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before the
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Policy Implications of Risk-Based Regulation
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Good Afternoon ladies and gentlemen. I am delighted to have been invited to address this luncheon session of the ANS Executive Conference on Risk Based Regulation.

I am pleased to see the wide participation at this executive conference. It confirms that we are starting to see recognition from both government and industry of the importance of risk based regulation. How do I define risk based regulation and its companion, risk based management? In my view, it means that we focus our resources and base our decisions on issues with the greatest impact on public safety and risk. Correspondingly, we can be less sensitive and less demanding on those issues with little safety impact, especially those that pose high economic costs.

The potential benefits to the nuclear industry of such a change in focus are quite significant. Reduction of regulatory requirements that offer marginal safety benefit can save industry money and allow reallocation of resources to higher priority risk reduction activities.

From my perspective as a safety regulator, I am also convinced that the public is best served by a regulatory framework that is well grounded in risk based priorities. After all, the NRC's responsibility is to assure that nuclear plant operations are safe. Utilizing a risk based regulatory approach gives us a vehicle to set priorities and to assess the effectiveness of our actions. Therefore, I see safety benefits and economic benefits as intimately tied together as we improve our focus on risk based regulation. I would like to talk with you today about some of the changes that are taking place in these areas. At the end of my presentation I look forward to addressing your questions and comments.

The use of risk-based considerations in the NRC regulatory process dates back to the era of the Atomic Energy Commission. Up to the time of the TMI accident, first the AEC and subsequently the NRC used limited probabilistic criteria to consider the likelihood of site hazards such as nearby hazardous materials or aircraft routes, and natural hazards such as tornadoes, floods, and earthquakes. The AEC also sponsored the ground breaking WASH 1400 reactor safety study. However, overall regulatory policy did not incorporate risk assessment methods explicitly into the formulation of safety requirements. These continued to be based on prescriptive criteria, founded on deterministic standards and engineering judgement.

The 1979 accident at Three Mile Island (TMI) substantially changed the character of reactor safety views regarding severe accidents worldwide. Both the Kemeny and Rogovin investigations of this accident recommended that PRA be used more by the staff to complement its traditional, non-probabilistic methods of analyzing nuclear plant safety. This led to a substantial research program on severe accident phenomenology and ultimately to staff recommendations that PRA techniques be used to complement the traditional non-probabilistic methods of analyzing nuclear plant safety.

After the TMI accident, the NRC applied probabilistic risk assessment methods successfully in selected regulatory activities, proving that PRA methods could be a valuable adjunct to deterministic engineering approaches. For example, simplified PRA methods were utilized effectively in the Systematic Evaluation Program to assess the significance of deviations from current licensing criteria for some of the oldest operating reactors. PRA techniques were also used during the Station Blackout rulemaking and in the Generic Issue prioritization and resolution process. Quantitative risk elements were also introduced into basic policies established by the NRC such as the Backfit Rule and the Safety Goals policy statement.

In the late 1980's, NUREG-1150 was issued, which took advantage of improvements in PRA technology to assess the risk associated with five selected plants. This study represented a significant milestone in the use of risk-based concepts in the regulatory process.

Currently, the NRC is relying significantly on PRA techniques -- a component of risk-based regulation -- to assess the safety importance of operating reactor events and in the Design Certification review process for Advanced Reactor Designs. Moreover, because of our Individual Plant Examination (IPE) programs, virtually all commercial reactor licensees are

performing PRAs in order to identify any severe accident vulnerabilities needing attention.

Although these examples show how the use of PRA methods have evolved at the NRC, PRA methods have been applied only sporadically and inconsistently throughout the Agency. Generally, elements of the staff that are strong in PRA expertise have applied the methods, while other parts of the organization have not.

Our Advisory Committee for Reactor Safeguards has pointed to a number of weaknesses in our use of PRA. A number of recent studies within the NRC have focused on the status of PRA use and its role in the regulatory process. These studies have addressed both improving our current use of PRA and identifying areas where its use can be extended.

In my view, the most significant of these studies was the Regulatory Review Group's comprehensive review of Agency regulations and programs, performed to determine where performance-based requirements should replace prescriptive requirements. The RRG identified over sixty major topic areas where regulatory changes could make our requirements less burdensome. Many of these are areas where risk assessment methods can be applied to support cost beneficial licensing action requests from the Industry. This study pointed out that the NRC was providing inadequate resources for assessing licensee requests that were safety neutral but provided economic benefit.

The NRC's internal PRA Working Group report has also been completed, providing an assessment of the Agency's current use of PRA and identified areas for improvement. The Working Group recommended that the NRC develop an integrated plan for PRA use as well as improving our interactions with industry PRA users.

The main focus of this study was to provide guidance to the NRC staff for increasing the quality of their PRA uses. The study resulted in technical guidance on how to use PRA methods in selected regulatory evaluations, such as generic issue prioritization and resolution. Having such uniform technical guidance is essential in ensuring that we will be consistent in our use of PRA methods. Numerous other application areas were also identified where PRA user guidance needed to be developed.

The Regulatory Review Group has told the NRC where the use of risk based regulation needed to be increased, and the PRA Working Group has guided us in how to ensure the quality of risk assessment activities. The NRC is going forward actively to implement the recommendations of these two studies. The Regulatory Review Group recommendations have been prioritized and scheduled for implementation. Many of these recommendations are

being incorporated into the NRC's PRA implementation plan, the major vehicle for the NRC to transition to a performance and risk based regulatory environment.

I would like to give you a few examples of areas where we expect to expand our PRA use. One of the most important is in application of IPE results to regulatory activities. Both the NRC and industry have expended large amounts of resources in completing the first phase of these plant specific severe accident vulnerability studies. Now is the time for us to reap benefit from this work. The NRC staff will expect to see IPE results used as appropriate to justify plant specific regulatory requests, such as in Technical Specification revisions and implementation of the Maintenance Rule.

We also plan to increase our use of risk methods to focus inspections on those areas which are more risk and safety significant. Overall I would hope to see our total inspection requirements decrease somewhat, saving both staff and industry resources.

Significant interactions with industry groups related to risk based regulation are already taking place. The NRC staff has been working with NUMARC (soon to be part of the Nuclear Energy Institute NEI) and others regarding initiatives on risk based burden reduction. A high priority of both the industry and NRC is to reassess quality assurance program requirements utilizing a risk based graded approach. This effort is expected to allow utilities to reduce Quality Assurance (QA) commitments for non risk significant systems and components, resulting in significant reductions in operations and maintenance (O&M) costs. The staff expects to be reviewing at least one pilot program later this year.

A number of other risk based initiatives are expected to be undertaken. In the area of reactor fire protection, for example, risk based arguments may allow for reductions in quality assurance requirements associated with purchasing, installing and maintaining fire barriers found not to be risk important.

The staff has already seen proposals from an Owners Group and NUMARC proposing a graded risk based approach for resolving motor operated valves operability concerns, providing for greater testing requirements on those MOVs with high risk and safety significance, but allowing less extensive demonstrations for valves with little safety importance. The staff has indicated its agreement in principle with such an approach.

We may see proposals to reduce certain prescriptive plant security requirements utilizing risk perspectives. Industry has also indicated it may propose reducing the size of emergency

planning zones and associated EP requirements for advanced plants with greater safety margins.

Many of these PRA applications will require good reliability data. We hope that the NRC/INPO discussions on obtaining selected plant specific reliability data will result in this needed information's being available to support risk based decision making. I would like to see this activity moving forward more quickly.

I am encouraged by the efforts I see on both the part of NRC and the Industry to bring risk based regulation and decision making into the mainstream of their operations. I recently challenged the NUMARC board of directors to identify candidates for risk based regulatory treatment. I extend that challenge to you today, to help us achieve better and more cost effective nuclear regulation.