

CNS
AP/O/B/5500/34ABNORMAL PROCEDURE FOR SECONDARY CHEMISTRY
PARAMETERS OUT OF SPECIFICATION

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1.0 SYMPTOMS

Listed below are the normal values and Action Level values of various Secondary Chemical Parameters based on the EPRI Secondary Water Chemistry Guidelines. Note that these values vary depending upon the mode of operation of the plant.

Mode 1 - Power OperationSteam Generator Blowdown Samples (A - D):

Parameter	Normal Value	Action Level Value		
		1	2	3
pH	8.5 - 9.2	< 8.5 > 9.2		
Cation Cond. $\mu\text{mho/cm}$	≤ 0.8	> 0.8	> 2	> 7
Na^+ , ppb	≤ 20	> 20	> 100	> 500
Cl^- , ppb	≤ 20	> 20	> 100	
SiO_2 , ppb	≤ 300	> 300		

Final Feedwater Sample:

pH	8.8 - 9.2	< 8.8 > 9.2		
Cation Cond. $\mu\text{mho/cm}$	≤ 0.2	> 0.2		
Sodium, ppb	≤ 3	> 3		
Dissolved O_2 , ppb	≤ 3	> 3		
Total Copper, ppb	≤ 2	> 2		
Total Iron, ppb	≤ 20	> 20		
N_2H_4 , ppb	$\leq 3 \times [\text{O}_2]$	< $3 \times [\text{O}_2]$		
NH_3	*	*		

Hotwell Pump Discharge Sample:

Dissolved O_2 , ppb	≤ 10	> 10	> 30
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*To be consistent with pH within ± 0.1 unit; if not, go to Action Level 1.

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2Mode 3 - Hot StandbySteam Generator Blowdown Samples (A - D):

Parameter	Normal Value	Action Level Value			Prior To Power Escalation
		1	2	3	
pH	8.5 - 9.2	< 8.5			
		> 9.2			
Cat. Cond. $\mu\text{mho/cm}$	≤ 2.0	> 2.0			< 2.0
Dissolved O_2 , ppb	≤ 5	> 5			
Na^+ , ppb	≤ 100	> 100			< 100
Cl^- , ppb	≤ 100	> 100			< 100

Final Feedwater Sample:

Dissolved O_2 ,	< 100	> 100
N_2H_4 , ppb	$\geq 3 \times [\text{O}_2]$	< 3 x $[\text{O}_2]$

Mode 5 - Cold ShutdownSteam Generator Blowdown Samples (A - D):

Parameter	Normal Value	Action Level Value			Value Prior to Heatup
		1	2	3	
pH	9.8 - 10.5	< 9.8			8.5 - 9.2
		> 10.5			
N_2H_4 , ppm	75 - 200	< 75			
Sodium, ppb	< 1000	> 1000			< 100
Cat. Cond. $\mu\text{mho/cm}$	< 10	> 10			≤ 2.0

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Auxiliary Feedwater Sample:Dissolved O₂, ppb < 100 in fill > 100 in fill2.0 IMMEDIATE ACTION

2.1 Automatic

None.

2.2 Manual

- 2.2.1 When a secondary chemical parameter reaches an Action Level Value, follow the actions outlined for the appropriate Action Level per Enclosure 4.1, Action Level Guidelines.

3.0 SUBSEQUENT ACTION

- 3.1 If the mode of unit operation was changed due to an Action Level Guideline, the unit may be returned to the original mode after the problem has been identified and corrected.

4.0 ENCLOSURES

4.1 Action Level Guidelines

- END -

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ACTION LEVEL ONE GUIDELINES

Objective: To identify and correct the cause for an out of spec. condition without any power reduction and before the condition develops into a significant corrosion problem.

- Actions:
1. Identify source of problem.
 2. Correct problem within 100 hours.
 3. If the problem is not corrected within 100 hours, go to Action Level 2.

ACTION LEVEL TWO GUIDELINES

Objective: To minimize corrosion by operating at reduced power (30% or less) while corrective actions are taken. This level of power reduction will provide sufficient flow to maintain automatic operation while the source of the problem is corrected.

- Actions:
1. Continue trying to identify and correct the source of the problem.
 2. Have Chemistry verify the sample analysis before power reduction.
 3. Reduce the power level to 30% or less within four hours of initiation of Action Level 2.
 4. If problem not corrected within 100 hours of initiation of Action Level 2, go to Action Level 3.

ACTION LEVEL THREE GUIDELINES

Objective: To correct a condition which will result in rapid steam generator corrosion. Plant shutdown will avoid ingress and eliminate further concentration of harmful impurities.

- Actions:
1. Have Chemistry verify the sample analysis prior to shutdown.
 2. Shutdown within four hours of the initiation of Action Level 3.
 3. Clean up by feed and bleed, or drain and refill as appropriate until normal values are reached.
 4. Identify and correct the source of the problem.