

# Enclosure 5

## A Brief History of Technical Specifications

### A History of Chaos

Section 182a of the Atomic Energy Act of 1954 stated that applicants for nuclear power plant operating licenses will state: "[S]uch technical specifications, including information of the amount, kind, and source of special nuclear material required, the place of the use, the specific characteristics of the facility, and such other information as the Commission may, by rule or regulation, deem necessary in order to enable it to find that the utilization . . . of special nuclear material will be in accord with the common defense and security and will provide adequate protection to the health and safety of the public. Such technical specifications shall be a part of any license issued."

When nuclear research and power reactors were first being operated in the late 1950's, any change to the plant, whether the design or the operating procedures, had to be approved in advance by the Atomic Energy Commission. As the number of reactors grew, especially the number of research reactors operated by future reactor vendors, getting AEC concurrence for every change became very time-consuming;. Therefore, in 1960 General Electric Corp. applied for an amendment to the operating license of the Vallecitos Boiling Water Reactor "which carefully delineates the changes which GE can make on its own, the changes which can be authorized by the staff, and the changes which require formal proceedings." The change was approved on November 2, 1960 and "technical specifications" were added as Appendix A to the Vallecitos Facility Operating License.

Knowing a good thing when they see one, the Atomic Energy Commission altered its regulations on June 9, 1962 by adding a new requirement to the licenses of nuclear power plants. This new requirement was contained in 10 CFR 50.36 and was called "Designation of Technical Specifications. In the same notice, the AEC added 10 CFR 50.59, "Authorization of Changes, Tests and Experiments.," These new rules gave the licensees the ability to change some things under 10 CFR 50.59, but changes to items in the Technical Specifications had to be approved by the AEC.

The original 10 CFR 50.36 stated, "The technical specifications incorporated in a license will be designed to include those significant design features, operating procedures, and operating limitations which are considered important in providing reasonable assurance that the facility will be constructed and operated without undue hazard to public health and safety.. Appendix A is provided as a guide to the type of matters which the Commission would generally expect to be covered by the technical specifications." Appendix A contained information that we would be surprised to see in modern Technical Specifications such materials of construction of the primary reactor vessel, isolation valve type and rating, and moderator and reflector materials.

On December 17, 1968, (33 FR 18610), the AEC revised 10 CFR 50.36 and replaced Appendix A with a much shorter, and more vague, set of information that should be contained in Technical Specifications. That list has not changed significantly since. Currently, Technical Specifications contain Safety Limits and Limiting Safety System Settings, Limiting Conditions for Operation, Surveillance Requirements, Design Features, and Administrative Controls. Very little explanatory text was given in the rule or the Statements of Consideration.

In 1979, the Atomic Safety and Licensing Board (ASLB) was hearing the licensing proceedings for the Trojan Nuclear Power Plant (Portland General Electric Co. Trojan Nuclear Plant, ALAB-531, 9 NRC 263, 273). There was significant disagreement between the NRC staff and Portland General Electric Company on what should be contained in the Technical Specifications. The Appeal Board ruled, "[T]here is neither a statutory nor a regulatory requirement that every

operational detail set forth in an applicant's safety analysis report (or equivalent) be subject to a technical specification, to be included in the license as an absolute condition of operation which is legally binding upon the licensee unless and until changed with specific Commission approval. Rather, as best we can discern it, the contemplation of both the Act and the regulations is that technical specifications are to be reserved for those matters as to which the imposition of rigid conditions or limitations upon reactor operation is deemed necessary to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to the public health and safety."

Because there were no clear criteria on what should be in the Technical Specifications, the level of detail and types of requirements in Technical Specifications varied wildly from plant to plant. At the time, the practice for developing the Technical Specifications for a new plant was to start with the Technical Specifications of the most recently licensed similar plant and to add additional requirements as necessary. , Therefore, the Technical Specifications grew with time in a haphazard and inconsistent manner. Even the existing "standard" technical specifications (for example NUREG-0212, Standard Technical Specifications for Combustion Engineering Pressurized Water Reactors, and NUREG-0452, Standard Technical Specifications for Westinghouse Pressurized Water Reactors), were not standards, but simply the latest approved Technical Specifications for a given style of plant. Even the "standards" for each style of plant were very different and inconsistent.

### **The Light Breaks**

Following the accident at Three Mile Island, the NRC and the industry expresses concern that some aspects of the Technical Specifications may be adverse to safety. Responding to an NRC survey, industry senior management believed that surveillance testing in particular was a case of "too much too often" and was degrading the safety of the plants. The NRC Committee to Review Generic Requirements (CRGR) also expressed concerns over new Technical Specification requirements coming before them. On August 3, 1983, the Deputy Executive Director for Regional Operations and Generic Requirements, Victor Stello, Jr., formed a Task Group to investigate the scope and nature of the problems with surveillance testing required by the Technical Specifications. The Task Group report made a number of recommendations to improve Technical Specifications. In response, on December 21, 1984 the Director of NRR established the Technical Specification Improvement Program (TSIP) to reconsider the entire subject of technical specifications and to make recommendations for improvement.

Under TSIP, representatives from the NRC and the Atomic Industrial Forum developed a set of criteria describing which requirements should be in the Technical Specifications. On January 9, 1987, the Commission issued the "Interim Policy Statement on Technical Specifications Improvement," which contained those requirements. Each Owner's Group applied the requirements to the Technical Specifications for their vendor type and submitted "split reports" to the NRC Staff. The split reports indicated which Technical Specification requirements would be retained and which would be relocated under the criteria. After the Staff commented on the split reports, the Owner's Groups prepared proposed Standard Technical Specifications (STS). From May 1989 through January 1991, the NRC reviewed the Owner's Groups proposed STS. In January 1991 the Staff issued the draft sets of improved STS for public comment. The Industry was not overjoyed at the NRC's handiwork, and over 15,000 comments were received., It took until September, 1992 to resolve the comments and issue the final STS.

There are 5 Standard Technical Specifications documents:

- NUREG-1430, "Standard Technical Specifications, Babcock and Wilcox Plants"

- NUREG-1431, , "Standard Technical Specifications, Westinghouse Plants"
- NUREG-1432, "Standard Technical Specifications, Combusting Engineering Plants"
- NUREG-1433, "Standard Technical Specifications, General Electric Plants, BWR/4"
- NUREG- 1434, "Standard Technical Specifications, General Electric Plants, BWR/6"

On July 16, 1993, the Commission approved the "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors." The Final Policy Statement includes four criteria which delineate those constraints on design and operation of nuclear power plants that belong in the Technical Specifications. They are:

Criteria 1: Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.

Criteria 2: A process variable, design feature, or operating restriction that is an initial condition of a Design Basis Accident or Transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier .

Criteria 3: A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a Design Basis Accident or Transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Criteria 4: A structure, system, or component which operating experience or probabilistic safety assessment has shown to be significant to public health and safety.

In 1994, the NRC added these four criteria to the regulations as 10 CFR 50.36(c)(2)(ii).

### **The Lead Plant Process**

The issuance of Revision 0 of the ITS didn't end the Technical Specification Improvement Project. Now that the NUREGs had been issued, the NRC wanted plants to adopt them. The NRC actively solicited lead plants to adopt the STS. In return, the NRC would waive review fees for the lead plants. (That didn't last long. Eventually, all lead plants had to pay review costs of hundred's of thousands of dollars in review fees). Several plants expressed interest and then dropped out. Eventually, the lead plants were:

Babcock and Wilcox	Crystal River
Westinghouse	Zion
Combustion Engineering	San Onofre 2 and 3
GE BWR/4	Hatch
GE BWR/6	All BWR/6s converted together

Because the STS NUREGs. are so similar, it became obvious early in the lead plant process that many of the changes identified by one lead plant would apply to the rest. In January, 1993 the Industry/NRC Lead Plant Meetings began. The meetings were held monthly with a utility host. The first day or two of the meetings were attended by utility representatives only. The last one or two days were also attended by representatives of the NRC Office of Technical Specification

Branch (OTSB). The Lead Plant process was an amazingly effective method of resolving issues, and not just details of the STS. Generic Industry issues, many of which had plagued the NRC and Industry for years, were systematically addressed and resolved.

Over 1500 changes to the NUREGs were proposed, debated, and adopted. Early in the process, uncooperative participants from both the industry and the NRC were replaced and a collegial atmosphere pervaded the lead plant meetings. Discussions were frank, open, and, in the preponderance of cases, successful in carrying the industry position. In 1995, the NRC incorporated the changes identified during the lead plant process and issued Revision 1 of the ISTS.

### **Moving Forward**

Recognizing the benefit of an industry and NRC structure for negotiating and coordinating changes to the STS, the Industry created the Technical Specifications Task Force (TSTF) under the auspices of the Nuclear Energy Institute (NEI). The TSTF is funded by the Owner's Groups and the chair of each of the Owner's Group STS committees is a member. The TSTF continues the activities started by the lead plant process, although in a more formal setting.

Revision 2 of the ISTS NUREGs was completed in April, 2001. In the intervening six years, the nuclear industry and the NRC developed and approved over 273 improvements to the STS, representing over 4,500 individual changes. Revision 3 of the ISTS NUREGs was completed in March 2004. Revision 3 incorporated 30 additional improvements to the ISTS, but the primary purpose of Revision 3 was to correct a large number of errors that were in Revision 2.

The TSTF and STS improvement process are now established in the nuclear regulatory structure, but much of the emphasis has shifted from plants converting to STS to supporting plant which have already converted to STS. As the Industry moves forward into the new world of risk-informed Technical Specifications, the STS and the TSTF are the vehicles used to explore this new frontier.