



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

ACRSR-2213

September 22, 2006

Mr. Luis A. Reyes
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

SUBJECT: LESSONS LEARNED FROM THE REVIEW OF EARLY SITE PERMIT
APPLICATIONS

Dear Mr. Reyes:

During the 535th meeting of the Advisory Committee on Reactor Safeguards (ACRS), September 7-8, 2006, we met with representatives of the NRC staff; Dominion Nuclear North Anna, LLC; System Energy Resources, Inc.; and, Southern Nuclear Operating Company, Inc. to discuss any lessons that may have been learned in the submission, evaluation, and review of the North Anna, Grand Gulf, and Clinton early site permit applications. This matter was also discussed by our Subcommittee on Early Site Permits on September 6, 2006. We had the benefit of the documents referenced.

In accordance with 10 CFR Part 52, Subpart A, early site permit applications address separately safety and environmental issues. The ACRS is required to report on those portions of the applications that concern safety. We have reported separately on each of the applications for North Anna, Grand Gulf, and Clinton. Generally, we have praised both the quality of the applications and the quality of the staff safety evaluation reports on these applications.

Based on our review of the applications and discussions with representatives of the NRC staff and the applicants, two lessons emerged that may have generic applicability, especially to the many Combined License (COL) applications now anticipated by the agency. One lesson concerned the development of a "common understanding" between the staff and the applicant regarding expectations for the application. The second concerned the use of data obtained from the internet to substantiate portions of an application and safety analysis.

The applications we have reviewed have been the first opportunity to exercise the early site permit regulations. Not all the guidance that might be desired has been in place. Some available guidance was written for rules in place in a previous era. Applicants found it important to establish through direct discussions with the staff a common understanding of staff expectations concerning portions of the early site permit applications. Where this common understanding had been established, the preparation of the application and review process were generally smooth. Where a common understanding was not established, the processes often were more time consuming. Time spent by the staff to establish guidance and develop a common understanding with the applicants should facilitate processing of anticipated COL applications.

In the current electronic age, ever more information is becoming available through the internet. This trend will continue and eventually the internet may replace libraries and other information repositories that support engineering and safety analyses. Internet resources have advantages in comparison to familiar printed resources. They also have vulnerabilities that are not suffered by printed resources. Though internet information sources were conservatively and appropriately handled for the three early site permit applications we have reviewed, it is evident that eventually the staff will have to establish guidance to ensure reliability of internet information and the continuing ability to retrieve such information.

Two of the applicants made specific note of the challenges they faced in the electronic submission of their applications and continuing challenges they face in the electronic submission of updates to these applications. The NRC staff is addressing these challenges in anticipation of electronic submissions of COL applications.

In the course of reviews of the first three early site permit applications, the staff found that it had to discipline the review process by defining criteria for the imposition of permit conditions and COL action items. We have reviewed the criteria staff established and reported favorably on these criteria in our March 24, 2006, report. The applicant for an early site permit application for the Clinton site surprised the staff by invoking a novel, performance-based, seismic hazard analysis. This new methodology deviated markedly from the staff-approved seismic analysis methodology. The staff was able to examine and approve this methodology as it applied to the Clinton early site permit. Again, we reviewed the staff's analysis and reported favorably in our March 24, 2006 report. Nevertheless, the new approach to seismic hazard analysis did strain staff resources. Timely processing of future early site permit applications and COL applications will depend on advance dialog between the staff and the applicants when new analysis methodologies are to be introduced.

The staff has identified other lessons from the review of the first three early site permit applications and is acting upon these lessons. Among the lessons are the needs for:

- definition and criteria for pertinent site characteristics,
- criteria for the controlling elements of the plant parameter envelope,
- guidance on the treatment of the high frequency (10-100 Hz) component of seismic ground motion,
- guidance on the depth of review of major features of the emergency plan for a proposed new site, and
- criteria and review guidance for the computation of the probable maximum flood at a proposed site.

The priority that staff ascribes to addressing these lessons is influenced by its anticipation that future applicants will adopt specific reactor technologies and will not rely on the plant parameter envelope option permitted under the current regulations. The staff also anticipates that future applicants will provide fully integrated emergency plans and will not ask for approval of just specific major features of an emergency plan.

During the review of the early site permit applications, a number of questions arose concerning the applicability of 10 CFR Part 21 and 10 CFR Part 50, Appendix B to the early site permit process and holders of early site permits. The staff did conclude that processes for reporting deficiencies and quality control of activities are needed. The staff now proposes rule changes to make these elements of the regulations applicable to the early site permit process.

Among the characteristics of a proposed site considered in the early site permit process are extremes of weather. There is an evolving understanding of climatic cycles that affect extremes of weather especially for sites on the east coast of the United States and near the Gulf of Mexico. Though it cannot be claimed that the understanding is well established, it is evident that there are weather cycles with periods on the order of decades that can affect site characteristics. The popular press ensures that the public is aware of this growing understanding of weather cycles. This public awareness may make it particularly important that the staff demonstrate some understanding of these processes and the likely effects of weather cycles on the suitability of proposed sites for nuclear power plants. The staff needs to ensure that historical weather data used to characterize a site extend over sufficient time intervals to capture cyclical extremes in the weather that will affect plant design.

In our meeting with the staff and applicants, a consensus developed that the experiences gained in the course of the early site permit process would aid considerably the preparation of applications for COLs at the sites. Applicants that have not been through the process will benefit from an effort to derive their own lessons to the extent they can from the review of these three early site permit applications. We anticipate that additional lessons will be learned should the staff undertake a review of an early site permit for a so-called "green field" site that is not adjacent to the site of a currently operating nuclear power plant.

Sincerely,

/RA/

Graham B. Wallis
Chairman

References:
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References:

1. Report dated March 12, 2003, from Mario V. Bonaca, Chairman, ACRS, to Richard A. Meserve, NRC Chairman, Subject: Draft Review Standard, RS-002: "Processing Applications For Early Site Permits."
2. Letter dated March 11, 2005, from G. B. Wallis, Chairman, ACRS, to L. A. Reyes, Executive Director for Operations, NRC, Subject: Interim Letter: Draft Safety Evaluation Report on North Anna Early Site Permit Application.
3. Letter dated June 14, 2005, from G. B. Wallis, Chairman, ACRS, to L. A. Reyes, Executive Director for Operations, NRC, Subject: Interim Letter: Draft Safety Evaluation Report on Grand Gulf Early Site Permit Application.
4. Report dated July 18, 2005, from G. B. Wallis, Chairman, ACRS, to N. J. Diaz, Chairman, NRC, Subject: Dominion Nuclear North Anna, LLC, Early Site Permit Application and the Associated NRC Final Safety Evaluation Report.
5. Letter dated September 22, 2005, from G. B. Wallis, Chairman, ACRS, to L. A. Reyes, Executive Director for Operations, NRC, Subject: Interim Letter: Exelon Generation Company, LLC, Application for Early Site Permit and the Associated NRC Staff's Draft Safety Evaluation Report.
6. Letter dated December 23, 2005, from G. B. Wallis, Chairman, ACRS, to L. A. Reyes, Executive Director for Operations, NRC, Subject: Early Site Permit Application for the Grand Gulf Site and the Associated Final Safety Evaluation Report.
7. Report dated March 24, 2006, from G. B. Wallis, Chairman, ACRS, to N. J. Diaz, Chairman, NRC, Subject: Final Review of the Exelon Generation Company, LLC, Application for an Early Site Permit and the Associated NRC Staff's Final Safety Evaluation Report.
8. Report dated May 22, 2006, from G. B. Wallis, Chairman, ACRS, to N. J. Diaz, Chairman, NRC, Subject: Proposed Revisions to 10 CFR Part 52: Licenses, Certifications, and Approvals for Nuclear Power Plants, and Conforming Amendments to Applicable NRC Regulations.