

## **Regulatory Guide Periodic Review**

**Regulatory Guide Number:** 3.7 Revision 0

**Title:** Monitoring of Combustible Gases and Vapors in Plutonium Processing and Fuel Fabrication Plants

**Office/Division/Branch:** NMSS/DFM/CTCFB

**Technical Lead:** Nicole Cortés Medina

**Recommended Staff Action:** Revise

**1. What are the known technical or regulatory issues with the current version of the Regulatory Guide (RG)?**

RG 3.7 Revision 0 was issued in March 1973 to provide guidance for a plutonium processing and fuel fabrication plant, including a mixed oxide (MOX) fuel fabrication facility. This RG is pertaining to monitoring of combustible gases and vapors to protect against the possibility of the formation of flammable mixtures that could result in a fire or explosion which might breach one or more of the confinement barriers and allow radioactive material to be dispersed within regions of the plant and possibly the environs.

A periodic review of RG 3.7 was performed in September 2013, and no issues were identified. As part of the staff's periodic review, the staff determined that the guidance contained in this reg guide is not captured in other agency guidance. Specifically, staff reviewed NUREG-1718 "Standard Review Plan for the Review of an Application for a Mixed Oxide (MOX) Fuel Fabrication Facility," and determined that this RG was not cited in the current guidance for MOX facilities. RG 3.7 takes into account the following measures:

- (1) Prohibiting or restricting the use of the combustible material
- (2) Using inert gas purging to reduce oxidant content, or increased air flow to dilute combustible concentrations below the lower limit for flammability
- (3) Establishing other procedural changes based on the results of the accident investigation

The staff regulatory guidance listed in RG 3.7 focus on: (1) the evaluation of sources of combustible solvents, gases, or vapors and their need to be managed by suitable process parameters and plant operating procedures; (2) assurance of maintained safe conditions by suitable continuous monitoring systems using audio and visual local alarms; and (3) an established procedure for remedial action to be taken in the event of an alarm signal.

NUREG-1718 mentions the National Fire Protection Association (NFPA) standards, monitoring of flammable gases, flammability limit, alarm monitoring systems, gas purging, and other measures but it does not fully encapsulate the staff positions listed in RG 3.7.

While the staff positions in RG 3.7 remain valid, the formatting is outdated. Therefore, the RG is recommended to be revised for administrative changes.

**2. What is the impact on internal and external stakeholders of not updating the RG for the known issues, in terms of anticipated numbers of licensing and inspection activities over the next several years?**

There will be no impact on licensing and inspection activities since there is currently no application expected for a plutonium processing and fuel fabrication plant within the next several years.

This RG is not recommended for withdrawal because it discusses NRC staff positions that are not clearly articulated in any of the current regulations or associated guidance. Additionally, there may be a future application for a plutonium processing and fuel fabrication plant and the guidance could be useful for facility designers.

**3. What is an estimate of the level of effort needed to address identified issues in terms of full-time equivalent (FTE) and contractor resources?**

Approximately 0.05 FTE to address the revision of RG 3.7 for administrative changes.

**4. Based on the answers to the questions above, what is the staff action for this guide (Reviewed with no issues identified, Reviewed with issues identified for future consideration, Revise, or Withdraw)?**

Revise.

**5. Provide a conceptual plan and timeframe to address the issues identified during the review.**

RG 3.7 should be updated to include missing sections such as the implementation section, the references section, and some additional administrative changes. The staff will consider any new available references and has estimated that the revision could be initiated in the 3<sup>rd</sup> quarter of CY 2024.

**NOTE: This review was conducted in March 2024 and reflects the staff's knowledge of industry plans as of that date.**