

February 4, 2013

MEMORANDUM TO: Chairman Macfarlane  
Commissioner Svinicki  
Commissioner Apostolakis  
Commissioner Magwood  
Commissioner Ostendorff

FROM: Eric J. Leeds, Director */RA/*  
Office of Nuclear Reactor Regulation

SUBJECT: INDUSTRY TRENDS INDICATOR EXCEEDED IN  
FISCAL YEAR 2011

This memorandum informs the Commission that, upon finalization of industry data, the Significant Events indicator exceeded its short-term (annual) prediction limit in fiscal year (FY) 2011. As discussed in SECY-12-0056, "Fiscal Year 2011 Results of the Industry Trends Program for Operating Power Reactors," dated April 9, 2012, the agency documented six events as Significant Events. As documented in SECY-12-0056, the staff had not yet finalized the probabilistic risk analyses for several other events.

The staff determines Significant Events through a detailed screening and evaluation of operating experience. Inspection Manual Chapter 0313, "Industry Trends Program," defines Significant Events as the following:

- a Yellow or Red Reactor Oversight Process (ROP) finding or performance indicator,
- an event with a conditional core damage probability (CCDP) or increase in core damage probability ( $\Delta$ CCDP) of  $1 \times 10^{-5}$  or higher,
- an abnormal occurrence as defined by Management Directive 8.1, "Abnormal Occurrence Reporting Procedure," and
- an event rated at two or higher on the International Nuclear Events Scale.

SECY-12-0056 noted the potential for a high number of significant events for FY 2011. As referenced above, the six documented events were related to Yellow or Red ROP findings, and the staff was still reviewing an additional seven events under the Accident Sequence Precursor (ASP) Program. The ASP Program, implemented by the Office of Nuclear Regulatory Research, systematically evaluates U.S. nuclear power plant operating experience to identify, document, and rank the operating events most likely to lead to inadequate core cooling and severe core

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damage (precursors). The ASP results of those seven events have been finalized since the staff submitted SECY-12-0133 on October 4, 2012, and indicate that all the events are significant with respect to CCDP. With the addition of these seven events, a total of 13 Significant Events occurred in FY 2011, which exceeds the annual prediction limit of 11 events.

The annual prediction limit is a value established from industry baseline data that sets an upper bound on expected performance in a year. Industry data within the Industry Trends Program is normalized per unit. The additional seven Significant Events not documented in SECY-12-0056 are the following:

- On April 16, 2011, a loss of offsite power (LOOP) occurred at Surry, Units 1 and 2, when a tornado damaged the switchyard (Unit 1 CCDP =  $9 \times 10^{-5}$ , Unit 2 CCDP =  $7 \times 10^{-5}$ ).
- On April 27, 2011, a LOOP occurred at Browns Ferry, Units 1, 2, and 3, when high winds damaged the area's transmission lines (Unit 1, 2, and 3 CCDP =  $1 \times 10^{-5}$ ).
- On August 23, 2011, a LOOP occurred at North Anna, Units 1 and 2, during an earthquake (Unit 1 CCDP =  $2 \times 10^{-4}$ , Unit 2 CCDP =  $4 \times 10^{-5}$ ).

In each of these three events, natural phenomena beyond the control of the licensees resulted in a LOOP. The Significant Events indicator value was further amplified because each of these events occurred at a multi-unit site, resulting in seven units impacted by three external initiators. Equipment at Browns Ferry responded as expected early in the event. While Browns Ferry experienced two separate and independent emergency diesel generator-related failures that resulted in a short duration loss of shutdown cooling (less than one hour each), these failures had a negligible contribution to the overall significance of the event because redundant electrical power sources were available and the reactors were in cold shutdown at the time. Surry did not experience equipment failure throughout the event; therefore, the plant responded as expected. While the risk numbers for the North Anna event were driven higher by complications from an emergency diesel generator-related equipment failure, sufficient levels of defense-in-depth remained. The Browns Ferry, Surry, and North Anna events do not represent degradation in overall industry safety performance mainly because the reliability and availability of safety systems, along with operator response, minimized the overall risk significance of each event.

Outside the Industry Trends Program, the Operating Experience Branch, within the Office of Nuclear Reactor Regulation, is reviewing significant events from the past 5 years to determine if there is any trend of concern that the Nuclear Regulatory Commission will need to address. The staff will document any conclusions or recommendations resulting from this review in the FY 2012 Industry Trends annual report. In addition, the staff will evaluate the conclusions and recommendations to determine if changes to the ROP are warranted as part of the ROP Self-Assessment Process.

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The Commissioners

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