



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001**

April 25, 2012

Mr. R.W. Borchardt  
Executive Director for Operations  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Subject: RESPONSE TO THE JANUARY 24, 2012, EDO LETTER REGARDING THE  
PROGRESS ENERGY FLORIDA COMBINED LICENSE APPLICATION FOR LEVY  
NUCLEAR PLANT, UNITS 1 AND 2

Dear Mr. Borchardt,

During the 593<sup>rd</sup> meeting of the Advisory Committee on Reactor Safeguards, April 12-14, 2012, we reviewed your January 24, 2012, letter responding to our December 7, 2011, report on our review of the staff's advanced safety evaluation report for the pending Progress Energy Florida combined license application (COLA) for Levy Nuclear Plant (LNP), Units 1 and 2. With regard to the staff's response to our recommendations, we provide the following comments.

**PROBABILISTIC EVALUATION OF TSUNAMI HAZARD**

ACRS Recommendation

Our December 7, 2011, report made the following recommendation.

A license condition should be established to require inclusion of a probabilistic evaluation of the tsunami hazard in the site-specific, full-scope probabilistic risk assessment required before fuel load.

Staff Response

The staff response summarized the deterministic analyses presented in its advanced safety evaluation report as the bases for its conclusion that the risk from flooding by a conservatively calculated maximum tsunami is not significant for the LNP site. With regard to our recommendation above, the staff responded as follows.

Currently, probabilistic tsunami hazard assessment (PTHA) is in development. In response to the 2004 Indian Ocean tsunami, the NRC initiated a research program to address tsunami hazards and their potential impact on U.S. nuclear power plants. This research program focuses on developing modern hazard assessment techniques and additional guidance through cooperation with the National Oceanic and Atmospheric Administration and the United States Geological Survey (USGS). This effort has already led to several technical reports, conference papers, and an update to NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," (Section 2.4.6). The potential for PTHA will be explored in the final phase of the research program. The goal is to provide new regulatory guidance on tsunami hazard assessment in parallel with ongoing efforts of the International Atomic Energy Agency Working Group on Tsunami Hazards. The United States and Japan are tasked with the lead for submarine landslide and seismic tsunami sources, respectively.

After reviewing recent efforts to develop a landslide probability methodology, the staff response concluded with the following.

An NRC-sponsored workshop on submarine landslide probabilities was held August 18-19, 2011, at the USGS Woods Hole Science Center in Massachusetts. Academic, industry and government participants provided an overview of topics that included geological characterization of submarine landslides, geotechnical techniques and measurements of slope stability, hydrodynamic modeling of landslide-generated tsunamis, and probabilistic methods for hazard assessment. The workshop concluded that there is currently insufficient information with which to incorporate submarine landslides into PTHA at the very low probabilities of interest to the NRC. The agency's research will continue to assess this issue.

#### ACRS Comment on Staff Response

As indicated in our December 7, 2011 letter, given the uncertainties in the parameters used in the LNP deterministic analysis, a probabilistic approach would provide additional confidence that the risk of wave runup exceeding the site elevation is acceptably low. We commented in our letter that this probabilistic analysis of the tsunami hazard should be performed regardless of whether a consensus standard is available.

The first generic issue we would like to discuss is the status and schedule outlook for the availability of guidance applicable to PTHA. The staff response referenced above suggests such guidance may not be available for an indefinite period. We acknowledge the status indicated following the August 2011 workshop. However, given the importance of tsunami to coastal sites, we wish to review the status and schedule outlook with the staff and consider whether additional actions should be taken to ensure the inclusion of PTHA in probabilistic risk assessments (PRAs) as soon as practical.

The second generic issue was not part of the staff's response, but has emerged from our review of the response. Based on 10 CFR 50.71 and the availability of consensus standards for external hazards, including flooding, it has been our expectation that all combined license holders will submit a PRA addressing these external hazards prior to fuel loading. However, we note that both Regulatory Guide (RG) 1.200 and the American Society of Mechanical Engineers/American Nuclear Society (ASME/ANS) standard appear to permit screening out of this hazard based on meeting the applicable portion of the Standard Review Plan. This seems to have followed from the guidance in NUREG-1407 for the Individual Plant Examination of External Events (IPEEE).

In the context of the IPEEE, this screening made sense because the intent was to ensure that these hazards did not produce significant vulnerabilities. However, the PRA for the combined license should provide a more realistic estimate of risk and not simply identify vulnerabilities.

We recognize the use of screening analyses to eliminate the need to address certain hazards in the PRA. However, these should be based on quantitative estimates of the hazard frequency and associated likelihood of core damage. The guidance provided in RG 1.200 for this approach is appropriate and acceptable. Only if it can be shown that a flooding hazard meets these quantitative criteria can it be acceptably screened from consideration in the PRA. We wish to confirm this understanding with the staff.

## **EVALUATION OF THE EFFECT OF ADJACENT WATERCOURSE**

### **ACRS Recommendation**

Our December 7, 2011, report also made the following recommendation.

Prior to approval of the COLA, the staff should verify that inclusion of the adjacent shipping canal and watercourse would not significantly affect the conclusions of its deterministic hazard evaluation described in the advanced safety evaluation.

### **Staff Response**

The staff summarized its independent tsunami analysis and stated that it was satisfied that the applicant's methodology has adequately considered the shipping canal and watercourse. The staff indicates that the impact on the overall water level at the site resulting from a tsunami is negligible given the size and location of the canal and watercourse relative to the site. The staff indicates that it does not believe that any additional deterministic analyses are needed to support the conclusions of its deterministic tsunami hazard evaluation described in the advanced safety evaluation.

### ACRS Comment on the Staff Response

We expect that the site specific evaluation of flooding hazards in the PRA will include the adjacent shipping canal and watercourse.

### **SUMMARY**

We consider the inclusion of flooding among the external hazards to be included in the site-specific, full-scope PRA for new plants to be very important. Based on the staff's response to our recommendation concerning LNP, as discussed above, we request that the staff present additional information to the Committee and respond to our further questions on a generic basis. We believe this should commence as soon as practical, given the importance of the matter to ongoing evaluations of flooding for both existing and new plants.

Thank you for your prompt response to our letter of December 7, 2011, and we look forward to further discussion of the probabilistic treatment of flooding hazards, including tsunamis.

Sincerely,

/RA/

J. Sam Armijo  
Chairman

### **REFERENCES**

1. EDO Letter, Subject: Report on the Safety Aspects of the Progress Energy Florida Combined License Application for Levy Nuclear Plant, Units 1 and 2, dated January 24, 2012 (ML113550501)
2. ACRS Letter, Subject: Report on the Safety Aspects of the Progress Energy Florida, Inc. Combined License Application for Levy Nuclear Plant, Units 1 and 2, dated December 7, 2011 (ML11339A126)
3. Regulatory Guide 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," Revision 2, March 2009 (ML090410014)
4. NUREG-1407, "Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities," June 1991 (ML063550238)

ACRS Comment on the Staff Response

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Letter to R.W. Borchardt, EDO, from J. Sam Armijo, ACRS Chairman, dated April 25, 2012

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**ML# 12108A270**

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