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UCLEAR POWER PLANT

# RAD-CHEM PROCEDURE

SPECIFICATIONS AND SURVEILLANCE
REACTOR COOLANT SYSTEM

RCP [illegible] REV

Approved by | Page 1 of 2

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1.0 PURPOSE

The purpose of this procedure is to specify the chemistry and radiochemistry and provide a surveillance program for the reactor coolant system (RCS). The RCS sampling points consist of the hot leg, pressurizer liquid and pressurizer vapor. All phases of expected operation of the RCS are included in this RCP.

The quality of the water in the reactor coolant system must be maintained as specified so that corrosion, deposit buildup and/or activation of impurities is minimized. In addition, some of the specifications given here are also listed in the Technical Specifications for the plant and therefore, have a limiting condition for the operation of the plant.

2.0 SPECIFICATIONS - Tables 1

The specifications given here are in some cases technical specification requirements or are recommendations by the NSSS supplier.

3.0 SURVEILLANCE - Tables 1

The surveillance requirements were taken from the technical specifications, recommendations by the NSSS supplier or were developed for the purpose of adequately monitoring the chemical and radiochemical behavior of the system

SPECIFICATIONS AND SURVEILLANCE

REACTOR COOLANT SYSTEM



TABLE I

HOT LEG (OR LETDOWN SX 6458)

| ANALYSIS/PROCEDURE | SPECIFICATION | FREQUENCY A (1) | FREQUENCY B (1) |
|---|---|---|---|
| 1. pH @ 25 C/902 | 4.5 - 10.2 | 5/W | 3/W |
| 2. Specific conductivity/901 | Consistent with conc. of additives | 5/W | 3/W |
| 3. Boron/903 (Tech Spec 3.1.1 & 3.9.1) | Variable | 5/W (2) | 1/24hrs. (2) |
| 4. Lithium/908 | 1ppm (max) (3) | 5/W | 3/W |
| 5. Chloride/906 (Tech Spec 3.4.7) | - 0.15ppm (max) | 1/72hr. | 1/72hrs. |
| 6. Fluoride/907 (Tech Spec 3.4.7) | 0.15ppm (max) | 1/72hrs. | 1/72hrs. |
| 7. Suspended Solids/911 | 0.5ppm (max) | 1/W | 1/W |
| 8. Hydrazine/910 | 1.5x measured $O_2$ conc. | (4) | None |
| 9. Ammonia/909 | (5) | 1/W | None |
| 10. Oxygen/905 (Tech Spec 3.4.7) | 0.10ppm (Max) (6) | 1/72hrs. | None |
| 11. Hydrogen/904 | 10-50cc/kg (7) | 1/W | None |
| 12. Nitrogen/904 | Not specified | 1/W | None |
| 13. Total Activity (Tech Spec 3.4.8) | $100/\bar{E}$ uCi/g (max)(8) | 1/72hrs. | 1/W |
| 14. $I^{131}$ Dose Equivalent (Tech Spec 3.4.8) | 1 uCi/g (8) | 1/14days | None |
| 15. Gross $\beta, \gamma$ Degassed Activity | Not specified | 1/W | 1/W |
| 16. Gross Alpha Activity/1001 | Not specified | 1/W | 1/W |
| 17. $I^{131}/I^{133}$ Ratio/1003 | Not specified | 1/W | 1/W |
| 18. Tritium/1007 | Not specified | 1/W | 1/W |
| 19. Crud Activity/1002 | Not specified | 1/W | 1/M |
| 20. $\bar{E}$ Determination/1009 (Tech Spec Table 4.4-4) | Not specified | 1/6mths. | None |
| 21. Iodine isotopic analysis (Tech Spec 3.4.8) | Not specified | (9) | (9) |

SPECIFICATIONS AND SURVEILLANCE

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TABLE

NOTES

(1) Frequency A = Modes 1, 2, 3, 4
Frequency B = Modes 5, 6

(2) Required 1/24 hrs. to verify shutdown margin per Tech. Spec. 3.1.1. in Mode 5. In Mode 6, 1/72 hrs. as per Tech. Spec. 3.9.1.

(3) Normal range 0.2 to 1.0ppm. Lithium should be maintained 0.2-0.5 when B $\leq$50ppm.

(4) Prior to exceeding 150° F. The presence of hydrazine will be verified following any chemical addition of hydrazine to the coolant.

(5) Normal concentration about 1.0ppm.

(6) Must be within specification prior to heatup >250 F.

(7) Hydrogen must be maintained within these limits for all plant operation above 1MWT. Less than 5cc $H_2$/kg $H_2O$ (STP) is required for opening the reactor coolant system to atmosphere.

(8) If the total activity $>100/\overline{E}$ uCi/g or >1.0 uCi/g dose equivalent I-131 perform analysis #21 of this procedure 1/4 hrs. until the activity is returned to within specification.

(9) This analysis shall be performed according to the following schedule:

a) Once per 4 hours, whenever the dose equivalent $I^{131}$ exceeds 1.0 uCi/gram (until the RCS specific activity is restored within its limits), and

b) One sample between 2 and 6 hours following a thermal power change exceeding 15% of the rated thermal power within a one hour period.