

November 2, 2012

MEMORANDUM TO: Brian W. Sheron, Director  
Office of Nuclear Regulatory Research

FROM: Sunil D. Weerakkody, Chairman */RA/*  
Panel for Review of Pre-Generic Issue 1 Screening Evaluation  
Division of Risk Assessment  
Office of Nuclear Reactor Regulation

SUBJECT: RESULTS OF SCREENING OF PROPOSED GENERIC ISSUE  
PRE-GI-0001, "MULTIUNIT CORE DAMAGE EVENTS"

In accordance with Management Directive (MD) 6.4, "Generic Issues Program," the screening panel completed its review of Pre-Generic Issue (Pre-GI)-0001, "Multiunit Core Damage Events." A potential safety concern was identified during the sequence identification and selection process for the State-of-the-Art Reactor Consequence Analysis (SOARCA) project for the Surry and Peach Bottom plants. Staff working on the SOARCA project identified scenarios in which both units at each plant would be expected to experience accident sequence progression pathways leading to core damage as a result of the initiating event. These scenarios had core damage frequencies in the range of  $10^{-6}$  per year. This frequency is low in an absolute sense, but it is in the range of other scenarios being evaluated in probabilistic risk assessment (PRA) studies. This topic was proposed as a Generic Issue because such multiunit core damage sequences may challenge the ability of the plant operating personnel to respond and may require resources (technical staff and equipment) beyond that which is available for single unit scenarios. Multiunit core damage scenarios may also increase the radionuclide releases and offsite consequences.

Current licensing policy and practice considers each plant individually; that is, a single license is not obtained for a site composed of multiple plants. There are currently 36 sites with multiple nuclear units and there are applications for more units at existing sites. A number of actions or policy changes can be envisioned to address this issue. However, the first necessary step to determine whether actions and policy changes may be warranted is to quantify the risk or safety significance of multiunit scenarios. This entails the development of appropriate risk tools, such as multiunit PRA models. During the screening of this issue, the March 2011 accident at Fukushima Dai-ichi in Japan occurred, further underscoring the importance of better understanding and quantification of multiunit risk.

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The screening panel recommends that this issue exit the Generic Issue (GI) Program because it will require longer term efforts to develop the tools to understand and quantify multiunit risk, i.e., more than the six months prescribed by Management Directive 6.4, "Generic Issues Program." Accordingly, this proposed GI does not meet the fifth of seven criteria required for designation as a GI. The fifth criterion states that an issue's risk or safety significance can be adequately determined, i.e., does not require longer term studies to evaluate.

The panel notes that the Office of Nuclear Regulatory Research (RES) has started a multiyear term initiative to develop a full scope level 3 PRA for a single site (Agencywide Documents Access and Management System Accession No. ML121320310). The objectives of that project are to:

1. Develop a level 3 PRA, generally based on current state-of-practice methods, tools, and data, that (1) reflects technical advances since the last NRC-sponsored level 3 PRAs were completed over 20 years ago, and (2) addresses scope considerations that were not previously considered (e.g., low power and shutdown events, multiunit risk, and other radiological sources)
2. Extract new insights to enhance regulatory decisionmaking and to help focus limited agency resources on issues most directly related to the agency's mission to protect public health and safety
3. Enhance PRA staff capability and expertise, and improve documentation practices to make PRA information more accessible
4. Demonstrate technical feasibility and evaluate the realistic cost of developing new level 3 PRAs

The panel also notes that post-Fukushima, the NRC determined that U.S. plants are safe for continued operation. In addition, as described in SECY-12-0095, "Tier 3 Program Plans and 6-Month Status Update in Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Subsequent Tsunami" numerous actions, such as orders and requests for information, are in progress which will enhance the resources (equipment, procedures, and emergency response staffing) available to respond to a multiunit event; thus reducing multiunit risk.

The GI Program staff will maintain the screening results of this GI in the Generic Issue Management Control System and track and report progress on the level 3 PRA project. When staff completes the level 3 PRA project, this topic will be reconsidered by the GI Program staff for possible designation as a Generic Issue based on insights gained from the level 3 PRA

B. Sheron

- 3 -

project and implementation of post-Fukushima actions. I request your approval of the panel's recommendation.

Approved:

\_\_\_\_\_  
Brian W. Sheron, Director  
Office of Nuclear Regulatory Research

Date: \_\_\_\_\_

B. Sheron

- 3 -

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Approved:

\_\_\_\_\_  
Brian W. Sheron, Director  
Office of Nuclear Regulatory Research

Date: \_\_\_\_\_

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