

August 15, 2015

MEMORANDUM TO: Brian E. Thomas, Director
Division of Engineering
Office of Nuclear Regulatory Research

FROM: Scott C. Flanders, Director */RA/*
Division of Site Safety & Environmental Analysis
Office of New Reactors

SUBJECT: RESULTS OF PERIODIC REVIEW OF REGULATORY GUIDE
1.221

This memorandum documents the US Nuclear Regulatory Commission's (NRC) periodic review of regulatory guide (RG) 1.221, "Design-Basis Hurricane and Hurricane Missiles for Nuclear Power Plants." This RG, published in October 2011, provides licensees and applicants with guidance that the staff of the NRC considers acceptable for use in selecting the design-basis hurricane wind speed and hurricane-generated missiles that a nuclear power plant should be designed to withstand to prevent undue risk to the health and safety of the public. As discussed in Management Directive 6.6, "Regulatory Guides," the NRC staff reviews RGs approximately every 5 years to ensure that the RGs continue to provide useful guidance. Documentation of the NRC staff review is enclosed.

Based on the results of the periodic review, the staff concludes that no changes to RG 1.221 are warranted at this time. The staff did not identify any technical or regulatory issues in the review.

Enclosure:
As stated

CONTACT: Brad Harvey, NRO/DSEA
(301) 415-4118

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DATE	07/26/2016	07/27/2016	08/15/2016

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Regulatory Guide Periodic Review

Regulatory Guide Number: 1.221, Revision 0

Title: Design-Basis Hurricane and Hurricane Missiles for Nuclear Power Plants

Office/division/branch: NRO/DSEA/RHM1/RMOT
Technical Lead: Brad Harvey

Staff Action Decided: Reviewed with no issues identified

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

RG 1.221, "Design-Basis Hurricane and Hurricane Missiles for Nuclear Power Plants," published in October 2011 describes a method that the staff of the U.S. Nuclear Regulatory Commission (NRC) considers acceptable in selecting the design-basis hurricane wind speed and hurricane-generated missiles that a nuclear power plant should be designed to withstand to prevent undue risk to public health and safety.

Nuclear power plants must be designed so that they remain in a safe condition under extreme meteorological events, including those that could result in extreme wind events (tornadoes and hurricanes) that could reasonably be predicted to occur at the site. Initially, the NRC considered such conditions for tornadoes in RG 1.76, "Design-Basis Tornado for Nuclear Power Plants," issued April 1974, as bounding for both tornadoes and hurricanes. In March 2007, the NRC issued Revision 1 of RG 1.76, "Design-Basis Tornado and Tornado Missiles for Nuclear Power Plants." RG 1.76, Revision 1, supported a decrease in design-basis tornado wind speed criteria presented in the April 1974 version of RG 1.76, primarily due to the implementation of the Enhanced Fujita Scale which was a revised assessment relating tornado damage to wind speed.

Since design-basis tornado wind speeds were decreased as a result of the analysis performed to update RG 1.76, it was no longer clear that the revised tornado design-basis wind speeds presented in RG 1.76, Revision 1, would bound design-basis hurricane wind speeds in all areas of the United States. This prompted an investigation into extreme wind gusts during hurricanes which lead to the publication of RG 1.221. Note that the design-basis tornado in RG 1.76 and the design-basis hurricane in RG 1.221 both correspond to an exceedance frequency of 10^{-7} per year, calculated as a best estimate.

No technical or regulatory issues were identified with RG 1.221.

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?

As no technical or regulatory issues were identified, there is no impact to internal or external stakeholders resulting from these activities.

- 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?**

As no technical or regulatory issues were identified, no resources are required.

- 4. Based on the answers to the questions above, what is the staff action for this guide?**

Reviewed with no issues identified.

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

No issues were identified during the review.

NOTE: This review was conducted in July 2016 and reflects the staff's plans as of that date. These plans are tentative and are subject to change.