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REPORT ON THE BWR OWNERS' GROUP RADIATION PROTECTION/ALARA COMMITTEE

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ABSTRACT

Radiation protection programs at U.S. boiling water reactor (BWR) stations have evolved during the 1980s and early 1990s from a regulatory adherence-based endeavor to a proactive, risk-based radiation protection and prevention mission. The objectives are no longer to merely monitor and document exposure to radiation and radioactive materials. The focus of the current programs is the optimization of radiation protection of occupational workers consistent with the purpose of producing cost-effective electrical power. The newly revised 10 CFR 20 defines the term ALARA (as low as reasonably achievable) to take into account the state of technology, the economics of improvements in relation to the state of the technology, and the benefits to the public health and safety. The radiation protection manager now must ensure that the program optimizes the protection of occupational workers and ensures the health and safety of the public while maintaining a cost-effective energy product.

The BWR Owners' Group (BWROG) initially formed the Radiation Protection/ALARA Committee in January 1990 to evaluate methods of reducing occupational radiation exposure during refueling outages. Currently, twenty U.S. BWR owner/operators (representing 36 of the operational 37 domestic BWR units), as well as three foreign BWR operators (associate members), have broadened the scope to promote information exchange between BWR radiation protection professionals and develop good practices which will affect optimization of their radiation protection programs.

In search of excellence and the challenge of becoming "World Class" performers in radiation protection, the BWROG Radiation Protection/ALARA Committee has recently accepted a role in assisting the member utilities in improving radiation protection performance in a cost-effective manner. This paper will summarize the recent activities of this Committee undertaken to execute their role of exchanging information in pursuit of optimizing the improvement of their collective radiation protection performance.

BACKGROUND

The Radiation Protection/ALARA Committee was formed in January 1990 to assist the BWROG Outage Management Committee evaluate methods of reducing occupational radiation exposure during refuel outages. BWRs have typically accumulated significantly more (180-190 Person-Rem/annum) exposure than the domestic Pressurized Water Reactor (PWR) Units (comparing median performance values per unit). Collective radiation exposure has been recognized as a valuable performance indicator of outage success and overall operating performance. Initial topics of discussion involved activities that directly affected outage performance (e.g., sub-system chemical decontamination, in-service inspection exposure management, refueling operations exposure reduction, and work in upper levels of the containment during fuel moves). The committee quickly recognized the success of this forum for information exchange and ventured out into addressing current critical issues facing the industry in all aspects of radiation protection.

MISSION

The mission of the BWROG Radiation Protection/ALARA Committee is to promote information exchange between BWR radiation protection professionals at site and corporate level positions. This information exchange is expected to allow the BWR operators to establish synergy and communicate the lessons learned and good practices utilized to optimize the mitigation of the effects of radiation on the nuclear power industry.

ACCOMPLISHMENTS

Three two-day meetings are held each year to provide the opportunity for each utility to attend at least two (assuming that each member may miss a meeting due to a refueling/maintenance outage). Committee attendance is not mandatory, however, 80-90 % of the member utilities are typically represented at each meeting. This high level of participation results in excellent and timely information exchange, discussions on critical issues facing the industry and improvement initiatives and strategies to address these issues. The committee dedicates approximately 50% of the meeting time to information exchange through the use of Plant Status Reports and the remainder of the time to high interest topics that are selected by a Steering Committee. Recent major meeting topics have included the following areas of interest:

- Long-Term Exposure Reduction
- Source Term Reduction
- Cobalt Reduction
- Chemical Decontamination
- ALARA Planning and Management
- Exposure and ALARA Initiatives for Repetitive Tasks
- Soft Shutdown
- Radiation Work Permit Process
- Exposure Reduction Incentives
- High-Radiation Area Control
- In-vessel Maintenance
- Health Physics Job Planning
- Implementation of the Revised 10 CFR 20 Rule
- Electronic Dosimetry and Access Control Programs
- Temporary Shielding

Presentations, panel discussions, and break-out sessions are typically led by member utility representatives. Institute of Nuclear Power Operators (INPO), American Nuclear Insurers (ANI), Nuclear Regulatory Commission (NRC), Electric Power Research Institute (EPRI), and various contractor and vendor representatives have also contributed significantly to the meetings allowing the communication and clarification of perceptions of industry performance and improvement efforts.

Recently two "WORKOUT" type sessions were held in which the cost effectiveness of radiation protection programs and the Utility/INPO interface were discussed. The cost effectiveness session resulted in 124 ideas for improvement being identified and several items identified for committee action and follow-up. Individual utility representatives were encouraged to further refine the cost effectiveness actions for potential short-term implementation at their sites. The Radiation Protection/ALARA Committee has established sub-committee working groups to further develop selected initiatives for utility wide endorsement. The recent Utility/INPO interface session resulted in a clarification of perceptions of the role that INPO has traditionally played in performance monitoring and assessment. Several improvement strategies were identified that would assist INPO and the industry in developing a synergistic role of INPO/Utility partnerships for assistance and improvement.

BENEFITS ACKNOWLEDGED

Participating utilities have found the information exchange and personal contacts to be invaluable problem-solving aids. Timely issues of high industry interest are discussed during the plant status reports and major meeting topics. In addition, information exchange in between meetings is performed through member-to-member discussions and committee sponsored surveys and questionnaires. The data exchanged during the plant status reports assists the member utilities to perform industry comparisons of their performance and provides for timely benchmarking of critical issues affecting their sites. A sub-committee has recently developed a process to begin routine (annual) collection of repetitive task exposure data for comparison and benchmarking.

Good practices are freely distributed to assist the industry. Temporary shielding program enhancements have assisted members save significant cost due to efficiency improvements addressed in the committee. Committee endorsement of the General Electric (GE) Service Information Letter (SIL) 541 regarding the implementation of "Soft Shutdowns" has greatly aided member utilities to support implementation at their sites. A peer assessment was organized through contacts made at committee meetings. Utilities have initiated sharing of equipment developed for specific high exposure tasks or for trial bases. Exposure and cost-saving ideas have been implemented throughout the membership. One member utility determined, using information obtained at a committee meeting, a way to save $ 13,000,000 in exposure savings through the use of $ 1,000,000 of permanent shielding.

Other qualitative benefits have been realized by member utilities. Participants improve their leadership and interpersonal management skills during this peer interaction. Personnel development is extremely important and value added by this participation.

COSTS

The budgeted funding for the BWROG Radiation Protection/ALARA Committee is developed each year by the Steering Committee and approved at a General Meeting of the BWROG Primary Representatives. The expenditures to hold three two-day meetings and perform the necessary project management functions have averaged approximately $80,000 per year. With 20 member utilities and four associate member utilities sharing the costs, each utility is assessed less than $4,000 per year to maintain participation. Additionally, each meeting attendee incurs travel and living expenses of typically $1,000 - $1,500 per person.

FUTURE ACTIVITIES

The next meeting scheduled for July 27-29, 1994 in Denver, Colorado, U.S.A., will be a joint meeting between the BWROG Radiation Protection/ALARA Committee and the PWR Radiation Protection/ALARA Committee. This meeting will discuss high interest industry critical issues that are common to Light Water Reactors (LWRs) (e.g. radiation protection impacts of zinc addition, radiation protection management of In-Service Inspection programs, spent fuel dry storage issues and litigation mitigation and defense). This meeting is expected to bring approximately 100 radiation protection professionals from 20 BWR utilities and 22-24 PWR utilities together to discuss initiatives to improve our industry performance. In addition, there is a third BWROG Radiation Protection/ALARA Committee meeting scheduled for December 1-2, 1994, in San Antonio, Texas, U.S.A. This meeting will focus on communication techniques for internal risk and Total Effective Dose Equivalent (TEDE) ALARA evaluations, permanent shielding applications and radiological concerns and management of failed fuel operations.

SUMMARY

The BWROG Radiation Protection/ALARA Committee provides a value added service to the member utilities to exchange information to assist them in their pursuit of optimizing their radiation protection programs. The benefits received by each member utility are significant and more than justify the costs associated with participation. The good mix of site and corporate personnel who participate provides for a broad base of expertise and understanding of all aspects of the issues discussed. A structured committee is essential to success of the identified mission. A program manager and steering committee provide the required long range planning, committee focus and continuity necessary to ensure effective and efficient meetings that meet the expectations of the membership.

Author Biography

Lary Aldrich is a Staff Health Physicist in the Health Physics Support Department of the Commonwealth Edison Company. Mr. Aldrich has over 15 years experience in Nuclear Power Health Physics. Mr. Aldrich's primary responsibility is the functional management of the radiation protection improvement initiatives for the company's six Boiling Water Reactor (BWR) units (Dresden 2 & 3, LaSalle County 1 & 2, and Quad Cities 1 & 2). Previously he has been responsible for the long-term exposure-reduction planning efforts as well as the research, development and application of advanced technologies used to reduce occupational radiation exposure for all twelve of the company's nuclear units. Prior to joining the corporate office staff, he worked as Radiation Protection Manager of the two-unit LaSalle County Station. He has a B.S. degree in Environmental Health/Health Physics from Purdue University and is a member of the Health Physics Society. In addition, he is a past Chairperson for the BWR Owners' Group Radiation Protection/ALARA Committee and was the founder and first Chairperson for the PWR Radiation Protection/ALARA Committee.

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