

August 31, 2015

Mark A. Satorius  
Executive Director for Operations  
U.S. Nuclear Regulatory Commission

Kurt T. Schaefer  
38845 Godfrey Pl.  
Fremont, CA 94536

Subject: Supplemental Information Providing the Grounds for and Interest in the Request/Petition for Rule Making to Define “Important to Safety”

- References:
1. Email from Kurt T. Schaefer to U.S. Nuclear Regulatory Commission, ‘Request for Rule Making - Defining “Important to Safety”,’ July 20, 2015.
  2. Letter from Mark A. Satorius (U.S. NRC) to Kurt Schaefer, August 24, 2015.
  3. Kurt T. Schaefer (A & K Nuclear Licensing), Licensing Training Manual “Detailed Instructions For Performing Nuclear Power Plant Licensing Evaluations, Generic BWR Version,” Revision 11, August 2015.

Dear Mr. Satorius;

Reference 1 requests a rule making to specifically define the often used term “important to safety.” Reference 1 provides a (mostly NRC accepted) set of criteria for determining which structures, systems, components (SSCs) and functions should be categorized as “important to safety.”

Reference 2 states that supplemental information must be provided. That information is to “clearly and concisely your grounds for and interest in the action requested.” The following provides the needed information.

My interest is related to the fact that I have been studying and teaching 10 CFR 50.59 since 1986. I have taught numerous classes in the US, two classes for Taiwan, three classes in Mexico and three classes in Spain. In the articles of consideration in the 1999 10 CFR 50.59 rule making, one of the major changes to 10 CFR 50.59 [Item (c)(4)] referred to one of my comments as a basis for the change. I standardized the contents of 10 CFR 50.59 and LAR forms used by Westinghouse for changes to the AP1000 DCD. These days I am supporting utility and vendor implementation of the United Arab Emirates Federal Authority of Nuclear Regulation (FANR) version of 10 CFR 50.59. Be it 1986 or today, correctly interpreting and implementing 10 CFR 50.59 requires being able to identify the SSC’s and functions “important to safety,” which are not specifically defined for nonsafety-related items in the regulations or regulatory guidance. (This issue described in Reference 1.)

I am a nuclear engineer with over 40 years of nuclear experience, and of those 40 years, 30 years of nuclear power plant licensing experience. For GE Nuclear, I produced the GE inputs to the Nine Mile Point 2 FSAR and a BWR\6 FSAR in Spain, and over 25 BWR power uprate safety analysis reports. For GE Hitachi, I produced the entire ESBWR Design Control Document (DCD) Revisions 0-3. Currently I am a nuclear licensing contractor and consultant. Reference 3, which I have included for you information and use without restriction, demonstrates some of the breath of my licensing knowledge.

10 CFR 50.59(c)(2) provides eight criteria for determining if a change requires prior NRC approval. Criterion (ii) states

“Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety previously evaluated in the final safety analysis report (as updated).”

Criterion (iv) states

“Result in more than a minimal increase in the consequences of a malfunction of a SSC important to safety previously evaluated in the final safety analysis report (as updated).”

As explained in Reference 1, prior to 1981, the terms “safety-related” (which has specific criteria in regulation) and “important to safety” were considered to be synonymous, thus a specific set of “important to safety” criteria was not needed. Today, Reg. Guide 1.70 Rev. 3 FSARs and DCDs can describe different “malfunctions” in Chapters 3, 5, 6, 7, 11 and 15, however, most malfunctions are addressed in Chapter 15. Chapter 15 addresses anticipated operational occurrences (AOOs) and accidents. AOOs, by definition, are “*conditions of normal operation which are expected to occur one or more times during the life of the nuclear power unit and include but are not limited to loss of power to all recirculation pumps, tripping of the turbine generator set, isolation of the main condenser, and loss of all offsite power.*” For a BWR, all four of those example faults involve nonsafety-related equipment, but within the regulation, there is no set of criteria for determining if these faults are malfunctions of equipment “important to safety.” The following addresses the four AOO examples with respect to 10 CFR 50.59(c)(2) and the Reference 1 important to safety criteria.

- The BWR recirculation flow function is not credited in any abnormal event analysis, thus *loss power to the recirculation pumps* (i.e., loss of recirculation flow) does not constitute a malfunction of a SSC “important to safety.” This is a non-limiting event that reduces reactor power and does not challenge any fission product barrier. However, if some modification could cause this event to challenge fuel cladding or the reactor coolant pressure boundary (RCPB), then that change would be applicable to Criteria “(vi) Create a possibility for a malfunction of a SSC “important to safety” with a different result than any previously evaluated in the final safety analysis report (as updated), and/or “(vii) Result in a design basis limit for a fission product barrier as described in the FSAR (as updated) being exceeded or altered.”
- *Tripping the turbine generator set* by itself is not a malfunction of a SSC “important to safety.” However, it does challenge components (i.e., fuel minimum critical power ratio) “important to safety,” thus (like the above example) is covered by the 10 CFR 50.59(c)(2) criteria.
- Turbine bypass is nonsafety-related, but the use of the main condenser is credited in some BWR AOOs, thus the *isolation of the main condenser* (i.e., failure of bypass valves to open), per the Reference 1 criteria, should be considered a malfunction of a SSC “important to safety.”
- The stability of an offsite electrical grid cannot be controlled by onsite personnel, and offsite power is not credited in any accident, thus the electric grid is nonsafety-related, and should not be considered “important to safety” because it cannot be maintained or controlled by onsite personnel. However, if switch yard equipment, taking power from the electrical grid, is credited in a limiting AOO response, then that equipment, per GDC 17 and the Reference 1 criteria, should be considered “important to safety.”

The accident, main steamline (MSL) break outside containment, involves the failure a nonsafety-related portion of pipe, and that pipe would be classified as “important to safety” by the criteria in Reference 1.

In the above examples, having a reasonable knowledge of the Chapter 15 events and the use of specific criteria for nonsafety-related equipment that is “important to safety” significantly aids in the understanding and application of the 10 CFR 50.59(c)(2) criteria.

I hope the above information satisfies the specified supplemental information, as directed in Reference 2.

If you have any questions or concerns, then please email them to me.

If you wish to call me, I will be in California from 9/12/15 – 10/3/15, @ 510 928-9464.

Best Regards;

A handwritten signature in blue ink that reads "Kurt T. Schaefer".

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