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THE U.S. NUCLEAR REGULATORY COMMISSION'S PROCESS
TO EVALUATE LICENSEE OPERATIONAL SAFETY PERFORMANCE

The Role Licensee Performance Evaluation Plays in the Assessment of
of Operational Experience
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INTRODUCTION

In its role of regulating the U.S. commercial nuclear power industry, the U.S. Nuclear Regulatory Commission (NRC) oversees the design, construction, and operation of the nation's nuclear power plants. As the numbers of operating nuclear power plants has grown to its present size of 100 plants or more the demand to assess licensee performance also has increased. The assessment of licensee performance is used to evaluate the ability of the utility to operate a plant safely and as a diagnostic tool to determine the root cause of poor performance. Currently, the need for licensee performance evaluation to predict poor performance has been perceived to be important as well.

The discussion that follows outlines how the licensee safety performance evaluation process is structured at the NRC. The evaluation process is dynamic and involves several NRC components evaluating a wide range of operational data.

The intricacies of a large onsite utility staff operating a complex power reactor under the close scrutiny of a competent regulatory agency and the often times subtle corporate influences are still not clearly understood with respect to root causes underlying variations in performance. One of the future

goals for the NRC's performance evaluation process will be to derive a better understanding of the root causes to more expeditiously anticipate and correct declining performance.

As a result of the process, the licensees receive information for self improvement, but most importantly the process serves as a tool to help allocate the Commission's resources based on safety concern and, in the longer term, to warn the NRC of safety problems.

In the formative period of the nuclear power program, care was taken to ensure that the correct designs, materials, and equipment were used to construct a high quality and safe facility. This care to ensure quality and safety was characterized as "defense in-depth." A similar approach is envisioned for operational performance and has been described as a "rising standard of excellence." The NRC believes that this approach will lead to a continuing improvement of the entire reactor population's operational performance. Specifically, with time overall standards are raised, greater expectations sought and thus, generally rising standards evolve.

OVERVIEW OF THE REGULATED NUCLEAR POWER INDUSTRY

The U.S. nuclear power industry by virtue of its size, structure, and diversity is unique. It is also an endeavor of the private sector. The companies involved in operating the nuclear power plants vary in structure and size. Competition among vendors has produced several reactor types.

Licensees represent more than 50 individual utilities, operating more than 100 plants at more than 70 sites. These plants are composed of, essentially, three reactor types: pressurized water reactors (PWRs) boiling water reactors (BWRs) and gas cooled reactors. However, because of developmental evolution, lack of standardization, and number of reactor vendors, almost no two reactors are similar. The licensees range from Maine Yankee Atomic Power Company whose single nuclear unit at the Maine Yankee plant represents 100 percent of the licensee's generating capacity and nearly one-third of the generating capacity of the State to the Federal Government's Tennessee Valley Authority (TVA) whose five nuclear plants represent less than 20 percent of TVA's generating capacity. Licensee performance evaluation in an environment where establishing a norm and deviations from the norm is, for many parameters, not feasible presents an interesting and demanding challenge.

CURRENT PERFORMANCE EVALUATION PROCESS

The performance evaluation process consists of (1) the Systematic Assessment of Licensee Performance (SALP) program; (2) performance evaluations by the Performance Evaluation Branch in the Office of Nuclear Reactor Regulation (NRR), Division of Licensee Performance and Quality Evaluation, and (3) senior management review and evaluation meetings.

Regional field organizations administer the SALP program. Under this program field and resident inspectors provide input for the evaluation process. The NRR Performance Evaluation Branch which does not have day-to-day contact with the licensees, takes a broader perspective. It does consider SALP inputs,

reported events, and technical issues and other data in its evaluations. Both of these endeavors provide supporting data for the senior manager review and evaluation meetings. In addition, the Office of Analysis and Evaluation of Operational Data develops performance indicators for use at the senior management review meetings.

The Systematic Assessment of Licensee Performance (SALP)

The SALP is an integrated agency effort to collect and evaluate available agency insights, data, and other information on a plant/site basis in a structured manner in order to assess and better understand the reasons for a licensee's performance. Unacceptable performance is addressed through NRC's enforcement policy, and the implementation of the enforcement policy is not delayed to await the results of an SALP. Compliance with NRC rules and regulations satisfies the minimum requirements for continued operation of a facility; the degree to which a licensee exceeds regulatory requirements is a measure of the licensee's pursuit of excellence.

The SALP process is used by the NRC to synthesize its observations of and insights into a licensee's performance and to identify common threads or symptoms. As such, it enables the NRC staff to recognize and understand the reasons for a licensee's strengths as well as the weaknesses. It is not intended, however, to identify proposed resolutions or solutions of problems. The licensee's management is responsible for ensuring plant safety and establishing effective means to measure, monitor, and evaluate the quality of all aspects of plant design, hardware, and operation. The SALP process is

intended to further NRC's understanding of (1) how the licensee's management guides, directs, evaluates, and provides resources for safe plant operations, and (2) how these resources are applied and used. As a result, emphasis is placed on understanding the reasons for a licensee's performance in identified functional areas and on sharing this understanding with the licensee and the public. The SALP process is intended to be sufficiently diagnostic to provide a rationale for allocating NRC resources and to provide meaningful feedback to a licensee's management.

The objectives of the SALP process are (1) to improve the NRC regulatory program by providing a mechanism for focusing NRC management's attention on areas of concern, and (2) to assist NRC management in making sound decisions regarding allocation of NRC resources used to oversee, inspect, and assess licensee performance. The SALP evaluation is performed for each site at an interval of about 15 months. The frequency may be reduced to 12 months for questionable performers or lengthened to 18 months for exemplary performers.

The SALP process begins with the drafting of a SALP report for a specific site. An NRC multidisciplinary SALP rating board is convened to evaluate the licensee. Using the draft SALP report and supporting testimony and data, the board provides a rating, generally, in seven functional areas for operating reactors. These areas are (1) plant operations, (2) radiological controls, (3) maintenance/surveillance, (4) emergency preparedness, (5) security, (6) engineering/technical support, and (7) safety assessment/quality verifications. Additional areas can be evaluated depending on the conditions of the site or plants.

In each of the seven functional areas, the licensee is evaluated using seven criteria: (1) assurance of quality, including management involvement and control; (2) approach to the identification and resolution of technical issues from a safety standpoint; (3) responsiveness to NRC initiatives; (4) enforcement history; (5) operational events (including response to, analysis of, reporting of, and corrective actions for); (6) staffing (including management); and (7) effectiveness of training and qualifications program.

The SALP rating board using the inputs and criteria arrives at a performance rating in the seven functional areas. There are three rating categories, which may be summarized as:

- Category 1 Licensee management attention and involvement are readily evident and place emphasis on excellence in the performance of nuclear safety and safeguards activities, with the resulting performance substantially exceeding regulatory requirements.

- Category 2 Licensee management attention and involvement are evident and are oriented toward enhanced performance of nuclear safety and safeguards activities.

- Category 3 Licensee management attention and involvement in nuclear safety and safeguards activities are not evident or are ineffective.

The SALP board may also note variations from one assessment period to the next by including a trend, which indicates that the licensee's performance has either increased or decreased in relation to the above categories.

EVALUATION OF LICENSEE PERFORMANCE BY A DEDICATED GROUP

There is a strongly held belief by the public that, before the accident at Three Mile Island Unit 2 and incidents such as the severe transients at Davis-Besse in Ohio and Rancho Seco in Sacramento, California, information existed at the NRC which, if collected and analyzed, could have forewarned the NRC of these conditions. The idea that a more dedicated global evaluation of the elements of plant design, SALPs, current technical issues, management approaches, etc., might provide a warning to the NRC of unacceptable performance resulted in a decision to form a group dedicated to the performance evaluation function.

Performance Evaluation by the Office of Nuclear Reactor Regulation

The Performance Evaluation Branch has the responsibility (1) to manage the formal (SALP) program, (2) to assess licensee performance in regard to maintenance and to formulate necessary actions for improving licensee maintenance programs, and (3) to evaluate licensee performance using SALP and other performance-related data to anticipate unacceptable levels of performance and recommend appropriate action to NRC senior management. This increased emphasis on performance evaluation has resulted in focusing more attention on the performance evaluation tools.

The objective of performance evaluation is to use the widest variety of information available to assess the effectiveness of licensee performance. Currently, this data base has been grouped into five broad categories:

(1) Plant Design Information

This category includes not only the common design bases, but probabilistic risk assessments and technical issues such as generic safety issues (GSIs), and unresolved safety issues (USIs) and other special studies or unique technical issues related to a specific plant.

The technical issues are identified, collected, placed in priority order, and correlated for use in the evaluation process.

(2) SALP Information

The traditional SALP report is an intrinsic part of the performance evaluation program. However, because the formal SALP process occurs on a frequency of about 12-18 months, depending on site performance, the input and feedback associated with the SALP process and other inspection reports as well as management meetings, will be monitored on a more or less continuous basis during the intervals between consecutive SALPs seeking to identify performance trends.

(3) Performance Indicators

Performance indicators are published quarterly by the NRC and will be integrated into the evaluation process.

(4) Licensing Information

License amendments, technical specification actions, plant-specific and multiplant actions will be integrated into the evaluation process.

(5) Enforcement History

The frequency of severity level of and plant functional area associated with the enforcement action will be correlated with other information and integrated into the evaluation process.

The preceding five categories of data are used in performance evaluation as follows:

- (1) A detailed review of the five major categories of data is performed for all plants in the five geographical regions to discern trends or indications of unacceptable performance by the Performance Evaluation Branch.
- (2) Secondary data are examined for indications of performance degradation if the review in item (1) does not identify any suspect plants or provides a confirmation that a plant is suspect.
- (3) Suspect plants are reviewed in a performance evaluation peer group meeting, and if after this meeting, a consensus prevails about the problem nature of the plant(s), the NRR Project Manager and regional staff are consulted. If the concerns persist, NRC senior management is notified.

SENIOR MANAGEMENT ASSESSMENT OF LICENSEE PERFORMANCE

The above SALP and NRR staff evaluations are used at a series of review and evaluation meetings of senior management who progressively focus the agency's

resources and coordinate activities on plants with questionable or unacceptable performance in regard to safety. These meetings also serve as progress reviews for plants that have been identified as a result of previous reviews.

The first level of the senior management review involves the NRR senior management and staff. These reviews essentially provide the status of and may be tailored to emphasize areas of changing interest such as performance, hardware, and personnel. In these meetings, all plants in the country are reviewed. Following the first-level meetings, which are generally staggered and scheduled to precede the NRC senior management review meeting, a second set of meetings is held with NRR and regional senior management with emphasis on plants that appear to be questionable or unacceptable in their performance. On the basis of the results of the NRR-regional senior management review, a list of plants and issues to be discussed at the following NRC senior management review meeting is formulated. These meetings and resulting action items are discussed below in greater detail:

(1) Project Directorate (Licensing) Briefings

Geographically, the NRC has divided the country into five regions and has a regional organization responsible for the commercial power reactors within that region. Within the Office of Nuclear Reactor Regulation (NRR), each site is assigned a licensing project manager. These project managers are grouped by region and further substructured into manageable units designated as project directorates containing five to seven sites per directorate. At approximately 6-month intervals, the Director, NRR, and selected senior management officials are briefed by the project

managers on the plants in each directorate. These briefings include reports on plant performance, inspection results, licensing actions, significant operational events, and technical safety issues. For example, if a SALP report has been completed since the last briefing or if a major licensing action or changes in the technical issues related to the plant have occurred, these issues may be discussed in depth. In addition, the project manager presents his/her overall assessment of the plant. These briefings cover all plants in the country.

(2) Pre-NRC Senior Management Screening Meetings

The pre-senior management screening meeting serves as a selection forum for plants and technical issues to be presented in detail and discussed at the semiannual senior management meeting. This meeting is attended by the NRR and regional management and staffs and provides a forum for the views of those who deal directly with the licensees on a day-to-day basis. The regional administrators and staff present their assessment of the plants in their region and their recommendations for plants to be discussed at the upcoming NRC senior management meeting.

(3) NRC Senior Management Meeting

As a result of the June 1985 loss-of-feedwater event at Davis-Besse, senior managers meet about every 6 months to discuss the plants of greatest concern to the agency and to plan a coordinated course of action. These plants are usually selected at the pre-NRC senior management screening meetings. Results of the NRC senior management meeting are presented to

and discussed with the NRC Commissioners in a public Commission meeting. The licensee whose facility will be discussed is notified by letter of the Commission meeting and informed that the plant will be subject to increased attention from the NRC.

Increased attention is usually in the form of increased plant inspection and periodic management meetings with the regional management and staff.

As can be seen, the performance evaluation process is an ongoing process tailored to focus the senior NRC management's attention on plants that are or have the potential to be of concern to the agency. The intent of this process is to anticipate problem at plants before they occur and to sustain a timely, integrated approach to improving the performance of those plants with unacceptable or marginal performance.

CONCLUSION

The NRC recently was reorganized to accommodate the changing regulatory responsibilities dictated by a maturing nuclear power industry. Understanding individual licensee performance and acting to correct declining performance are the regulatory keys to protecting public health and safety. The NRC recognized this and provided an organization and a functional process that focuses senior management attention on both above and below average licensee performance. This provides the NRC the opportunity to ensure timely and integrated corrective action on the part of poor performers and to identify positive performance that can be used in self-improvement programs.