

August 17, 2000

MEMORANDUM TO: ACRS Members

FROM: Noel Dudley, Senior Staff Engineer */RA/*

SUBJECT: TRIP REPORT ON THE AMERICAN NUCLEAR SOCIETY 2000
UTILITY WORKING CONFERENCE, "MANAGING THE BUSINESS
OF NUCLEAR POWER," AMELIA ISLAND, FLORIDA — AUGUST
6-10, 2000

Attached is my trip report that summaries the working sessions I attended and discussions I had at the American Nuclear Society 2000 Utility Working Conference held at Amelia Island Plantation, Florida, August 6-10, 2000.

Attachment: As stated

cc via e-mail:

J. Larkins
H. Larson
S. Duraiswamy
ACRS Fellows and Technical Staff

TRIP REPORT

AMERICAN NUCLEAR SOCIETY

2000 UTILITY WORKING CONFERENCE

“MANAGING THE BUSINESS OF NUCLEAR POWER”

AMELIA ISLAND, FLORIDA

AUGUST 6-10, 2000

Noel Dudley

TRIP REPORT

American Nuclear Society 2000 Utility Working Conference
Managing the Business of Nuclear Power
Amelia Island, Florida
August 6-10, 2000
by
Noel Dudley

I attended the first two days of the 2000 Utility Working Conference sponsored by the American Nuclear Society. The Conference, as its name implies, focused on operating nuclear power plants as businesses with regulatory oversight as one of the activities that needs to be managed. After the Plenary Session on Monday morning, the Conference offered seven different parallel tracks of break out sessions. I followed the Regulatory Relations track and attended sessions on reactor oversight, risk-informed regulations, and license renewal. The fourth day of the Conference consisted of an ANS Professional Development Workshop concerning the maintenance rule and condition monitoring. The agenda for the Conference and the Workshop is attached [pp 9-23].

Approximately 250 people attended the Conference. The 15 NRC staff members who attended also participated as panel members during selected sessions. Vendors, consultants, industry executives, and licensee regulatory and maintenance managers were well represented. A list of the attendees is available upon request.

OBSERVATIONS

The scenario of a resurgence of nuclear power presented at the Conference was predicated on the following assumptions. With the increasing demand for reliable power being driven by the communications industry, power generators will be motivated to build more base-load electric power plants. Due to deregulation, the price volatility of fossil fuels, and environmental concerns, nuclear power will be competitive with other fuel sources. Since deregulation will allow a better return on capital, investors will be more likely to accept the risk associated with financing construction of new nuclear power plants.

Based on the content of the different sessions at the Conference, issues that nuclear power executives need to consider under the assumed scenario are operating nuclear power plants as businesses, increasing present generating capacity, maintaining aging equipment, retaining a skilled work force, and effectively managing the regulatory environment.

Some speakers noted the importance of protecting public health and safety. Other speakers explained that operating a nuclear plant as a low cost power producer will ensure safety. However, speakers did not talk about how safety will be maintained or how the regulatory structure will ensure public health and safety.

PLENARY SESSION

The speakers during the plenary session were upbeat about the future of nuclear power. Most speakers focused on the business aspect of operation a nuclear power plant and expressed a belief that nuclear power is competitive with any other source of electric power. Only two of the speakers stressed the need for continuing to operate the plants safely.

Commissioner Merrifield made the case that the outlook for nuclear power is the brightest it has been since the Three Mile Island (TMI) accident. He presented lessons learned from a book entitled "Containing the Atom" by J. Samuel Walker, the NRC Historian. One lesson learned from the 1950's is the need to prevent licensing bottlenecks caused by lack of NRC resources. Commissioner Merrifield noted that the NRC should establish an infrastructure to support the review of license renewal application as a priority over reviewing the applications. Another lesson from the 1960's concerned the loss of public confidence resulting from the fear of radiation from nuclear weapons' fallout. Similarly, the fear created by the plant events at TMI and Chernobyl in the 1970's and 1980's adversely effected nuclear power. He noted that public confidence must be earned and that it is fragile. He warned against advocating further cuts in the NRC that may adversely effect public confidence. A copy of Commissioner Merrifield's remarks are attached [pp 24-31].

In response to questions Commissioner Merrifield made the following statements:

- The Commission will wait until the consolidation of the electric power industry is completed before deciding on changes to the boundaries of NRC Regional Offices.
- Fewer licensees would not necessarily make it easier to regulate the 103 operating plants.
- The NRC will review new plant design applications, such as the pebble bed design, when they are received.
- Based on his discussions with resident inspections, the inspectors are changing their negative views towards the Revised Regulatory Oversight Process.
- The federal government should rescind its prohibition against foreign ownership of nuclear power plants, since nuclear proliferation is no longer an issue.
- Performance indicators enhance public confidence.
- Maintaining adequate electric power is not the NRC's responsibility. The NRC should ensure plants can withstand voltage dips on the power grids.
- The NRC should improve the timeliness of its review of spent fuel storage issues including high burnup fuel and damaged fuel elements in spent fuel pools.
- The NRC has provided the infrastructure necessary to license a new plant within one year. An application for construction of a new nuclear power plant may be submitted within 7 to 10 years.

Mr. Jerry Yelverton, President and CEO of Entergy Nuclear, Inc., presented statistics demonstrating how safely and efficiently nuclear power plants are being operated. He stated that the consolidation of the nuclear power generation industry would continue partly because it reduces a company's risk and provides the least expensive source of base-load electricity. Mr. Yelverton stated that the larger companies would hire the skilled craftsmen they need and would be less reliant on operating service providers. He explained that the costs of electricity from present nuclear power plants is less than the cost of electricity from operating gas plants due to the present high cost of gas. Mr. Yelverton was encouraged by license renewal, which would allow present plants to continue to operate until new plants are built. He concluded that nuclear power is competitive with other sources of electricity because of increased capacity (power uprates), lower staffing and operating costs, and stable fuel cost. Selected slides used during this presentation are attached [pp 32-37].

Dr. Lucian Conway, President, Conway Consulting, provides financial decision making training to industry executives. He explained how the transition from a regulated monopoly business model to a deregulated model will result in reducing expenses and working capital. He stated that the return on the regulated portions of an electric company is 12 percent and that the return on the unregulated portions of a company is about 20 percent. As a result, more funds will flow into nuclear power plants as deregulation progresses. Dr. Conway concluded that if nuclear power plants are run as businesses they will be competitive with other types of electricity generators.

Mr. David A. Christian, Senior Vice President-Nuclear, Dominion Generation, explained that North Anna and Surry nuclear power plants were low cost producers because the organizational vision of safe operations had been adopted by the employees. He stated that increased capacity factors resulted in increased revenues. He noted that increased regulation of fossil fuel emissions would make nuclear power even more competitive. Concerning mergers and takeovers, Mr. Christian observed that quality was added by increased safety and not increased size. He concluded that licensees should be less concerned with safety risk and concentrate on managerial factors. His remarks are attached [pp 38-50].

Mr. Edward Tirello, Jr., Managing Director, Deutsche Banc Alex Brown, is a Wallstreet electric power company analyst. He disagreed with the decision to separate power generation, transmission, and distribution into different companies. He stated that as the electric power industry consolidates the nuclear power producers must think like a business since they will be the largest profit centers. He speculated that there eventually will be eight to ten transmission companies that will need to invest billions of dollars in upgrading the national infrastructure. He noted the present regulatory environment discourages investment in transmission lines. Mr. Tirello explained that the reserved margin for operating grids has dropped to 8 percent and peak electricity usage has extended into the evening hours due to the internet. He stated that the demand for electricity by high tech companies presently represents 13 percent of the demand and will increase to 25 percent.

Mr. Tirello projected that five to eight major electric generating companies would compete on each transmission grid and that 30-40 distribution companies would sell different grades of power nation wide. He expected high tech companies would purchase reliable nuclear power and that consumers and warehouse facilities would purchase less reliable power generated by

electric peaking stations. Mr. Tirello stated that electric power generating companies must be managed as businesses similar to the vicious competition that occurs in the food industry. He speculated that oil companies would soon become involved in the electric power generation industry.

In response to questions, Mr. Tirello provided the following answers:

- In the present rapidly changing business environment, the NRC needs to approve new plant applications within months and not years.
- Distributive power generation equipment, such as fuel cells, soon will be used at major buildings, farms, and telecommunication towers.
- The government has collected money, which is earning interest, and is doing nothing to build a high level waste repository. A law suit is needed to make progress.
- Regulators can adapt to the new business environment, but change will be slow and training will be needed.
- Craft workers are not drawn to nuclear facilities because the industry is viewed as dying. The industry needs to sell job security and better manage overtime work.
- Competition has not decreased the sharing of information since the industry is interdependent with regards to maintaining a safety focus.
- Since utilities have been purchasing vendor organizations and developing buying groups, the demand for vendor services will decrease.
- Training, which provides an understanding of economic competition, information on how well the company is doing, and what the employee can do to help, should be used to motivate employees to be more productive and efficient.

REACTOR OVERSIGHT PROGRAM

My conclusion from this session is that the Revised Regulatory Oversight Program (RROP) is supported by both the NRC and the industry and will be revised to improve its effectiveness. The differences and issues between the NRC and the industry were clearly identified, the need to revise the present RROP was repeatedly noted, and the quality of the working relationship between the NRC and industry was continually highlighted. The NRC staff stated that the cross-cutting issues will be reflected in the performance indicators and that additional leading indicators are unnecessary. One staff member stated that performance indicator thresholds would be exceeded before a risk significant event occurs.

The RROP is predicated on the effectiveness of each licensee's corrective action program. In a private discussion, a consultant who reviews licensee corrective action programs stated that most licensees have weak corrective action programs. The primary weaknesses of the programs were the inability to correct identified problems and the inability to identify latent errors, which could eventually result in self-identifying problems.

Mr. William Dean, NRC, described the regulatory framework and the initial implementation of the RROP. He explained that the NRC staff was developing tools to improve the objectivity and consistency of the performance indicators and the Significance Determination Processes (SDPs). Other issues discussed were fault exposure time in relationship to reliability and the need to more closely inspect the cross-cutting issues. Mr. Dean described future NRC initiatives such as establishing an initial implementation evaluation panel, considering the use of risk-based performance indicators, evaluating resources, and holding public workshops. Selected slides used during this presentation are attached [pp 51-53].

Mr. Peter Wilson, NRC, provided an overview of the SDPs and explained that the SDPs for the cornerstones are works in progress. He concluded that due to the SDPs, objectivity has improved and the NRC is better focused on safety significant issues. Selected slides used during this presentation are attached [pp 54-61].

Ms. Donna Alexander, Manager, Regulatory Affairs, Carolina Power and Light Company, presented insights gained during the pilot program for the RROP. She stated that no major process changes were necessary to implement the oversight program. She noted that internal thresholds were lower than the NRC thresholds and that program results were reviewed by a panel before being sent to the NRC. Ms. Alexander stated that the number of inspection hours appeared to increase and that the inspection reports were pretty bland. She suggested that resident inspector observations, similar to those contained in the old style inspection reports, should be conveyed to the licensee. She questioned the appropriateness of the NRC issuing three violations for one event. Ms. Alexander concluded that communications with the NRC had been good and that the RROP was still dynamic as indicated by the continued use of draft documents for program guidance.

Mr. Greg Gibson, Nuclear Oversight and Regulatory Affairs Division, Southern California Edison Company, presented insights from the Shadow Plant Program, which involved licensees not in the pilot program applying the RROP to their plants. He reported that the licensees who participated in the Shadow Plant Program were pleased with the oversight process. Mr. Gibson identified problems with the thresholds used for the health physics and security performance indicators. He stated that there should be a disciplined process for adding new performance indicators. Mr. Gibson indicated that including the responses to frequently asked questions on the NRC web site provided instantaneous up-to-date information to all licensees.

Mr. Stephen Floyd, Nuclear Energy Institute, summarized the latest performance indicator results and identified issues related to the RROP. The slides used to summarize the performance indicator results are attached [pp 62-63].

Mr. Floyd discussed the following issues related to the performance indicators:

- potential adverse effects of counting manual scrams on operator decisions,
- better definition of unplanned power changes,
- safety system availability criteria are more restrictive than maintenance rule criteria, and
- inconsistent use of components, systems, or trains to determine availability.

Mr. Floyd noted that the RROP had significantly reduced the number of enforcement actions. For example, severity level IV violations have dropped from 1037 to about 8 per year. Slides showing the reduction in enforcement actions are attached [pp 64-65]. He indicated that the SDPs still need work to establish consistency and standardization.

RISK-INFORMED REGULATION

During this session it was difficult to determine the level of interest of the industry in risk-informing the regulations either thought Option 2 and/or Option 3. The NEI and South Texas Project representatives were very vocal in their support of both Option 2 and Option 3. In a private discussion, one licensee representative stated that there is no benefit to his facility in maintaining a probabilistic risk assessment or developing risk-informed license amendments partly because the Q List is small.

Mr. Timothy Reed, NRC, presented an overview of the staff's approach to risk-informing 10 CFR Part 50 special treatment requirements. He described the development of 10 CFR 50.69, Appendix T, the associated regulatory guide, and the Nuclear Energy Institute's implementation guidance document. He identified the following technical issues that are still under discussion.

- quality of probabilistic risk assessments (PRA),
- peer certification and expert panels,
- monitoring and providing feedback on RISC III components,
- comparison of commercial practices and 10 CFR Part 50 Appendix B requirements, and
- change controls to ensure PRA assumptions remain valid.

Mr. Eugene Hughes, President, Erin Engineering, presented the role of the regulator in a risk-informed environment. Using dam safety, coal mining safety, and the WASH 1400 report as examples, he explained that as knowledge about a safety hazard increases the need for regulation decreases. Mr. Hughes stated that proposed regulations should address the risk perceived by the public in an effective way. He suggested that risk-informed requirements could be one of the following types:

- prescriptive that would require direct oversight,
- performance-based that would require periodic inspections, and
- incentive-based that would require self-oversight.

Mr. Hughes asserted that rules should be imposed only when a result is expected, such as a defined level of performance, availability, or reliability and when it is necessary to ensure safety. He used the example of components on licensees' Q Lists, and asked the question what is achieved when a component is on the List. Mr. Hughes noted that NASA required highly reliable components since there is no redundancy built into many space craft systems. He questioned whether the same level of quality assurance is necessary at nuclear plants where a single component failure is assumed as part of the general design criteria. He recommended further discussion of commercial grade components.

Mr. James Chapman, Director, PSA and Safety Analyses, SCIENTECH, defined risk-informed and presented a case that the insights derived from PRAs over the last two decades have proven to be robust. Mr. Chapman highlighted important risk-informed initiatives that have

been completed. He predicted that South Texas Project will be successful in implementing graded quality assurance. He concluded that the regulations do not need to be revised to improve regulatory activities. Selected slides used during the presentation are attached [pp 66-70].

Mr. Mark Reinhart, NRC, described the use of probabilistic safety assessments in the regulatory framework, such as in reviewing deterministic license amendments, quality assurance programs, and technical specification configuration management.

LICENSE RENEWAL

Mr. Stephen Hoffman, NRC, provided an overview of the license renewal activities and 10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants." He outlined the process for license renewal including the license renewal application, the environmental review, and the opportunity for a hearing. He noted that license renewal is a business decision. Mr. Hoffman summarized the schedule for reviewing generic license renewal guidance documents and expected license renewal applications.

Mr. Barth Doroshuk, President and Chief Operating Officer, Constellation Nuclear Services, provided an overview of the preparation of the Calvert Cliffs Nuclear Power Plant license renewal application. He stated that life cycle management required a good understanding of plant historical behavior, resources, mitigation measures, discovery techniques, and corrective action and follow-up. He noted that the license renewal application is not only a regulatory document but also provides an extended planning horizon for the engineering department. Mr. Doroshuk stated that license renewal lessons learned can be viewed from the perspectives of assessment and planning, management decision support, project implementation, application preparation, and implementation of a plant lifetime program.

Mr. Greg Robison, Project Manager, License Renewal, Duke power Company, provided an overview of the preparation of the Oconee license renewal application. He explained that license renewal was a business decision that required the assessment of plant and equipment mortality. He noted that reconstruction of 30 year old decisions was difficult and some re-engineering of past decisions was necessary. Mr. Robison made the following observations:

- clear definition of terms is important,
- do not assume preparers and reviewers are on the same page,
- the licensee is the application integrator - the NRC staff is the application reviewer,
- the license renewal process must be standardized, and
- a technically sound process for reviewing emerging issues should be developed.

Mr. Tony Pietrangelo, NEI, provided an overview of the license renewal process. He stated that scoping the plant is a labor intensive effort and that licensees need to know their current licensing basis. He recommended that license renewal personnel speak the same language as plant personnel and not attempt to teach license renewal to plant operators. Mr. Pietrangelo explained that NEI 95-10 will be the source document for preparing applications while the Standard Review Plant for license renewal and the Generic Aging Lessons Learned (GALL) report will stabilize the application review process.

The following information was exchanged during the meeting session discussions:

- system engineers do the scoping,
- design engineers identify the aging management programs, and
- due to process requirements 24 months is the minimum possible time to review an application.

Attachments: As Stated