

Protective Action Guidelines

Iodine Thyroid Blocking

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Potassium Iodide PAG

1992 PAG Manual

- If iodine released, a thyroid dose-based evacuation recommended for adult thyroid dose range 5 to 25 rem

2017 PAG Manual

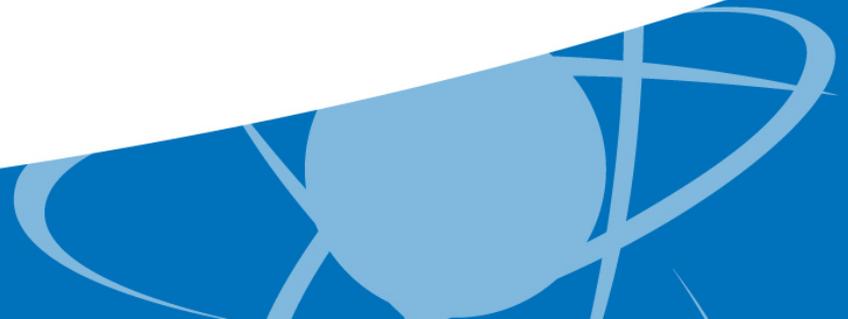
- If iodine is released, administration KI should be considered as a supplementary protective action if the projected child thyroid dose exceeds 5 rem (50 mSV)
 - Only for communities that currently include KI in their range of protective actions
 - Communities do not need to add KI to their EP plans

2017 PAG Thyroid Blocking

- If significant quantities of radioiodine have been/expected to be released, use of KI should be considered as a supplementary protective action if projected child thyroid dose exceeds 5 rem (50 mSv)
 - This is a change from the 1992 PAGs (5 to 25 rem adult thyroid)
- The lower dose based on early studies of Chernobyl exposure data.
 - FDA guidance on thyroid blocking requirements incorporated into PAG manual
 - Based on early data from Chernobyl that suggested greater sensitivity of child thyroid to iodine
- One-year old age group is expected to be limiting for thyroid dose projections (ICRP 60 series 1991)
 - EPA recommends 1 year old age group thyroid dose be projected if considering use of KI

Protective Action Guidelines

- PAGs are a trigger point to consider taking action
- Considerations of protective action decisions include benefit vs risk
 - Benefit of dose avoidance against the risk of the protective action
- Evacuations are not risk free;
 - Evacuation at 1 year old child thyroid dose may result in many people unnecessarily evacuated at doses potentially much lower than 1 rem



2017 PAGs

- PAGs are appropriate for all members of the public, including sensitive subpopulations (young children)
- Assumptions made to generate default parameters and derived response levels in the FRMAC Assessment Manual, Volume 1, Appendix C, 3 include worst-case assumptions
 - early phase derived levels are based on the assumption person is outdoors 24 hours a day for four days exposed to the plume
 - radionuclides are in the chemical and physical form that yields the highest dose (e.g., the particle size is one micrometer mean aerodynamic diameter).

EPFAQ 2017-001

- NRC staff-generated to provide licensees with implementation guidance
 - Out for public comment (due June 24)
- Key points/topics
 - Licensees work with OROs and revise onsite plan if necessary to maintain alignment
 - Compare licensee and ORO dose model results, and understand differences
 - EAL and PAR changes made as described should not require an LAR

Summary

- NRC radiation protection regulations (10 CFR 20) based on ICRP publication 26 and associated guidance
- EPA 2017 PAGs use ICRP publication 60 and associated guidance
- It is important for licensee to understand differences in dose calculation assumptions and outputs when making protective action recommendations to offsite authorities
- NRC updated its RASCAL* code to allow users to toggle between ICRP 26 and 60

*versions of RASCAL before 4.2 do not have this capacity.

Questions?



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