

Technical Specification Change Request No. 25 (Appendix A)

Replace page 3/4 7-11, 7-12, B3/4 7-3 with the attached revised pages 3/4 7-11, 7-12, B 3/4 7-3.

Proposed Change

Revise the Basis for the Secondary Water Chemistry Specification per the attached, revised pages.

Reason for Change

A test program was conducted at Crystal River Unit 3 during approximately the first 6 months following initial criticality. This program was an extension of the preoperational program and it encompassed the program presently described in the Basis for the Secondary Water Chemistry Specification. Toward the end of the test period, it was becoming apparent to the industry that steam turbine disc cracking as well as steam generator tube failures were a result of unknown mechanisms between the discs/tubes and the secondary water.

In order to correlate secondary water chemistry to these failures, the Electric Power Research Institute (EPRI) is backing Nuclear Water & Waste Technology (NWT) in a study of the secondary cycle chemistry of pressurized water reactors having once-through steam generators (Study No. PR-704-1).

A description of this study as well as a milestone chart is attached. The benefits of this program will be:

- 1) Operational comparison of four Babcock & Wilcox reactors, having important design and control differences in their secondary cycles.
- 2) Independent review of CR-3 sampling and analytical capabilities.
- 3) Correlation of operational chemistry control data to condenser leakage, polisher performance, chemical treatment dosage, and steam generator/turbine corrosion/deposition rates.
- 4) Availability of operational experience to interested electric utilities and EPRI via quarterly reports.

Considering the history of steam generator tube failures, recent turbine disc cracking and the probability of improving present control strategies, it is proposed that this study replace the study in the Tech Specs as the basis for the Secondary Water Chemistry Specification.

As can be seen on the milestone chart, the program is scheduled to run till the end of 1979, at which time, the results will be submitted to the Commission. In the meantime, Secondary Water Chemistry will be maintained within B&W specified limits (See Attached table).

Safety Analysis Justifying Proposed Change

None of the requirements applicable to the Safety Analysis are diminished by the proposed changes and no unreviewed safety question is involved.

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While the original test program identified chemical constituents and concentration phenomena at various points in the secondary cycle, the lack of correlation to actual plant operations was detrimental in attempting to specify limits on parameters and frequencies for monitoring. The continuation of the use of vendor specified limits on parameters and frequencies of monitoring is sufficient to ensure the integrity of the secondary system until the proposed study is completed and the result can be instituted.

CRYSTAL RIVER - UNIT 3

3/4 7-11

TABLE 3.7-2

SECONDARY WATER CHEMISTRY LIMITS

Water Sample
Location

*

Parameters*

*

*Sample locations, parameters and limits to be established based upon test program described in bases.

CRYSTAL RIVER - UNIT 3

3/4 7-12

TABLE 4.7-3

SECONDARY WATER CHEMISTRY SURVEILLANCE REQUIREMENTS

Water sample
Location

*

Parameters*

*

*Sample locations, parameters and frequencies to be established based upon test program described in bases.

PLANT SYSTEMS

BASES

positive reactivity effects of the Reactor Coolant System cooldown associated with the blowdown, and 2) limit the pressure rise within containment in the event the steam line rupture occurs within containment. The OPERABILITY of the main steam isolation valves within the closure times of the surveillance requirements are consistent with the assumptions used in the safety analyses.

3/4.7.1.6 SECONDARY WATER CHEMISTRY

A test program will be conducted during 1978 and 1979 to establish the appropriate limits on the secondary water chemistry parameters and to determine the appropriate frequencies for monitoring these parameters. The results of this test program will be submitted to the Commission for review. The Commission will then issue a revision to this specification specifying the limits on the parameters and the frequencies for monitoring these parameters.

The test program will include an analysis of normal plant chemistry including background chemistry, present chemistry follow, and corrosion product hardness follow. Inleakage chemistry will be looked at by chloride follow, sodium follow, sulfate silica follow, modeling, resin throw, and turbine sampling. The chloride follow for example will consist of four intensive two-week studies and two extended four month studies. The intensive studies will sample the secondary water, low and high pressure steam, moisture separator drains, and demineralizer inlets and outlets. The extended studies will compare three groups of samplings for six weeks each. The sampling groups are: (1) secondary water, low and high pressure steam, and moisture separator drains; (2) secondary water, demineralizer inlets and outlets and low pressure steam; and (3) low pressure steam, low pressure turbine drains A and B, and condensate.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator pressure and temperature ensures that the pressure induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 110°F and 237 psig are based on a steam generator RT_{NDT} of 40°F and are sufficient to prevent brittle fracture.

3/4.7.3 CLOSED CYCLE COOLING WATER SYSTEMS

The OPERABILITY of the closed cycle cooling water system ensures that sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the safety analyses.