United States Nuclear Regulatory Commission
Office of Public Affairs
Washington, DC 20555
Phone 301-415-8200 Fax 301-415-2234
Internet:opa@nrc.gov

No. S-98-18

A Full Plate: Current Regulatory Issues

by

Dr. Shirley Ann Jackson, Chairman
U.S. Nuclear Regulatory Commission
to
Nuclear Power Reactor Safety Course
Massachusetts Institute of Technology
Cambridge, Massachusetts
July 20, 1998

I. Introduction

Good afternoon. I am pleased to be able to participate once again in the MIT Nuclear Power Reactor Safety Course.

Today I will summarize for you the Nuclear Regulatory Commission (NRC) mission and safety philosophy, and discuss several areas of current NRC focus, including: (1) the incorporation of risk insights into NRC regulation; (2) the NRC Maintenance Rule; (3) reactor design basis issues and the revision to 10 CFR 50.59; (4) proposed revisions to our reactor performance assessment processes; (5) reactor license renewal; and (6) our efforts to achieve international consensus and cooperation on matters of nuclear safety regulation.

II. NRC Mission and Safety Philosophy

Based on the Atomic Energy Act of 1954, as amended, the mission of the NRC is to regulate the civilian use of byproduct, source, and special nuclear materials to ensure the adequate protection of public health and safety, to promote the common defense and security, and to protect the environment. Some of the principal terms of the NRC regulatory mandate, however--such as "protection of public health and safety," or "reasonable assurance of adequate protection"--are not defined in the Act, nor are they

self-explanatory. The process of interpreting and applying these terms and provisions is a continuing effort that has evolved over several decades of Commission regulation, Congressional oversight, and judicial review of specific NRC actions. The result has been the creation of a body of regulations, decisions, and practices through which the NRC safety philosophy is expressed.

This philosophy comprises several closely interrelated elements, which we have defined as: defense-in-depth, licensee responsibility, safety culture, regulatory effectiveness, and accountability to the public.

"Defense-in-Depth" ensures that successive measures are incorporated into the design and operating procedures for nuclear installations to compensate for potential failures in protection or safety measures, wherever such failures could lead to serious public or national security consequences.

"Licensee Responsibility" embodies the principle that, although the NRC is responsible for developing and enforcing the standards governing the use of nuclear installations and materials, it is the licensee who bears the primary responsibility for conducting those activities safely.

"Safety Culture" recognizes the responsibility of each licensee to establish and maintain a set of attitudes and operational principles to ensure that safety issues get the proper attention. A safety culture encourages a questioning attitude toward safety issues and discourages complacency.

"Regulatory Effectiveness" emphasizes the approach that, because safety is paramount in the NRC regulatory program, certain standards and practices to ensure adequate protection will be required, whatever the cost. Over and above that baseline, additional safety upgrades will be required only if their benefits justify the added cost. Regulatory effectiveness also involves the ongoing examination of NRC regulations, internal procedures, and oversight activities, to ensure consistency, fairness, ease of implementation, and compatibility with the overall NRC mission and program.

"Accountability to the Public" dictates that, just as licensees are accountable to the NRC, the NRC is accountable to the American people and to their elected representatives. This accountability entails being candid about NRC activities and their results, acknowledging the public interest in and right to know about safety issues, and ensuring that the public has sound, complete, up-to-date information on which to base their judgments.

III. NRC Focus Area: Incorporating Risk Insights into NRC Regulation

I now would like to highlight several areas of current NRC focus, beginning with a discussion of risk assessment activities and the incorporation of risk insights into NRC regulation.

The NRC has established its regulatory requirements, in both reactor and materials applications, to ensure that “no undue risk to public health and safety” results from NRC-licensed uses of nuclear materials and facilities. The objective of these requirements always has been to ensure low probabilities for accidents with the potential to affect public health and safety adversely. However, many NRC regulations were developed without the benefit of quantitative assessments of risk, but rather have been based largely on deterministic engineering criteria; establishing safety margins through the use of multiple barriers and the "defense-in-depth" philosophy I spoke of earlier; codes and standards; conservative analyses, assumptions, and acceptance criteria; and qualitative engineering judgment.

The NRC regulatory framework can be divided conceptually into at least two regions. The first corresponds to adequate protection--that is, what regulations are necessary to ensure the “adequate protection” of public health and safety? In practice, this region has been defined as comprising those regulations and regulatory requirements that are necessary regardless of cost. Beyond adequate protection, cost is a consideration. Here, regulations must demonstrate that their requirements and the cost of their implementation are worth the additional safety benefit. The Commission uses “regulatory analysis” to determine this cost-benefit. The regulatory analysis increasingly makes use of risk insights.

Since many of the requirements first were put in place, significant advances have been made and considerable experience has accrued with quantitative Probabilistic Risk Assessment (PRA) methods. These methods offer the potential to sharpen the focus and to improve the effectiveness of existing NRC requirements, allowing better decision-making by concentrating on those aspects of a facility most important to safety, thereby achieving better utilization of resources and reducing unnecessary burdens. PRA insights and information have been applied successfully in numerous regulatory activities, and have proven to be a valuable complement to deterministic engineering approaches. All of this is undergirded by the Commission Safety Goals.

Back in 1986, the Commission issued its Safety Goal Policy Statement which, for the first time, expressed quantitatively the Commission expectation on the safety of nuclear power plant operation. Through the Safety Goal Policy Statement, the Commission promulgated its philosophy that the risk from the operation of a nuclear power plant should be no more than 0.1 percent of the risk to which people are exposed from other sources. This statement of risk translates into objectives on individual risk of $2x10^{-6}$/yr of a latent fatality and $5x10^{-7}$/yr of an early fatality.

The Commission continues to focus on expanding the application of risk assessment methodologies to improve the overall regulatory process. This initiative has been called “risk-informed regulation.” In August 1995, the Commission issued the Probabilistic Risk Assessment Policy Statement, formalizing its commitment to risk-informed regulation. More recently, the Commission has been working on a paper on risk-informed, performance-based regulation that would define what is meant by these terms and how these concepts fit into the regulatory process. The paper also would

make it clear that the Commission does not endorse “risk-based” regulation (i.e., regulation in which decisions are based solely on risk assessment results).

Recent NRC risk-informed activities have included the preparation of Regulatory Guides (RGs) and Standard Review Plans (SRPs), pilot applications in specific areas, and several other applications. I would like to discuss each of these activities briefly.

A. Regulatory Guides and Standard Review Plans

The Commission recently approved for publication a set of RGs and SRPs that will support implementation of risk-informed regulation of power reactor licensees, by providing guidance on how to use PRA information to support and evaluate plant-specific changes to the licensing basis. By "licensing basis," I am referring generally to that set of regulations, license conditions, technical specifications, and commitments that define the design and operating envelope within which a licensee must maintain and operate its facility. These RGs and SRPs describe acceptable approaches to decision-making for any area in which risk assessment can be used. This guidance includes a generic regulatory guide and standard review plan, as well as application-specific guidance documents. They contain specific guidelines applicable to the areas of technical specifications, in-service testing, in-service inspection of piping and graded quality assurance.

Five fundamental safety principles, as described in these guidance documents, govern the licensee use of risk assessment insights to support plant-specific changes to the licensing basis:

① The proposed change meets the current regulations unless it is related explicitly to a requested exemption or rule change.

② The proposed change is consistent with the defense-in-depth philosophy.

③ The proposed change maintains sufficient safety margins.

④ When proposed changes result in an increase in core damage frequency and/or risk, the increases should be small and consistent with the intent of the Commission Safety Goal Policy Statement

⑤ The impact of the proposed change should be monitored using performance measurement strategies.

These five principles are intended to ensure that the essential elements of traditional NRC approaches to safety regulation are maintained, and that the insights from risk assessment are integrated into the safety review process in a way that complements the existing review process by focusing the reviewers on the most important issues.

B. Pilot Applications

To test the process, approach, and guidelines laid out in the RGs and SRPs, the Commission is reviewing proposed plant-specific changes to the licensing basis through several licensee pilot applications. These pilots are in the areas of technical specifications, in-service testing (IST), in-service inspection (ISI) of piping, and graded quality assurance (QA), with two or more licensees participating in each technical area. Examples of the types of licensing basis changes being reviewed in the pilot applications include:

- changes to allowable equipment outage times;
- changes to equipment testing intervals;
- changes to the types, locations, and frequency of piping inspections; and
- reduced quality assurance measures on specified equipment.

License amendments are being approved for licensees in each of these areas. Out of these pilots have come refinements to the application-specific RGs and SRPs on technical specifications, IST, ISI, and graded QA.

In addition to the above pilot activities, the Commission also has begun interactions with the Nuclear Energy Institute (NEI) on several “whole plant” pilot risk studies whereby full-scope PRA information is to be compared against regulatory requirements, and in turn against operations and maintenance costs, for the purpose of identifying potential imbalances among risk importance, requirements and cost. We expect that out of this activity will come requests for plant-specific as well as (potentially) generic changes in requirements. In fact, the first such request under this program already has been received. We expect to give increased focus to these pilots, and to license amendments submitted pursuant to them, in the coming months.

C. Other Risk Assessment Activities

To support the expanded use of risk assessment in the regulatory process, efforts are underway to improve or develop risk assessment methodology in certain key areas, including human reliability analysis, plant aging, fire protection, and shutdown risk. We also are expanding our international cooperation in the risk assessment arena, sharing with other regulators our methods, our tools, and our experience with various applications. A key element of this is the formation of the International Cooperative Research Program, involving participants from approximately fifteen countries. To date, the efforts of this group have focused on potential collaborative research on organizational influences on risk, digital and software systems risk, and shutdown risk.

In addition, we are using risk assessment in our accident sequence precursor program, to better analyze the risk significance of operating events. We also are continuing to develop more structured ways of addressing uncertainties in risk-informed decision-making, considering factors such as the uncertainty in data and models used, as well as the uncertainty resulting from what is not modeled.

Finally, beginning last year, we have been participating, along with the nuclear power industry, in an activity to develop a standard on PRA quality. The American Society of Mechanical Engineers (ASME) is coordinating the industry side of this activity, with the goal of having a draft standard covering PRAs for internal events, Level 1 analysis (i.e., core damage frequency), and being ready to begin the ASME standard committee approval process by December 1998. Follow-on activities are planned in 1999, to expand the standard to cover additional PRA scope (e.g., external events and shutdown). This is a key activity because, if successful, it will facilitate licensee and NRC staff efforts to converge on defining the acceptable level of PRA analysis needed to support a range of regulatory decision-making, including changes to a plant licensing basis.

IV. NRC Focus Area: the Maintenance Rule

Over the last decade, the performance of power reactors has improved consistently in certain areas monitored, such as the industry average number of reactor scrams or the number of safety system actuations. The NRC has continued to focus, however, on equipment problems and equipment failure rates, for two reasons: first, because equipment failure continues to be the leading cause of all scrams; and second, because of the lack of sustained improvement in safety system failures and the forced outage rate. The overall improvement in average unit availability has been due--not to fewer forced outage hours--but to greatly reduced scheduled outage hours, achieved through increased maintenance activity while at power. This is a consequence of longer fuel cycles (which result in greater intervals between refueling outages), combined with shorter, more efficient refueling outages.

This overall picture has caused the NRC to consider how our programs, including NRC regulations, reactor oversight, and enforcement, might best be focused to address equipment failure--and in particular maintenance-related equipment failure--as part of reactor licensee overall performance. A key component in the NRC effort to address this area has been the NRC Maintenance Rule--which became effective in July 1996--as well as the associated guidance on its implementation. Inherent in the Maintenance Rule is a risk-informed, performance-based emphasis on ensuring the availability and reliability of key structures, systems, and components in the facility.

Just this month, we completed the last of the initial round of NRC inspections of operating power reactor licensees under this rule. Based on the insights from these inspections, the Commission has directed the NRC staff to propose a modification of

the rule, to clarify that the rule applies to shutdown operations and to ensure that the licensee assesses the safety impact of all out-of service equipment when performing maintenance--and in particular, online maintenance. Given the inspection results and the overall improvements in emphasis in licensee programs, we believe that the continued implementation of this rule--together with industry efforts to collect and use associated equipment reliability and availability data--should produce a significant benefit in precluding risk-significant or unsafe plant equipment configurations, and in reducing the number of safety system failures and forced shutdowns.

V. NRC Focus Area: Design Basis Issues and the 10 CFR 50.59 Revision

Another area of particular Commission focus has been the performance of reactor licensees in maintaining their design and licensing bases. In response to events at Millstone Station and at Maine Yankee, the NRC conducted a wide range of special inspections and lessons-learned reviews that have formed the basis for a number of corrective actions. Coming out of these reviews, in February 1997, the NRC staff forwarded to the Commission two papers that summarized an examination of NRC regulatory processes in three related areas: (1) the maintenance of the design and licensing bases; (2) the use and content of plant Safety Analysis Reports; and (3) issues related to 10 CFR 50.59, “Changes, tests, and experiments.”

By way of background, the 10 CFR 50.59 rule allows power reactor licensees to make changes and to conduct tests and experiments, in their plants, provided that these changes, tests, and experiments do not create what is termed an “unreviewed safety question.” If the threshold--which is a procedural, rather than a safety threshold--is exceeded, a licensee must seek specific NRC review and approval of the proposed change, test, or experiment. Disagreement has existed between the industry and the NRC staff for many years on the interpretation and implementation of the rule. The Commission directed that a renewed effort be made to clarify and resolve these differences.

In May 1997, the NRC requested public comment on 22 topical areas related to the implementation of 10 CFR 50.59. Following their analysis of public comments, the NRC staff sent to the Commission, in September 1997, a paper recommending that immediate guidance be issued to clarify the role of 10 CFR 50.59 in the resolution of degraded and nonconforming conditions. The paper also provided a series of options describing possible improvements in four areas: (1) the implementation of 10 CFR 50.59; (2) the use and required content of plant Safety Analysis Reports; (3) design basis issues; and (4) NRC oversight of licensee commitments and related internal process improvements. In response to these papers, the Commission requested that the staff initiate an expedited rulemaking to modify the language of 10 CFR 50.59, in order to clarify the current rule. Last week, the staff presented to the Commission the Proposed Final Rulemaking on 10 CFR 50.59, and the Commission currently is evaluating the staff proposal. In addition, the Commission also has asked that regulatory guidance be developed to clarify the scope and methods needed to update Safety Analysis Reports. The Commission and NRC staff will continue to be involved

actively in these topics, as we strive to provide clarity and consistency in the implementation of these issues.

VI. NRC Focus Area: Reactor Licensee Performance Assessment Process

Another area undergoing change is our reactor licensee performance assessment process. Currently, the NRC uses several processes to assess the safety performance of nuclear reactor licensees. They include Plant Performance Reviews, conducted every six months by regional managers; Systematic Assessments of Licensee Performance, conducted every 12 to 24 months by agency middle managers; and Senior Management Meetings, which traditionally have been conducted every six months by agency senior managers, and which the Commission recently redirected to be held annually. These assessment processes were developed and implemented at different times over the past 18 years to address specific agency concerns.

All three of these processes have been subject to periodic, detailed reevaluation. However, until recently, the agency had never conducted an integrated review of the entire assessment process. In October 1997, the NRC initiated the Integrated Review of the NRC Assessment Process for Operating Commercial Nuclear Reactors (referred to as IRAP) to address perceived weaknesses with the current set of assessment processes. The primary goals of the IRAP are: (1) to clarify objectives; (2) to eliminate redundancies; (3) to define roles, responsibilities, and authorities; (4) to improve consistency; (5) to match processes to NRC staff resources; and (6) to reduce administrative burden.

In March of this year, the staff presented to the Commission the results of the IRAP study, and just last month, the Commission released the paper to solicit public comment on the staff proposals. While the eventual decision on what form our reactor assessment processes should take is not yet clear, some of the changes being considered include: (1) streamlining and integrating into a single process the best elements of our current processes; (2) tying specific regulatory actions directly to the assessments made; (3) improving the systematic use and categorization of data; (4) developing and using threshold criteria; (5) focusing on performance results; and (6) providing opportunity for licensee response at appropriate stages. Regardless of the specific form that eventually results, the Commission is committed to achieving the optimum degree of objectivity, scrutability, fairness, and efficiency in assessing the safety performance of operating commercial nuclear reactors.

VII. NRC Focus Area: License Renewal

My next topic of discussion, reactor license renewal, in all likelihood will continue to grow as an area of NRC focus and effort. As you know, nuclear power plant operating licenses are issued initially for a 40-year period. Approximately 10 percent of the current operating licenses will expire by the end of 2010, and more than 40 percent will expire by 2015. Renewing these licenses for up to an additional 20 years, where appropriate, may be important in ensuring a diverse future energy mix for our nation.

Some of you may be familiar with the history of the license renewal process; however, to ensure that we are all “on the same page,” I will provide you with a brief bit of background.

In 1991, the NRC issued 10 CFR Part 54, to establish the technical and procedural requirements for the renewal of operating licenses. Based on initial experience in implementing this rule, and with important feedback from the nuclear power industry on the need to modify the rule, the Commission amended the rule in 1995. I would emphasize that industry feedback on the License Renewal Rule was instrumental in ensuring that a rule change actually was enacted, rather than a simple expansion or clarification of existing guidance documents, as the NRC staff was proposing at that time. In my view, this is an important distinction, and a valuable industry contribution.

The revised rule limited the scope of the license renewal review to time-limited aging analyses, and to aging management of long-lived passive structures, systems, and components. This was the first key step in ensuring that a more stable and predictable regulatory process for license renewal could be established.

A second key step entailed the NRC staff review of a document compiled by the Nuclear Energy Institute (NEI), known as NEI 95-10, “Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule.” In August 1996, the NRC staff published a draft regulatory guide for license renewal, proposing to endorse this NEI document as an acceptable method for implementing the license renewal rule. I would note that the NRC staff has not, to this point, endorsed NEI 95-10. However, the efforts to date illustrate the importance of industry placing a “straw man” on the table to challenge us and to galvanize thought on how to proceed, in good faith, in an open process that includes all NRC stakeholders. The NRC staff, through its plant-specific and owners’ group reviews, is continuing to gain experience with implementation issues, and continues to interact with the nuclear power industry through NEI.

Finally, the NRC environmental regulation, 10 CFR Part 51, was amended in 1996, to enhance our environmental review process for license renewal. This revision streamlined the environmental review process by addressing a large number of environmental issues in a Generic Environmental Impact Statement, thereby eliminating the need for such issues to be addressed individually by each license renewal applicant.

In April of this year, the Baltimore Gas and Electric Company submitted to the NRC the license renewal application for the Calvert Cliffs facility, thereby becoming the first such applicant. Earlier this month, the Duke Power Company submitted the license renewal application for its Oconee units. In addition, the Southern Nuclear Operating Company recently announced plans to consider license renewal for its Hatch units. And the Commission has taken note of recent correspondence by a significant number of Chief Nuclear Officers (from Virginia Power, Northern States Power, etc.) explaining their plans and tentative schedules for license renewal applications.

Baltimore Gas & Electric Company and Duke Power Company have taken an important first formal step toward license renewal. Now that the process has begun, we must ensure that, if a hearing is required, the adjudicatory process must be fair to all stakeholders and focused on the technical merits as laid out in 10 CFR Parts 54 and 51. Within the constraints of such a process, the industry and the NRC must work diligently, efficiently, and, again, in good faith to make license renewal a reality. As far as the NRC staff review is concerned, it must be focused, well-organized, and as timely as the complexity of the issues allows. On the industry/licensee side, responses should be as timely as possible, complete, and to the point.

The NRC is working diligently to ensure that a predictable license renewal path exists, fair to all parties involved, and resting on the technical merits of the applications. To these ends, the following actions have been taken:

- I have tasked the Executive Council of the NRC (comprised of the Executive Director for Operations, the Chief Financial Officer, and the Chief Information Officer) to ensure that the implementation of license renewal is a unified and coherent process. These senior managers will focus on three areas: oversight, coordination, and strategic implementation.

- The NRC Chief Financial Officer and Chief Information Officer have been tasked with establishing a process for efficiently shifting or refocusing resources, as needed, to ensure a timely license renewal review.

- I have reminded the Executive Council to ensure that generic policy matters warranting Commission attention are identified promptly and communicated to the Commission. Accordingly, a license renewal steering committee has been established (under the Director of the Office of Nuclear Reactor Regulation) to monitor progress and review issues related to implementation of this program. The steering committee is comprised of senior NRC managers who represent the principal functions associated with processing license renewal applications.

- The Commission has approved a number of measures identified by our Office of the General Counsel (OGC) which would streamline the hearing process for license renewal. These measures would include issuing a policy statement, currently in draft, that would clarify Commission expectations for the Atomic Safety and Licensing Board with regard to licensing hearings. Additional measures would include: (1) establishing an efficient and reliable adjudicatory schedule--imposed by order, as necessary and appropriate--while ensuring a fair resolution of contested issues; (2) the timely surfacing of any open generic policy issues for Commission decision; (3) taking advantage of procedural lessons learned and applied in Federal Court proceedings; and (4) effective integration of the review of technical issues into the adjudicatory process.

I reiterate, then, that the Commission is committed to ensuring a fair, effective, and efficient process for license renewal. We understand and appreciate the role of the

nuclear power industry in developing and refining the License Renewal Rule and guidance documents. We recognize that NEI continues to sponsor various industry initiatives for license renewal, and has established an industry working group to address license renewal issues. We also are aware that differences continue to exist between the NRC staff and the nuclear power industry on how Part 54 should be implemented. The Commission intends to ensure that the stage is set for thorough, yet timely, license renewal reviews.

VIII. NRC Focus Area: International Coordination and Cooperation

The final area I would like to discuss with you is a specific and relatively recent area of international coordination and cooperation. With the emergence of the global marketplace, and most certainly in the post-Chornobyl era, the focus on safety in the generation and use of nuclear energy has become an issue that transcends national boundaries. What is sometimes less widely understood is that the effectiveness of national nuclear regulatory bodies also has become, by inference, an issue with international implications. To enhance international communication and cooperation, the most senior nuclear officials of eight nations formally created the International Nuclear Regulators Association (INRA) during a meeting in Paris, France in May of 1997. I was elected to serve as the INRA Chairman for the initial two-year period.

The INRA believes firmly that nuclear safety must remain the responsibility of the nation states in which the technology is utilized. However, we also emphasize the value of having national nuclear regulators exchanging views on broad regulatory policy issues (including technical, legal, economic, and administrative matters). The specific aims and objectives of the Association are as follows:

- To build a global nuclear safety culture;
- To encourage the most efficient use of resources in areas of common interest;
- To work to enhance the stature of nuclear regulatory organizations worldwide;
- To seek consensus on how nuclear regulatory issues can be approached and resolved;
- To facilitate international cooperation in regulation;
- To identify emerging nuclear regulatory challenges; and
- To work to advance nuclear safety through cooperation among its members, cooperation with relevant existing intergovernmental organizations (such as the International Atomic Energy Agency), and cooperation with other national nuclear regulatory bodies and other groups, as appropriate.

The INRA is organized as a forum for periodic (currently biennial) discussions, without an institutional bureaucracy. As an early area of focus, the INRA has sought to identify

and agree upon a set of fundamental elements in nuclear safety regulation that are common to the regulatory systems of nuclear countries, and thereby to define the essential characteristics of a sound national nuclear regulatory infrastructure. During the January 1998 INRA meeting in Walnut Creek, California, a number of commonalities in regulatory approach were identified, including, for example: the existence of a clear statutory and legal framework for nuclear regulation; the establishment of the basic industrial, technological, and human resource infrastructure necessary to ensure nuclear safety; an unambiguous recognition that the prime responsibility for the safety of a nuclear installation rests with the holder of the license (i.e., the operator of the installation); and a national commitment to safety as the fundamental requirement for a nuclear program.

The INRA recognizes that differences exist in the history, development, current structure, and scope of responsibilities of various national nuclear regulatory bodies, as well as in the degree to which nuclear energy plays a role in any given national energy strategy. However, the similarities identified indicate the value of sharing insights on how best to fulfill fundamental safety objectives, to meet technical and policy challenges, to ensure effectiveness as regulators, and to position these regulatory organizations for change in national and global economies. In addition, the degree of commonality indicates the value of identifying and designating those key elements of nuclear safety that should be incorporated into every national nuclear power program.

Past experience gained by donors and recipients of nuclear safety assistance has been revealing. In cases where these efforts have not been coordinated well among the donor nations or organizations, duplication and confusion too frequently have been the result. The tendency has been to provide short-term assistance solutions, rather than the more practical and worthwhile longer-term cooperation that is needed. Too often, the regulatory component of nuclear safety assistance has been neglected or overlooked entirely. Seldom have these efforts incorporated a coherent overall input from the regulators themselves, related to regulatory safety policy.

Given this context, the members of the INRA hope that the efforts of the Association to identify and promulgate the key elements of a national nuclear power program will be of considerable value in advancing international efforts to ensure nuclear safety. The INRA will continue to pursue this and other focus areas, seeking to make substantial contributions to nuclear safety by enhancing the effectiveness of national nuclear regulatory bodies. The INRA is in the process of structuring protocols or memoranda of understanding with other multinational nuclear organizations, including the IAEA and the OECD/NEA.

IX. Conclusion

In closing, I hope that this discussion has given you a better understanding of the NRC regulatory perspective on nuclear power plant safety, and has enhanced your appreciation of some of the technical challenges the NRC faces. Here I have covered only a sampling of current issues, but in each case, a sound regulatory approach

requires both theoretical knowledge and practical experience, combined in the unique NRC mixture of science, technology, law, and public policy. The overall regulatory agenda must then be evaluated in relation to the three questions that derive from my overarching vision for the NRC: (1) as an agency, are we fulfilling our primary mission of protecting public health and safety, promoting the common defense and security, and protecting the environment? (2) as regulators, are we effective? and (3) have we anticipated and readied ourselves for change? We, at the NRC, believe the initiatives we have underway offer affirmative answers to all of these questions.

Thank you for the invitation to speak again at this annual safety course, and thank you for your attention. I will be happy to address any of your questions.