

ATTACHMENT I TO IPN-90-007
PROPOSED TECHNICAL SPECIFICATION CHANGES
RELATED TO
ALLOWABLE EXTENSIONS FOR SURVEILLANCE INTERVALS

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
DPR-64

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1.11 QUADRANT POWER TILT RATIO

The quadrant power tilt ratio shall be the ratio of the maximum upper excore detector calibrated output to the average of the upper excore detector calibrated outputs, or the ratio of the maximum lower excore detector calibrated output to the average of the lower excore detector calibrated outputs, whichever is greater. With one excore detector inoperable, the remaining three detectors shall be used for computing the average.

1.12 SURVEILLANCE INTERVAL

Each Surveillance Requirement shall be performed within the specified surveillance interval with a maximum allowable extension not to exceed 25% of the specified surveillance interval.

1.13 OPERATION IN A DEGRADED MODE

The plant is said to be operating in a degraded mode when it is operating with one or more systems listed herein inoperable as permitted by the Technical Specifications. If inoperable components or systems are subsequently made operable, the action statements requiring plant shutdown no longer apply.

1.14 \bar{E} -AVERAGE DISINTEGRATION ENERGY

Noble gas \bar{E} shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration (in MeV) for isotopes with half lives greater than 10 minutes, making up at least 95% of the total activity in the coolant.

1.15 DOSE EQUIVALENT I-131

DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcurie/gram) which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in Table III of TID-14844, "Calculation of Distance Factors for Power and Test Reactor Sites."

4. SURVEILLANCE REQUIREMENTS

4.1 OPERATIONAL SAFETY REVIEW

Applicability

Applies to items directly related to safety limits and limiting conditions for operation.

Objective

To specify the minimum frequency and type of surveillance to be applied to plant equipment and conditions. Performance of any surveillance test outlined in these specifications is not required if the plant condition is the same as the condition into which the plant would be placed by an unsatisfactory result of that test.

Specification

- A. Calibration, testing, and checking of analog channel and testing of logic channel shall be performed as specified in Table 4.1-1.
- B. Sampling and equipment tests shall be conducted as specified in Table 4.1-2 and 4.1-3, respectively.

Basis

A surveillance test is intended to identify conditions in a plant that would lead to a degradation of reactor safety. Should a test reveal such a condition, then the Technical Specifications require that, either immediately or after a specified period of time, the plant be placed in a condition which mitigates or eliminates the consequences of additional related casualties or accidents. If the plant is already in a condition which would satisfy the failure criteria of the test, then plant safety is assured and performance of the test yields either meaningless information or information that is not necessary to determine safety limits or limiting conditions for operation of the plant.

Definition 1.12 establishes the limit for which the specified time interval for Surveillance Requirements may be extended. It permits an allowable extension of the normal surveillance interval to facilitate surveillance scheduling and consideration of plant operating conditions that may not be suitable for conducting the surveillance; e.g. transient conditions or other ongoing surveillance or maintenance activities. It also provides flexibility to accommodate the

4.1-1

Amendment No. 8

length of a fuel cycle for surveillances that are performed at each refueling outage and are specified with an 18-month surveillance interval. It is not intended that this provision be used repeatedly as a convenience to extend surveillance intervals beyond that specified for surveillances that are not performed during refueling outages. The limitation of Definition 1.12 is based on engineering judgement and the recognition that the most probable result of any particular surveillance being performed is the verification of conformance with the Surveillance Requirements. This provision is sufficient to ensure that the reliability ensured through surveillance activities is not significantly degraded beyond that obtained from the specified surveillance interval.

Based on experience in operation of both conventional and nuclear plant systems, when the plant is in operation, the minimum checking frequency of once per shift is deemed adequate for reactor and steam system instrumentation.

Calibration

Calibrations are performed to ensure the presentation and acquisition of accurate information.

The nuclear flux (linear level) channels are calibrated daily against a heat balance standard to account for errors induced by changing rod patterns and core physics parameters.

Other channels are subject only to the "drift" errors induced within the instrumentation itself and, consequently, can tolerate longer intervals between calibration. Process system instrumentation errors induced by drift can be expected to remain within acceptable tolerances if recalibration is performed at intervals of each refueling shutdown.

Substantial calibration shifts within a channel (essentially a channel failure) will be revealed during routine checking and testing procedures.

Thus, minimum calibration frequencies of once-per-day for the nuclear flux (linear level) channels, and once each refueling shutdown for the process system channels is considered acceptable.

Testing

The minimum testing frequency for those instrument channels connected to the safety system is based on an average unsafe failure rate of 2.5×10^{-6} failure/hrs. per channel. This is based on operating experience at conventional and nuclear plants. An unsafe failure is defined as one which negates channel operability and which, due to its nature, is revealed only when the channel is tested or attempts to respond to a bona fide signal.

For a specified test interval W and an M out of N redundant system with identical and independent channels having a constant failure rate λ , the average availability A is given by:

$$A = \frac{W - Q \left(\frac{W}{N-M+2} \right)}{W} = 1 - \frac{N!}{(N-M+2)! (M-1)! (\lambda W)^{N-M+1}}$$

where A is defined as the fraction of time during which the system is functional, and Q is the probability of failure of such a system during a time interval W .

For a 2-out-of-3 system $A = 0.9999968$, assuming a channel failure rate, λ , equal to 2.5×10^{-6} hr⁻¹ and a test interval, W , equal to 720 hrs.

This average availability of the 2-out-of-3 system is high, hence the test interval of one month is acceptable.

Because of their greater degree of redundancy, the 1/3 and 2/4 logic arrays provide an even greater measure of protection and are thereby acceptable for the same testing interval. Those items specified for monthly testing are associated with process components where other means of verification provide additional assurance that the channel is operable, thereby requiring less frequent testing.

ATTACHMENT II TO IPN-90-007
SAFETY EVALUATION OF
PROPOSED TECHNICAL SPECIFICATION CHANGES
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Section I - Description of Changes

Using the guidance provided in Generic Letter 89-14, this submittal proposes a change to the Indian Point 3 (IP3) Technical Specifications which revises Definition 1.12 regarding allowable extensions to surveillance intervals. The proposed change removes the statement which limits the allowable extension for three (3) consecutive surveillance intervals to 3.25 times the specified surveillance interval. This change to the Technical Specifications removes unnecessary restrictions on extending surveillance requirements and can result in a benefit to safety when plant conditions are not conducive to the safe conduct of surveillance requirements. The bases in section 4.1 of the Technical Specifications have been revised to include the basis of Definition 1.12.

This submittal also proposes to remove the statement in Definition 1.12 which excludes shift and daily surveillances from the 25-percent allowance to extend surveillance intervals. Removal of this statement will make Definition 1.12 of the IP3 Technical Specifications consistent with Specification 4.0.2 of the Westinghouse Standard Technical Specifications (W STS) and will allow the extension of shift and daily surveillances in cases when plant conditions are not conducive to the safe conduct of surveillance requirements.

Section II - Evaluation of Changes

Definition 1.12 of the IP3 Technical Specifications allows surveillance intervals to be extended up to 25-percent of the time interval specified. However, the definition states that the combined time interval for any three (3) consecutive surveillance intervals is to be limited to 3.25 times the specified surveillance interval. The original intent of the 3.25 limit was to preclude routine use of the provision for extending a surveillance interval by 25-percent.

The 3.25 limitation on extending surveillances has not been a practical limit on the use of the 25-percent allowance for extending surveillances that are performed on a refueling outage basis. The impracticality of this limit is demonstrated by the fact that the NRC staff has routinely granted requests for one-time exceptions to the 3.25 limit on extending refueling surveillances because the risk to safety is low in contrast to the alternative of a forced shutdown to perform these surveillances.

The 3.25 limit on extending surveillance intervals is also impractical for those surveillances performed on a more routine basis. The 3.25 limit does not allow enough flexibility to permit consideration of plant conditions that may not be suitable for conducting a surveillance at its specified time interval. When plant conditions are not suitable for the conduct of surveillances due to safety systems being out-of-service for maintenance or due to other ongoing surveillance activities, safety is enhanced by the use of the allowance that permits a surveillance interval to be extended by 25-percent.

Furthermore, the 3.25 limitation requires tracking the use of the 25-percent allowance for prior surveillance intervals to ensure compliance. Removal of the 3.25 limit will relieve this administrative burden.

The 25-percent limit described in Definition 1.12 is restrictive enough to ensure the timely performance of required surveillances without being overly restrictive in cases when plant conditions are not suitable for performance of the surveillance. The proposed changes to the IP3 Technical Specifications do not require any physical plant modifications, or any alteration in the method of plant operation. Therefore, it can be concluded that the proposed changes to the Technical Specifications remove unnecessary restrictions on extending surveillance requirements and can result in a benefit to safety when plant conditions are not conducive to the safe conduct of surveillance requirements.

Since the 25-percent allowance can result in a benefit to safety when plant conditions are not conducive to the safe conduct of surveillance requirements, this submittal proposes to remove the statement which excludes shift and daily surveillances from the 25-percent allowance to extend surveillance intervals. The IP3 Technical Specification bases do not provide the basis of the original exclusion of these surveillances from extension allowances. Removal of this statement will make Definition 1.12 of the IP3 Technical Specifications consistent with Specification 4.0.2 of the W STS and will allow flexibility to permit consideration of plant conditions that may not be suitable for conducting shift or daily surveillances at their specified time interval.

Section III - No Significant Hazards Evaluation

Consistent with the requirements of 10 CFR 50.92, the enclosed application is judged to involve no significant hazards based on the following information:

- (1) Does the proposed license amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response:

The proposed changes to the Technical Specifications allow greater flexibility in the performance of surveillance tests/inspections. This flexibility can allow a surveillance to be performed when the plant is in a condition which is conducive to the safe performance of the surveillance. These technical specification changes reduce the need to shut down the plant in order to perform a surveillance. The 25-percent limit described in Definition 1.12 will remain in place to ensure the timely performance of surveillance tests/inspections. Therefore, the proposed changes do not involve an increase in the probability or consequences of a previously-analyzed accident.

- (2) Does the proposed license amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response:

The proposed technical specification changes do not require any physical plant modifications, or any alteration to the method of plant operation. Surveillance tests/inspections will be performed at the frequency currently specified in the IP3 Technical Specifications with a 25-percent limit on extending the surveillance interval. Therefore, the possibility of a new or different kind of accident from any accident previously evaluated is not created.

- (3) Does the proposed amendment involve a significant reduction in a margin of safety?

Response:

The 25-percent limit described in Definition 1.12 is restrictive enough to ensure timely performance of required surveillances without being overly restrictive in cases when plant conditions are not suitable for performance of the surveillance. Therefore, removal of the 3.25 limit and removal of the statement which excludes shift and daily surveillances from the 25-percent allowance will not significantly reduce a margin of safety.

Section IV - Impact of Change

This change will not adversely impact the following:

ALARA Program
Security and Fire Protection Programs
Emergency Plan
FSAR or SER Conclusions
Overall Plant Operations and the Environment

Section V - Conclusions

The incorporation of this change: a) will not increase the probability nor the consequences of an accident or malfunction of equipment important to safety as previously evaluated in the Safety Analysis Report; b) will not increase the possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report; c) will not reduce the margin of safety as defined in the bases for any Technical Specification; d) does not constitute an unreviewed safety question; and e) involves no significant hazards considerations as defined in 10 CFR 50.92.

Section VI - References

- a) IP-3 FSAR
- b) IP-3 SER
- c) GL 89-14, "Line-Item improvements in Technical Specifications - Removal of the 3.25 Limit on Extending Surveillance Intervals."