August 11, 2016

The Honorable John McCain
United States Senate
Washington, DC 20510

Dear Senator McCain:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am responding to your letter of June 15, 2016, to the U.S. Department of Energy (DOE) forwarding correspondence from your constituent, Michael Derivan. DOE forwarded your letter to the NRC, as it relates to a matter within our purview.

Mr. Derivan has had difficulty obtaining an answer to a question he posed to the NRC following a March 30, 2016, posting on the NRC blog concerning an open phase condition (OPC) in an electric power system. Specifically, Mr. Derivan inquired as to whether the NRC staff performed any safety analysis or transient analysis for the January 2012 event at Byron Station Unit 2 to support the assertion that a design-basis event concurrent with an OPC likely would have resulted in the plant exceeding emergency core cooling acceptance criteria specified in NRC regulations (specifically 10 CFR 50.46).

The NRC staff's determination was based on engineering judgment and qualitative reviews of the Byron Unit 2 event and plant-specific accident analysis performed by the licensee. The operating event at Byron Unit 2 revealed a significant design vulnerability where an OPC in the plant's offsite power supply caused a loss of certain safety functions powered by the site's alternating current electric power system. As a consequence, neither the onsite emergency diesel generators nor the offsite electric power system was able to perform its intended safety functions in accordance with NRC requirements.

In this case, the OPC was unrecognized by the operators for almost 8 minutes. The accident analysis for Byron Unit 2, as described in Chapter 15 of the Updated Final Safety Analysis Report, discusses postulated design basis loss-of-coolant accident (LOCA) scenarios, which are unlikely, and demonstrates that the plant is designed to meet the regulatory acceptance criteria for both large-break and small-break LOCAs. As part of the analysis sequence of events, tables provided the expected times when various actions occur. For example, in a large-break LOCA sequence of events, pumped safety injection is expected to occur at 46 seconds and the resulting peak clad temperature would occur at 96 seconds. For a small-break LOCA analysis, pumped safety injection is expected to occur as early as 54.3 seconds and the peak clad temperature would occur as early as 889 seconds. The availability of pumped safety injection depends on power from either the emergency diesel generators or offsite power. It is the NRC staff's engineering judgment, and reasonable to assume that, had a design-basis large break LOCA occurred concurrent with the unrecognized OPC that occurred at Byron, it likely would have resulted in the plant exceeding the emergency core cooling systems acceptance criteria due to the delay in pumped safety injection.

I hope this information is useful to you and Mr. Derivan. If you need anything additional, please contact me or Eugene Dacus, Director of the Office of Congressional Affairs, at (301) 415-1776.

Sincerely,

/RA/

Victor M. McCree
Executive Director
for Operations

I hope this information is useful to you and Mr. Derivan. If you need anything additional, please contact me or Eugene Dacus, Director of the Office of Congressional Affairs, at (301) 415-1776.

Sincerely,

/RA/

Victor M. McCree
Executive Director
for Operations

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