

Fact Sheet

“PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents”

2016

What are Protective Action Guides (PAGs)?

In the event of a radiological emergency, decision-makers can direct the members of the public to take protective actions to avoid exposure to unhealthy amounts of radiation. Protective Action Guides (PAGs) are radiation dose guidelines that trigger protective actions such as evacuation or staying indoors.

EPA developed a Manual of Protective Action Guides (the “PAG Manual”) to help federal, state, tribal and local authorities decide how to protect the public during radiological emergencies. Emergency response organizations use the guidance in the PAG Manual in their emergency response planning.

PAGs are for use only in emergencies. PAGs are not legal radiation limits, and do not supersede any environmental laws or regulations. The PAG Manual provides emergency responders with flexible guidance on protective actions because every incident is different. State, tribal and local officials can take actions to protect the public based on incident-specific conditions.

Why did EPA issue an updated PAG Manual?

The previous final version of the PAG Manual was issued in 1992. Since then, there have been advancements in scientific understanding of radiation dose and risk to human health. EPA worked with multiple federal agencies including the Department of Homeland Security, Federal Emergency Management Agency, Department of Energy, Department of Health and Human Services, Department of Agriculture, Nuclear Regulatory Commission, Occupational Safety and Health Administration and Department of Defense to develop the revised PAG Manual. Guidance based on the best available science can help local authorities save lives and minimize the impact of a radiological emergency. Local authorities rely on EPA guidance to keep their emergency response plans up-to-date with the most current science.

The 2016 PAG Manual includes updated dose calculations based on the latest science. A number of other changes in the revised PAG Manual are based on lessons learned from actual radiological emergencies, including the Fukushima nuclear power plant accident. Significant changes in the 2016 manual include—

- **Use of PAGs in Different Types of Radiological Emergencies:** The 2016 PAG Manual now applies to a broader range of radiological emergencies, including terrorist acts. The 1992 version, while it applied to all radiological emergencies, was heavily focused on nuclear power plant incidents.
- **Food Guidance:** Planners are referred to current guidance on radioactive contamination in food from the U.S. Food and Drug Administration (FDA). The previous version of the PAG Manual included an older FDA food guidance document that had been significantly updated since 1992.

- **Administration of Potassium Iodide (KI):** EPA has adopted the latest guidance from FDA on administration of a potassium iodide (KI), a compound that inhibits the thyroid's uptake of radioactive iodine taken into the body. (Note: Administration of KI is an appropriate protective action only in emergencies that involve radioactive iodine; it does not provide protection against other radioactive substances.)
- **Guidance on Reentry:** The Manual contains brief planning guides on reentry to areas from which people have been removed because of a radiological incident.
- **Cleanup and Waste Disposal Considerations:** The 2016 Manual provides brief guidance for planning a cleanup process and considerations for planning the disposal of radioactive waste. Cleanup and waste disposal decisions will involve careful coordination with stakeholders throughout the process.
- **Updated Dosimetry:** For projecting doses, the PAG Manual points users to the Federal Radiological Monitoring and Assessment Center (FRMAC) Assessment Manuals. The FRMAC Manual's dosimetry is based on the International Commission on Radiological Protection's Publication 60 (ICRP 60).

When would the PAG Manual be used?

The PAG Manual provides federal, state, tribal and local emergency planners with guidance they can use in their emergency response plans. It provides information for each phase of a radiological incident—

- **Early or Emergency Phase:** This is the beginning of the incident, when immediate decisions must be made about actions to protect the public. This phase can last hours to days.
- **Intermediate Phase:** This period, lasting weeks to months, begins after the radiation releases have been brought under control, and reliable environmental measurements are available for use as a basis for decisions on protective actions.
- **Late or Recovery Phase:** This period, lasting months to years, is no longer a response to an emergency. Activities during this phase support site restoration and cleanup.

Where can I find more information?

Visit our web page to learn more and download the PAG Manual:

<https://www.epa.gov/radiation/protective-action-guides-pags>