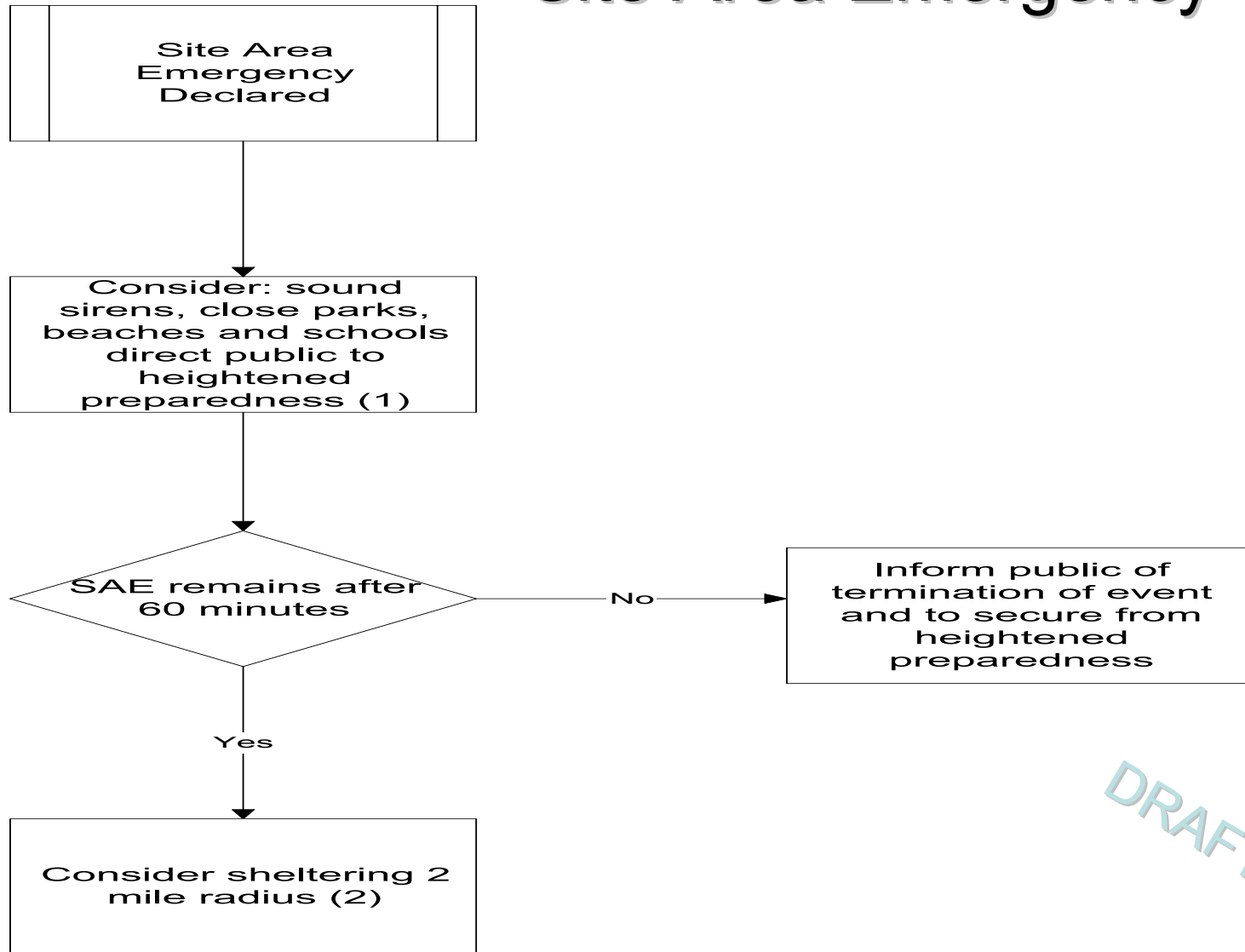
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Heightened Preparedness

Intended to mean that the population within the plume exposure emergency planning zone is informed of the serious emergency at the nuclear plant and told that they should prepare for the possibility of evacuation, sheltering and/or other protective actions

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Site Area Emergency



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Note 1

- dependent on State and local emergency plans
- Security events may require different response that should be preplanned with offsite response organizations

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Note 2

- dependent on State and local emergency plans
- Strongly consider for some EAL classifications

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PAR Study Public Survey

- What about the general public?
- How will they respond?
 - National telephone survey (within EPZs) began on March 11, 2008
 - Public willingness to follow direction for alternative protective actions
 - Best methods to communicate advanced PAR strategies to the public

PAR Study Public Survey

- Conducted randomly in the EPZs
- Data compiled nationally, with some broad regional analysis of results possible
- Data cannot be analyzed by site
 - 2,500 phone calls to collect about 800 completed surveys
 - About 5 million people live in EPZs
 - Households of licensee employees excluded



Questions?

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