Background

The Code of Federal Regulations (CFR) at 10CFR50.69 contains the U.S. Nuclear Regulatory Commission’s (NRC) regulatory requirements for risk informing the categorization and treatment of systems, structures and components (SSC) in nuclear power plants. The goal of this voluntary regulation is to improve overall plant safety by focusing attention on those SSCs that are important to safety as determined by a risk-informed process. In addition to the safety focus, another benefit to utilities is that low-safety significant SSCs can be repaired and replaced using alternative treatment that has the potential to save as much as $1 million annually per reactor unit. Under the regulation, utilities can purchase, install and maintain safety-related, low-safety significant components in a manner similar to those used for nonsafety-related components, provided the utilities can establish reasonable assurance that the safety-related components will perform their design-basis function.

Thus, the regulation allows utilities and the NRC to focus efforts on issues related to high-safety significant SSC and to reduce the regulatory burden and costs associated with low-safety significant equipment.

Description

The focus of the regulation is a robust categorization process that blends risks and deterministic insights to evaluate the safety significance of components. Westinghouse has been an industry leader in the development of a categorization process that the NRC has endorsed as an acceptable method of implementing the 10CFR50.69 regulation. The categorization guidance is contained in Nuclear Energy Institute (NEI) 00-04, 10CFR50.69 Structures, Systems, and Components (SSC) Categorization Guideline, and American Society of Mechanical Engineers (ASME) Code Case N-660, Risk-Informed Safety Classification for Use in Risk-Informed Repair/Replacement Activities.

Westinghouse is the only organization to use this guidance in a practical application. Through the Pressurized Water Reactor Owners Group (PWROG) 10CFR50.69 efforts, Westinghouse has successfully completed trial applications of the categorization process at two PWR plants and is intimately involved in a current pilot effort at another PWR. One of the trial applications received NRC approval for the categorization process for both active and passive components. The passive categorization was based on modifications to the ASME Code Case N-660. The overall categorization process includes defense-in-depth criteria, and the approval by a multidiscipline decision-making panel of experts from the plant.

Westinghouse is currently involved in a full 50.69 pilot effort with another utility. Westinghouse brings valuable experience in the development of the 50.69 rule, the categorization guidance and the tria
applications to this full pilot effort. This experience is crucial to developing the details of the categorization and monitoring process to provide consistency with previous NRC interactions for timely and efficient regulatory acceptance.

Utilities implementing this regulation are required to submit a License Amendment Request to the NRC that describes the robustness of the categorization process and the utility plans for monitoring the performance of SSCs within the scope of this program. Following what is expected to be a short NRC review process, the utility will receive NRC approval for implementation of the categorization process and monitoring program.

The 10CFR50.69 regulation is performance-based, meaning that the actual treatment for low-safety significant components is not specified in detail; only the performance requirements are set. The performance requirements state that there must be reasonable confidence in a component’s ability to perform its design-basis function. In anticipation of post-implementation regulatory oversight activities, the industry developed guidance, under the auspices of the Electric Power Research Institute, to see that a uniform and acceptable level of treatment is being applied to these safety-related low-safety significant components. This will help provide consistent and appropriate regulatory oversight of the process, thereby allowing the projected savings to be realized.

Benefits
Given Westinghouse’s extensive experience with safety regulation, it can help utilities achieve the projected benefits of the 10CFR50.69 regulation.

Benefits of 50.69 Implementation
- Reduced quality assurance and equipment qualification requirements
- Reduced surveillance and reporting requirements
- Removal of SSC from the scope of current ASME nuclear requirements for in-service inspection, in-service testing and repair/replacement
- Reduced scope of check valve, motor-operated valve and containment isolation valve (10CFR50, Appendix J) testing programs
- Reduced maintenance rule efforts
- Reduced procurement costs
- Reduced need for spare parts and inventory
- Reduced instances of worker radiation exposure
- Reduced work order efforts associated with planning and scheduling

Benefits of Westinghouse Experience
- Westinghouse has contributed significantly to the development of the 10CFR50.69 regulation and both the NEI and the ASME categorization guidance, and understands the basis for and details behind the guidance.
- Westinghouse has applied industry categorization guidance in a practical application through the PWROG 10CFR50.69 trial use efforts at two PWRs, and understands the issues that arise during implementation.
- Westinghouse has developed an efficient and effective process for documentation of the categorization of SSCs, the value of which cannot be overestimated for a process that changes the plant design basis.
- Westinghouse has worked with utilities to understand the changes to the plant infrastructure that will be required for successful implementation of the 50.69 program.