December 15, 2009

The Honorable Thomas R. Carper
Chairman, Subcommittee on Clean Air
and Nuclear Safety
Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

I am responding to your October 15, 2009 letter regarding the U.S. Nuclear Regulatory Commission's method for reviewing new nuclear reactor applications. In your letter, you expressed concern that the NRC is not receiving complete license applications, which in turn hinders the licensing process.

In a December 10, 2009 letter, Chairman Gregory Jaczko provided a summary of the actions the NRC is taking to ensure that new license applications are processed in an appropriate and timely manner. The Chairman's letter also referred to a number of external and internal challenges that the NRC faces in this matter. Enclosed is a document that discusses in further detail those issues that may impact new reactor licensing reviews.

Sincerely,

/RA/

Rebecca L. Schmidt, Director
Office of Congressional Affairs

Enclosure: As stated

Challenges Impacting New Reactor Licensing Reviews

This additional information on challenges that have impacted the United States Nuclear Regulatory Commission's (NRC's) review of design certification (DC) and combined license (COL) applications for new reactors.

Challenges Concerning Design Centered Approach

The concurrent DC and COL application reviews, departures, and exemption requests, illustrate how industry and applicant design proposal decisions can complicate reviews or extend review schedules beyond the normally expected timeline.

- **Concurrent DC and COL Reviews:** The designs are not final and applicants are submitting COL applications concurrently with the DC applications. Only one of the 18 COL applications submitted to the NRC references a certified design. The NRC cannot complete its review of COL applications referencing a design until all NRC requirements are met, including certification of the referenced designs in accordance with 10 CFR Part 52 through rulemaking.

- **Departures and Exemptions:** COL applicants are introducing departures, meaning the applicant is deviating from the standard design in the DC applications. Only two of the 18 COL applications to the NRC do not identify any departures or exemptions from the referenced designs. Thus requiring NRC to review and approve these departures, or the NRC staff must confirm that NRC approval is not necessary, in accordance with 10 CFR Part 52 requirements, and the NRC must address the Exemption requests.

Challenges Concerning Review of DC Applications

The main challenges that the NRC is facing with regards to the predictability of DC reviews are design changes, applicant's performance in responding to requests for additional information (RAIs), and first-of-a-kind design approaches.

- **Design Changes**: All DC applicants made design changes after the NRC staff began its reviews. As a result, there was a delay in schedules for each of the design centers. Some changes were initiated by the applicant. For example, the NRC received a revision to the pending amendment to the AP1000 DC regarding the Reactor Vessel Head Design and the 125 - 250 Volt Direct Current safety-related buses. Other changes were made in order to ensure the proposed design would meet regulatory requirements. For example, at the end of October 2009, the applicant for the advanced pressurized-water reactor (APWR) DC submitted design changes in several areas. The layout and structure were modified to meet the NRC requirements associated with physical security and aircraft impact, and there were design changes to accommodate broader customer specifications, such as increasing the seismic margin.

- **Applicant's Performance in Responding to RAIs:** Several applicants submitted DC applications that, when evaluated during the NRC staff's reviews, did not provide enough details to support the design. In some instances, RAI responses did not address the question or did not provide enough information to close an open item and necessitated multiple rounds of RAIs. This occurred during the reviews for the AP1000 DC amendment, the US Evolutionary Power Reactor (US EPR) and the Economic Simplified Boiling-Water Reactor (ESBWR) DCs. As a specific example, recently the NRC staff

published an updated schedule for the ESBWR DC based on current information regarding the number and scope of remaining open items and the schedule for applicant's RAI responses. The NRC staff issuance of the Final Safety Evaluation Report for the ESBWR DC is now scheduled for January 18, 2011. This reflects a schedule extension of about one year.

- **First-of-a-kind Design Approaches:** All applicants chose to submit first-of-a-kind design approaches for some aspects of their design. Often these design approaches did not conform with applicable guidance or national codes, or their designs included equipment that operating reactors have never used. This has caused delays in the review of the gas turbine generators for the APWR, the reliability of batteries for extended duty cycles (72 hours), the passive control room designs for the ESBWR and AP1000, the passive containment cooling for the US EPR, and the shield building design for the AP1000.

Challenges Concerning Review of COL Applications

The main challenges that the NRC is facing with regards to the predictability of DC reviews are applicants' difficulties in meeting schedule, applicants' difficulties in providing adequate RAI responses, design changes and departures, and changing applicant business strategies.

- **Difficulties in Meeting the Schedule:** Several of the applicants had difficulties in meeting industry's timeliness goal of 30 days for responding to NRC staff RAIs. If a specific review topic is on a critical path, the applicant's inability to meet its schedule results in extension of the review schedule. For example, the applicant for the V.C. Summer COL (AP1000) was late in responding to some of the RAIs from the staff safety reviews. As another example, the staff had to extend the safety review schedule for Calvert Cliffs (US EPR) by about 9 months due to late submittals by the applicant, and the applicant's intent to reply to RAIs in the geotechnical and structural areas 4 – 6 months in the future.

- **Difficulties in Providing Adequate RAI Responses:** Several applicants across all Design Centers had difficulties providing responses to RAIs that resolved the NRC staff's concerns. For example, the STP COL (ABWR) application review has required four rounds of RAIs in the area of hydrology for the Environmental Impact Statement. These issues took almost 2 years to resolve. In another example, the applicant for the Bellefonte COL (AP1000) requested the NRC staff reschedule the hydrology review in order to address, in part, the NRC staff's quality assurance inspection findings. The applicant for Bellefonte acknowledged it was unable to meet many of the scheduled deliverable milestones established in its plan to correct the problems identified in the NRC staff's position. Currently, the applicant for the North Anna COL (ESBWR) is challenged to submit information that is sufficient for the NRC's evaluation to address fiberglass piping for the plant service water system, cyber security, large area fires, and physical security.

- **Design Changes and Departures:** About one third of the applicants made design changes (i.e., design modifications or site layout changes) after the NRC staff began detailed safety and environmental reviews. For example, the applicant for the Bell Bend COL (US EPR) is proposing to move the nuclear reactor 1000 feet to reduce the impacts to "exceptional value" wetlands to satisfy the needs of the U.S. Army Corps of Engineers

for a Clean Water Act Section 404 permit. The applicant for the Fermi COL (ESBWR) has submitted changes for relocation of the cooling tower. These changes also affect the meteorological monitoring tower, and the NRC staff must assess whether the changes will impact the safety and environmental reviews. Further, as part of the William States Lee, III COL (AP1000) review, the applicant included the addition of a 1-mile by 4-mile pond to provide additional water resources during drought conditions, but the new pond will require the agency to conduct an additional public scoping meting, open a supplemental scoping period, and expand its environmental reviews.

- **Changing Applicant Business Strategies:** About one third of the applicants have changed their business strategies. The NRC is only actively reviewing 13 of the 18 COL applications. In response to applicants requests, the NRC has suspended the review or significant portions of the review of five COL applications. For example, the applicant for the Callaway COL (US EPR) asked that the NRC suspend its review because the applicant was suspending its efforts to build a nuclear power plant in Missouri. In addition, the applicant for the Grand Gulf and River Bend Station COLs (ESBWR) asked the NRC to suspend its review until further notice, pending its reevaluation of the alternative technologies.