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Docket No. STN 50-470F

July 31, 1985
LD-85-034

Cecil O. Thomas, Chief
Standardization and Special
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: CESSAR System 80™ Technical Specification Review

Dear Mr. Thomas,

In the course of your review of the CESSAR System 80™ Technical Specifications, a number of questions were asked by reviewers which you formally transmitted to Combustion Engineering (C-E) in a letter dated July 10, 1985. In response to your letter, C-E is providing formal responses to the questions. These responses are provided in the attachment.

If you have any questions on this subject, please feel free to call me or Mrs. R. O. Hoogewerff of my staff at (203) 285-5217.

Very truly yours,

COMBUSTION ENGINEERING, INC

A. E. Scherer
Director
Nuclear Licensing

AES:bks
Attachment

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RESPONSES TO NRC QUESTIONS ON CESSAR TECHNICAL SPECIFICATONS

Question 1:

Provide the appropriate numbers in Tables 2.2-1, 3.3-2, 3.3-4 and 3.3-5 of the CESSAR System 80 Tech Specs which were used in the CESSAR Chapter 15 accident analyses.

Response:

Table 2.2-1 of an applicant's technical specifications presents trip setpoint limits for reactor protective instrumentation. The format of the table is such that two values are provided for each functional unit:

- Trip Setpoint - Sometimes referred to as the equipment setpoint, this is the nominal value at which the functional unit setpoint is physically set. The relationship between the trip setpoint and safety analysis values appearing in Chapter 15 of the FSAR is that the trip setpoint is established to assure the required safety analysis setpoint, considering instrument drift, plant-specific instrument uncertainties, and environmental effects.

- Allowable Value - This is simply the trip setpoint adjusted by the amount of instrument drift that is anticipated between surveillances. Unlike safety analysis setpoints, both trip setpoints and allowable values are under the control of, or can be verified by, the operating utility.

It has been suggested to assign CESSAR Chapter 15 safety analysis setpoint values to the "Trip Setpoint" column of the System 80™ Technical Specifications. The purpose of placing numerical values in the System 80 version of Table 2.2-1 at all would be to streamline the tech spec review process for subsequent System 80 applicants. C-E supports this concept; however, we wish to illustrate potential problems with the proposed approach.

The enclosed marked-up page from Palo Verde tech specs Table 2.2-1 shows the table as C-E would prepare it for System 80, according to the suggestion mentioned above. Multiple values appear because different transient-specific environmental effects and acceptance criteria result in different safety analysis setpoints. (In a specific applicant's technical specifications, the more restrictive trip setpoint value resulting from the various safety analysis

Question 1 Response (Continued)

values is what appears in Table 2.2-1.) It has also been suggested to only insert the "most limiting" safety analysis value in the "Trip Setpoint" column of the System 80 tech spec table. However, this would complicate the NRC reviewer's task, since he would no longer have access to a safety analysis reference which would normally accompany safety analysis setpoint information.

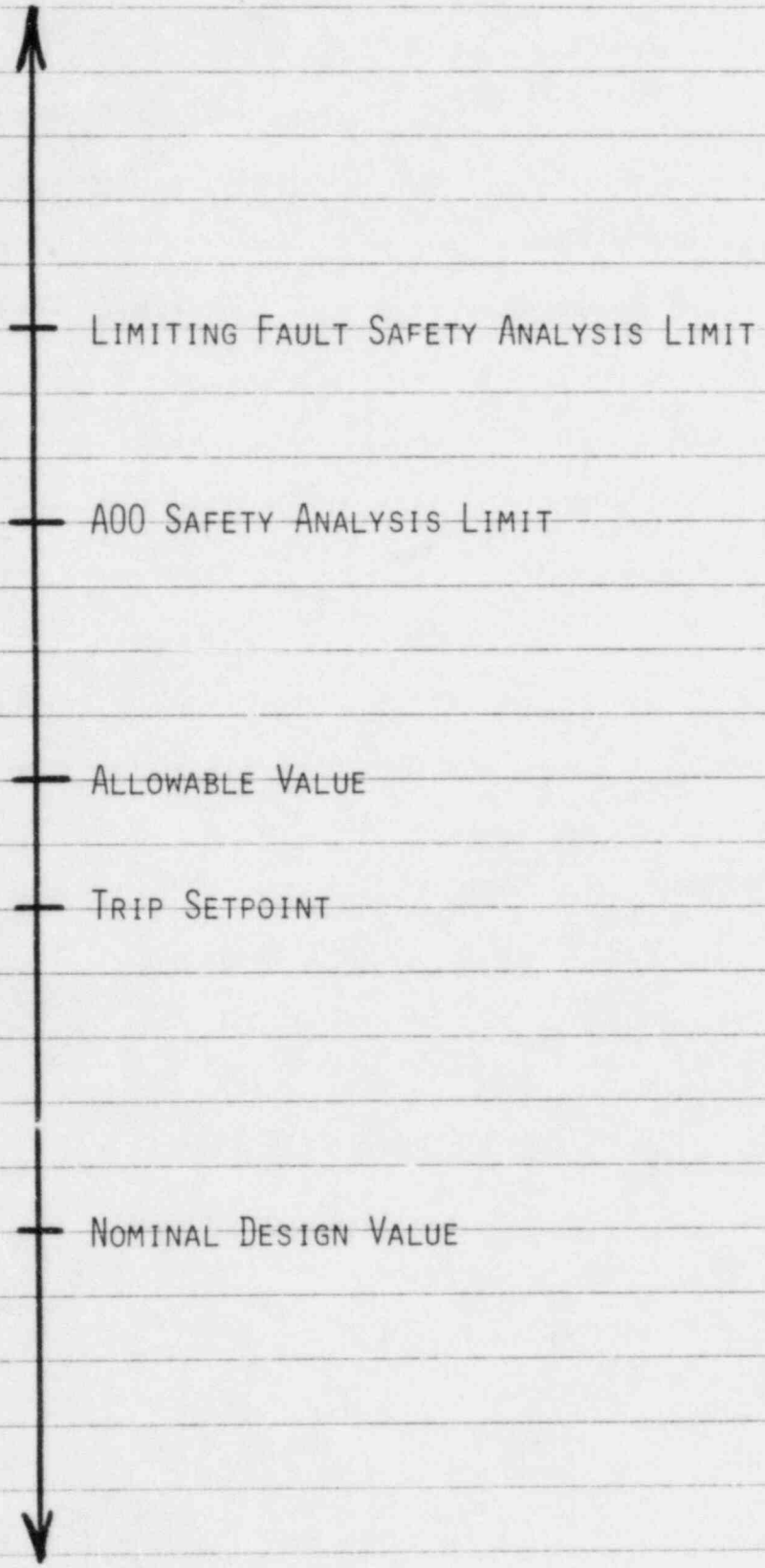
The primary concern associated with placing safety analysis values in System 80 Technical Specifications Table 2.2-1 relates to the fact that direct comparison between the tabular data in the System 80 Tech Specs (safety analysis setpoints) and the applicant's tech specs (equipment setpoints and allowable values) is not practical without knowledge of what the assumed impact of uncertainty and environmental conditions are on the functional trip unit. These effects are plant specific. By way of clarification, the figure below illustrates the relationship between various labels assigned to a representative process parameter for which an RPS trip signal is generated above a certain value. The AOO or limiting fault (or both) safety analysis value has been proposed for the System 80 tech specs. By implication, if a future System 80 applicant shows "Allowable Values" which are bounded by the System 80 Table 2.2-1 values; that applicant's tech spec review process is simplified. However, it is unreasonable to expect that a reviewer will approve the applicant's tech specs in this scenario without any information as to the instrument uncertainties and environmental effects accounted for in the applicant's safety analysis report.

As an alternate suggestion, C-E recommends that the System 80 Tech Specs refer the reviewer to the Applicants SAR for Table 2.2-1 (and, by extension, Tables 3.3-2, 3.3-4 and 3.3-5). C-E believes the review process should entail only plant-specific documentation.

TABLE 2.2-1

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

FUNCTIONAL UNIT	~~TRIP~~ ANALYSIS SETPOINT	ALLOWABLE VALUES
I. TRIP GENERATION		
A. Process		
1. Pressurizer Pressure - High	≤ 2450/2475 psia	See applicant's FSAR
2. Pressurizer Pressure - Low	≥ 1630/1600 psia	
3. Steam Generator Level - Low	≥ 40/35 % WR	
4. Steam Generator Level - High	≤ 99% NR	
5. Steam Generator Pressure - Low	≥ 820/810 psia	
6. Containment Pressure - High	≤ 6.0 psig	
7. Reactor Coolant Flow - Low	[LATER]	
a. Rate		
b. Floor		
c. Band		
8. Local Power Density - High		
9. DNBR - Low		
B. Excore Neutron Flux		
1. Variable Overpower Trip		
a. Rate		
b. Ceiling		
c. Band		


LIMITING FAULT SAFETY ANALYSIS LIMIT
AOO SAFETY ANALYSIS LIMIT
ALLOWABLE VALUE
TRIP SETPOINT
NOMINAL DESIGN VALUE

Question 2:

Provide justification for the Safety Limit Bases "SG Level High" and "Reactor Coolant Flow Low" in the CESSAR Tech Specs, as compared to the corresponding items in PVNGS Tech Specs.

Response:

The "Steam Generator Level High" trip function is not relied on to meet SRP criteria in any Chapter 15 Safety Analyses for PVNGS or CESSAR. As discussed in Section 15.1.2.2 of the CESSAR FSAR, this trip provides protection against high steam generator level. APS provided additional words in their PVNGS Technical Specification to more clearly demonstrate that this trip does not correspond to a safety limit but provides SG overfill protection and enhances the overall reliability of the reactor protective system.

With respect to the "Reactor Coolant Flow Low" trip, the PVNGS Chapter 15 Safety Analysis for Steam Line Break credits a four pump coast down because CPC's are not credited. The CESSAR Chapter 15 Safety Analysis for Steam Line Break credits the CPC's for reactor trip and therefore does not require the Reactor Coolant Flow Low trip.

Question 3:

Explain the removal of the entries "Loss of Load" and "Linear Power Level High" in Table 2.7-1, page 2.3 of the CESSAR Tech Specs; these entries are present in Table 2.2-1 of C-E Standard Tech Specs, Rev. 3. Also, explain the addition of "Variable Overpower Trip" in the same table of the CESSAR Tech Specs. Are these System 80 specific differences?

Response:

The System 80 Variable Overpower Trip replaces the Linear Power Level High Trip used in older plant designs. As described in Section 7.2.1.1.1.1 of the CESSAR FSAR, "The Variable Overpower Trip is provided to trip the reactor when indicated neutron flux power either (1) increases at a great enough rate, or (2) reaches a preset value." The Linear Power Level High Trip is provided in other designs to trip the reactor when indicated neutron flux reaches a preset value. A Loss of Load trip is not part of the System 80 RPS Design and is not credited in any safety analyses. The System 80 Reactor Power Cutback system is a control system designed to handle loss of load events.

Question 4:

Provide an explanation for not referring to "associated heat tracing circuit" in CESSAR Tech Specs 3/4.1.2.1 and 3/4.1.2.2, pages 3/4 1-7 and 1-8, as done in the corresponding specs of C-E Standard Tech Specs, Rev. 3.

Repsonse:

Heat tracing circuits are not addressed in the CESSAR Technical Specifications because System 80 does not utilize concentrated Boric Acid Make up Tanks (BAMTs) for boration. Designs which utilize BAMTs require heat tracing in the piping to ensure there is no boron precipitation in the lines. System 80 borates via the Refueling Water Tank which utilizes a much lower boron concentration that precludes boron precipitation.

Question 5:

Explain why Fig. 3.1-2A and 3.1-2B of PVNGS Tech Specs, page 3/4 1-21, were deleted from the corresponding Tech Specs (3/4 1.2.1).

Response:

The CESSAR safety analysis (and the resulting limits on plant operation via the CPC System) were performed assuming CEA misalignments which covered all accidents involving CEAs. The resulting CEA misalignment constants were included in the CPC/CEAC data base. In order to reduce the number of spurious CPC trips the penalty factors in CPCs can be reduced based on a plant-specific analysis, and replaced by specific controls on CEA operation. This option was selected by Arizona Public Service and Figures 3.1-2A 3.1-2B and 3.1-1 were subsequently developed for the Palo Verde-1 Technical Specifications.

Question 6:

Justify reducing the thermal power to less than 20% rated thermal power in Tech Specs 3/4.2.1, 3/4.2.2 and 3/4.2.4, pages 3/4 2-1 to 2-5 (CESSAR), instead of requiring to go to Hot Standby, as in C-E Standard Tech Specs Rev. 3.

Response:

Revision 3 of the C-E Standard Tech Specs is over-restrictive in this respect. The conditions of CESSAR Technical Specifications 3/4.2.1, 3/4.2.2, and 3/4.2.4 are monitored using the Core Operating Limit Supervisory System (COLSS). Below 20% power, COLSS treats the power level as though it were 20%. If COLSS is out of service, an appropriate restriction through Figure 3.2-2 is used with the Core Protection Calculators. Below 20% of rated thermal power, the linear heat rate (LHR) limit of 14.0 Kw/Ft (3/4.2.1) and the DNBR margin limits (3/4.2.4) cannot be exceeded during normal operation. While the planar radial peaking factor (3/4.2.2) and the azimuthal power tilt specification (3/4.2.3) could possibly be exceeded, these are inputs to LHR and DNBR calculations whose inputs would not be exceeded at less than 20% power. Thus it is only necessary to reduce power to 20% or less, and not to Hot Standby, should one of these technical specifications limits be violated.

Question 7:

Explain why CESSAR Tech Spec 3/4.10.4, page 3/4 10-5, is different from PVNGS Tech Spec 3/4.10.4.

Response:

The Palo Verde test exception, as written, accomplishes the intended purpose of allowing wider RCS cold leg temperature swings during temperature coefficient measurements than normally allowed by Palo Verde Technical Specification 3.2.6.

The revised CESSAR test exception accomplishes the same purpose, but adds an additional surveillance on condenser vacuum to anticipate an increase in condenser backpressure which might initiate a turbine trip. This is because the loss of condenser vacuum event is most sensitive to the excepted parameters at beginning of cycle. However, it is recognized that the usual causes of a loss of condenser vacuum occur too rapidly to be detected by this surveillance requirement and it is included simply as an added precaution to detect those events which may occur at a slower rate.