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**BEFORE THE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR SAFETY
UNITED STATES SENATE**

OCTOBER 3, 2007

The Nuclear Energy Institute (NEI) is the organization responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include all utilities licensed to operate commercial nuclear power plants in the United States, nuclear plants designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

NEI, on behalf of the nuclear energy industry, appreciates the opportunity to provide this testimony for the record in support of congressional oversight of the Nuclear Regulatory Commission.

This testimony will focus on:

- the effectiveness of the NRC's Reactor Oversight Process (ROP) and a few areas where the agency can improve this process
- our agreement with the NRC that the ROP is superior to the one-time experience of conducting an Independent Safety Assessment (ISA)
- the current status of NRC readiness for review of new-plant license applications and industry activities and expectations related to those applications.

INDUSTRY PERSPECTIVE ON THE ROP

The NRC's Reactor Oversight Process (ROP) began in April 2000 and replaced the NRC's Systematic Assessment of Licensee Performance (SALP) program. The NRC developed the ROP with substantial input from the agency's stakeholders, including the nuclear industry and public interest groups. The development effort took over two years and resulted in a comprehensive, structured program with recognition that improvements would be made based on implementation experience and stakeholder feedback.

Today, the ROP has matured but is still evolving due to the culture of continuous improvement in the program that has existed at the agency since the ROP's creation. The industry has maintained a ROP Working Group that meets publicly with the NRC on a monthly basis. This effort includes continual review of every aspect of the ROP, including guidance for reporting data to support the performance indicator program, review of methodologies used to support the significance determination process, and comment on inspection procedures that comprise the

baseline and supplemental inspection program. The NRC also seeks public comment annually on the ROP and uses this feedback to make improvements to the process.

This continuous dialogue on the implementation of the ROP has resulted in an effective tool for the NRC to oversee its reactor licensees. At the heart of this effectiveness is communication at every level among licensees, the NRC and the public. The ROP is the most open and transparent regulatory process of any regulated industry. With the exception of safeguards information that deals with nuclear security matters, every inspection report, every piece of data that supports the performance indicators, and every assessment of reactor licensee performance by the NRC is made available on the NRC's public website.

Beyond openness and transparency, the other principle that underlies the ROP is objectivity. Risk-informed, performance-based approaches are used to ensure that meaningful thresholds of performance are established while maintaining a constant focus on safety. These thresholds direct a graded approach to the allocation of inspection resources, with every plant site receiving baseline inspection of over 2000 hours by NRC personnel each year, and supplemental inspection if licensee performance falls below established thresholds.

In its 2006 report, the GAO concluded that the "NRC's oversight process is finding safety problems and is getting the industry to constantly improve."

It is the nuclear industry's view that the ROP has been a successful program as well as a significant improvement over the previous SALP program. Since the ROP was initiated, the safety performance of U.S. nuclear power plants has improved by every objective indicator of safety performance, while the average capacity factor for the fleet has remained at approximately 90% and overall production costs have decreased. This has been a "win-win-win" for safety, productivity and efficiency.

AREAS FOR IMPROVEMENT

The industry has worked with the NRC to institute a number of improvements to the ROP since its inception. These include significant enhancements to some of the performance indicators as well as the incorporation of the safety culture initiative into the inspection process.

The 2006 GAO report also noted three areas for improvement: the first two related to "... the timeliness of the process used to determine the risk significance of inspection findings and the ability of performance indicators to contribute to the early identification of poorly performing plants." The third area identified by GAO related to the assessment of safety culture as part of the ROP.

The industry agrees with the GAO finding that improvements can be made to performance indicators, and since the GAO report such improvements have already been incorporated into the ROP, (e.g., mitigating system performance indicator) and other enhancements are currently being assessed by the NRC and external stakeholders. More progress is needed to improve the significance determination process (SDP), the process used to determine the risk significance of inspection findings. The SDP evaluates inspections findings for their safety significance and

assigns a corresponding color: green for a finding of very low significance, white for low to moderate significance, yellow for substantial significance, and red for high safety significance.

In the reactor safety area of the ROP, quantitative analysis using probabilistic risk assessment tools is used to assign safety significance to an inspection finding. In numerical terms, the green/white threshold is a one-in-one-million increase in the probability of a core damage event from a particular finding, the white/yellow threshold is a factor of ten higher at one-in-one-hundred-thousand increase, and the yellow/red threshold at one-in-ten-thousand increase in the probability of a core damage event.

Consistent with the GAO comment on timeliness, the main concern the industry has with the SDP in the reactor safety area is with the evaluation of findings at the very low to moderate levels, or around the green/white threshold (one-in-one million increase in probability). This level is so low that it is within the uncertainty bands of the probabilistic risk assessment tools used by licensees and the NRC. Routinely, both licensees and the NRC spend inordinate resources on these *de minimus* risk evaluations because the outcome of the evaluation can change the NRC's oversight of a licensee within the ROP as well as the perception of the licensee's performance to other stakeholders. As noted by the GAO report, the NRC has worked on this issue without achieving the same progress as has been achieved in the area of performance indicators. We hope that at the next oversight hearing we will be able to report that the issue has been successfully addressed.

Before addressing the GAO concern about safety culture, another area where industry believes improvements to the SDP can be made are in the emergency preparedness and public radiation safety cornerstones of the ROP. The SDP for these cornerstones do not rely on the results of probabilistic risk assessment. Rather, the SDP for each cornerstone is rule-based, meaning that the process assesses compliance against existing standards to determine the safety significance of the inspection finding. The industry's concern is that the SDP for these areas can result in determinations inconsistent with the actual safety significance of the finding. These determinations can incorrectly overstate the safety significance of a finding and inadvertently mislead the public.

Two examples illustrate this concern. The first is in the radiation protection area. The industry agrees with the NRC and other stakeholders that it is unacceptable to have inadvertent spills or releases of tritium from our plants, and we have taken affirmative actions across the entire industry to assure appropriate monitoring for such situations and the prompt reporting of them if they occur. While these actions are both necessary and appropriate to ensure credibility and maintain public confidence, rarely do such events constitute an actual increase in risk to the public.

Using the SDP for the public radiation protection area, the NRC issued a white finding to a licensee for failure to assess an inadvertent release when it occurred. Subsequent assessment demonstrated that this release was of very low significance. Thus, the white finding incorrectly communicated to the public the safety significance of this release. While it may be appropriate for NRC to take some form of regulatory action for this type of occurrence, labeling this finding

as having low to moderate safety significance in ROP space is misleading. We intend to work with the NRC and other stakeholders to improve the SDP in this cornerstone.

The second example deals with the emergency planning area. In this case, during a drill, the licensee must classify an event within 15 minutes with the information available at the time. The licensee, per procedures and training, conservatively classified the event for the scenario being exercised. The NRC issued a finding for the subsequent licensee critique of the drill, stating that a less conservative classification was more appropriate for this scenario, and that the licensee's critique should have identified this shortcoming. Using the SDP as the emergency planning cornerstone of the ROP, the NRC concluded this was a white finding. Again, the industry believes that a white finding in this case incorrectly communicated to the public the safety significance of a finding related to a "critique" following a drill.

In summary, to maintain the credibility of the ROP with all stakeholders, the SDP must be objective, risk-informed, and accurately communicate the significance of inspection findings to the public, and we hope to report progress in this area to this Committee at your next oversight hearing.

With regard to the GAO recommendations related to safety culture, as a result of the Davis-Besse reactor vessel head corrosion event, the industry has initiated through the Institute of Nuclear Power Operations (INPO) a major effort to address the issue of safety culture.

This effort has included the development of a clear set of behaviors expected of a strong safety culture which are codified in a principles document prepared by INPO. All of the plants have conducted critical self-assessments against the expectations.

INPO has incorporated safety culture as an explicit area for assessment in its biannual evaluations at every plant site and the importance of safety culture is reinforced at workshops and training sessions on a regular basis. In addition, the NRC has explicitly incorporated safety culture assessments as part of its review of cross-cutting findings in the ROP process. Because of the potential subjectivity associated with assessing safety culture based upon inspection findings, the industry continues to review the process and its outcomes.

While the NRC safety culture process is still in its early implementation stage, it appears to be functioning consistently across NRC regions. It appears to have significant NRC management oversight to ensure consistent and responsible implementation. The GAO recommended that NRC consider looking at specific performance indicators to identify safety culture issues. We have not found any specific performance indicator that provides such insights.

THE ROP AND INDEPENDENT SAFETY ASSESSMENTS

We note that two senators have introduced legislation calling for independent safety assessments (ISA) of nuclear power plants. We also note that the NRC has on its web page a comprehensive comparative review of the ROP against the ISA that was conducted at Maine Yankee in 1996. The industry fully agrees with the NRC's conclusion that the current ROP inspection procedures

and NRC review standards provide essentially full coverage of key aspects of the Maine Yankee ISA, and greater attention to safety culture and potentially risk-significant problems. A great deal of mythology has been created around the Maine Yankee ISA and the owners' decision to decommission the plant. The ISA was not the cause of this decision as few significant issues were uncovered, and the cost to address those issues was in the tens of millions of dollars. There were many other factors that contributed to the decision including the need for steam generator replacement (hundreds of millions of dollars), the uncertainty regarding license renewal (no plant had yet received a renewed license at that time) and the lack of strong public support for the continued operation of the plant (several public referendums in Maine in the 1990s on continued operation narrowly passed). All of these items contributed more to the decision to shut the plant down than the ISA.

In addition to the extensive NRC inspection and oversight processes, each plant has processes for identifying potential safety or quality issues, determining root-causes and ensuring accountability through corrective action programs. Also, all plants receive evaluations by INPO at least every two years. INPO was formed in 1980 by the nuclear industry to promote excellence in all aspects of nuclear safety in plant operations. INPO evaluations utilize peers from other operating companies as well as INPO subject matter experts. These evaluations are discussed with the senior management personnel of each operating company and each company holds each other accountable for performance through the INPO process. The extensive industry programs and the new and robust ROP provide significant assessment, transparency and timely oversight of NRC licensees.

NEW NUCLEAR POWER PLANTS

Both the NRC and the industry have been working diligently to put in place the regulatory requirements and associated industry guidance documents for licensing new plants. With a projected 40 percent increase in electricity demand by 2030, a clear need for new baseload generation and with concerns about climate change, new nuclear plants in the United States are essential to meet our electricity needs and environmental goals. In this regard, just last week the first full combined operating license (COL) was filed with the NRC. Currently, there are 17 companies planning on submitting 22 COLs for 31 potential new nuclear plants.

The final NRC rule (10 CFR Part 52) on new nuclear plant licensing was issued last month and more than 250 regulatory guides and standard review plans have been issued for public comment. The NRC has also established a New Reactor Organization (NRO) and has placed experienced management personnel in this group and has been aggressively hiring staff to support the new organization. Also, NRC has installed a new project controls system for managing activities related to new plant licensing. All of these actions by NRC should contribute positively to the review of the license applications they receive.

The GAO has just completed a review of the NRC's preparedness to receive and review new plant license applications and in general is complimentary of the NRC's actions.

The industry is committed to standardization within each reactor family and to the submittal of high-quality license applications. Companies are accomplishing these objectives through the use

of design-centered working groups preparing standardized sections for each license application. We expect that between 65-75 percent of a license application can be standardized, with the remainder including site specific information. Given the degree of standardization, the industry would expect significant reductions in NRC resources required for subsequent reviews, beyond the reference submittal, resulting in decreased licensing fees, and significantly decreased review schedules. In this regard, following the completion of the reference plant submittals, the industry expects that the NRC review schedule should be able to be reduced from 42 months to 27 months. The industry recognizes that for the first wave of submittals, if filed almost concurrently, the schedule savings would be less. We are committed to working with the NRC on achieving the maximum efficiencies possible, without decreasing either the quality of the review, or its transparency. We look forward to updating the subcommittee on the progress we are making towards new plant deployment to satisfy our nation's energy demand and environmental goals.

Finally, we note that this subcommittee's oversight of the NRC has led to several changes at the agency, including the advent of the ROP itself and incorporation of the safety culture initiative into the ROP. Public confidence is a key factor in the resurgence of nuclear power as a means to address this country's energy and environmental goals. The NRC's role as a strong, credible and independent federal regulator is a fundamental component of this public confidence. The industry urges the subcommittee to exercise its oversight responsibility rigorously to ensure the agency is effective in carrying out its mission, and, when required, to pass authorizing legislation necessary for that to occur.

NEI appreciates the opportunity to address the subcommittee.