

September 11, 2017

MEMORANDUM TO: Dennis Morey, Chief  
Licensing Processes Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

FROM: Joseph J. Holonich, Senior Project Manager */RA/*  
Licensing Processes Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF THE AUGUST 15, 2017, MEETING  
WITH WESTINGHOUSE REGARDING THE WESTINGHOUSE  
NUCLEAR SAFETY ADVISORY LETTER ON THE AC160  
CONTROLLER

On August 15, 2017, U.S. Nuclear Regulatory Commission (NRC) staff met with representatives from Westinghouse Electric Company (Westinghouse). The purpose of the meeting was to discuss the Westinghouse Nuclear Safety Advisory Letter (NSAL) 17-2 related to the self-testing diagnostic features of the AC160 Controller within the Common Qualified (Common Q) platform. Information pertaining to this meeting, including documents cited in this summary, can be found in the meeting package at Agencywide Documents Access and Management System Accession No. ML17199G605.

Westinghouse opened the meeting by informing the NRC staff that it had a SharePoint site where all the NSALs were contained and would provide access to the site for any NRC staff who wanted access to the information within it. Westinghouse noted that all the NSALs were public so NRC staff would be accessing information that was publically available. An action was taken for the NRC staff to provide names of individuals who would want access to the SharePoint site.

The meeting then focused on the Westinghouse presentation, a nonproprietary version of which can be found in the meeting package referenced earlier. During the presentation, the NRC staff asked a number of questions to better understand the design and function of the watchdog timer (WDT) function. They included questions on the stall timers within the microprocessors and the impact to the overall WDT function if the stall timer did not function due to inactivation.

CONTACT: Joseph J. Holonich, NRR/DPR  
301-415-7297

Westinghouse informed the NRC staff that if the stall timers were not activated, the window watchdog timer (WWDT) would continue to activate in the presence of any triggers needed to ensure safety features were engaged. Based on Westinghouse's determination that the WWDT would continue to ensure the activation of fail-safe diagnostic features, Westinghouse concluded that there was not a safety issue but rather a licensing-basis concern.

The NRC staff asked if, as a result of the newly provided timing values of the individual timers within the WDT function, an additional delay for safety features to activate would occur because of the longer time required for the WDT feature to function. Westinghouse responded that individual plants do not include diagnostic response times in the response time analyses. Diagnostic response times only provide timely annunciation of safety-system trouble and are not part of the safety-system response time itself. For instance, the response time analysis Westinghouse performed for the Palo Verde Core Protection Calculator System did not take into account the watchdog timer timeouts.

During the presentation, the NRC staff asked how non-activation of the stall time was discovered. Westinghouse answered that it was discovered during an investigation into an unrelated issue. A more detailed review of the error conditions led to the discovery that the stall timers were not activated.

Another question asked by the NRC staff was how any future AP1000 applicants would be aware of this concern. Westinghouse responded that there have been many license amendments to the original Vogtle COL based on the AP1000 Design Control Document, Revision 19. The watchdog timer licensing deviation would be one more license amendment. It is assumed that future AP1000 applicants would review these license amendments that have accumulated since revision 19 of the AP1000 Design Control Document.

The NRC staff continued the questioning by asking why some current combined license holders were not listed as being affected in the text of the NSAL. Westinghouse took an action from the meeting to look at those plants not listed as affected by the NSAL and determine if they should be included.

When asked by the NRC staff why the stall times could not be activated, Westinghouse cited several reasons. First, Westinghouse said that many plants had been running for as long as 27<sup>1</sup> (sic) years without the stall timers being activated. Activating them today could lead to unintended consequences that had not been anticipated. Second, not all plants are using the same software version in their AC160 controllers so there is not a common fix that could be applied. Again, Westinghouse emphasized that there was not a safety issue but rather a licensing issue from the NSAL.

Two other questions from the NRC staff asked why the commercial grade dedication (CGD) process of the Common Q platform did not discover the stall timers had not been activated and what other platform requirements were not properly identified and tested. Westinghouse responded that because the window WDT function would ensure the activation of the WDT relay and other diagnostic self-testing features cover the same software fault, and the oversight of not activating the stall timers did not impact the safety-related actuation path (e.g., WDT relay), so there was no safety concern.

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<sup>1</sup> Following the meeting Westinghouse clarified that 17 years is the correct time.

However, Westinghouse stated that it was looking at what changes were needed in the CGD process to ensure oversights like this were identified and corrected. Westinghouse stated that their causal analysis will be completed by October 2017 and the extent of condition report will be completed by November 2017.

The NRC staff stated that it needed to review its safety evaluation (SE) for WCAP-16097-P, Revision 3 "Common Qualified Platform." The reason for this review was that the SE was based on the information related to the overall WDT function provided in WCAP-16097. If the stall timers were not activated, the NRC staff needed to determine if changes were needed to the SE for WCAP-16097. A copy of the SE is in the ADAMS meeting packaged cited earlier.

A question was asked by the NRC staff as to whether Westinghouse had received any information on the stall timers for other industrial applications. Westinghouse said that it had not received any information in areas outside of nuclear.

Based on the discussions at the meeting and the Westinghouse conclusion that the stall timer need not be activated, the NRC staff asked why the stall timer should even be considered in the design in the future. In addition, the NRC staff noted that, per the software development process guidance document, Branch Technical Position (BTP) 7-14, Revision 5, "Guidance On Software Reviews For Digital Computer-Based Instrumentation and Control Systems," it is not a good practice to include unnecessary and non-active code in the controller design. Westinghouse agreed to look at the need for the stall timer to be included in future designs. This was an action from the meeting. A copy of BTP 7-14 can be found in the ADAMS package for this meeting.

At the end of the presentation and discussions, it was agreed that another meeting would be beneficial. An action was taken to schedule a second meeting in the early December time frame.

Actions from the meeting were:

- 1) NRC staff will provide names of individuals who would want access to the NSAL SharePoint site;
- 2) Westinghouse will look at whether the stall timer should remain in the controller design; and
- 3) NRC staff and Westinghouse will schedule a meeting in the early December time frame to continue the discussions. Westinghouse will provide the information listed in its presentation on the schedules listed to support the meeting.

Project 700

SUBJECT: SUMMARY OF THE AUGUST 15, 2017, MEETING WITH WESTINGHOUSE REGARDING WESTINGHOUSE NUCLEAR SAFETY ADVISORY LETTER ON THE AC160 CONTROLLER DATED: SEPTEMBER 11, 2017

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<b>NAME</b>	JHolonich	MWaters	DMorey	JHolonich
<b>DATE</b>	08/28/2017	09/6/2017	09/7/2017	09/11/2017

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