

**EPFAQ Number: 2017-01**

**Date Accepted for Review:**

**Originator: Don A. Johnson**

**Organization: NRC**

**Relevant Guidance: NEI 99-01, NEI 07-01, NESP-007**

**Applicable Section(s): EAL Set AU1, AA1, AS1, and AG1**

**Status: Draft for discussion**

**QUESTION OR COMMENT:**

What guidance can the NRC provide licensees related to implementation of the revised EPA PAG Manual?

**PROPOSED SOLUTION:**

*TBD from NEI*

**NRC RESPONSE (*Draft for discussion, not final*):**

The revised EPA PAG Manual is an effort to update the guidance from 1992 and to provide offsite response officials (OROs) updated guidance related to protecting the public from the radiological consequences of an incident. For the purposes of this EPFAQ the incident of concern will be with a licensed commercial nuclear power plant (NPP).

The applicability, relevance, and significance of protective action decisions made by OROs for radiological events needs to be understood in context. The EPA PAGs "...are not meant to be applied as strict numeric criteria, but rather as guidelines to be considered in the context of incident specific factors," and "the PAGs are not legally binding regulations or standards and do not supersede any environmental laws." In addition, "the decision to advise members of the public to take a protective action during a radiological incident involves a complex judgement in which the radiological risk must be weighed against the action's inherent risks." While the EPA PAG Manual provides updated guidance (it also has removed guidance and added guidance), it is the responsibility of OROs to determine what, if any, revisions to ORO Emergency Plans should be implemented based upon this update to the EPA PAG Manual.

The NRC's position is that licensees work cooperatively with the applicable OROs in the development of protective action strategies that best meets the needs of the public for their specific area(s). In addition, the staff recognizes that timely and effective communication between the licensee and OROs related to the incident, and the public risk(s) that are, or may, be presented from the incident, is extremely important. Inasmuch as possible, both the licensee and OROs should determine what protective action strategies meet the needs of their communities, and then how best to implement them.

While the revised manual is primarily for OROs to consider, there are a few changes that have been made that licensees should understand and work with their OROs to consider for implementation. The staff is not requiring implementation, per se, but does stress the importance of being in alignment with their OROs as much as is reasonably possible.

For emergency action levels (EALs), the staff does not presently see an issue where the endorsed EAL schemes, which all licensees have used in the development of their site-specific EAL scheme, are in error. The scheme provided the option for the licensee to use either 1 REM

TEDE or 5 REM thyroid committed dose equivalent (CDE) as the bases in developing the numeric thresholds for Initiating Conditions ASI and AGI. The EPA has eliminated the 5 REM thyroid dose as a PAG for evacuation or sheltering in the early phase. For a licensee that chose to base the EAL thresholds on 5 REM thyroid, due to their ORO wanting to use that option, then an eventual change to EALs AG1 and AS1 may be necessary (which may require a corresponding change to EAL AU1 and AA1 to ensure appropriate margin exists between the EALs). But, again, this depends on what the ORO decides to do. The endorsed guidance is correct in that the EALs in this set need to be in alignment with the strategy chosen by the ORO.

The other change of significance to the licensee is the EPA's changes to the PAG related to the administration of Potassium Iodide (KI). The Food and Drug Administration (FDA) "...recommends that KI be administered to both children and adults at the lowest intervention threshold (i.e., > 5 rem (50 mSv) predicted internal thyroid exposure in children, The one-year old age group thyroid dose is expected to be limiting," (EPA-400/R-17/001, pp 20-22) This may require the licensee to revise/update their dose assessment program to ensure that the appropriate protective action recommendation (PAR) is provided to the OROs for their consideration. This does not need a corresponding EAL, though an EAL may likely already be declared. Note that EAL AG1 is based upon the primary PAGs of evacuation, and/or sheltering in place, not the supplemental PAG of administration of KI (EPA -400/R-17/001, p 11).

The EPA has also recommended the use of the ICRP-60 dose quantities and associated dose conversion factors. Licensees should review the documentation of their dose assessment software. Some commercial dose assessment software have system manager-controlled options to select particular dose conversion factors. Otherwise, the licensee, working with the OROs should assess the magnitude of the potential differences between dose conversion factors based upon ICRP-60 and on the earlier calculational methods. The licensee should also consider whether the calculation methods for EAL numeric thresholds based on dose need to be adjusted. The NRC is not requiring that licensees migrate to ICRP-60 dose quantities. The staff does recommend that licensees run comparison runs between their dose assessment models and ORO models to identify the magnitude of, and reason for, observed differences. Understanding the differences ahead of time may avoid delays in implementing protective actions.

Another possible key addition to the EPA PAG Manual that licensees should discuss with OROs is the new PAG for drinking water. Licensees whose facilities are on bodies of water from which public drinking water is drawn, may have procedures to alert the drinking water plant so that they can cease drawing water as intake to the processing plant. Consideration should be given to updating those procedures for the new guidance. This PAR does not need a corresponding EAL even though an EAL may already be declared.

To summarize:

- 1) The NRC expects licensees to work cooperatively with their OROs to review, understand, and determine what PAG strategies presented in the revised EPA PAG Manual are to be implemented, if any. It is the responsibility of the OROs to decide what is best for their communities.

## EMERGENCY PREPAREDNESS FREQUENTLY ASKED QUESTION (EPFAQ)

- 2) The licensees are expected to reasonably revise their Radiological Emergency Plans, if necessary, to support maintaining alignment with ORO PAG procedures.
- a) For EALs: If AG1 and AS1 was based upon the 5 Rem CDE option, and the ORO decides to adopt the revised EPA PAG guidance, then the licensee may consider submitting the applicable EAL set to the NRC for prior approval in accordance with App. E to 10 CFR 50 as this EAL set is one of the cornerstones of the entire EAL scheme and must be evaluated accordingly. *[Note: Only EALs AG1 and AS1 specifically deal with EPA PAG values, however, in order to properly evaluate the EAL set, particularly the gap between EALs AU1, AA1, AS1, and AG1, submittal of the entire EAL set may be necessary.]*
  - b) For licensee PARs:
    - i) If the OROs decide to implement the PAG strategy for the administration of KI to children and adults, then the licensee may consider how best to support the OROs in this effort. The dose assessment model, and program, may need to be revised to support this. This does not need a corresponding EAL, and does not need to be tracked or evaluated as part of the Drill and Exercise Performance - Performance Indicator (DEP-PI) program.
    - ii) If the OROs decide to implement the PAG strategy (proposed) for drinking water, then the licensee may consider how best to support the OROs in this effort. The dose assessment model, and program, may need to be revised slightly to support this. This does not need a corresponding EAL, and does not need to be tracked or evaluated as part of the Drill and Exercise Performance - Performance Indicator (DEP-PI) program.

In accordance with Regulatory Issue Summary (RIS) 2003-18, Supplement 2, "Use of Nuclear Energy Institute (NEI) 99-01, Methodology for Development of Emergency Action Levels, Revision 4," dated January 2003, the changes to the EALs (if desired) would be considered a DEVIATION. Any changes made to the licensee's Radiological Emergency Plan due to revised PAR strategies, and/or dose assessment methods, would need to be evaluated via 10 CFR 50.54(q).

### RECOMMENDED FUTURE ACTION(S):

- INFORMATION ONLY, MAINTAIN EPFAQ
- UPDATE GUIDANCE DURING NEXT REVISION