NRC NEWS

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"Standards: An Integral Part of Regulating for Safety"

Prepared Remarks for
The Honorable Gregory B. Jaczko
Chairman
U.S. Nuclear Regulatory Commission

ASME S&C Board of Directors
Washington, DC
October 14, 2010

Thank you for the introduction. I appreciate the opportunity to share my thoughts about several significant issues of mutual interest to the Nuclear Regulatory Commission (NRC) and the American Society of Mechanical Engineers (ASME). During my time on the Commission, I have been consistently impressed by ASME's professional excellence and the tremendous contributions you make to nuclear safety through your work in developing codes and standards.

As you know, in recent years, the renewed interest in nuclear power in the United States and around the world has elicited much attention from policymakers, regulators, utilities, and other stakeholders, including ASME. This has been one of the most significant developments in the NRC's regulatory landscape in recent years, and it also raises important issues for ASME's efforts in developing codes and standards. Although new reactor issues warrant attention, it is critical for everyone involved in nuclear safety to maintain a strong focus on the potential safety issues and challenges for operating reactors.

Despite our hard work in enhancing nuclear safety, I believe that the nuclear industry faces potentially significant challenges in maintaining the safety of currently operating reactors. These challenges are grounded in the potential complacency borne of past safety successes, and the concern that – as countries and companies increasingly focus on new reactors – attention may be diverted from the safety of currently operating reactors. Today, I would like to discuss two important issues where I think ASME's professional expertise can make a real difference to enhance nuclear safety among operating reactors.

Probabilistic Risk Assessments

The first issue concerns the NRC's reliance on probabilistic risk assessments (PRAs) and ASME's important role in developing standards to evaluate their quality and effectiveness. As you may know, the NRC has been using PRA techniques for many years to identify and understand plant vulnerabilities and assess the safety impact of proposed design or operational changes. Although not all of the agency's regulatory activities lend themselves to this type of risk analysis, these techniques are being used in a number of areas, including fire protection regulations and the reviews of design certifications for new reactors. It is no exaggeration to say the NRC is a regulatory leader in the use of these risk methods.

The Commission has endorsed the use of PRA methods and other risk tools as a way to enhance the agency's traditional deterministic regulatory framework. This policy recognizes that both deterministic and probabilistic approaches have strengths and weaknesses, and can best contribute to nuclear safety if used in an integrated way.

For several decades now, the NRC's deterministic approach through its engineering principles and conservatism has helped ensure the safety of the nation's operating reactors. The Commission, however, has recognized that this approach – though effective – has its limitations. For example, the agency's deterministic framework did not appropriately assess the risks posed by fires and small loss-of-coolant accidents – risks that resulted in the two most serious safety events in the history of the U.S. nuclear industry: the 1975 Brown's Ferry Fire and the 1979 Three Mile Island accident.

By deploying probabilistic methods, the Commission believes that the agency can consider risks in a more coherent, complete, and explicit manner. Under a strictly deterministic approach, the NRC establishes a specific set of design-basis events and requires that the licensed facility include safety systems capable of preventing or mitigating those events. This approach always included implied elements of probability; simply put, events thought too improbable were not analyzed as design-basis events. Through probabilistic methods, the NRC can more directly and systematically assess the likelihood of those events. With this more refined approach, the NRC can potentially consider a broader set of safety challenges, prioritize those challenges based on their safety significance, and deploy a broader set of resources to defend against them.

But the potential to realize those safety gains depends on the quality, scope, and detail of the risk models. That is why ASME's efforts to develop standards to evaluate the quality of PRAs are so important. It is my understanding that the ASME Committee on Nuclear Risk Management has combined with the American Nuclear Society (ANS) Risk-Informed Standards Committee into a single committee. The NRC staff has spoken very positively of its working relationship with ASME, and we look forward to continuing to work constructively with this joint committee. I would like to commend you for your efforts in developing a joint PRA standard with ANS to replace the individual standards that have historically been issued and maintained by the respective societies. This effort represents an unprecedented level of cooperation, and is a significant accomplishment for ASME and ANS.

Underground Piping

The second issue I would like to discuss is one that has received considerable attention from the public, policymakers, and stakeholders – the issues surrounding underground piping. As you may know, there have been groundwater issues at several nuclear power plants due to degraded underground piping in recent years. Although the leaks to this point have been of low safety significance, they have led the agency to more closely consider whether we are doing enough in this area. An agency task force is currently examining our past and planned actions in response to these groundwater events, and is in the process of developing recommendations for the Commission on whether the agency should expand those efforts.

ASME has an important role to play in ensuring that we have the right standards in place regarding underground piping. The NRC staff has been in communication with the relevant ASME committees, and has raised two specific issues. First, we should examine whether existing codes and standards for the inspection of underground piping are adequate to detect the types of degradation being discovered. By working with stakeholders, including the industry, ASME can consider ongoing operational experience and ensure that this issue is thoroughly addressed.

The second issue concerns the circumstances under which the standards for addressing operational leakage apply. At this time, existing Section XI rules generally apply only during scheduled inspections. Out of concern that current plant-specific plans for addressing operational leakage vary widely, the NRC has asked that ASME consider expanding the scope of Section XI rules to address leakage regardless of when it is found. Given the significance of these issues, and the attention they attract from our stakeholders and the public, it is important that we maintain our focus on these areas.

Design Certification

I will close my remarks by addressing a new reactor issue that has received considerable attention – the ongoing efforts to achieve greater standardization in nuclear plant design. The Commission has recognized the potential safety benefits of increased standardization and encouraged standardization through our licensing system. Potential safety benefits include: the concentration of greater resources on specific design approaches, the standardization of construction practice, quality assurance, and personnel training programs, and the development of more effective maintenance and operational approaches. This is in part why, beginning in the late 1980s and continuing through the late 1990s, the agency developed new licensing procedures with an eye towards encouraging greater design standardization. Specifically, the Commission established a process to certify standardized designs that could then be referenced by subsequent applications without the need to review the technical issues resolved during the certification process. Although the Commission encourages standardization, the decision of how many different designs to pursue is one for private industry. Our regulatory role is to ensure safety regardless of how that question is answered.

Despite our policy of encouraging standardization, the Commission has never endorsed the idea of an internationally-approved design certification that would be accepted without our independent safety reviews. That does not appear to be a practical option. The obstacles to standardization are rooted in the large number of diverse organizations across many different countries involved in the design, construction, operation, and regulation of nuclear power plants. Every nation has its own approaches, and its sovereign right to determine how safe is safe enough. Furthermore, this may not be a desirable option from a safety perspective. By conducting its own safety and licensing reviews, a national regulator can ensure that the technology is appropriate for that country and acquire additional expertise and experience to help it more effectively oversee possible construction or operation. This is all the more important in light of the large number of countries that have expressed an interest in developing nuclear power programs.

On the international front, steps can be and are being taken to enhance nuclear safety globally through efforts to share information about designs and technical evaluations of new reactors. Several organizations, including the Multinational Design Evaluation Program, are playing an important role in that effort. ASME has contributed significantly to these efforts by working with standards development organizations from other countries to document similarities and differences between codes. This type of effort is succeeding because each regulatory authority is becoming better informed, more focused on safety, and developing a stronger basis for independent decisionmaking.

One additional way in which ASME could contribute to nuclear safety is by working with other standards organizations from around the world on the International Atomic Energy Agency's efforts to develop an international standard on safety classification. The different safety classification schemes used from country to country have been a communication challenge for the NRC staff as we work with our counterparts in other countries. An international safety classification for nuclear system, structure, and components could significantly improve communication on licensing matters much in the same way that the international nuclear event scale helps improve communication concerning on the safety significance of events occurring at nuclear facilities.

Conclusion

These are just a few issues that I wanted to raise with you. Obviously, there are many other issues that engage both the NRC and ASME, and I would be glad to discuss those as well in the remaining time we have. Thank you.