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4.9. Surveillance of Activity in Secondary Cooling System

Applicability: This specification applies to the surveillance frequency of cooling tower (secondary system) water for identification of potential radioisotope concentrations.

Objective: The objective is to discover incipient primary-to-secondary heat exchanger leaks, either newly-formed or due to secondary tube plug failure(s), by identification of sodium-24 or other reactor-produced radionuclides in the secondary water. A second and related objective is to satisfy TS 3.1.4 (Radioactive Effluents; Airborne Effluents), TS 3.4.2 (Radioactive Effluents; Liquid Effluents), and 10 CFR 20 limits. If sodium-24 or other radionuclide activity is observed in secondary system water, appropriate maintenance on the secondary system will be initiated.

Specification: Cooling tower (secondary system) water shall be sampled and analyzed for radionuclides, at least weekly.

Bases: The plugging of heat exchanger secondary tubes and the impact of primary-to-secondary heat exchanger leaks are analyzed in UVAR LEU-SAR Section 9.19 and Section 9.20, respectively. It is reasoned that incipient secondary tube plug failures and new secondary tube pinhole leaks (possibly caused by corrosion and/or erosion) would be associated with initially very small and slowly-increasing leak rates. This TS 4.9, "Surveillance of Activity in Secondary Cooling System", specifies a secondary system water sampling and counting interval appropriate to ensure small leak identification long before time-averaged liquid and airborne release concentration limits are challenged.

This TS 4.9 is not material to the secondary tube double-ended-guillotine-break (DEGTB) analyzed in LEU-SAR Section 9.20.8, which would result in a leak rate sufficiently large for rapid (<1 day) discovery (by visible and noticeably rapid falling pool water level). Mitigation of the consequences of this hypothetically most-severe case would also occur before time-averaged liquid and airborne release concentration limits are challenged. Specification of a very short secondary water sampling interval is not appropriate for large-scale leaks.