SNUPPS

Standardized Nuclear Unit
Power Plant System

5 Choke Cherry Road
Rockville, Maryland 20850
(301) 869-8010

Nicholas A. Petrick
Executive Director

May 25, 1984

SLNRC 84-0087 FILE: 0543/0278
SUBJ: SNUPPS Technical Specifications
Reactor Systems Branch Issues

Mr. Harold R. Denton
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Docket Nos. 50-482 and 50-483

Reference: SLNRC 84-080, 5/14/84, same subject
SLNRC 84-082, 5/16/84, same subject

Dear Mr. Denton:

The referenced letters forwarded SNUPPS responses to 18 questions posed by Reactor Systems Branch (RSB). An amplification of the revised response to question 6 is forwarded herewith to satisfy RSB comments on the initial reply. An amplification of the response to question 15, which was also questioned by RSB, will be forwarded under separate cover.

Very truly yours,

Nicholas A. Petrick

JHR/mjd/2b12
Attachment

cc: D. F. Schnell UE
G. L. Koester KGE
D. T. McPhee KCPL
J. Neisler/B. Little USNRC/CAL
H. Bundy USNRC/WC
B. L. Forney USNRC/RIII
E. H. Johnson USNRC/RIV

A001
1/1

6. Several Tech Spec Sections

(1) Technical Specification 3/4.4.3, entitled "Pressurizer," limits the pressurizer level to less than or equal to 92% (1657 ft³) during Modes 1, 2 and 3. There is no Technical Specification low level limit on the pressurizer.

(2) The Tech Specs impose no limits on Steam Generator level in Modes 1, 2 and 3. However, Technical Specifications 3.4.1.2, 3.4.1.3, and 3.4.1.4.1 define an operable Steam Generator as one having $\geq$ 10% of the wide range span during Modes 3, 4, and 5.

(3) Tech Spec 3.1.1.4 specifies the minimum temperature for criticality in Modes 1 and 2 as Tave $\geq$ 551°F. Tech Spec 3.2.5 specifies the maximum Tave relative to DNB as Tave $\leq$ 595°F during Mode 1.

(4) Tech Spec 3.2.5 specifies the minimum pressurizer pressure relative to DNB as p $\geq$ 2220 psia during Mode 1. Tech Spec 3.4.2.1 and 2 specify the maximum possible operating system pressure (without safety valve lifting) to be 2485 psig ± 1% during Modes 1, 2, 3, 4, and 5.

The above four parameters, namely pressurizer level, steam generator level, Tave, and pressurizer pressure are among other input parameters that are used for the accident analysis. Nominal programmed values plus or minus an error allowance are used in the accident analysis, while per the Technical Specifications the plant is allowed to operate within a much wider range. For example, the plant may operate at the following conditions without violating the Technical Specifications:

(a) A pressurizer level of 92% or 0%

(b) A steam generator level of 78% or 23.5% (Although the Tech Specs do not limit the steam generator level to a high or low value, the reactor trip setpoint of steam generator level Hi-Hi is 78%. The Lo-Lo trip setpoint is 23.5%.)

(c) A Tave of between 551°F and 595°F.

(d) A pressurizer pressure of between 2220 psia and 2500 psia.

The staff finds that the Tech Specs may not be consistent with the FSAR analyses. That is, the plant may be operated outside those bounds assumed in the safety analyses. Therefore, it is not clear that the safety analyses are bounding.

The staff requires that the applicant either: (a) propose appropriate Tech Spec changes; or (b) verify that the Tech Specs are consistent with the FSAR accident analysis.

Response

6. The initial conditions in the accident analyses in Chapter 15 of the SNUPPS FSAR are based on the nominal programmed values of temperature, pressurizer pressure and level, and steam generator level. To these nominal values are added appropriate measurement uncertainties which are added in the conservative direction (positive or negative) as appropriate to the accident in question. The Tech Specs are based upon the assumptions and results of the safety analyses which are consistent with the assumptions of nominal initial conditions plus or minus uncertainties.

The system parameters of RCS temperature, pressurizer pressure, pressurizer level and steam generator level may be controlled by manual or automatic controls. Typically, pressurizer pressure and level would be in automatic control during operation in MODES 3 and above, and RCS temperature and steam generator water level are typically maintained by automatic control above power levels of around 20%. Temperature is programmed as a function of power level and controlled by the rod control system, and pressure is controlled by the heaters and sprays. The pressurizer and steam generator levels are programmed as a function of Tave and power level, respectively, and use various input parameters to maintain the program level. All of these systems may be operated manually, in which case the operator strives to duplicate the automatic system.

The correct maintenance of these plant variables is consistent with the Tech Specs for two reasons. First, although failures in these systems could cause deviations from the programmed values, this would be detected by the resulting plant transient and subsequently fixed. These transients cause and are already bounded by the Condition II events and analyses presented in the SNUPPS FSAR. Second, these programmed values are displayed in the control room for each channel and these parameters are also monitored by the operator in accordance with plant operating procedures. In addition, deviation alarms sound in the control room if any of these four control parameters fall outside the allowable program value. Thus, if a failure in the control system did not cause a transient or if the plant were operating under manual control, the operator would detect the deviation as a result of the alarms or according to the surveillance requirements in the procedures and/or correct and maintain them as well.

The operating procedures used by the plant ensure that the plant is operated in accordance with the design of these control systems, whether they are operated automatically or in manual control. Control system parameters are specified in the Precautions, Limitations, and Setpoints document. The PLS document parameters are developed to optimize plant operation and are consistent with the assumptions made in the safety analysis as to initial conditions and the programming of all control system variables. Furthermore, those control system variables which are important to the safety analysis are specifically noted in the PLS, usually by footnote. This footnote states that the given variable is assumed in the safety

analysis and that the variable should not be changed without a review of the possible operational and safety significance. This requirement for review has been incorporated into the plant design documents.

For Callaway the PLS document setpoints and the above described footnote provided by Westinghouse is incorporated into Bechtel Drawing J-U-8000. Wolf Creek incorporates the PLS setpoints and above described footnote into the WCGS Total Plant Setpoint Document. In both cases the documents are treated as design documents and revisions are considered a change in design and reviewed pursuant to the requirements of 10CFR50.59

In addition to the footnote/procedure which calls for a safety evaluation before changing control system setpoints, the PLS/procedures also state that the operator should maintain the controlled parameters within the uncertainties of the programmed control values, whether in automatic or manual control. Again, the PLS states that this is required because of the assumptions made in the safety analysis concerning the uncertainties (4°F, 30 psi, 5% level span). These requirements are incorporated into those procedures required by Section 6.8.1.a (Reg. Guide 1.33, Revision 2, Appendix A). Specifically, this includes General Operating Procedural, Normal Operating Procedures (for each system), Alarm Response Procedures, and Off-Normal Procedures. When in automatic control, the control system will maintain the programmed values according to the program of the variable and within the uncertainties of the control system. When at power, automatic control of the plant is the preferred method of operation. In manual control, the operator will match the program value. Deviation alarms (the setpoints for which are in the PLS) will alert the operator to take corrective action if the variable falls outside the allowable range of the program. Note that the setpoints for the alarms are sometimes more restrictive than the uncertainties used in the safety analysis. This is also noted in the PLS. The alarms and their conservative setpoints ensure that the operator will take action before significant deviations from the program occur.

Note that the maintenance of operating procedures is required by the Tech Specs. Since these operating procedures prevent continuous operation with abnormal combinations of plant parameters and since failures of the control systems are detectable, the Tech Specs as written are consistent with the safety analysis and no further specifications on controlled parameters are required. (The control systems are not required to operate once the accident has started. The safety analysis does not assume operation of the control system unless the operation makes the results more limiting with respect to the acceptance criteria.) Finally, the control systems, although not safety grade, are highly reliable systems. There is no indication, based on a large amount of plant operating experience, that the current Specs are not adequate.

In conclusion, a review of the Tech Specs and the FSAR accident analysis shows that no safety issue exists due to the lack of Tech Specs on the parameters discussed above. This conclusion is based upon the stated assumptions for the accident analysis, normal operating procedures, and control limitations such as interlocks and limiters. For all of these parameters, there are adequate annunciators to alert the operator to excessive deviation from the normal parameters and allow timely restoration.