



Duke Energy/NRC Observation Meeting: Robinson LAR to Adopt TSTF-577, Rev. 1

September 14, 2022



Duke Energy Attendees

Mike Classe (GM Nuclear Engineering, Robinson)

Ryan Treadway (Director, Nuclear Fleet Licensing)

Etienne Fonteneau (Manager, Steam Generator Programs Engineering)

Dan Mayes (Principal Engineer, Steam Generator Programs Engineering)

Jordan Vaughan (Lead Nuclear Engineer, Nuclear Fleet Licensing)

Chris Courtenay (Lead Nuclear Engineer, Nuclear Fleet Licensing)

Tim Thulien (Lead NDE Specialist (ECT Level III), Materials Integrity)

Technical Specifications Application for Unplugged Tube

- Existing Proposed Change in LAR under NRC review: Perform next 100% eddy current inspection of SG tubes during Refuel 35 (targeted to begin November 2026)
- Issue/Problem Statement: Although recent inspection history demonstrates no wear growth for 'B' SG tube R3C5, Technical Specification (TS) 5.5.9.c projected plugging limit criteria will be exceeded prior to Refuel 35.
- Specifically, after applying TS 5.5.9.c's 2% per year reduction to the 47% plugging criteria, R3C5's 38% through-wall (TW) indication exceeds the calculated 72-month criteria of 37% TW. The projection from Dec. 2020 is represented as follows:

0-12 months – 47% Plugging limit 2020-2021
12-24 months – 45% Plugging limit 2021-2022 R233
24-36 months – 43% Plugging limit 2022-2023
36-48 months – 41% Plugging limit 2023-2024 R234
48-60 months – 39% Plugging limit 2024-2025
60-72 months – **37%** Plugging limit 2025-2026 R235

Proposed LAR Supplement

- Duke Energy proposes to remove the time-based aspect of the tube plugging criteria in TS 5.5.9.c, as follows:

5.5.9

Steam Generator (SG) Program
(continued)

- c. Provisions for SG tube plugging criteria. Tubes found by inservice inspection to contain flaws with a depth equal to or exceeding ~~the following criteria shall be plugged: 47%~~40% of the nominal tube wall thickness ~~if the next inspection interval of that tube is \leq 12 months, and a 2% reduction in the plugging criteria for each 12-month period until the next inspection of the tube shall be plugged.~~

The following alternate tube plugging criteria shall be applied as an alternative to the preceding criteria:

Tubes with service-induced flaws located greater than 18.11 inches below the top of the tubesheet do not require plugging. Tubes with service-induced flaws located in the portion of the tube from the top of the tubesheet to 18.11 inches below the top of the tubesheet shall be plugged upon detection.

Proposed LAR Supplement

- The proposed LAR supplement would align the Robinson provisions for SG tube plugging criteria in the SG Program TS to that of NUREG-1431 (Standard Technical Specifications for Westinghouse plants).
- The time-based reduction component of the SG tube plugging criteria was added to the Robinson TS upon the issuance of Amendment No. 44 on November 17, 1979 (ADAMS Accession No. ML020500754) and was carried through to conversion to Improved TS (ITS).
 - At the time of adoption in 1979 until 1984, Robinson had 600 mill-annealed (MA) SG tubes. The replacement (existing) Robinson SGs have 600 thermally-treated (TT) tubes. The time-based element was very site-specific and should have been removed when the original SGs were replaced in 1984.
 - The 2% reduction in plugging limit per 12-month period was added to address wastage (thinning) indications in the original Robinson SGs with 600MA tubes. Due to existing chemistry treatment, wastage is not an issue in the existing 600TT tubes.

Proposed LAR Supplement

- The proposed LAR supplement also revises the SG tube plugging criteria in TS 5.5.9.c to be 40% of the nominal tube wall thickness instead of 47% of the nominal tube wall thickness.
 - This change is conservative relative to the existing TS 5.5.9.c.
 - The 47% value was determined for the 600MA SG tubes and was approved in the November 1979 SE. This value should not apply to the replacement (existing) 600TT SG tubes. A value of 40% is consistent with STS and other Westinghouse plants in the industry.
- With the proposed supplement, Robinson would align with STS for Westinghouse plants and 'B' SG tube R3C5 would not exceed the tube plugging criteria prior to the next inspection during Refuel 35 (November 2026).

