ENCLOSURE 1
ATTACHMENT A

— NOT A CONTROLLED —
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Dept. Head DBR
PORC

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3.7.4.2 SECONDARY CHEMISTRY TEST FREQUENCIES AND SPECIFICATIONS

1.0 DISCUSSION

1.1 Routine surveillance by sampling and analysis of secondary water systems is essential to ensure that the proper chemistry balance is being maintained, thereby minimizing corrosion and resulting plant downtime. Applicable systems include the steam generation system (condensate, feedwater, steam generator inventory, and main steam), the Demineralized and Primary Water Storage and Condenser Surge Tanks, and the Primary and Secondary Component Coolant systems.

1.2 This procedure defines the analyses, frequencies and specifications that comprise the secondary chemistry surveillance program. Chemistry and applicable Radiological Controls personnel are responsible for carrying out these required tests under the direction of the Chemistry Section Head. Responsibilities include required sampling and analysis, batching and adjustment of chemical addition feed systems, bulk chemical and make-up water inventories, and the initiation of remedial actions and timely reporting of out-of-specification conditions. The Secondary Chemist is responsible to follow the day-to-day implementation of the program and report problems or discrepancies to the Chemistry Section Head.

2.0 OBJECTIVE

This procedure defines the implementation of a surveillance program to assure secondary chemistry is being controlled within practical limits, and that timely indication is given when out-of-spec conditions exist.

3.0 REFERENCES

3.1 MY Proc. 7-02-1, QA/QC Program for Chemistry Technical Specification Surveillance Tests

3.2 MY Proc. 7.304, General Sampling Procedures

3.3 MY Proc. 7.304.2, Secondary Systems Sample Points

3.4 MY Proc. 7.205 Series - Feed Tank Batching Procedures

3.5 Applicable individual Analytic procedures as referenced in the tables of this procedure.

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4.0 PRECAUTIONS

4.1 All precautions listed within the individual procedures must be followed.

4.2 All glassware, sample containers, and equipment must be kept clean. Wash out casseroles, beakers, etc. before and after each analysis using demineralized water.

4.3 Do not leave conductivity cells or pH and specific ion electrodes in sample water. Upon completion of the analysis rinse them thoroughly with demineralized water and store in the same.

4.4 When the sample is drawn, the bottle should be filled completely with water and immediately capped tightly. This will minimize atmospheric contamination.

4.5 Samples for pH or conductivity analysis should be analyzed as soon as possible after the sample bottle has been opened.

5.0 PREREQUISITES

5.1 All personnel involved with the chemistry analysis of the Secondary System should be familiar with those problems commonly encountered in the testing of these systems.

5.2 Sample lines should be properly flushed to insure a representative sample, and closed following obtaining the sample.

5.3 The sample bottle must be clean and adequately flushed with sample water before drawing any sample. Care must be taken not to touch the mouth of the bottle against the lip of the sample connection and to keep foreign matter, including fingers, from contaminating the sample.

5.4 All samples should be cooled or heated to approximately 25^{o}C as to avoid errors of volume and electrical measurement.

5.5 A supply of fresh reagents must be on hand to run all analysis, as well as a back up supply of chemicals to prepare new reagents as required. Reagents must be checked before use. Look to see if appearance of reagent is good. Check the date the reagent was prepared. If the shelf-life has expired, follow guidance of Proc. 7-02-1.

5.6 Instruments must be clean and in good working condition to insure accurate results.

6.0 EQUIPMENT

As required by applicable referenced procedure.

7.0 PROCEDURE

7.1 Chemical addition feed tanks required to be in operation shall be checked early dufing each shift and rebatched as required.

7.2 Table 7.1 indicates the minimum frequency at which each of the systems shall be analyzed for each of the various parameters.

7.3 Tables 7.2 through 7.12 list test parameter, frequency, specification, analytic procedure and remedial action for each system as follows:

Table 7.2 - Steam Generators, Power Operation
Table 7.3 - Steam Generators, Hot Standby
Table 7.4 - Steam Generators, Cold Shutdown
Table 7.5 - Steam Generators, Dry Lay-Up
Table 7.6 - Condensate
Table 7.7 - Feedwater
Table 7.8 - Main Steam
Table 7.9 - Condenser Surge Tank
Table 7.10 - Demineralized Water Storage Tank
Table 7.11 - Primary Water Storage Tank
Table 7.12 - Primary and Secondary Component Coolant

7.4 Analysts shall perform the required tests at the interval indicated by the analytic procedure referenced.

7.4.1 At times, due to equipment failures or conflicts with higher priority work, it may not be possible to perform all testing at the frequency indicated. When this occurs, the Secondary Chemist, the Radiochemist, or the Chemistry Section Head, only, may authorize omissions or less conservative alterations of the surveillance schedule.

7.4.2 For some reason it may not be possible or practical to perform an analysis by the referenced analytic procedure. In such cases, an alternate analytic procedure may be used providing it is by an approved procedure and has a minimum level of detectability consistent with the specification. Results should be annotated to reflect the alternative procedure employed.

7.5 As each analysis is completed, results shall be logged in the appropriate space on a MYAPCo. Secondary Chemical Analysis Report (MY-CH-7-72) or MYAPCo. Chemical Analysis Report (MY-CH-5-72).

7.6 Results shall be compared to the specification. If the results are found to be within specification, no further action is required by the analyst.

7.7 If results are found to be out-of-specification:

7.7.1 Resample to verify the initial results. If the confirmation analysis is found to be within specs, annotate the log to indicate a resample was performed and found to be within spec. No further action is required.

7.7.2 Ensure that the analytic procedure was properly followed, and that reagents and standards are not expired or otherwise questionable.

7.7.3 Check the remedial action for that specification. (Cross referenced from the specification to the Remedial Actions listed in Appendix A).

7.7.4 If the remedial action requires reporting as denoted by an asterik (*), immediately notify a chemistry supervisor (PSS or SOS on backshifts, weekends and holidays). The chemistry supervisor shall be responsible for notifying the PSS or SOS as appropriate.

7.7.5 Initiate remedial action required by the specification.

7.7.6 For those parameters requiring notification, verbal notification shall be made initially, and followed up by written notification (MY-CH-55-84).

8.0 ACCEPTANCE CRITERIA

8.1 The specifications as stated establish the acceptance criteria. Remedial actions for out-of-specification conditions are described in Appendix A.

8.2 Periods may exist during transitions from one reactor operating condition to another when the parameters can be expected to be out of specification. This condition is acceptable provided the variations are recognized by supervisory personnel, are not significant, and are actively being addressed for clean up.

8.3 All results, within or out of specification shall be logged on the appropriate daily chemistry report (Step 7.5). This report shall be reviewed and approved by a Chemistry supervisor, with out-of-specification conditions identified and correction actions annotated. Significant surveillance out-of-specification conditions shall be reported as per Step 7.7.6.

8.4 The Secondary Chemist shall trend key parameters to identify those which may be approaching an out-of-spec condition, in order that remedial action can be taken before that occurs.

9.0 FINAL CONDITIONS

9.1 Required tests have been performed within the specified interval and are satisfactory or corrective action has been initiated to bring out-of-specification conditions back into control.

TABLE 7.1

SURVEILLANCE TEST FREQUENCY

	pH	COND	Cl^-	B^+	D.O.	F^-	SiO_2	N_2H_4	NH_3	TUS	Gross	Cu	Fe	Sp ACT	Dos. EQ.	Morphi	CrO_4	N_2
Steam Generators (Fower Operations)	D	D	D	D	D	W	D	D	D	D	D	W	W	W	A/R			
Stm gen (Wet Lay-up/ Hot Standby	D	D	D	D	D	W	D	D		D	D							
Stm Gen (Wet Lay-up/ Cold Standby)	3/wk	3/wk	3/wk	A/R			3/wk	3/wk										
Stm Gen (Dry Lay-up)																		W
Condensate	D	D	D		D				D							A/R		
Feedwater	D	D	D		D	W	D	D		D		W	W					
Steam	D	D		W			D											
Demin Water Storage & Surge Tanks	D	D	D	A/R		D	D			D	D		W					
Primary Water Storage Tank	D	D	D	D	W	D	D			D	D		W					
Component Cooling (Primary & Secondary)	W										W						W	

D - Daily (Minimum of 5 times per week)
W - Weekly

3/Wk - 3 times per week
A/R - As Required

TABLE 7.2

STEAM GENERATOR SPECIFICATIONS, POWER OPERATIONS
(Applies to Stm Gen #1, #2 and #3 Blowdown when in Reactor Operating Condition 7)

Parameter	Frequency	Specification	Analytic Procedure	Remedial Action
R				
pH	D	7.50 to 9.20(3)	7.309.39.2	1 & 5
Conductivity	D	<10 μmhos/cm	7.309.104	2
Chloride	D	<0.05 ppm	7.309.20.2 or .7	3*
Fluoride	W	<0.10 ppm	7.309.30	4*
Hydrazine	D	≤0.25 ppm	7.309.60.1	5
Silica	D	≤0.30 ppm	7.309.82.1	6*
Dissolved Oxygen	D	<0.005 ppm	7.309.63.2	7*
Total Undissolved Solids	D	≤1.0 ppm	7.309.105.5	8*
Ammonia	D	≤1.0 ppm	7.309.60.4	9
Copper	W	≤0.05 ppm	7.309.23	10
Gross γ	D (T.S. 3.24 & 4.2-1)1	≤ 1.02 E-2 μci/ml	3.7.1.1, Step 6.1	11*
Specific Activity	W (T.S. 3.24 & 4.2-1)1	Ref. Only	3.7.1.1., Step 6.2	11*
Dose Equivalent I-131	A/R (T.S.3.24 & 4.2-1)1	<0.1 μci/ml	7.306.4.1	11*
R				
Boron	D	3 to 6 ppm(2)	7.309.12	12
Iron	W	≤0.10 ppm	7.309.43	10

(1) Steam Generator Activity is a Tech. Spec. item. Table 4.2-1 requires a gross activity determination at least once per 72 hours, and DOSEQ-I-131 at least once per 6 months whenever the gross activity determination indicates iodine concentrations less than 1.0 E-2 μci/ml, or once per 31 days whenever it indicates iodine concentrations greater than 1.0 E-2 μci/ml. Tech. Spec. 3.24 limits specific activity of the secondary coolant system to less than or equal to 0.10 μci/gm Dose Equivalent I-131.

(2) If it is anticipated that the Steam Generators will be exposed to a potentially oxygenated environment, reduce the boron concentration to as low as practical before entering that condition, eg Cold Shutdown. If the plant is only going to Hot Standby, and no oxygen is anticipated, maintain the normal operating boron concentration.

On initial startup from an extended outage Boric Acid soaks may be conducted at less than 50% power at 30 to 50 ± 10 ppm. Boron concentrations for those soaks will be governed by the applicable procedure for that activity.

(3) Attempt shall be made to maintain pH above 7.80 whenever practical.

TABLE 7.3

STEAM GENERATOR SPECIFICATIONS, FULL WET LAY-UP, HOT STANDBY
(Applies to Stm Gen #1, #2 and #3 Blowdown when in Reactor Operating Condition 4, 5 or 6)

Parameter	Frequency	Specification	Analytic Procedure	Remedial Action
pH	D	8.00 to 9.50	7.309.39.2	13 & 1
Conductivity	D	<100 μmhos/cm	7.309.104	13 & 2
Chloride	D	<1.0 ppm	7.309.20.2	13 & 14
Fluoride	W	<1.0 ppm	7.309.30	13 & 4*
Dissolved Oxygen	D	<0.01 ppm	7.309.63.2	13 & 15
Hydrazine	D	<10.00 ppm	7.309.60.1	13 & 15
Silica	D	<5.0 ppm	7.309.82.1	13 & 6*
Total Undissolved Solids	D	<5.0 ppm	7.309.105.5	13 & 8*
R				
Boron	D	<3.0 ppm	7.309.12	16
Gross γ	D (T.S. 3.24 & 4.2-1)	< MDA	3.7.1.1, Step 6.1	11*

TABLE 7.4

STEAM GENERATOR SPECIFICATIONS, FULL WET LAY-UP, COLD SHUTDOWN
(Applies to Stm Gen #1, #2 and #3 Inventory when in Reactor Operating Condition 1, 2 or 3)

Parameter	Frequency	Specification	Analytic Procedure	Remedial Action
pH	3/wk	9.8 to 10.5	7.309.39.2	17
Conductivity	3/wk	< 200 μmhos/cm	7.309.104	17
Hydrazine	3/wk	75 to 200 ppm	7.309.60.1	17 & 18*
Chloride	3/wk	Ref. only	7.309.20.2	17 & 14
Silica	3/wk	Ref. only	7.309.82.1	17 & 6*
R				
Boron	A/R	< 3.0 ppm	7.309.12.2	19

TABLE 7.5

STEAM GENERATOR SPECIFICATIONS, DRY LAY-UP
(Applies to Stm Gen #1, #2 and #3 only when Laid-up under a Nitrogen Blanket)

Parameter	Frequency	Specification	Analytic Procedure	Remedial Action
Nitrogen	W	> 95%	7.309.60	20

TABLE 7.6

CONDENSATE SPECIFICATIONS, POWER OPERATIONS

Parameter	Frequency	Specification	Analytic Procedure	Remedial Action
pH	D	8.80 to 9.50	7.309.39.2	1
Conductivity	D	≤ 10.0 μmhos/cm	7.309.104	2
Dissolved Oxygen	D	< 0.005 ppm	7.309.63.2	7*
Chloride	D	< 0.05 ppm	7.309.20.2	3*
Ammonia	D	< 1.0 ppm	7.309.60.4	9
Morpholine	A/R	< 0.02 ppm	7.309.60.2	21

TABLE 7.7

FEEDWATER SPECIFICATIONS, POWER OPERATIONS

Parameter	Frequency	Specification	Analytic Procedure	Remedial Action
pH	D	8.00 to 9.50	7.309.39.2	1
Conductivity	D	≤ 10 μmhos/cm	7.309.104	2
Dissolved Oxygen	D	<0.005 ppm	7.309.63.2	7*
Chloride	D	<0.05 ppm	7.309.20.2	3*
Fluoride	W	<0.10 ppm	7.309.30	4*
Silica	D	<0.02 ppm	7.309.82.1	6*
Hydrazine	D	<0.05 ppm	7.309.60.1	5
Total Undissolved Solids	D	<0.50 ppm	7.309.105.5	8*
Dissolved Copper	W	<0.05 ppm	7.309.23.1	10
Dissolved Iron	W	<0.10 ppm	7.309.43	10

TABLE 7.8

MAIN STEAM SPECIFICATIONS, POWER OPERATIONS
(Applies to Stm Gen #1, #2 and #3 Main Steam)

Parameter	Frequency	Specification	Analytic Procedure	Remedial Action
pH	D	8.00 to 9.50	7.309.39.2	1
Conductivity	D	< 10 μmhos/cm	7.309.104	2
Silica	D	< 0.02 ppm	7.309.82.1	6*
Boron	W	Ref. only	7.309.12	22

TABLE 7.9

CONDENSER SURGE TANK SPECIFICATIONS

Parameter	Frequency	Specification	Analytic Procedure	Remedial Action
pH	D	5.50 to 8.50	7.309.39.2	23
Conductivity	D	< 3.5 μmhos/cm	7.309.104	24*
Chloride	D	<0.05 ppm	7.309.20.2	24*
Fluoride	D	<0.10 ppm	7.309.30	24*
Silica	D	<0.05 ppm	7.309.82.1	24*
Total Undissolved Solids	D	<0.5 ppm	7.309.105.5	24*
Total Iron	W	<0.10 ppm	7.309.43	24*
Gross γ R	D	<MDA	7.309.19	25*
Boron	A/R	<3.0 ppm	7.309.12	26*

TABLE 7.10

DEMINERALIZED WATER STORAGE TANK SPECIFICATIONS

Parameter	Frequency	Specification	Analytic Procedure	Remedial Action
pH	D	5.50 to 8.50	7.309.39.2	23
Conductivity	D	< 3.0 μmhos/cm	7.309.104	24*
Chloride	D	<0.05 ppm	7.309.20.2	24*
Fluoride	D	<0.10 ppm	7.309.30	24*
Silica	D	<0.05 ppm	7.309.82.1	24*
Total Undissolved Solids	D	<0.5 ppm	7.309.105.5	24*
Total Iron	W	<0.10 ppm	7.309.43	24*
Gross γ R	D	<MDA	7.309.19	25*
Boron	A/R	<3.0 ppm	7.309.12	26*

TABLE 7.11

PRIMARY WATER STORAGE TANK SPECIFICATIONS

Parameter	Frequency	Specification	Analytic Procedure	Remedial Action
pH	D	5.50 to 8.50	7.309.39.2	23
Conductivity	D	<2.50 μmhos/cm	7.309.104	24*
Chloride	D	<0.05 ppm	7.309.20.2	24*
Fluoride	D	<0.10 ppm	7.309.30	24*
Silica	D	<0.05 ppm	7.309.82.1	24*
Total Undissolved Solids	D	<0.5 ppm	7.309.105.5	24*
Total Iron	W	<0.10 ppm	7.309.43	24*
Gross γ	D	<MDA	7.309.19	25*
Dissolved Oxygen	W	Ref. only	7.309.63	27
Boron	D	<0.40 ppm	7.309.12	26*

TABLE 7.12

PRIMARY AND SECONDARY COMPONENT COOLANT WATER SPECIFICATIONS

Parameter	Frequency	Specification	Analytic Procedure	Remedial Action
pH	W	7.00 to 8.50	7.309.39.2	28
Chromate	W	500 to 1000 ppm	7.309.21.1	29
Gross γ	W(1)	< MDA	3.7.1.1, Step 6.1	30*

(1) More frequent analysis may be required by operating procedures, depending on plant conditions. Whenever RHR is in operation, daily sampling is required.

APPENDIX A

REMEDIAL ACTIONS FOR OUT OF SPEC CONDITIONS

R NOTE: Those actions denoted by an asterick (*) require notification as per 7.7.4

1. pH is important for corrosion control and is dependent primarily upon the concentrations of boric acid, hydrazine, ammonia, and morpholine, but may also be affected by the intrusion of seawater through the condenser. Check to see if boric acid, hydrazine and ammonia are in spec. If they are not, take appropriate remedial action to return those parameters to specification, and follow pH in conjunction with this action. If these parameters are in spec but pH is low, check the chloride concentration for evidence of seawater intrusion and follow the chloride remedial action. If instead the pH is high, analyze for morpholine, which if out-of-spec should be corrected as indicated in Remedial Action 21.

2. Conductivity is a measure of ionic impurities. First, ensure that the sample was not contaminated with carbon dioxide by resampling and measuring the conductivity as soon as possible. Ensure that temperature has been adequately compensated. Check the other parameters to determine possible sources of this condition (chlorides, ammonia, T.U.S., copper, etc.) and follow remedial action for any found to be out-of-specification.

*3. Chlorides contribute to steam generator tube denting and may effect those units' integrity. Therefore, this is one of the key parameters which must be kept within specification. The primary source of chlorides is from seawater intrusions into the condenser through tube and/or tube sheet leaks. However, following a plant trip or reactor shutdown, chlorides can be expected in the steam generator blowdown having leached out of deposits in the generators. If during normal operations, steam generator chlorides are detected (0.05 ppm or greater), but are less than or equal to 0.25 ppm, inspect the sled for confirmation of the source being from the condenser. Inform operations, recommending increased blowdown and a scan of the individual water boxes using the SLeD. Resample after one hour to verify the trend is within control, unless other indications show a need for more frequent sampling. Continue to follow the situation by sampling on a 2 to 4 hour frequency or as may be deemed necessary by operations or chemistry supervision.

If the leak is major, ie, greater than 0.25 ppm increase in the steam generators since the last sample, immediately notify operations, and concentrate sampling on the condensate, while still following the steam generators. A large intrusion may or may not be the result of condenser tube leakage. If the hotwell temperature exceeded 125°F, the in leakage may have been due to dynamic flexing of the tubesheet. Other pathways have also been experienced. Isolating the SLeD on individual boxes may not be in the best interest in these cases.

R Specific operational guidance is given in AOP 2-27, High Chlorides in the Steam Generators or the Condenser.

If the condensate is found to have detectable chlorides, trend the concentration by frequency sampling, ie about every 10 to 15 minutes, until it can be seen that the intrusion has peaked and the concentration is decreasing. Whenever the hotwell is found to be contaminated, operations should be cautioned to, if possible, close the spill valve back to the storage tank to avoid contaminating that inventory of water.

If the intrusion can not be pinpointed as coming from the circulating water other possibilities are condenser overboard dump valve back leakage, makeup water contamination, feed chemical addition contamination, contamination within the aux condensate system. Each of these systems should be sampled.

*4. Fluoride: If the concentration is equal to or greater than 0.10 ppm, attempt to identify the source and isolate it. Increase blowdown on all three steam generators until the problem is corrected. A likely source could be the makeup water. If this is found to be so, follow corrective measures of Remedial Action 6.

5. Hydrazine out-of-spec highly should also be indicated by higher than normal pH. Insufficient hydrazine may not be readily apparent by analysis for hydrazine, but could contribute to low pH and should be supported by lower than normal ammonia concentrations. If out-of-spec high, reduce the feed tank chemical concentration and/or feedrate (pump stroke), increase the blowdown rate, and monitor the boron concentration making adjustments as necessary (Remedial Action 12). If the pH is low, check the chem addition tank to see that there is feed volume and rebatch if necessary, than check to ensure that the pump is on and properly pumping. If there are no problems, increase the feed tank concentration and/or feedrate by gradual step changes.

*6. Silica: The most obvious source of silica is from the makeup water supply. Silica will break through on a demineralizer before there is an effluent conductivity indication. If silica is detected, immediately notify operations recommending they isolate any storage tank make up or system supply until the problem can be isolated. If the steam generators or steam indicate silica, caution should be taken in increasing blowdown as this will require additional makeup water which may be the source, and will only aggrevate the problem. Sample the storage tanks and makeup demineralizers (including vendors) for silica. Take the culprit demineralizer out of service for regeneration. As possible drain and refill contaminated storage tanks until they are back within specification.

<u>CAUTION</u>: The DWST is committed to be maintained at greater than 100,000 gals of inventory.

As soon as possible, increase steam generator blowdown if those units have been contaminated.

*7. Dissolved oxygen most probably will originate from air inleakage around the turbine, condenser or condensate pumps. If leakage is in the condenser, it should be accompanied by an increase in the air ejection off-gas flow rate. Dissolved oxygen may be masked in the condensate and feedwater systems, by complexing with other ions, especially copper, making it undetectable. With increased temperature, such may break down and appear as oxygen in the generators. Whenever oxygen is detected, notify operations and P.E.D., advising for an investigation for air inleakage, unless the source is readily apparant (ie, switching condensate pumps to one with a defective boot). Ensure that hydrazine is maintained at the appropriate concentration.

*8. High Total Undissolved Solids are expected during plant startups from shutdowns. During normal operations, they could result from a physical or chemical shock to the system. Attempt to identify the source. Condensate cleanup should be placed into operation until T.U.S. is within specification. Increase steam generator blowdown, directing it overboard as possible while T.U.S. values remain high. Failure to do so can clog the I-6 prefilters and possibly foul the resin.

9. Ammonia is generated by the decomposition of hydrazine and morpholine. High concentrations will adversely affect the feedwater heaters by reacting with the copper. If high levels are observed, reduce the hydrazine feed rate or concentration. Normal system cleanup (blowdown and I-6) can be used to decrease the levels.

10. Metal Analyses (Copper, Iron, etc.) are basically used to monitor the corrosion rate and the transport of oxides throughout the feedtrain and into the steam generator. If detected, check other parameters that may contribute to the increase (ie, ammonia, dissolved oxygen, hydrazine, etc.) and review operational activities which may be the cause. As possible, eliminate or minimize the cause, while increasing blowdown in the interim.

*11. (Tech Spec) Steam Generator radioactivity is a Technical Specification. Immediately notify the Plant Shift Superintendent, Safety Engineer, and senior available Chemistry Supervisor. Refer to Tech. Spec. 3.24 and 4.2, Table 4.2-1, item 7. Comply with sampling requirements of the specification. Sample to attempt to identify possible sources: primary to secondary tube leakage in the steam generators, auxiliary system heater leakage into the aux condensate (ie, evaporators or degassifier). Attempt to quantify the leak rate and determine the condenser partition factor when and if possible.

12. If boron is out-of-spec low, turn on the boric acid feed tank to return to specification. If the tank is already on, ensure the valve line up is correct and that the pump is pumping. When the boron is out-of-spec high, make sure the feed system is secure, and bring the concentration to within the desired concentration by increasing blowdown overboard. Either of these out-of-spec conditions can be expected to effect the pH.

13. While in hot standby, the ability to take remedial action on out of specification conditions is severely limited. The best that can be accomplished is to identify and isolate the source or cause of the condition and to feed and bleed the generators to clean them up. Low feed flow rates, however, greatly restrict the ability to do this. If the conditions are not too severe, it may be necessary to proceed to power operations and clean up the units while still at reduced power, eg less than 30%.

14. Chlorides can be expected to leach out in the steam generators during standby conditions. If there is no feed or aux feed only to the generators, this can be assumed to be the source, providing the aux feed water supply source is not contaminated.

15. Inadequate hydrazine feed to the aux feed system may cause insufficient scavenging of the dissolved oxygen. Check to ensure that the feed tank is properly batched and feeding to the generators at 100% stroke. If it is found to be correct, consideration should be given to increasing the concentration. If the hydrazine values are too high, check for proper batching. Consideration should be given to decreasing the concentration or pump stroke.

R 16. If the condition that led to hot standby was anticipated, the boron concentration should have been reduced to specification prior to entering this condition. However, if it resulted from a plant trip, the boron may well be above 3 ppm. If immediate power resumption is expected, attempts to reduce the boron concentration are not necessary but efforts should be made to guard against the introduction of dissolved oxygen. If the plant is to be down for some period, eg, more than <u>24</u> hours, Remedial Action 13 should be followed.

17. These conditons can only be met by wet lay up operations. Corrective action for cold shutdown out-of-spec conditions once laid up involves drain and refill of the steam generators. Because of the time factors involved and the potential impact on plant operations, such remedial action will be based on supervisory review and assessment of the severity of the out-of-spec condition before it is made.

*18. Operational line ups to add hydrazine for wet lay ups has often resulted in insufficient hydrazine additions. Sample the D.W.S.T to account for excess hydrazine if the expected valves are not met in the steam generators.

19. Boron can be expected to leach back into solution. Remedial Action 17 should be followed when out-of-spec conditions occur because of the adverse effects boric acid can have. The amount of boric acid leaching out and lost should be accounted for as it will be a critical value when determining the need to perform a boric acid soak prior to ascension to full power.

20. Nitrogen provides a non reactive environment through the exclusion of oxygen. If below spec, feed and bleed to restore purity.

21. The limits of detectability of the morpholine analysis do not render it useful for trending trace levels normally found in the system. However, if pH is unexplainably high and all other possible causes have been eliminated, test for morpholine. If found to be out of specification, rebatch the feed tank and follow its effect. If this continues to yield high pH, high morpholine, again rebatch the tank at an appropriately more dilute strength. Caution must be taken not to interfere with the hydrazine feed strength/rate if that has found to be satisfactory.

22. The concentration of boron in the steam is basically a function of the volatility, but may be affected by the degree of moisture carryover. This parameter is measured for historical data only.

23. pH of the storage water is a function of the clarification and demineralization process, and per se is not controllable. Out-of-spec conditions, however, may be indicative of other problems and should be followed up to determine why.

*24. High conductivity is likely to be caused by failure to secure demineralizer operation upon depletion of the bed. This may well be accompanied by high silica values, and possibly chlorides. A second source can be cross contamination by spillage back from a contaminated condenser hotwell or transfer from one tank to another. By sampling, attempt to identify the source, and isolate it before it further aggrevates the situation. Quite often with storage tanks it has been found that contaminants will stratify in layers within the tank. Cleanup consists of draining of the tank in stepped intervals, ie, in 10,000 gal batches, until the parameters are back within specification. (A feed and bleed corrective action is not recommended since it will involve a larger volume of demin water. However, it may be necessary for the D.W.S.T., which is committed to a minimum of 100,000 gals).

*25. Demineralized water is used for several purposes throughout the plant. It is not anticipated that the storage tanks could become radioactively contaminated without major contamination problems elsewhere in the plant. It is important to know whether or not this water has become contaminated in order to take appropriate rad controls precaution. Cleanup should be initiated as per Remedial Action 24.

*26. (PWST only) As described in Remedial Action 24, boron can be introduced back into the storage tanks from operating system. Its presence above spec in the D.W.S.T. and C.S.T. is of no major concern, and does not require immediate action. Its presence in the PWST has potential reactivity implications, especially in periods of low boron concentrations in the RCS. Operations should be immediately notified of the situation, and cleanup initiated as per Remedial Action 24.

27. There are no controls in place to protect against dissolved oxygen being introduced into the water inventory in the storage tanks. Therefore, D.O. can be expected in this water. This analysis is for historical and trending purposes only, where trend analysis may provide insight on a growing problem.

28. The pH of the component coolant is dictated by the chromate concentration and should be assessed in conjunction with that parameter in analyzing small variations. If the shift can not be so explained, Operations should be alerted to the potential problem, and an investigation initiated to determine the source. Once the source has been identified, the pH should be resotred to within spec by feed and bleed.

29. Excessive chromate is not cause of major concern but should be diluted as possible by feed and bleed. Insufficient chromate should be corrected by batch addition of sodium chromate into the system.

*30. Activity in either of the component cooling systems is indicative of an inleakage from one of the primary system components they are cooling. If detected, immediately notify operations of the fact. Perform a specific nuclide analysis to determine the nature of the activity. If noble gas is found, sample the gas space on the top of the applicable system surge tank for activity as this is a direct release pathway to the primary vent stack. If gaseous activity is found, this should be treated as an uncontrolled inadvertent release. See Procedure 7.310.