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Washington, DC 20555-001

This letter provides comments from the Nuclear Energy Institute (NEI)[1] on the *Regulatory Structure for New Plants Licensing – Part 1: Technology Neutral Framework draft NUREG 3-2005.* These comments complement those provided by other NEI members.

NEI appreciates the continuing dialogue and interaction with the NRC staff in the development of a risk-informed, performance-based and technology-neutral framework. The industry commends the NRC staff for taking this first important step towards further improving the power reactor regulations. The industry commends the staff for taking the time and effort to fully involve the public and the industry in a very constructive and open set of meetings and workshops on this important topic. A topic that is important to the long term future of the industry.

There are three enclosures to this letter:

- Enclosure 1: provides our comments on the draft NUREG document.
- Enclosure 2: proposes an overall approach and schedule for developing the new and optional risk informed, performance-based regulations that would be technology neutral, and
- Enclosure 3: a copy of NEI comment letter to the NRC staff, dated April 11, 2005 on three policy issues: integrated risk, level of safety and containment functional requirements. It is included for completeness and as an aid in the understanding of our comments.

[1] 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 plant designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

SISP Review Complete
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Add A. Singh (AXS3)

It is important that these early documents and interactions provide a vision for the future regulatory regime in a manner that the public and the industry can relate to in terms of implementation and schedule. To assist in this important aspect, we have included a provisional overall plan and approach for developing this new regulatory regime (Enclosure 2). It includes testing the new regulatory regime, building on non light-water reactor (non-LWR) prototype reviews and testing, LWR experience and NRC reviews. We believe that using such an approach will ensure that a more practical and objective set of regulations is developed. It will enable the initial set of technology-neutral regulations to be issued with a higher degree of confidence and stability. We believe that following an assessment of the public comments, NRC should proceed on a dual track of finalizing the general framework and publishing an Advanced Notice of Proposed Rulemaking (ANPR) on the issuance of a set of optional, technology-neutral, risk-informed, performance-based regulations for power reactors. To assist in the development of the ANPR, the industry will provide a set of follow-up comments to these in May 2005 that could used as a basis for developing an ANPR.

In regard to priority, NEI agrees that the activities outlined in these comments are of secondary importance when compared to regulatory and safety issues associated with the operating plants and NRC's review of Part 52 applications, and the resolution of generic Part 52 implementation issues.

We look forward to the next steps in the process. The industry appreciates the opportunity to comment and participate in the development of the Technology-Neutral Framework. If the NRC staff has questions relating to these comments, please contact Cedric Jobe of the NEI staff, cij@nei.org or me.

Sincerely,

Adrian P. Heymer
Director, New Plant Deployment

Enclosures

c. Mr. Luis A. Reyes, NRC
Dr. Carl J. Paperiello, NRC

Enclosure 1

COMMENTS ON THE NRC STAFF DRAFT NUREG 03-2005

General Comments

NEI supports the staff's development of a risk-informed and technology-neutral framework for new power reactors. The framework should build on, and take advantage of, industry and NRC experience in applying risk-informed, performance-based licensing approaches to new and existing reactor designs. The new framework and accompanying set of regulations should be based on a blend of probabilistic risk assessment insights and deterministic criteria.

As suggested in NEI 02-02, *A Risk-Informed, Performance-Based Regulatory Framework for Power Reactors*, the regulations would provide high-level design and operational requirements. They would describe what is to be achieved, but not how to implement a specific requirement. Specific methodologies and detailed criteria for specific reactor designs would be described in regulatory guides.

We believe that the framework is reasonable and represents an appropriate first step to the development of technology-neutral regulations. We do, however, recognize that a great deal of work remains to be completed in finalizing the overall framework and evolving the content of the NUREG Framework into a set of regulations.

The proposed framework referenced in the *Federal Notice* (Vol. 70, p5228, dated February 1, 2005) describes some of the main elements. It focuses on some of the issues. It provides a substantial emphasis on probabilistic risk assessment methods and associated issues, but does not describe how the framework would be integrated with other essential regulatory elements such as oversight.

A new, risk-informed, technology-neutral regulatory framework should include the general scope, description, guidelines and implementing principles and concepts. Also, for the industry to support such a project, it is important for the framework or an ancillary document to provide a vision and schedule on how and when the elements will be developed and merged into an integrated regulatory regime. From the framework and the implementation concepts and schedule, it should be relatively easy for a prospective licensee to determine how the new regulations will influence the design; how the operational phase, post fuel-load will be regulated, and when this set of regulations is likely to be enacted.

In the draft framework and in the public workshop, there was a continuing theme of public acceptance and public acceptance metrics. Public acceptance and confidence in NRC activities, processes and regulations is achieved by adhering to the NRC

Principles of Good Regulation and NRC Organizational Values. As stated in the NRC's Strategic Plan FY 2004-2009, the Principles of Good Regulation are:

- Independence in the standards of ethical performance and professionalism in regulating
- Open and candid transaction of nuclear regulation
- The best possible management and administration of regulatory activities to ensure efficiency
- Coherent, logical and practical regulations to ensure clarity, and
- Regulations based on the best possible knowledge from research and operational experience to ensure reliability.

Oversight of NRC activities and regulations is provided by Congress and the public through public meetings. Public acceptance and confidence is an essential requisite for both the industry and the regulatory agency. Defining a single objective metric for public confidence and public acceptance is a noble but difficult goal to achieve. It is not a task that should be undertaken as part of the development of a technology-neutral framework. It should be a completely separate project. The prime focus of this project should be on developing a framework and technical criteria for power reactors. Public acceptance and confidence will be established by involving the public in the development of the new regulatory regime, by seeking public comment, and by writing clear and unambiguous regulations, guidance and supporting documents.

Level of Safety

The NEI letter to the NRC dated April 11, 2005 (Enclosure 3) provided our comments on the level of safety issue.

Protective Strategies

Framework Structure

NEI agrees that an appropriate structure for the new framework should follow the high-level principles of the Atomic Energy Act and strategic safety areas. However, the proposed regulatory structure described in the framework document needs to be expanded to include radiation safety and physical protection. Such a step would result in a structure that reflects that of the NRC's Reactor Oversight Process. The framework structure should adopt the same terminology as the Reactor Oversight Process (ROP), making the NRC's oversight process consistent with the new regulatory framework and the accompanying regulations. Failure to align with the ROP could result in regulatory inconsistencies between the oversight process and the regulations.

Characteristics for the New Framework

NEI recommends that the framework be principled on the following characteristics:

- be technology-neutral and avoid application of Light-Water-Reactor (LWR)-specific criteria
- produce consistent standards for different designs
- support a stable and predicable regulatory environment
- use an appropriate blend of probabilistic and deterministic approaches
- result in an appropriate allocation of resources in managing risk, and
- be testable using practical and current examples to demonstrate feasibility

We also note that in some instances the language in the draft framework is inconsistent with generally accepted regulatory terms and is sometimes overly focused on LWR technology. A glossary of terms, which is more technology-neutral would be beneficial to enable a common understanding of the principles to be established and maintained.

To facilitate a timely and effective development process leading to rulemaking, our review of the overall model proposed in the draft NUREG (Reference Figure 1-1), indicates that each of the respective parts of the regulatory structure namely, Framework Guidelines and Criteria, Technology-Neutral Requirements, Technology-Specific Framework and Technology-Specific Regulatory Guides, should be developed in an iterative fashion. There would be substantial advantages to such an approach. We recognize that it may take longer, but it would result in a more stable product, leading to a lower likelihood of rework. In addition, we agree that the use of focus groups to address specific policy and technical issues such as PRA use for determination of design basis events, represents an effective way to advance resolution of these particular issues. Also, we need to recognize that some issues will require resolution at the technology specific level.

Plant Siting Criteria

Parts 50, 51, 52, and 100 are adequate to determine whether a siting permit (Early Site Permit in Part 52) should be issued for a commercial nuclear power plant. This applies to both "Greenfield" sites as well as to sites adjacent to an existing plant. These regulations are sufficient and appropriate, as demonstrated by the on-going reviews of the three Early Site Permit demonstration projects. As noted in SECY 03-0047, the new ALWR designs present a much lower risk to the general public, by at least an order of magnitude. Thus, the siting of new plants adjacent to existing sites should result in an incrementally small increase in risk to the public surrounding the plants. Providing the industry continues to develop designs that

are safer than existing designs, and the indications are that the advanced reactors will present even less risk to public health and safety than the recently certified ALWR designs, there should be no need for additional siting criteria beyond what has been established. Enclosure 3 provides additional information.

Quantitative Risk Objectives

Use of Frequency-Consequence Curves

Development of frequency regions on a frequency-consequence diagram is a useful approach for portraying radiation releases over a frequency range from normal operations, AOOs, through DBEs to very low probability, abnormal events (Emergency Planning Basis Events (EPBE). Discrete frequency-consequence curves that express acceptable doses of accident families of a given frequency are useful for selecting DBEs. NEI supports the use of frequency-consequence curves for the new regulatory framework. A usable definition of frequency-consequence needs to be developed that can be used in the design of the plant by comparing the combined frequency and consequence of accident families against a clearly defined acceptance standard.

NEI believes that a frequency-consequence curve should not be adjusted for conservatisms. In fact, NEI's opinion is that the frequency-consequence curve should be aligned for regulatory acceptance with designers incorporating sufficient operating margin, within the regulatory acceptance curve. Incorporation of conservatism into the design and operating criteria is; however, appropriate to assure that the limits described in the graph are satisfied.

The International Nuclear Safety Advisory Group Publication 9 (INSAG-9), *Potential Exposure in Nuclear Safety,* deals with the potential radiation exposure from existing and future reactors. The report was published to provide a more specific treatment of potential radiation exposure from nuclear power plants than was provided in the International Commission on Radiological Protection (ICRP) recommendations and report, ICRP Publication 64, *Protection from Potential Exposure.* The INSAG-9 document was developed specifically for reactors and is more appropriate for use in power reactors. In this document, the y-axis of a frequency-consequence curve represents the probability of a person receiving a dose at a specific point from the accident, and <u>*not*</u> the frequency of occurrence of the accident. If frequency of occurrence is to be the y-of an event or accident, it is important to recognize that not all events result in a radioactive release.

The industry would like to emphasize that until there is greater experience in designing, operating and regulating advanced reactors, numerical subsidiary objectives should not be placed in regulations, but instead the framework should include a general description (non-numerical) of subsidiary objectives, that would

provide the same level of safety as the numerical surrogates for LWR prevention and mitigation. Our position on this is addressed fully under 'Level of Safety' in Enclosure 3.

Safety Goals

As is the case for existing licensing actions, the overarching goal of the new framework should be the satisfaction of the NRC's Safety Goal and the Quantified Health Objectives (QHOs). Existing generic, quantitative requirements governing acceptable releases during normal operation and from design basis events should be used as the anchor points to develop decision criteria for the acceptable frequencies and consequences of licensing basis events. There is no need to change the Safety Goal or the QHOs. They should remain generic and be used as general goals for gauging industry safety and the effectiveness of NRC's regulations.

The current LWR surrogate safety objectives -- core damage frequency (CDF) and large early release frequency (LERF) -- are not be appropriate for a technology-neutral framework. Surrogates should not be required for advanced reactor designs, but rather the frequency-consequence curves based on event sequences should be used. New metrics should be developed and will become plant-level design objectives. Quantitative probabilistic risk numbers should not, however, be incorporated into the regulations as these would be specific to each advanced reactor design. Rather, NEI proposes that a plain language description of the criteria be given in the regulations, with the quantitative design objectives being described in specific reactor type regulatory guides. An example of one common criterion could be a large fission product release that would result in a prompt fatality at the exclusion area boundary.

Use of PRA

PRAs are an appropriate mechanism to gain design and safety insights that will improve advanced reactor designs and enhance operational safety. PRAs can be used to gain a better understanding of the importance and safety significance of structures, systems and components (SSCs) as well as useful insights on potential vulnerabilities. In addition, internal and external event PRAs provide valuable insights to develop the basis for new and improved regulation.

NEI agrees that there are sufficient data and operating experience from plant operating events to use internal event PRAs as a basis for regulation as the uncertainties are small. This is not the case for external events, for which the uncertainties are large and the set of data and operating experience comparatively small. Technology-neutral methods that can be practically implemented should be used in the assessment and modeling of external events.

PRA Terminology

PRA terminology, used in the Draft NUREG document, needs to be reconsidered. For example, the term "level one PRA" may not be appropriate for non-light-water reactor designs. The lack of a counterpart for the non-LWR core damage end-state- and, the splitting of accident sequences into Level 1 and Level 2 segments do not apply to new gas reactors. Accident sequences for many new reactor designs proceed from initiating event to offsite release category end-states without including an intermediate state, such as core damage, as it is defined today.

Selection of Design Basis Events (DBEs) and Design Sequences

For advanced reactors, NEI agrees that design basis events and event sequences for plant-centered events (internal events, including fires and floods) should be defined by probability criteria, with due consideration for uncertainties. We strongly recommend that Framatome and PBMR proposals on how to select design basis events and event sequences discussed in the workshop and in other regulatory interactions be adopted. For modular designs, the definition of a plant should be that provided for in recently proposed legislation on Price-Anderson Renewal. Enclosure 3 provides additional industry input on integrated risk and licensing of modular reactors.

Another distinction in the definition of PRA elements for defining DBEs is in the treatment if initiating operating states such as full power, low power and shutdown modes. In the LWR case, the early PRA work was focused on the full power state as representing the most limiting potential for producing risk significant sequences. In the late 1980s to early 1990s, it was realized that accidents initiated during shutdown, had risk significance.

For large current-day LWRs, shutdown PRAs are very complex because of the number of system configurations that can exist during a shutdown. By contrast, the configurations of non-LWR reactor safety systems and features are not as complex and therefore, may lead themselves to a more simple and integrated PRA. As such, a shutdown PRA is not so demanding. Hence for each non-LWR reactor PRA element, it may be easier to address applicable sequences in all modes of operation. This can be accomplished without the need for separate models for each mode of operation. As a result, the technology-neutral requirements should not require a shutdown PRA, but require the risk to public health and safety during shutdown to be assessed and addressed. How that risk is assessed and addressed is a function of technology, and would be addressed in the technology specific guides. It should be noted, that the use of a shutdown PRA may provide more realistic results. As such, the use on non-PRA methods may result in additional conservatisms being applied.

In applying PRAs to identify a complete set of accident sequences in the design basis frequency range for advanced reactor designs, NEI recommends that 'cliff edge' events where uncertainty bands are large enough to extend into the DBE accident range, be included in the set of DBEs. In general, if the uncertainty band crosses classification boundaries, the event or sequence would be classified in the most conservative manner.

Single Failure Criterion

We do not believe that at this time the Commission has approved the change in regulations to permit use of probabilistic criteria to replace the single failure criteria.

We would support further discussion on this topic for use in the new framework and Part 50 for possible use in new reactor licensing.

SSC Classification

In the review and approval of the new ALWR designs, risk-insights and traditional methods were used as a basis for classifying as non-safety-related, systems that have traditionally been considered safety-related. The process should continue to be used for any future design. In addition, designers and licensees should be afforded the option of further component level classification, as defined in 10 CFR 50.69 and ASME code cases, if the defined risk-metrics are appropriate for that technology.

For non-LWRs, fixed criteria based on Risk Achievement Worth (RAW), Risk Reduction Worth or Fussell-Vesely (F-V) type of metrics is not appropriate for a generic framework because such metrics do not reflect the margins between the risk profile and the frequency consequence criteria. In one case a structure, system or component (SSC) might have a high RAW value but its failure results in a risk profile far away from the frequency consequence criteria. In another case, an SSC might have a low RAW value but its achievement exceeds the frequency-consequence criteria. Finally, the existing risk importance metrics focus on the impact of basic event probability on surrogate risk metrics such as CDF and LERF. This approach should not be used as surrogate risk metrics are not applicable for use in advanced reactor licensing.

Special Treatment

Special treatment controls for SSCs would be applied in the same manner as they are today. The normal suite of safety-related controls, quality assurance, environmental qualification, inspection and testing, would be applied to safety-related/safety significant SSCs to provide reasonable assurance that the safety-

function would be satisfied. For non-safety-related/non-safety-significant SSCs the normal range of commercial controls would be applied to ensure that the SSCs satisfy their commercial functions. For the set of SSCs that are non-safety-related, but are taken credit for in PRAs in for mitigating beyond design bases events, the standard suite of "augment" quality controls would be applied, which will be similar to the controls applied to fire-protection and ATWS SSCs in existing plants.

Accident Prevention

The NRC's proposed framework uses accident prevention, which is one of the first levels of Defense-In-Depth parameters, as a surrogate for the latent fatality QHO. Accident event sequences, rather than initiating events should be used in establishing acceptance criteria. Frequency criteria should not be applied to initiating events as the consequences of an initiating event cannot be defined outside the context of the full event sequence description.

An analogy to LWR reactor '*Core Damage Frequency*' for non-LWRs is difficult to define on a technology-neutral basis, for there is no single pinch-point in an accident progression that is analogous to a core melt event and that leads to a large step increase in potential consequences. For example, extreme accident conditions (such as a sustained (days) air ingress into a ruptured gas-cooled reactor) or failure of a reactor cavity cooling system for gas-cooled reactors will not necessarily involve dangerous releases of fission products from the reactor vessel.

We strongly disagree with the NRC staff proposal for criteria on accident prevention and accident mitigation of $1x10^{-5}$/ry and $1x10^{-6}$/ry, respectively. These are an order of magnitude lower than existing criteria and contrary to the NRC position on level of safety described in SECY 03-0047, which was approved by the Commission. Enclosure 3 provides additional detail on this topic.

Design Criteria

Technology-neutral regulations should include requirements on design criteria as part of the regulations and not as an Appendix. The regulations should describe general criteria covering all expected designs. At this point, there is insufficient knowledge on detailed advanced reactor designs and the specific details of the new regulatory framework to make an informed decision on whether high-level technology-specific design criteria should be included in the new regulatory regime. Further discussions with future design certification applicants should be held on this specific issue before a decision is made and a recommendation is put before the Commission.

Construction

The industry agrees that a protective strategy should cover design, construction and operation. However, the framework should not be developed in isolation from Part 52 and its Inspections, Tests, Analyses and Acceptance Criteria (ITAAC). The ITAAC are a performance-based means for assuring that the plant has been constructed in accordance with the design approved at the time of COL issuance. ITAAC, the licensee's quality assurance and associated quality programs, and the NRC's construction inspection program encompass the regulatory framework for construction. There is no need for additional regulatory requirements on construction.

The issue of inspection and assessment of modular construction activities at locations off-site and the foreign manufacture of safety-related components are not new. Safety related components have been manufactured overseas for over 20 years, and there is a well-established and proven process of inspecting, reviewing and interacting with foreign manufacturers. The ITAAC and the construction inspection processes apply to modular construction offsite as well as construction on site.

Treatment of Uncertainties - Defense in Depth

Defense-in-Depth and Treatment of Uncertainties

The extensive use of passive safety systems and inherent design features will require the safety assessment of future advanced reactors to be based on initiating events of very low probability. For advanced reactors safety will be achieved through the application of the following defense-in-depth strategies:

- The design of the fuel itself.
- The reactor design, which includes physical barriers for the confinement of fission products.
- Plant design, which again includes the provisions for the most effective confinement of fission products within the defined plant structures.
- Accident management provisions, including graded emergency preparedness

Overall defense-in-depth will integrate both deterministic and probabilistic considerations to provide metrics for assessing the safety and adequacy of each level of defense.

For non-LWRs, the state of development of deterministic requirements is still in progress. This creates a concern when LWR structuralist principles are applied to non-LWRs. Many current deterministic requirements are specific to LWRs, such as where redundancy and diversity appear as examples of structuralist approaches to

protective systems. Redundancy and diversity are design strategies for designs that are heavily reliant on active systems and components, such as current LWR designs. For future designs, whose safety is directly linked to passive safety features, diversity and redundancy should not be given the same degree of emphasis, and in some cases may not be relevant strategies. This suggests that the new framework and its regulations should have different sections relating to:

- designs that have a safety strategy, which is predominantly based on active systems and barriers, and
- designs that have a safety strategy, which is predominantly based on passive systems and barriers.

NEI acknowledges that Defense-in-Depth (DID) as a fundamental concept for treating uncertainties in advanced reactor designs is needed. In order to effectively determine DID requirements however, protective strategies should be analyzed both individually, as well as an integrated set so as to accurately determine overall DID requirements. Furthermore, the framework model should be tested against a licensed LWR design to determine its overall effectiveness.

The effectiveness of DID strategies, which incorporate structuralist elements to address completeness uncertainties identified by PRA must be clearly demonstrable. For this reason, we believe that the use of monitoring and feedback to verify the effectiveness of the DID needs to be incorporated into the framework.

In order to optimize advanced reactor designs, prototype operating experience should be applied as a basis to determine whether relaxation of initial defense-in-depth requirements is justifiable. In addition, the framework needs to recognize that uncertainties may be addressed by focused research and development as well as design-specific features.

NEI believes that additional dialogue is necessary before a practical, technology-neutral approach and description of defense-in-depth requirements can be developed.

Emergency Preparedness

We believe that criteria that consider factors such as likelihood of release, magnitude and chemical form of the radionuclide release and timing of releases are needed for determining the scope and nature of the required offsite emergency preparedness measures

Current requirements associated with emergency preparedness have been developed primarily in consideration of the risks from existing plants, LWRs.

Although 10 CFR 50.47 recognizes that for gas cooled reactors, and for reactor with an authorized power level of less than 250 MW thermal, the emergency planning zone may be determined on a case-by-case basis, in very few instances has this approach been applied.

There is a discussion in the framework document on the potential for a reduction or elimination in the Emergency Planning Zones. Such a topic is an emotive and important issue that calls for substantial public interaction before such a step is taken. There are a number of external influences on a decision to reassess the emergency planning zones. In addition, as we progress towards the development of a technology-neutral framework, we need to recognize that radiological emergencies may vary according to reactor design. The framework needs to be broad enough to encompass varying radiological emergencies and public health and safety risks from various reactor designs. The industry will continue to evaluate this issue so that we are in a position to provide input into the discussion on revising the emergency planning provisions and zones, when the time arises.

Containment Functional Performance

The industry position regarding public confidence on the issue of containment functional requirements for advanced reactor designs is reflected in our position as stated in Enclosure 3. We believe that while the structures as utilized today may not be necessary, advanced designs must provide the same functional performance requirements as met by current designs. We recognize that this is an issue which needs to be effectively communicated to the public.

Definition of Scope of Requirements

The framework should form the foundation for the development of a completely new set of regulations for power reactors: an optional, technology-neutral Part in 10 CFR for power reactors. It should provide future licensees and design certification applicants with an option of using the Part 50-Part 52 process or the Part 53-Part 52 processes.

Selective Implementation

We acknowledge the staff's intention to develop a technology-neutral framework and requirements for new plant licensing on an integrated basis, leading to a view that this will make selective implementation impractical. We disagree. The new regulations should be applicable to all types of reactor designs, light water reactors, gas reactors, liquid metal, etc. As a result, the new regulatory requirements could be applied existing LWR plants, if a licensee chose to adopt these new regulations. Naturally, a Part 50 licensee wishing to adopt the operational sub-part would be required to submit the necessary information that would form the basis for such a

request, including updated PRA information and other required studies and analyses, consistent with the regulations, the technology and design specific regulatory guides.

The new regulations should be organized such that a Part 50 license holder could adopt the risk-informed operational programs in place of the counterpart programs in Part 50, via a license amendment. This could be achieved by structuring the new requirements in a manner similar to that suggested in NEI 02-02 by having specific sections or subparts relating to: general requirements, design requirements, operational requirements and administrative requirements.

The alternative technology-neutral regulations will provide potential licensees and nuclear reactor suppliers with an option of using the Part 50 – 52 process or a combination of the new regulations and Part 52 process for the approval and issuance of new designs and power rector licenses. The proposed framework should be structured to allow an applicant for a combined construction and operating license (COL) to combine a Part 50/52 certified design with the new regulations operational requirements in the Part 52 combined construction and operating license process. In addition, the framework should not preclude the use of a design that is approved under Part 50 from being combined with the new regulations' operational requirements in a license application.

PRA Standard

The requirement for a living PRA is appropriate and would support design, operations and the new risk-informed, performance-based regulatory regime. NEI believes that the PRA review and update frequency should be the same as that defined in the ASME and other national consensus PRA standards. Yet, because of the differences in LWRs and new non-LWR reactor designs, additional guidance is needed to define the acceptable attributes of a full scope, internal events PRA for non-LWRs. NEI recommends that the current ASME PRA standard be used as a basis for developing such guidance.

Both model and incompleteness uncertainties should be addressed in reactor specific PRAs. At this stage there is not enough experience to determine how these uncertainties can be effectively addressed at a technology-neutral level. Without more experience in non-LWR technologies, it is not clear whether the level of PRA quality and fidelity should be higher for non-LWRs than that used in LWR risk management applications because of the differences in risk metrics.

Operations

There should be a requirement for a reliability or condition monitoring program, with language modeled on that used in the Maintenance Rule covering the safety

systems and major safety components. This would be consistent with the concepts developed in the approval of the ALWR designs and recent risk-informed regulatory improvement activities.

Change Control Process

The change control process for the new framework should be similar to that outlined in §50.59, which has stood the test of time. NEI 02-02 provided an example of a regulation and the regulatory basis for such a change process.

The concerns voiced in relation to maintaining the PRA and the potential impact on the SSC categorization and the design certification regime is minimal. Under Part 52, a licensee or a COL applicant may make changes to Tier 2 of the design certification. Changes to Tier 1 can be made by the licensee using a license amendment. Changes to safety-related non-Tier 1/Tier 2 equipment and processes would be controlled through the §50.59 type process.

For changes to the certified design, no changes could be made to Tier 1 or Tier 2 by the Design Certification (DC) holder or the NRC unless there are special circumstances that are directly linked to adequate protection of public health and safety or national security. As a result, a DC holder should keep a log of potential changes to the design caused by insights from operating experience, once a plant of that design is operating.

The principle of the new regulatory framework would be the same as for 10 CFR 50.59. A licensee would be allowed to make changes to the facility or procedures, or conduct tests or experiments not described in the FSAR without prior NRC approval if certain criteria are met. These criteria do not allow changes to Technical Specifications, or other changes which do not meet the conditions specified in the regulations or guidance documents.

License by Test

The new framework and requirements should provide provisions for approving, in part, new designs by allowing confirmatory testing as part of the design approval process. Such testing should be performed under controlled conditions. The licensing process should be Part 52, with licensing provisions similar to those used in the 1960s for licensing prototype reactors.

Decommissioning and Decontamination

Current rules addressing decommissioning and decontamination for LWRs are adequate for non-LWRs. There is no need for the framework to address this topic apart from referencing the existing criteria and requirements.

Enclosure 2
An Approach for the Development of a New Regulatory Framework for Power Reactors

Introduction

This paper provides a summary of an overall approach and possible schedule for developing a new and optional set of risk-informed, performance-based regulations for power reactors that would be easily applied to a reactor based on any nuclear technology.

The proposed framework referenced in the *Federal Notice* (Vol. 70, p5228, dated February 1, 2005) describes some of the main elements. It focuses on some of the issues. It provides a substantial emphasis on probabilistic risk assessment methods and associated issues, but does not describe how the framework would be integrated with other essential regulatory elements such as oversight.

A new, risk-informed, technology-neutral regulatory framework should include the general scope, description, guidelines and implementing principles and concepts. Also, for the industry to support such a project, it is important for the framework or an ancillary document to provide a vision and schedule on how and when the elements will be developed and merged into an integrated regulatory regime. From the framework and the implementation concepts and schedule, it should be relatively easy for a prospective licensee to determine how the new regulations will influence the design and how the operational phase; post fuel-load will be regulated.

Background

There is substantial regulatory activity associated with new power reactor projects. The prime focus of this activity has been on the evolutionary light-water reactor designs that are ready for commercial deployment. An advanced reactor (non-LWR or LWR) design will not be approved or certified by the NRC as a commercial design until a prototype or scaled testing has been performed[2], the results assessed and the design modified to reflect the lessons learned from the prototype testing. This will take time and resources to accomplish. Even without prototype testing, it is unlikely that a complete regulatory framework (regulations and regulatory guidance) could be in place before 2012 because of competing NRC resource demands.

The current regulatory framework evolved over time, by incorporating lessons learned from regulating construction and operations. As the regulatory framework

[2] The prototype testing may be performed in another country, yet to be recognized and approved by the NRC, the details test program, the test conditions, the test results and insights must be available for NRC review and approval.

matured and the number of regulations and guidance documents grew so did the cost and complexity of managing, operating and regulating new nuclear power plants. Under Part 50, light-water reactors (LWRs) and non-light-water reactors (non-LWRs) have been licensed. Yet, the Part 50 regulations and its associated supporting framework have developed a substantial bias towards LWR technology because in the 1960s and 1970s practically all of the new owners chose the LWR technology. As a result, it will be cumbersome and time-consuming to license numerous non-LWR designs against Part 50. To do so would entail an acceptance that many future reactors would be licensed with numerous exemptions to the regulations, making the process of regulating nuclear plants more complex.

The growth of the Part 50 framework was a long, often arduous experience for both the regulator and the industry. In 1989, the NRC took the proactive step in issuing a new regulatory process for the design, siting and licensing of new nuclear power facilities. 11 years later, following the publication of the NRC Policy Statement on the *Use of Probabilistic Risk Assessment Methods in Nuclear Regulatory Activities*, the NRC introduced an improved, risk-informed, performance-based regulatory oversight process. Yet, while the oversight process is risk-informed few of the Part 50 regulations have been risk-informed.

Now, with the advent of new and advanced technologies and analytical techniques there is an opportunity to simplify and streamline the regulations, both for Part 50 LWR licensees and future advanced reactor licensees. It will be possible to make the regulations more objective and safety focused, while reducing the resource burden associated with implementation. In addition, it will be possible to establish a regulatory regime that can be readily applied to any reactor technology.

The new regulatory framework should provide a structure that allows current LWRs to adopt this new set of more safety-focused requirements. This can be achieved by having the regulations divided into subparts: general requirements; design; operations; and if necessary, administrative.

Issue

What is the optimum way to certify the first non-LWR designs and develop a set of risk-informed, technology-neutral regulations for power reactors, given the competing priorities for NRC resources?

General Approach & Schedule[3] for Licensing Initial non-LWR Designs

- Work with the NRC to develop a general framework and a set of principles for implementing a technology-neutral set of regulations for power reactors and the associated implementing guidance. Ensure that the new regulatory framework is consistent with the concepts established for the improved reactor oversight process, so that a common set of reactor oversight principles can be applied to either Part 50 or the new framework. (1Q FY 2006)
- Publish an Advanced Notice of Proposed Rulemaking (ANPR) on the issuance of an optional set of requirements for power reactors: issues plus a draft set of risk-informed, performance-based, technology-neutral regulations, so that the public and prospective licensees can better assess the benefits of the proposed regime. (Early FY 2006).
- Following public comments, adjust the proposed regulations, and issue in draft form, a set of technology-neutral regulations. (Complete 3Q FY 2007).
- Submit an advanced design(s) for approval and eventual certification following prototype testing. The proposed draft set of technology-neutral regulations would act as a potential guide and bases for review, when Part 50 requirements are not applicable, although eventual certification would be against new technology neutral requirements.
  - The application would describe the prototype testing program based on pre-application interactions. (1Q FY 2008).
- NRC licenses the design for prototype testing under Part 50 regulations. In a parallel activity, the design and the review criteria are assessed against the draft set of technology neutral regulations. (FY 2010)
- As a parallel activity, assess the proposed new regulations against a LWR design that has recently been certified, if the advanced design referenced above is a non-LWR.
- Start construction of prototype. (FY 2010)
- Complete construction of prototype; implement testing program based on the program approved as part of the prototype license. (FY 2012 - ?)
- Evaluate and adjust draft set of regulations, based on the assessments against the prototype and traditional LWR designs.
- Issue a Notice of Proposed Rulemaking for the issuance of the new set of regulations, which have been adjusted based on the lessons learned from the review of the prototype design and initial prototype tests. (Early FY 2013)
- Issue final rule on risk-informed, technology-neutral requirements for power reactors(FY 2014)
- Adjust the design based on lessons learned from prototype tests.
- Submit a supplement to design certification application. (FY 2015)

[3] The schedule could be shortened by as much a three years, if the testing is performed on an existing prototype plant, possibly at an overseas location, that mirrors the design under review at the NRC.

- NRC approves design for commercial operations against new, technology-neutral requirements (FY 2016)
- NRC certifies design against new requirements. (FY 2017)

General Approach for Designing and Regulating Advanced Reactors (LWRs and non-LWRs) under the New Framework

Summary: PRAs would be used to improve and enhanced the design and to reduce latent plant vulnerabilities and the risk to public health and safety from nuclear power plant operations. The plant would be regulated in a manner similar to existing plants following the issuance of the combined construction permit and operating license, with the oversight process based on the current NRC oversight process.

General Approach

- Develop preliminary design
- Perform PRA (level 3, internal events plus internal fire and flood) on preliminary design.
- For internal events, fire and flood PRA, the goal would be to have a design that meets a metric equivalent to a LWR Core Damage Frequency of 10^{-5} /plant-year[4], where a plant is defined as a single power reactor or a series of modular reactors whose combined electrical generating output does not exceed 1300 MW, or (the thermal equivalent).
- Perform external event, seismic and shutdown PRAs or perform a scoping and screening risk assessment similar to the Seismic Margins assessment methodology, as a separate activity.
- Adjust and optimize the design based on the insights from the PRA, and external event and seismic risk assessment evaluations.
- For external events and seismic, the design criteria would be based on the traditional historical criteria approach, as for today's plants, enhanced with insights from PRA or risk assessment scoping (SMA) analyses.
- Re-run the PRAs to confirm design satisfies the goals and the criteria expressed in the Frequency-Consequence curve[5].
- Freeze the design and develop detailed design specifications, including design reliability criteria based on PRA insights.
- Supplier files design certification application
- NRC reviews and approves the design

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4 NOTE CDF value is lower because it does not take into consideration seismic and external events, which are assumed to be 10% of the overall core damage frequency (risk).

5 The Frequency-Consequence curve would be that derived from the regulations, similar to the one developed by Exelon in their provisional approach to licensing the PBMR

- Potential licensee or owner files an Early Site Permit Application (Optional)
- NRC staff reviews and approves Early Site Permit
- Develop Tech. Specs and equipment reliability criteria based on the insights from the PRA and realistic engineering conservatisms
- Combined license application submitted, referencing the certified design, and, or an Early Site Permit, as circumstances dictate
- NRC reviews and issues the combined license, which include the ITAAC
- Construct the plant.
- Verify that ITAAC have been satisfied, and load fuel and start power ascension testing.
- Perform as-constructed PRA (internal events and fire). Determine whether the as-constructed facility satisfies the risk metrics. Adjust reliability criteria as necessary, or perform modifications to enable the risk metrics to be satisfied.
- The plant (unit) would be regulated in the same way as existing plants, but with more emphasis on equipment reliability. The design bases and criteria would be that set in the design-specific certification. NRC oversight would be based on criteria similar to the existing criteria in the current reactor oversight process.
- The living PRA criteria would be applied against the internal events and fire PRAs, not the external event and seismic PRAs[6].
- PRA updates would be performed consistent with the criteria proposed in national consensus standards.
- Changes to the plant, including the design and, in the extreme, the design basis, would be regulated by a process similar to the process employed for existing plants.
- For changes to seismic and external event design and the condition monitoring criteria, the decision on whether to initiate generic changes to the standard design or design methodologies would be governed by a group of industry and NRC subject matter experts, assisted by seismic or external event PRA or risk assessment insights.

[6] The external event and seismic risk assessments are designed to provide insights to improve the design through the identification of latent vulnerabilities.

Enclosure 3

NUCLEAR ENERGY INSTITUTE

Adrian P Heymer
DIRECTOR, NEW PLANT
DELPOYMENT, NUCLEAR
GENERATION DIVISION

April 11, 2005

Ms. Mary Drouin
U.S. Nuclear Regulatory Commission
Office of Nuclear Regulatory Research
Mail Stop 10 E50
Washington, DC 20555-0001

Dear Ms. Drouin:

This letter is in response to the NRC staff request for public comments on three policy issues: integrated risk, level of safety, and containment functional requirements. These issues are related to the development of a new regulatory framework for advanced reactor licensing. They will be the subject of a Commission paper in mid 2005. The enclosure provides additional details on the three policy issues.

Integrated Risk: The industry generally agrees with the approach described in the NRC framework and SECY 05-0006, *Second Status Paper on the Staff's Proposed Regulatory Structure for New Plant Licensing and Update on Policy Issues Related to New Plant Licensing.* The Quantitative Health Objectives (QHOs) are suitable for assessing the public health and safety risk in the vicinity of a nuclear power plant site. Recent industry studies, which have been reviewed by the NRC staff, indicate that there is substantial safety margin between the QHOs and the light-water reactor (LWR) subsidiary objectives, when using the revised source term. As a result, the surrogate objectives should continue to be used as an overall gauge of industrywide safety performance.

Containment Functional Requirements: The industry believes that Option 1 generally reflects the industry's view of an approach for determining the "containment" functions for non-light-water reactors.

NEI believes that non-LWRs may be licensed without the traditional "containment" structure. Yet, in the design and licensing of non-light-water reactors, the applicant will have to demonstrate how the design satisfies the same containment functional performance criteria for current LWRs, such as radionuclide retention, and equipment structural support.

Level of Safety: The industry is confused as to why the issue is being raised again, 18 months after the Commission approved the NRC staff proposal in SECY 03-0047. In its SRM on SECY 03-0047, *Policy Issues Relating to Non-Light-Water Reactors,* the Commission approved the NRC staff's recommendation on how to ensure that future

non-light-water reactors would meet the safety expectations described in the Commission's Advanced Reactor Policy Statement. The staff's proposal mirrored the way the issue had been successfully addressed for light-water reactors.

In SECY 05-0006, NRC staff proposed non-LWR subsidiary objectives for accident prevention and mitigation of 10^{-5}/year and 10^{-6}/year respectively. These criteria are not consistent with the NRC staff's 2003 proposals or the Commission's directives on level of safety. It is unclear whether the NRC staff is proposing these more conservative criteria because of the potential for the elimination of traditional Emergency Preparedness activities. Such a topic is an emotive and important issue that calls for substantial public interaction before such a step is taken. Until such interactions are concluded, more stringent and conservative subsidiary surrogates should not be developed.

The industry supports the preliminary goal of establishing subsidiary surrogates for non-light-water reactors based on the Safety Goals and Quantitative Health Objectives. However, until there is greater experience in designing and regulating advanced non-light-water reactors, the framework should avoid including specific numerical subsidiary objectives in the regulations. Once we have more experience with LWR and non-LWR designs, risk assessments and operations, and with advances in knowledge and technology, we may be able to evolve to including specific numerical subsidiary objectives with risk informed quantification in the regulations.

NEI commends the NRC staff on the conduct of the March 2005 Workshop. It facilitated public input and understanding of the NRC's preliminary proposals on the new framework. The industry looks forward to participating in the discussions on the development of an optional, technology neutral regulatory framework for power reactors. We will provide comments on the other issues described in SECY 05-0006, in a separate letter.

Sincerely,

Adrian Heymer

Enclosure

c: Dr. Carl Paperiello, NRC

Enclosure

NEI COMMENTS ON POLICY ISSUES: REGULATORY STRUCTURE FOR NEW PLANT LICENSING: TECHNOLOGY NEUTRAL FRAMEWORK

A. Integrated Risk

As stated in SECY 05-0006, NRC staff has typically considered risk on a per reactor basis, regardless of the number of reactors on a site, except for instances where there are a number of common safety systems shared between several reactors at a single site.

We acknowledge the staff position that for a site with several modular reactors the assessment of public risk could be more realistically determined by assessing the risk of all modules at the site. The risk from small modular reactors should be consistent with the Commission's Safety Goal Policy. Consequently, we agree that the integrated risk for multiple modules, i.e., a 'plant' where several small reactors are used to generate the electrical output equivalent to that of one large reactor, should be characterized by treating accident prevention independent of reactor power, while allowing reactor power to be considered in the assessment of risk measures related to accident mitigation and consequences. Applying this approach, modular reactor characteristics are realistically accounted for, and safety requirements are not more stringent than implied by the Safety Goal Policy, when considered on a per plant basis.

Consistent with the above statements, NEI believes that a single license should be issued for plants having multiple modules, where the definition of a modular plant is based on the language proposed in the Price-Anderson legislation. This would allow a set of modular reactors to be treated as a single unit with a combined rated capacity of up to 1300 MW electric.

B. Containment Functional Requirements

Option 1, as stated in the draft December 2004 NUREG generally reflects the industry's view of an approach for determining the "containment" functions for non-light-water reactors.

The approach may allow non-LWRs to be licensed without the traditional "containment" structure. In the development and review of designs and license applications for non-light-water reactors, the applicant will have to demonstrate how the design satisfies the same functional safety objectives as a design with a traditional pressure-retaining structure, i.e., to adequately reduce radionuclide releases to the environs to meet onsite and offsite radionuclide dose acceptance criteria for events selected in the event categories, and protect and support safety related equipment.

The industry believes that functional performance requirements and criteria for containment of radionuclides need to be developed on a technology neutral basis.

Consequently, the fission product barrier function should be viewed as a plant wide function and not necessarily be limited to a pre-determined set of physical barriers, or SSCs, or necessarily manifest itself as a pressure-retaining structure. The differences in performance requirements among plant designs should reflect differences in designers' integrated approaches, but reach the same end point in regard to fission product release.

Containment functional performance requirements should be stated at a high level in the framework, with design specific functional performance requirements included in specific design certifications. The high level functional performance requirements for advanced reactor designs should be based on the functional performance characteristics of LWR Containments including the fission product retention criteria.

NEI further believes that risk informed insights for each design type will determine the level of risk to be protected against including the examination of beyond design basis sequences for "cliff edge" effects. Design-specific risk considerations will eliminate costly technology solutions based on non-mechanistic events that result in unnecessary plant design features which could be counterproductive to more realistic accident mitigation. The framework should not impose solutions, which result in additional technology to support source term calculations and design related enhancements that result in the unnecessary expenditure of additional resources.

NEI recommends that the criteria for functional containment performance specify that functions must adequately reduce exposures to the public to meet onsite and offsite radionuclide dose acceptance criteria for the events selected in the event categories. Option 1 provides designers with flexibility to develop new reactor concepts and to meet regulatory acceptance criteria. It provides a structured, consistent, technology-neutral and performance-based process to establish the acceptability of different plant designs.

C. Level of Safety

In the Commission's 1985 Severe Accident Policy Statement, 50 FR 32138, the Commission stated its expectation that new plants are to achieve a higher standard of severe accident safety performance than prior designs. This was followed in 1986 by the Commission's Advanced Reactor Policy Statement, 52 FR 24643, in which the Commission stated its expectation that advanced reactors will provide enhanced margins of safety and/or utilize simplified, inherent, passive, or other innovative means to accomplish their safety functions. In addition, the Commission stated that as a minimum, advanced reactor resigns will provide at least the same degree of protection of the public and the environment as is required for current generation light water reactors, and comply with the Commission's Safety Goal Policy Statement.

In 1989 the issue of how the NRC was going to ensure that the goals of the two policy statements would be satisfied was referred to the Commission in SECY 89-102, *Implementation of the Safety Goals.* In June 1990, the Commission provided direction to the NRC staff in its SRM on SECY 89-102 on both implementation of the Safety Goals, and on the method to assure that the level of safety for new plants is enhanced. The Commission recognized that the level of safety provided by the regulations must be maintained at a common standard for different generations of reactor designs, and that a more stringent level of safety should not be imposed through regulation on future plant designs. The Commission made it clear that it expected and encouraged designs with enhanced safety, but did not support the imposition of an increased level of safety through new generic regulations.

For the advanced LWRs, the above Commission policies were implemented and proven by:

1. Industry setting specific design and operational requirements for new reactors, which were documented in EPRI's LWR Requirements Document. The Utility Requirements Document required the designers to incorporate features that would improve safety performance and improve the plant capability to respond to, and withstand a severe (beyond design basis) accident.

2. Designers providing simplified or passive safety systems (including scaled facility testing to demonstrate performance), and by providing features to improve the prevention and mitigation of severe accidents.

3. The NRC reviewing these designs with these improved features, and codifying them in the design certification process.

The NRC staff performed confirmatory experimental and analytical work to confirm plant performance, while the industry worked with the NRC in developing criteria for assessing the performance of those designs under severe accident conditions.

In 2002 the NRC staff raised the issue of level of safety for new non-light-water reactors. In SECY 03-0047 *(Policy Issues Related to Licensing Non-Light Water Reactor Designs),* the NRC staff recommended that the Commission:

- Approve implementation of enhanced safety through a process similar to that used in the evolutionary LWR and advanced light-water reactor (ALWR) design certification reviews (i.e., reactor designers are expected to propose designs with enhanced safety characteristics; the NRC staff reviews each design on its own merits and, on an as-needed basis; recommend additional enhancements in areas of high uncertainty, subject to Commission endorsement). Such enhancements could include additional design features, additional testing by the designer, or additional confirmatory testing and/or oversight by NRC in areas of large uncertainty, and would be recommended

with the intent to achieve a level of safety and confidence similar to that achieved in the evolutionary and ALWR design certifications.

The Commission approved the NRC staff's recommendation. As a result, the industry is confused as to why the issue of level of safety is being raised again, 18 months after the Commission agreed with the NRC staff proposal in SECY 03-0047. From the discussions in the March 2005 workshop, it appears that the issue may not be about level of safety, but about defining and including one or more numerical subsidiary safety goal objectives in regulations for future plants. Yet the NRC staff proposals in the draft NUREG would impose an increased level of safety through generic regulation, contrary to the Commission's directives over the past 15 years.

In SECY 05-0006, NRC staff proposed non-LWR surrogate objectives for accident prevention and mitigation as 10^{-5}/year and 10^{-6}/year respectively. This is not consistent with the NRC staff's 2003 proposals and the Commissions directives on level of safety. It would constitute an imposition, through regulation, of a higher level of safety for new plants, compared to existing plants. It would confuse and possibly alarm the public, who would struggle with having two different levels of safety that define adequate protection.

In the SECY and the draft Framework, there was a brief discussion on the potential for adjusting or eliminating traditional emergency planning requirements. It is unclear whether part of the rationale for the more stringent and conservative subsidiary objectives of 10^{-5}/year and 10^{-6}/year are based on the potential for eliminating traditional emergency planning requirements. Such a topic is an emotive and important issue that calls for substantial public interaction before such a step is taken. Until such interactions are concluded, more stringent and conservative subsidiary surrogates should not be developed. We will provide additional input on the policy issue associated with the potential elimination of traditional emergency preparedness requirements in a follow up letter to these comments.

NEI agrees that the QHOs should be the foundation for development of a new and optional, technology-neutral regulatory framework for power reactors. We remain cognizant that in the SRM on SECY 03-0047, the Commission stated its expectation that new reactors should be safer than existing plants, but left the task of determining how to meet that expectation to the designer. The NRC staff's role is to confirm that the expectation has been satisfied.

The industry supports the concept of establishing subsidiary objectives for non-light-water reactors based on the Safety Goals Policy and QHOs. The Quantitative Health Objectives and subsidiary objectives established for light-water reactors set an appropriate industrywide level for safety performance expectations for those designs. However, we emphasize that in the case of LWRs; numerical subsidiary objectives were arrived at after extensive operating experience, review of LWR PRAs, and crystallized with that broader knowledge base. As a result, we strongly recommend that, initially, subsidiary objectives for non-LWRs should be viewed as performance goals for the industry and the regulations, and be in plain text rather

than numerical values. At this stage, it is unclear whether numerical subsidiary objectives are necessary for non-LWRs given that the regulatory process for a technology-neutral set of requirements is still in the embryonic form.
Until there is greater experience in designing, operating and regulating advanced reactors, numerical subsidiary objectives should not be placed in the regulations. The framework should include a general description (non-numerical) of subsidiary objectives that would provide the same level of safety as the subsidiary objectives for LWRs; namely, objectives that would provide an equivalent level of safety as the numerical LWR subsidiary of 10^{-4}/year and 10^{-5}/year for accident prevention and mitigation, respectively. Specific numerical values may be used as goals for specific designs and documented in the design specific regulatory guides.

PRAs provide useful insights on potential vulnerabilities and can be used to adjust the design and operational activities. Also, they provide a good tool for establishing realistic bases for equipment reliability criteria. The inclusion of numerical subsidiary probability objectives in regulations would make PRAs the central and critical element of the licensing basis. It would require a higher level of PRA fidelity and quality than what is being considered for current risk-informed applications. At this time, neither the industry nor the supporting technology is at a stage to make PRAs the central element of the licensing bases.

Over time and with greater experience in implementing the new risk-informed regulations under the Part 50 regime, we may evolve to including specific risk-informed quantitative subsidiary objectives in the regulations. It would require further advances in knowledge and technology and considerably more experience in developing and using high quality PRAs.

We agree that a Frequency-Consequence curve could be used to define the regulatory envelope for a commercial nuclear power plant. Such a curve has already been proposed in the previous regulatory interactions several years ago on licensing the Pebble Bed Modular Reactor. With minor modifications, this curve could be used as the basis for proceeding with advanced discussions on the framework.

From: "FUNDERBURK, Tonya" <tvf@nei.org>
To: <NRCREP@nrc.gov>
Date: 4/25/05 2:26PM
Subject: Regulatory Structure for New Plants Licensing

April 22, 2005

Rules and Directives Branch

Office of Administration

U.S. Nuclear Regulatory Commission

Washington, DC 20555-001

This letter provides comments from the Nuclear Energy Institute (NEI)[1] on the Regulatory Structure for New Plants Licensing - Part 1: Technology Neutral Framework draft NUREG 3-2005. These comments complement those provided by other NEI members.

NEI appreciates the continuing dialogue and interaction with the NRC staff in the development of a risk-informed, performance-based and technology-neutral framework. The industry commends the NRC staff for taking this first important step towards further improving the power reactor regulations. The industry commends the staff for taking the time and effort to fully involve the public and the industry in a very constructive and open set of meetings and workshops on this important topic. A topic that is important to the long term future of the industry.

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[1] 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 plant designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

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