Response to SDAA Audit Question

Question Number: A-16-7

Receipt Date: 07/31/2023

Question:

The SDAA in Part 2 FSAR Chapter 16 and in Part 4 uses both EFPD and EFPDs to stand for “effective full power days;” suggest ensuring consistent use of the acronym for this unit of measure in the generic TS and Bases, as well as FSAR Table 16.1-1. Note that Rev. 5 of the W-STS uses EFPD to stand for “effective full power days."

Response:

NuScale revises the following SDAA sections to ensure consistent use of the acronym EFPD (effective full power days):

Chapter 16, Table 16.1-1 (page 16.1-6)

Technical Specification Bases B 3.1.2 (page B 3.1.2-5)

Technical Specification Bases B 3.1.3 (Page B 3.1.3-5)

Technical Specification 3.1.2 (page 3.1.2-2)

Technical Specification 3.1.3 (page 3.1.3-2)

Markups of the affected changes, as described in the response, are provided below:

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Table 16.1-1: Surveillance Frequency Control Program Base Frequencies

Surveillance Requirement	Base Frequency	Basis
3.1.1.1	24 hours	The Frequency of 24 hours is based on the generally slow change in required boron concentration and the low probability of an accident occurring without the required shutdown margin (SDM). This allows time for the operator to collect the required data, which includes performing a boron concentration analysis, and to complete the calculation.
3.1.2.1	31 effective full-power days (EFPDs)	The required subsequent Frequency of 31 EFPDs, following the initial 60 EFPDs after exceeding 5% rated thermal power (RTP), is acceptable based on the slow rate of core changes due to fuel depletion and the presence of other indicators (e.g. axial offset (AO)) monitored by the core monitoring system for prompt indication of an anomaly.
3.1.4.1	12 hours	Verification that individual control rod assembly (CRA) positions are within alignment limits at a 12 hour Frequency provides a history that allows the operator to detect a CRA that is beginning to deviate from its expected position. The specified Frequency takes into account other CRA position information that is continuously available to the operator in the control room so that during actual rod motion deviations can immediately be detected.
3.1.4.2	92 days	The 92 day Frequency takes into consideration other information available to the operator in the control room and SR 3.1.4.1, which is performed more frequently and adds to the determination of OPERABILITY of the CRAs.
3.1.5.1	12 hours	Because the shutdown CRAs are not moved during routine operation, except as part of planned surveillances, verification of shutdown CRA position at a Frequency of 12 hours is adequate to ensure that the shutdown CRAs are within their insertion limits. Also, the Frequency takes into account other information available in the control room for the purpose of monitoring the status of shutdown rods.
3.1.6.1	12 hours	Verification of the regulating group insertion limits at a Frequency of 12 hours is sufficient to detect a CRA that may be approaching the insertion limits because, normally, very little rod motion is expected to occur in 12 hours.
3.1.8.1	30 minutes	Verification that the THERMAL POWER is ≤ 5% RTP ensures that the unit is not operating in a condition that could invalidate the safety analyses. Verification of the THERMAL POWER at a Frequency of 30 minutes during the performance of the PHYSICS TESTS ensures that the initial conditions of the safety analyses are not violated.
3.1.8.2	24 hours	The Frequency of 24 hours is based on the generally slow change in required boron concentration and on the low probability of an accident occurring without the required SDM.
3.1.9.1	31 days	A 31 day Frequency is considered reasonable in view of other administrative controls that ensure a misconfiguration of the chemical and volume control system (CVCS) makeup pump demineralized water flow path is unlikely. Also, the Frequency takes into account other information available in the control room for the purpose of monitoring the status of CVCS makeup pump demineralized water flow path configuration.
3.1.9.2	24 months	The 24 month Frequency is based on the potential for unplanned plant transients if the surveillances were performed with the unit at power. The 24 month Frequency is also acceptable based on consideration of the design reliability of the equipment. The actuation logic is tested as part of engineered safety features actuation system (ESFAS) actuation and logic testing, and valve performance is monitored as part of the Inservice Testing Program.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	----------NOTE---------- Predicted reactivity values may be adjusted to correspond to measured core reactivity prior to exceeding a fuel burnup of 60 effective full power days (EFPDs) after each refueling. ---------- Verify overall core reactivity balance is within ±1% Δk/k of predicted values.	Once prior to exceeding 5% RTP after each refueling AND --------NOTE-------- Only required after 60 EFPDs. ---------- In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.3.1	Verify MTC is within the upper limit.	Once prior to exceeding 5% RTP after each refueling
SR 3.1.3.2	Verify MTC is within the lower limit.	Once within 7 effective full power days (EFPDs) after reaching 40 EFPDs fuel burnup from beginning of cycle (BOC) AND Once within 7 EFPDs after reaching 2/3 fuel burnup from BOC AND -------NOTE------- Only required when projected end of cycle MTC is not within limit. ---------- 7 EFPDs thereafter

BASES

ACTIONS (continued)

acceptable for continued operation, then the boron letdown curve may be renormalized and power operation may continue. If operational restriction or additional SRs are necessary to ensure the reactor core is acceptable for continued operation, then they must be defined.

The required Completion Time of 7 days is adequate for preparing and implementing whatever operating restrictions that may be required to allow continued reactor operation.

B.1

If the core reactivity cannot be restored to within the 1% Δk/k limit, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 2 within 6 hours. If the SDM for MODE 2 is not met, then boration may be required to meet SR 3.1.1.1 prior to entry into MODE 2. The allowed Completion Time is reasonable, for reaching MODE 2 from full power conditions in an orderly manner.

SURVEILLANCE REQUIREMENTS

SR 3.1.2.1

Core reactivity is verified by periodic comparisons of measured and predicted RCS boron concentrations. The comparison is made considering that other core conditions are fixed or stable, including CRA position, moderator temperature, fuel temperature, fuel depletion, xenon concentration, and samarium concentration. The Surveillance is performed prior to exceeding 5% RTP as an initial check on core conditions and design calculations at BOC. The Surveillance is performed again prior to exceeding 60 effective full power days (EFPD~~s~~) to confirm the core reactivity is responding to reactivity predictions and then periodically thereafter during the fuel cycle in accordance with the Surveillance Frequency Control Program. The SR is modified by a Note indicating that the predicted core reactivity may be adjusted to the measured value provided this normalization is performed prior to exceeding a fuel burnup of 60 EFPD~~s~~. This allows sufficient time for core conditions to reach steady state, but prevents operation for a large fraction of the fuel cycle without establishing a benchmark for the design calculations.

The subsequent Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The requirement for measurement, within 7 effective full power days (EFPDs) after reaching a core burnup of 40 EFPDs from core beginning of cycle (BOC) and again within 7 EFPDs after reaching two-thirds core burnup from BOC, satisfies the confirmatory check of the lower MTC value. The measurement is performed at any power level so that the projected EOC MTC may be evaluated before the reactor actually reaches the EOC condition. MTC values may be extrapolated and compensated to permit direct comparison to the specified MTC limits.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 11.

2. FSAR, Chapter 15.