

September 9, 2013

MEMORANDUM TO: Richard P. Correia, Director
Division of Risk Analysis
Office of Nuclear Regulatory Research

FROM: David L. Skeen, Director **/RA/**
Japan Lessons-Learned Project Directorate
Office of Nuclear Reactor Regulations

SUBJECT: CONSIDERATION OF A POTENTIAL GENERIC SAFETY ISSUE
REGARDING THE ASSESSMENT AND UPDATE OF THE FSAR
RESULTING FROM THE POTENTIAL INCREASE IN RISK DUE TO
MAN-MADE ACTIVITIES ATTRIBUTABLE TO CHANGES IN SITE
ENVIRONS

INTRODUCTION

In issuing a license to construct and operate a nuclear power plant, site suitability evaluations are performed and presented in the license application. A siting evaluation assessing potential hazards from external events is a key aspect of the NRC review of a nuclear plant application. These external events include natural events such as seismic; flooding; wind and missile loads from tornadoes and hurricanes; snow and ice loads for roof design; and man-made events associated with infrastructure such as, transportation or other nearby facilities. In light of lessons learned from the accident at Fukushima Dai-ichi, the committee on Appropriations of the House of Representatives and the Senate promulgated Public Law 112-74, such that action is required to address national security or imminent risks to public safety. Under Section 402, the NRC shall require reactor licensees to reevaluate the seismic, tsunami, flooding and other external hazards at their sites against current applicable Commission requirements and guidance. As clarified by the Office of Congressional Affairs, Congress intended "other external hazards" to include natural, not man-made, hazards.

Prior to Public Law 112-74, the Near-Term Task Force (NTTF), prepared a recommendation to re-evaluate the hazards due to seismic, tsunami and flooding events making them a top priority (Tier 1) based on immediate concerns. In response to Public Law 112-74, NRC Senior Management expanded the scope of Fukushima Lessons Learned activities as stated in SECY-12-0025, to include re-evaluation of other natural hazards such as wind and missile loads from tornadoes and hurricanes, and snow and ice loads for roof design as Tier 2 activities. However, as part of an assessment of additional issues, as the Senior Level (SL) Screening Group has recommended that "other external events" be expanded to include considerations for all types of events (co-located facilities, nearby facilities, and other site-specific external hazards), not just the stated "natural events," as proposed in SECY-12-0025. The NRC Senior Management and the staff agreed to continue to limit the Tier 2 portion of the NTTF Recommendation 2.1 to "Other Natural External Hazards Reevaluations" and use other regulatory processes such as the Generic Safety Issue Program to evaluate the need for licensees to reevaluate man-related hazards. In performing staff evaluations of applications for new nuclear units co-located with existing units, the Office of New Reactors observed that

changes to man-made activities due to area expansion or growth (such as new industrial facilities being built or existing facilities expanding or changing usage) that occurred since the approval of the existing operating unit/units, were considered only in the hazard evaluations for new proposed units to ensure that there are no potential adverse impacts posing a threat to public health and safety. The hazard evaluations did not include any assessment of impacts on the existing operating unit/units.

For existing operating units, there is no NRC regulatory requirement mandating the periodic examination of changes to man-made activities due to transportation or nearby facilities in the site vicinity (within 5 miles), that may potentially impact the safe operation of the nuclear power plant. In addition, the older nuclear power plants may have been assessed using limited data and different methodologies as compared to the NRC's current criteria and use of state of the art methodologies with larger data bases, which may offer a more systematic examination of plant specific hazards. There is no current NRC regulatory requirement to assess the potential increase in risk from man-made activities reflecting the changes due to area expansion or growth in the site vicinity on a periodic basis. Due to uncertainty of increased risk potential from the hazards resulting from the area expansion and growth of site vicinity after license approval, it may be appropriate to consider and evaluate this risk potential as Generic Safety Issue under the "Generic Issue Program."

This memo submits the issue for processing under the Generic Issues Program.

This memo is requesting the Operating Experience and Generic Issues Branch to evaluate this issue using the criteria in M.D. 6.4 "Generic Issue Program" to determine if area expansion or growth in the site vicinity with respect to manmade hazards such as transportation or nearby facilities could pose an increased risk for the safe operation of the plant. The assessment would also determine what remedial actions or improvements could be instituted to mitigate or reduce the plant risk, if appropriate.

TECHNICAL ISSUE

In light of lessons learned from the accident at Fukushima Dai-ichi, Public Law 112-74 Section 402 was enacted, which mandates the Nuclear Regulatory Commission require reactor licensees to re-evaluate seismic, tsunami, flooding, and other external hazards at their sites. In SECY-12-0025, the staff discussed their intent to reevaluate seismic and flooding hazards at nuclear power plants. Staff also stated that they would evaluate other natural hazards to comply with Public Law 112-74, section 402. Subsequent to SECY-12-0025, the JLD SL (Senior Level) Screening Group recommended that staff look into "other external hazards" that include events pertaining to co-located facilities, near-by facilities, and other site-specific external hazards not just the stated "natural events" (SECY-12-0025). Based on the presentation of the SL Screening Group and the staff, the Steering Committee recommended pursuing this under other regulatory processes such as the Generic Issue Program. As such, it is being proposed to examine and evaluate potential hazards from external events attributed to man-made activities such as transportation or nearby facilities under the Generic Issue Program. The basis for this potential concern is enumerated below.

Based on the review of information presented in recent COL and ESP license applications,

where new units are being proposed at sites located very close to operating nuclear unit(s), it is clear that a significant expansion or growth of industrial activities have occurred at several sites.

Since the original approval of each plant's license, it is possible that many operational plants may have experienced significant area expansion or growth related to transportation or nearby facilities, which could alter the risk potential to the plant from external hazards such as overpressure from explosions, vapor cloud explosions, missiles from explosions, thermal effects, toxic chemicals releases affecting control room habitability, and aircraft crash impacts. The possible increase of these hazards has the potential to challenge the design basis due to rate of change and/or magnitude of change resulting in a potential increased risk. Although the risk may still be acceptable and within the original risk evaluation, a periodic reassessment based on change in information would further ensure the safe operation of the plant. However, this assessment is not currently required. It should be noted that applicants are required to periodically update their FSAR, pursuant to 50.71. However, nearby hazards are generally considered "historical information" in plant FSARs and are not updated. There are some instances where additional evaluations were performed and documented for either compliance with the State and/or other Federal Agency requirements, or as part of NRC's resolution of public concerns that rose through petitions or allegations.

For example, the Maryland Department of Natural Resources acting through the Power Plant Research Program (PPRP) of Federal Energy Regulatory Commission (FERC), evaluated risks associated with the expansion of the Cove Point LNG facility to nearby residential communities and the Calvert Cliffs Nuclear Power Plant. The results of this study are incorporated into Calvert Cliffs Unit 3 Combined Operation License Application (COLA) and found to not pose a threat to the safe operation of the plant. Another example pertains to the petition submitted in accordance with Section 2.206, by a member of the public in 2008 and also in 2011, asking the NRC to investigate the consequences of a rupture of natural gas pipelines on the Indian Point Nuclear Plant site. The NRC staff evaluated potential hazards and concluded that the natural gas pipelines at Indian Point do not pose a threat to the safe operation of the plant.

Licensees are required to periodically update the FSAR as a part of regulatory requirement Title 10 of the *Code of Federal Regulations* (10 CFR) 50.71. Other regulatory programs that rely on an understanding of offsite conditions require some periodic review. For example, Emergency Plans as a part of Emergency Preparedness are required to be updated as a part of regulatory requirement 10 CFR 50.47 and Appendix E. The site specific maximum individual dose to a member of the public from meat, milk and food pathways from the nearby plant is required to be determined based on the nearest meat, milk and garden location to the plant from annual surveys of the area conducted in close proximity to the plant as a part of an Annual Report requirement. Periodic update of certain information such as those addressed are required as part of the operating license of a nuclear power plant. However, there is no NRC regulatory requirement to assess the potential risk increase from man-made activities attributing to the site environs.

Based on the discussion above, the issue is being submitted to the Generic Issues Program for evaluation.

Therefore, based on the technical rationale, and also based on considering similar periodic updates that are addressed above, it may be necessary to examine and evaluate this issue under the Generic Issue Program. Since there is presently no NRC regulatory requirement, licensees may not be performing any periodic evaluations for the potential increase in risk. The

staff will use the results of the assessment requested in this memorandum to inform possible regulatory changes to address risks and/or to improve current reporting requirements.

REFERENCES

PPRP, "Cove Point LNG Terminal Expansion Project Risk Study," Maryland Power Plant Research Program, June 28, 2006.

NRC Internal Memo (Non-Public): John P. Boska to Theodore R. Quay dated March 02, 2011, "Review of 10 CFR 2.206 Petition on Gas Pipelines near the Indian Point Reactors."

U.S. Nuclear Regulatory Commission, "Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities," NUREG-1407, April 1991.

U.S. Nuclear Regulatory Commission, "Perspectives Gained From the Individual Plant Examination of External Events (IPEEE) Program," NUREG 1742, September 2001.

Public Law 112-74, Section 402, December 23, 2011.

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