

TMI DOCUMENTS

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METROPOLITAN EDISON COMPANY.

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203 340

5.1.E, F

EVAPORATOR FEED AND BOTTOMS

1800.2
Revision 3
11/10/76

Analysis	Frequency	Limits	Desirable	Remarks
B, ppm	R	I	<17000 ppm B	Shows need for dumping concentrates
Gross By, uCi/ml	R	I		

5.1.G

RAD WASTE CATION DEMIN. IN & OUT

(CE-127, 128, 129, 130)

pH	R	I		
Cond, umho/cm	R	I		
Cl ⁻ , ppm	R	I	<0.02 OUT	Indicates need for Resin replacement
F ⁻ , ppm	R	I	<0.02 OUT	Indicates need for Resin replacement
B, ppm	R	I		
Gross By, uCi/ml	R	I		Indicates need for Resin replacement

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THREE MILE ISLAND NUCLEAR STATION
STATION CHEMISTRY PROCEDURE 1800.2

SAMPLING SCHEDULE (UNIT #1)

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3.0	11/10/76	3	28.0	11/10/76	3	53.0		
4.0	11/10/76	3	29.0	11/10/76	3	54.0		
5.0	11/10/76	3	30.0	11/10/76	3	55.0		
6.0	11/10/76	3	31.0	11/10/76	3	56.0		
7.0	11/10/76	3	32.0	11/10/76	3	57.0		
8.0	11/10/76	3	33.0	11/10/76	3	58.0		
9.0	11/10/76	3	34.0	11/10/76	3	59.0		
10.0	11/10/76	3	35.0	11/10/76	3	60.0		
11.0	11/10/76	3	36.0			61.0		
12.0	11/10/76	3	37.0			62.0		
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15.0	11/10/76	3	40.0			65.0		
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20.0	11/10/76	3	45.0			70.0		
21.0	11/10/76	3	46.0			71.0		
22.0	11/10/76	3	47.0			72.0		
23.0	11/10/76	3	48.0			73.0		
24.0	11/10/76	3	49.0			74.0		
25.0	11/10/76	3	50.0			75.0		

Unit 1 Staff Recommends Approval

Approval J. J. Calitz Date 11/29/76
Cognizant Dept. Head

Unit 2 Staff Recommends Approval

Approval MA Date _____
Cognizant Dept. Head

Unit 1 PORC Recommends Approval

Chairman of PORC _____ Date _____
PORC comments of _____ included _____
(date) _____
By _____ Date _____

Unit 2 PORC Recommends Approval

Chairman of PORC _____ Date _____
PORC comments of _____ included _____
(date) _____
By _____ Date _____

Approval J. J. Calitz Date 11-29-76
Station Superintendent/
Unit Superintendent

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Section 2, Sampling and Analysis Schedules

The following analysis requirements are a reasonable frequency of analysis for routine, steady-state operation. The frequencies of various analyses may be changed based on plant operations. For example, more frequent analyses should be made during a start-up or major load change when there is a reasonable chance that limits may be exceeded. Analyses, not required by Technical Specifications, may be deleted by the Chemistry Supervisor/Foreman if unit conditions or department workload are restrictive. Such deletion shall be reported to the Supervisor of Radiation Protection and Chemistry.

The analyses required by this procedure will be scheduled by the Technical Specification Surveillance Procedure Schedule and the Chemistry Scheduling Program.

Legend

Frequency

D - Daily

W - Weekly

3/W - 3 analyses/week, assumed to be Mon., Wed., Fri.

5/W - Analysis to be performed each working day.

M - Monthly

Y - Yearly

Q - Quarterly

R - As required

C - Continuous Monitor

NOTE: The maximum allowable time interval for any given analysis is that specified $\pm 25\%$.

Limits

I - No limit set by manufacturer or tech specs. Analysis

Made to obtain necessary information.

* - Following a limit indicates technical specification limit. The frequencies given meet or exceed requirements for normal operating conditions. See tech specs for further information.

DM - Daily Maximum

WA - Weekly Average

MA - Monthly Average

SAMPLE LOCATIONS

PRIMARY PLANT

1.1 REACTOR COOLANT SYSTEMS

- A. R. C. Letdown
- B. R. C. Decay Heat
- C. Pressurizer H_2O Space
- D. Pressurizer Steam Space

1.2 MAKE-UP AND PURIFICATION SYSTEMS

- A. Purification Demin. Outlet
- B. Make-up Tank Liquid
- C. Make-up Tank Gas
- D. -Bleed Tanks
- E. Deborating Demins.

PRIMARY PLANT (continued)

1.3 MISCELLANEOUS PRIMARY SYSTEMS

- A. BWST
- B. Core Flood Tanks
- C. $\text{Na}_2\text{S}_2\text{O}_3$ Tank
- D. Na OH Tank
- E. Reclaimed Boric Acid Tank
- F. Reclaimed Water Storage Tank
- G. 4% Boric Acid Mix Tank
- H. Boric Acid Mix Tank
- I. Spent Fuel Pool
- *J. R. D. Drain Tank

* No established analysis requirements

SECONDARY PLANT

2.1 FEEDWATER TRAIN

- A. Condenser Hotwell
- B. Condensate Pump Discharge (CE-2,3)
- C. Powdex Effluent (CE-4)
- D. Condensate Booster Pump Discharge (CE-5)
- E. Steam Generator Inlet (CE-6)
- F. Condensate Storage Tank

2.2 OTSG WATER

- A. Wet Layup
- B. <15% Power

2.3 STEAM TRAIN

- A. Main Steam
- B. Moisture Separator Drains
- C. 6th Stage Heater Drains
- D. H. P. Heater Drains

3. AUXILIARY SYSTEMS

3.1 CLOSED COOLING SYSTEMS

- A. Intermediate Closed Cooling
- B. Nuclear Services Closed Cooling
- C. Secondary Services Closed Cooling
- D. Decay Heat Cooling
- E. Chilled Water Closed Cooling Systems
- F. Diesel Cooling
- G. Stator Cooling

3.2 AUXILIARY BOILER

- A. Auxiliary Boiler Feedwater
- B. Auxiliary Boiler Drum
- C. Auxiliary Boiler Steam
- D. Auxiliary Condenser

3.3 MISCELLANEOUS

- *A. Fluid Block

* No established analysis requirements

4. WATER TREATMENT

4.1 CYCLE MAKE-UP PRETREATMENT

A. Clarifier Effluent

4.2 CYCLE MAKE-UP DEMIN

A. Carbon Filter Effluent

*B. Cation Demin. Effluent

*C. Vacuum Degasifier Effluent

*D. Anion Demin. Effluent

*E. Mixed Bed Demin. Effluent

F. Make-up Demin. Effluent

G. Demineralized Water Storage Tank

* No established analysis requirements

4.3 RAW WATER SYSTEMS

A. River Water

B. Cooling Water Chlorinator

C. Circulating Water Chlorinator

D. Makeup Demin. Neutralizing Tank

E. River Water Discharge

F. Main Condenser Circulating Water (Excluding Water Treatment)

G. Sewage Treatment Plant

4.4 POTABLE WATER

A. Domestic Water

*B. Softened Water

* No established analysis requirements

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5. WASTE SYSTEMS

5.1 LIQUID WASTE SYSTEM

- A. Miscellaneous Waste Storage Tank
- B. Laundry Waste Storage Tank
- *C. Concentrated Waste Storage Tank
- D. Evaporator Condensate Demineralizer Effluent
- E. Evaporator Bottoms
- F. Waste Evaporator Feed
- G. Rad Waste Demineralizers
- *H. Neutralizing Feed Tank
- *I. Neutralizing Mix Tank
- *J. Neutralizing Storage Tank

* No established analysis requirements

5.2 GASEOUS WASTE SYSTEMS

- *A. Waste Gas Decay Tanks

* No established analysis requirements

Analysis	Frequency	Limits	Desirable	Remarks
pH	5/W	4.8 - 8.5	Hot Calculated > Neutral	Can show Need for other analyses
Cond, umho/cm	5/W	I		Can show need for other analyses
Cl ⁻ , ppm	5/W*	0.100, 0.150*	<0.02	
F ⁻ , ppm	5/W*	0.100*	<0.02	
N ₂ H ₄ , ppm	R ¹	0.1-1.0 (Hot Shut- down if H ₂ not in spec.	-----	Must not be added during power operation
Crud, ppb	W		<100 ppb	
B, ppm	5/W, 2/W*	0-2285		Also after deliberate change in Conc
Li, ppm	5/W	0.5 - 2.1		
Pb, ppb	W	< 1.0	Not Detectable	
H ₂ , cc/l H ₂ O	3/W	15-40	30-40	Should be allowed to drop to ~16 prior to sched. shut down.
Radio Iodine, uCi/ml	W*2	I		Fuel pin leakage monitoring
Gamma Scan, uCi/ml	W*, M*	I		Used in complete Radiochemi- cal Analysis *
$\bar{E}$	2/Y*	Total Activity <130/ $\bar{E}$ uCi/ml		Necessary for $\bar{E}$ calculation
Gross By, uCi/ml	5/W*	I		15 min. degassed
Tritium, uCi/ml	W, M*	I		Used in complete Radio- chemical Analysis
Gross α , uCi/ml	6/Y	I		Should not be detectable
Dissolved Oxygen, ppb	5/W	100*	<5	
Total Gas cc/l	W	<100		

1* Daily if H₂ not in spec during hot shutdown2 Performed when power level changes greater 9.0
than 15%/Hr.

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Analysis	Frequency	Limits	Desirable	Remarks
Sr ⁸⁹ - Sr ⁹⁰ , uCi/ml	M*	I		Used in Radiochem Analysis

1.1.B

DH COOLER OUTLET - COLD SHUTDOWN (CE-119)

pH	5/W	4.8 - 8.5		Can show need for other analyses
Cond, umho/cm	5/W	I		Can show need for other analyses
Cl ⁻ , ppm	5/W	0.100, 0.150*	< 0.02	Tech Spec. applies when TAVG >200°F.
F ⁻ , ppm	5/W	0.100*	< 0.02	Tech Spec. applies when TAVG >200°F
N ₂ H ₄ , ppm	5/W	0.1 - 1.0		
B, ppm	2/W*	0-2285		Also after deliberate change in conc
Pb, ppb	W	<1.0	Not detectable	
Gamma Scan, uCi/ml	W, M*	I		Can show migration of corrosion & Act. Prod. Is used in Radiochem Analysis
$\bar{E}$	2/Y*	Total Activity <130/ $\bar{E}$ uCi/ml		Necessary for $\bar{E}$ calculation
Gross B _γ , uCi/ml	5/W	I		15 min degassed
Tritium, uCi/ml	W, M*	I		Tech Spec. applies when TAVG >200°F
Gross α, uCi/ml	6/Y	I		should not be detectable
Sr ⁸⁹ , Sr ⁹⁰ , uCi/ml	M	I		

1.1.C

PRESS H₂O SPACE

Analysis	Frequency	Limits	Desirable	Remarks
pH	R	4.8 - 8.5		
Cond, umho/cm	R	I		
Cl ⁻ , ppm	R	0.100, 0.120*		Should be = to RC letdown
F ⁻ , ppm	R	0.100*		Should be = to RC letdown
B, ppm	R	0-2285		Check for conc of B in Press
Dissolved Oxygen, ppb	R	I		Check for O ₂ buildup

1.1.D

PRESS STEAM SPACE - POWER OPERATION (CE-106)

Gamma Scan, uCi/ml	R	I		Can show need for degassing press
Gaseous H ₂ & O ₂ , %	R	I		Can give warning of "hard bubble"

1.2.A PURIFICATION DEMIN OUT - POWER OPERATION & HOT SHUTDOWN (CE-123)

Cl ⁻ , ppm	R	I	<0.02	Can show need for Resin replacement
F ⁻ , ppm	R	I	<0.02	Can show need for Resin replacement
Li, ppm	W	I		Can show need for Resin replacement

1.2.A (cond't) PURIFICATION DEMIN OUT - POWER OPERATION & HOT SHUTDOWN (CE-123)

Analysis	Frequency	Limits	Desirable	Remarks
Gamma Scan, uCi/ml	R	I		
Gross By, uCi/ml	W	I		Compare with RC Letdown Gross By to determine Demin DF.
Boron, (ppm)	R	I		Determines Boron saturation

1.2.B

MU TANK LIQUID - OPERATION & HOT SHUTDOWN

(CE-120)

Li, ppm	R	I		
Dissolved Oxygen, ppb	R	I		
B (ppm)	R	I		
Crud (ppm)	W	<0.1		

1.2.C

MU TANK GAS - POWER OPERATION & HOT SHUTDOWN

(CE-120)

Gamma Scan, uCi/ml	W	I		Can indicate need for degassing RC System
Gaseous H ₂ & O ₂ , %	W	I		Prevents buildup of explosive mixture in MU Tank

Analysis	Frequency	Limits	Desirable	Remarks
pH	R	4.8 - 8.5		
Cond, umho/cm	R	I		
Cl ⁻ , ppm	R	<0.100		
F ⁻ , ppm	R	<0.100		
Crude, ppb	R	<0.100		
B, ppm	R	0-2205		
Li, ppm	R	I		
Gross By, uCi/ml	R	I		
Tritium, uCi/ml	R	I		
Dissolved Oxygen, ppb	R	<0.100		

1.2.E

DEBOR DEMIN IN & OUT

(CE-126 & CE-124)

B, ppm	R	I		Detects Resin Exhaustion

Analysis	Frequency	Limits	Desirable	Remarks
pH	M	4.5 - 8.5		
Cond, umho/cm	M	I		
Cl ⁻ , ppm	M	<0.100		Must be same quality as SF pool water for refueling
F ⁻ , ppm	M	<0.100		Must be same quality as SF pool water for refueling
B, ppm	W or * After MU	>2270*		Must be same quality as SF pool water for refueling
Gamma Scan, uCi/ml	R	I		
Gross BY, uCi/ml	M	I		Personnel exposure
Tritium, uCi/ml	M	I		Personnel exposure
Turbidity, Visual	M	Clear		Same as SF pool

1.3.B

CORE FLOOD TANKS

(CE-121 & CE-122)

pH	M	I		
Cond, umho/cm	M	I		
Cl ⁻ , ppm	M	I	<0.100	Potential RC System contaminant
F ⁻ , ppm	M	I	<0.100	Potential RC System contaminant
B, ppm	M or * after MU	>2270*	2300-2350	

Analysis	Frequency	Limits	Desirable	Remarks
Gross Bv, uCi/ml	M	I		Check valve leakage monitoring
Tritium, uCi/ml	R	I		Check valve leakage monitoring

1.3.C

SODIUM THIOSULFATE TANK

pH	Q*	9.0 - 10.0	~9.5	
E, ppm	Q*	I	1750	
Na ₂ S ₂ O ₃ , W%	Q*	Nominal 30*		Also after each makeup *

1.3.D

SODIUM HYDROXIDE TANK

Na OH, W%	Q*	Nominal 20*	20-22	Also after each Makeup*

1.3.E,F

RECLAIMED WATER STORAGE TANK

Revision 3

1800.2

11/10/76

Analysis	Frequency	Limits	Desirable	Remarks
Cl ⁻ , ppm	R	I		Determines suitability for re-use
F ⁻ , ppm	R	I		Determines Suitability -
B, ppm	R	I		See Tech Specs. for required soluble poison inventory
Gross Br, μ Ci/ml	R	I		Determine suitability for re-use
Tritium	R	I		Determine suitability for re-use.

1.3.G,H

B.A. MIX TANKS AND RECLAIMED BORIC ACID TANK

B, ppm	2/W*	I*		See tech specs for required soluble poison inventory
Gross B- γ μ Ci/ml	R	I		Determine suitability
F ⁻	R	I		Determine suitability
Cl ⁻	R	I		Determine suitability

1.3.I

SPENT FUEL POOLS

pH	M	4.5 - 8.5		
Cond, μ mo/cm ³	M	I		
Cl ⁻ , ppm	M, W ²	<0.100		
F ⁻ , ppm	M, W ²	<0.100		
N ₂ H ₄ , ppm	R	I		During refueling
B, ppm	M or * After MU	>2270	2300 - 2350	

Analysis	Frequency	Limits	Desirable	Remarks
Li, ppm	R	I		
Gamma Scan, uCi/ml	R	I		
Gross By, uCi/ml	M, W ²	I		Of concern due to personnel exposure near pool
Tritium, uCi/ml	M, W ¹	I		Necessary to calculate airborne tritium levels
Turbidity, (Visual)	M, W ¹	I		Necessary for observation of refueling operations.
	¹ refueling			
	² demin not in service			

2.1.A

MAIN & AUX CONDENSERS

(CE-19 thru 37 CE-53 & 54)

pH	R	I		Check for tube leaks
Cond. umho/cm	R	I		Check for tube leaks
Cl ⁻ , ppb	R	I		Check for tube leaks
Na, ppb	R	I		Check for tube leaks
SiO ₂ , ppb	R	I		Check for tube leaks
Cat Cond. (umho/cm)	C	I	<0.5	Check for Tube leaks

Analysis	Frequency	Limits	Desirable	Remarks
pH	W	I		
Cond, umho/cm	W	I		Indication of condenser tube leakage
Cl ⁻ , ppb	W	I		Indication of condenser tube leakage
Cation Cond, umho/cm	C	<1.0		Indication of condenser tube leakage
Fe, ppb	W	I		
Na, ppb	C	I		Indication of condenser tube leakage
SiO ₂ , ppb	W	I		Indication of condenser tube leakage
Dissolved Oxygen (ppb)	W		<20	

2.1.C

POWDEX EFFLUENT

(CE-4)

Cat. Cond, umho/cm	C	<0.5	<0.100	
Cl ⁻ , ppb	W	I	<20	
Fe, ppb	W	I	<5	
Na, ppb	W	I	<10	
SiO ₂ , ppb	W	I	<5	

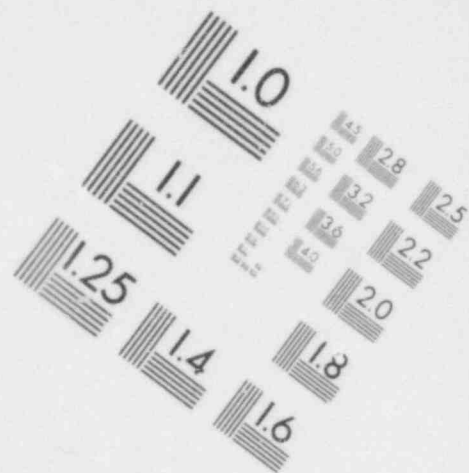
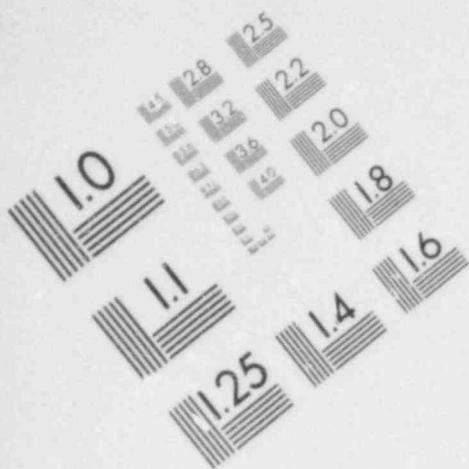
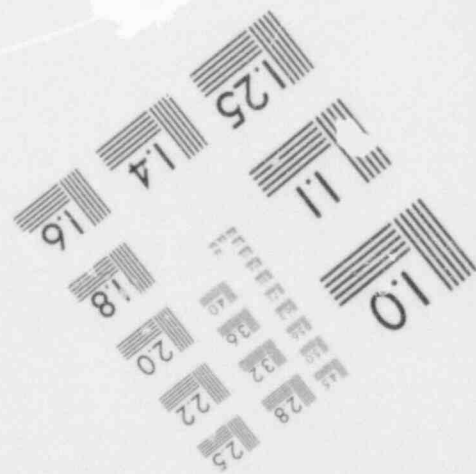
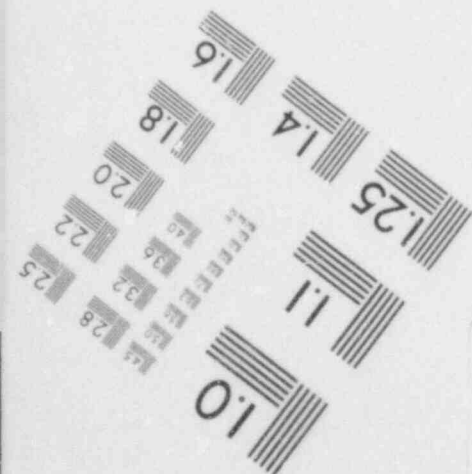
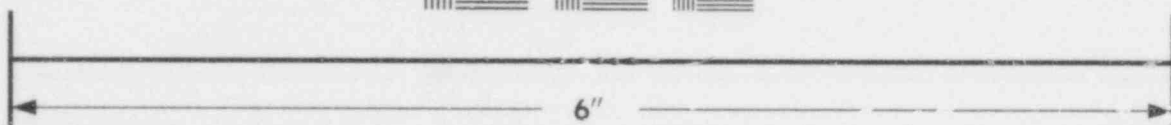


IMAGE EVALUATION
TEST TARGET (MT-3)



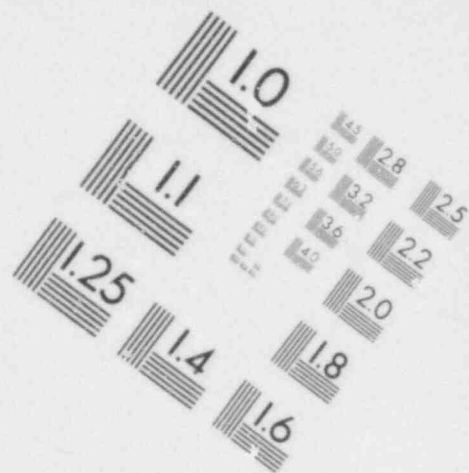
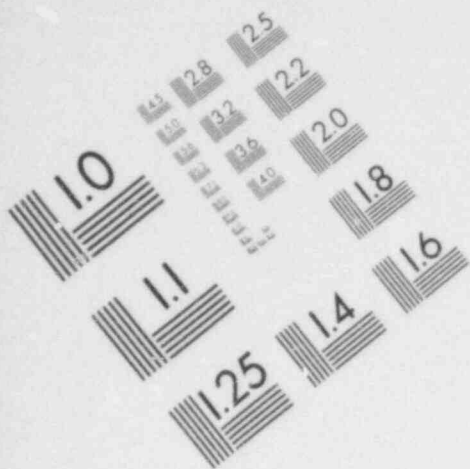
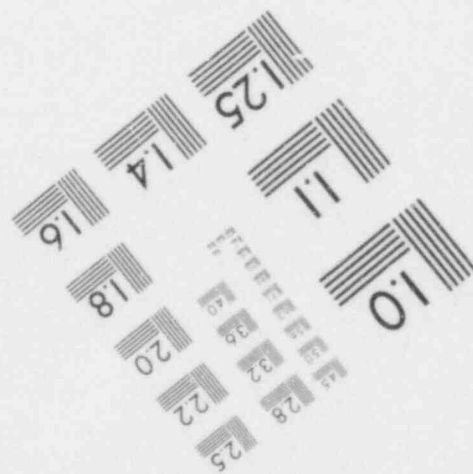
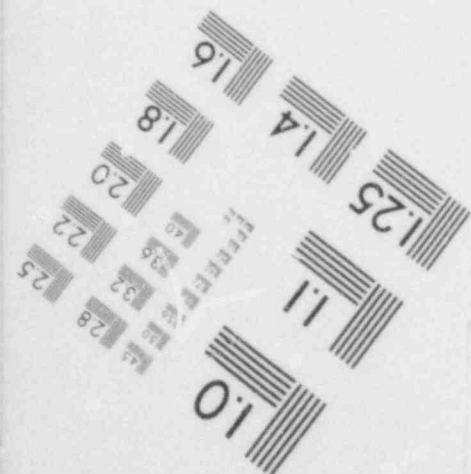
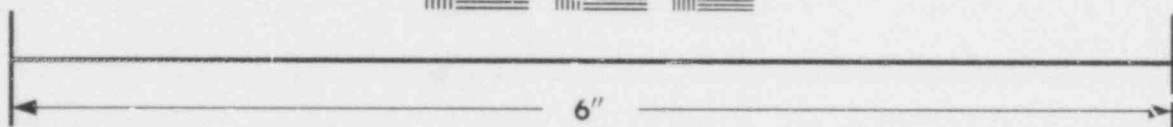


IMAGE EVALUATION TEST TARGET (MT-3)



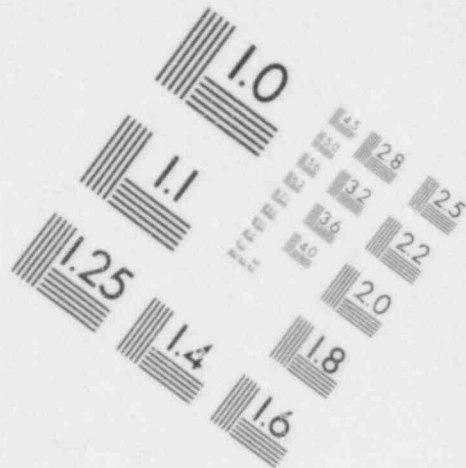
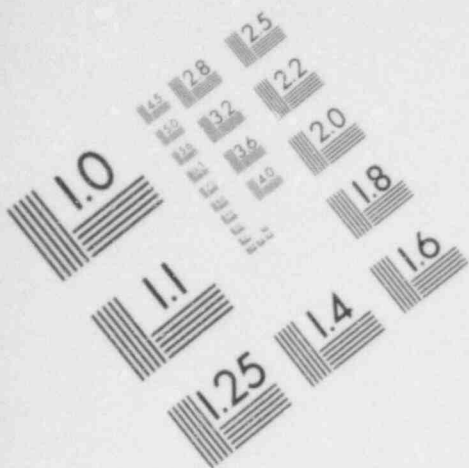
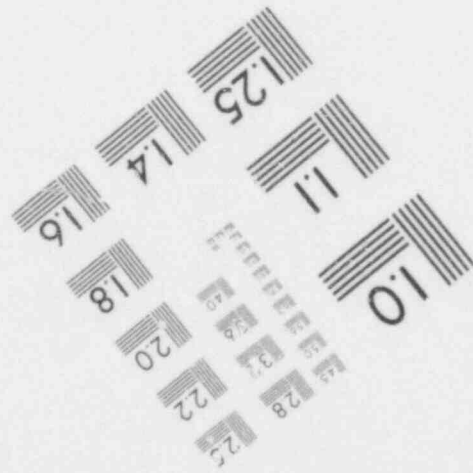
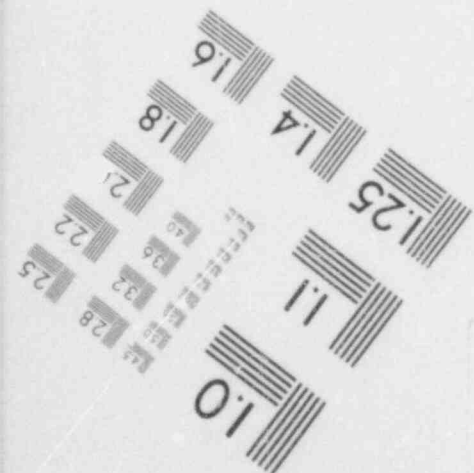
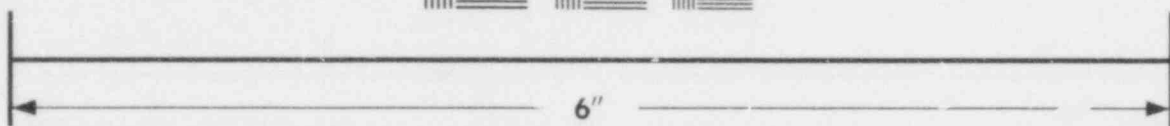


IMAGE EVALUATION TEST TARGET (MT-3)



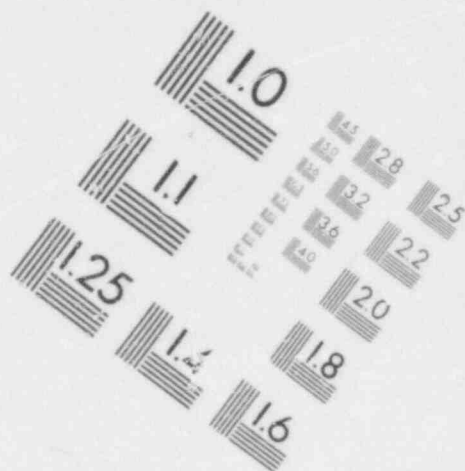
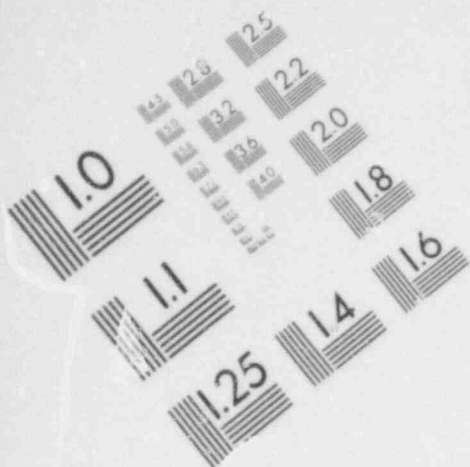
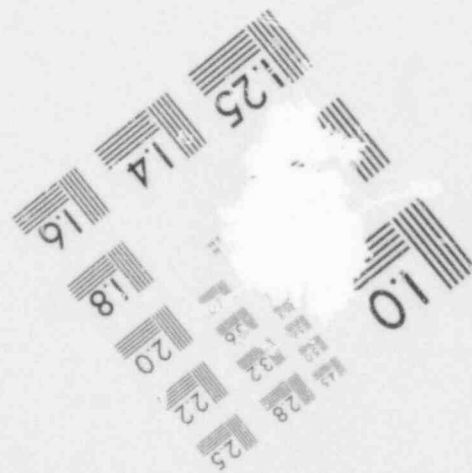
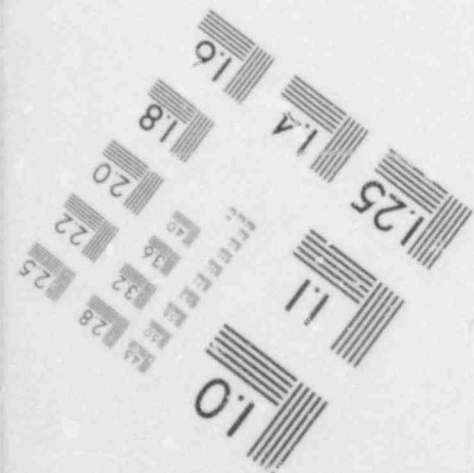


IMAGE EVALUATION
TEST TARGET (MT-3)



Analysis	Frequency	Limits	Desirable	Remarks
Cond, umho/cm	C	I	5.7 - 8.4	Check on ammonia feed system
NH ₃ , ppb	W	0.7 - 1.5		Sufficient to adjust pH to 9.3-9.5
N ₂ H ₄ , ppb	C	20-100		300% of O ₂ Value
Dissolved Oxygen (ppb)	C		<7	

pH	C	9.3 - 9.5		
Cation Cond, umho/cm	C	<0.5		
NH ₃ , ppb	R	I		
N ₂ H ₄ , ppb	D	20-100		300 % of O ₂ Value
Fe, ppb	D	10		
Cu, ppb	W	2		
Na, ppb	C		<20	
SiO ₂ , ppb	D	< 20		
Dissolved Oxygen, ppb	D,C	< 7		
F ⁻	W	I		
Cl ⁻ , ppb	W	I		
Pb, ppb	W	0.0		

Analysis	Frequency	Limits	Desirable	Remarks
pH	W	I	9.3 - 9.5	
Cat. Cond, umho/cm	W	I		
N ₂ H ₄ , ppb	W	I	Slight residual	
Fe, ppb	Q	I	<20	Indication of failure of epoxy lining
Dissolved Oxygen, ppb	W	I		Should be run if no hydrazine present

2.2.A

STEAM GEN. SHELL SIDE - WET LAYUP

(CE-8 & CE-9)

pH	D ¹	9.5 - 10.5		
Cat. Cond, umho/cm	D ¹	<10		
Cl ⁻ , ppm	D ¹	<1.0		
NH ₃ , ppm	D ¹	2-20		
N ₂ H ₄ , ppm	D ¹	<50	~200	
Na, ppm	D ¹	<1.0		
1. Frequency reduced to weekly after chemistry stabilizes				

Analysis	Frequency	Limits	Desirable	Remarks
pH	3/D	I		
Cation Cond, umho/cm	3/D	<10.0		
Cl ⁻ , ppm	3/D	<1.0		
Na, ppm	3/D	<2.0		Daily at less than 15% power
Gross B _Y , uCi/ml	W*	<2.0 x10 ⁻⁸ *		RCS >300 psig or Tav >200°F only*
Radio-Iodine, uCi/ml	R ¹	I		
1. Performed when gross b _y increase by a factor of 2 above background and each 10% increase thereafter.				

2.3.A

MAIN STEAM

(CE-15 & CE-16)

pH	W	I		
Cation Cond, umho/cm	W	I		
Na, ppb	W	I		Check on SG carryover
SiO ₂ , ppb	W	I		Check on SG carryover
Tritium $\frac{\mu\text{Ci}}{\text{cc}}$	W	I		

2.3.B

MOISTURE SEPARATOR DRAINS

11/10/76

180.2
Revision 3
(CE-13 A, B, C, D, E, F)

Analysis	Frequency	Limits	Desirable	Remarks
pH	R	I		
Cation Cond, umho/cm	C	I		
Fe, ppb	R	I		
Dissolved Oxygen, ppb	R	I		
Na, ppm	R	I		
Silica ppm	R	I		

2.3.C

6TH STAGE DRAINS TANK

(CE-12)

pH	W	I	9.3 - 9.5	
Cation Cond, umho/cm	C	I		
Fe, ppb	W	I		
Na	W	I		
SiO ₂	W	I		

2.3.D

H.P. HEATER DRAINS 2ND STAGE

(CE-10 & CE-11)

pH	W	I	9.3 - 9.5	
Cation Cond, umho/cm	W	I		
NH ₃ , ppb	W	I		

22.0

204 004

Analysis	Frequency	Limits	Desirable	Remarks
Fe, ppb	W	I		Indication of erosion on HP heater tubes
Na, ppb	R	I		

3.1.A

INTERMEDIATE COOLING CLOSED

pH	W	8.7-9.0		
Cond, umho/cm	W	I		
Cl ⁻ , ppm	W	<1.0		
F ⁻ , ppm	W	<1.0		
N ₂ H ₄ , ppm	W	300% Dissolved Oxygen Content		
Gross B ₇ , uCi/ml	W	I		
Tritium, uCi/ml	R	I		
Morpholine ppm	R	I		
Dissolved Oxygen	W	I		
Ammonia (ppm)	W	0.1 -3.		

3.1.B

NUCLEAR SERVICES CLOSED

pH	W	8.7 - 9.0		
Cond, umho/cm	W	I		

Analysis	Frequency	ts	Desirable	Remarks
Cl ⁻ , ppm	W	<1.0		
F ⁻ , ppm	W	<1.0		
N ₂ H ₄ , ppm	W	300% Dissolved Oxygen Content		
Gross By, uCi/ml	W	I		
Tritium, uCi/ml	R	I		
Morpholine ppm	R	I		

3.1.C

SECONDARY SERVICES CLOSED

pH	W	8.7 - 9.0		
Cond, umho/cm	W	I		
N ₂ H ₄ , ppb	W	300% Dissolved Content		
Fe, ppb	W	I		Indication of effectiveness of corrosion inhibitor.
Morpholine ppm	R	I		

Analysis	Frequency	Limits	Desirable	Remarks
pH	W	8.7-9.5		
Cond, umho/cm	W	I		
Cl ⁻ , ppm	W	<1.0		
F ⁻ , ppm	W	<1.0		
N ₂ H ₄ , ppm	W	300% Dissolved Oxygen Content		
Gross By, uCi/ml	W	I		
Tritium, uCi/ml	R	I		
Morpholine ppm	W	I		

3.1.E

CHILLED WATER CLOSED SYSTEMS

pH	M	I		
Cond, umho/cm	M	I		
Fe, ppb	Q	I		Indication of effectiveness of corrosion inhibitor
Corrosion Inhibitor, ppm	M	I		

Analysis	Frequency	Limits	Desirable	Remarks
pH	M	I		
Cond, umho/cm	M	I		
Corrosion Inhibitor, ppm	M	>1500	1500-2500	Drewguard

3.1.G

STATOR COOLING SYSTEM

pH	W	I		
Cond, umho/cm	W	< 9.9	<0.5	Shows need for Resin Replacement
NH ₃ , ppb	M	I		Can show resin degradation
Cu, ppl	M	I		Can show erosion of conductors

3.2.A

AUX. BOILER FEEDWATER

pH	D ¹	8.7 min.	9.3 - 9.5	
Cond, umho/cm	D ¹	1 max.	0.5 max	Cation Cond
Cl ⁻ , ppb	D ¹	I	100 max	
NH ₃ , ppb	D ¹	I	700 - 1700	
N ₂ H ₄ , ppb	D ¹	20 min.	20 - 100	

Analysis	Frequency	Limits	Desirable	Remarks
Na, ppb	D ¹	I	200 max	
SiO ₂ , ppb	D ¹	500 max	20 max	

3.2.B

AUX BOILER BLOWDOWN

pH	D ¹	8.5 min	8.7 min	
Cond, umho/cm	D ¹	10 max	6 max	Cation Cond.
Cl ⁻ , ppb	D ¹	I	1000 max	
Na, ppb	D ¹	I	2000 max	
SiO ₂ , ppb	D ¹	I	2000 max	

3.2.C

AUX. BOILERS STEAM

pH	D ¹	8.7 min	9.3 - 9.5	
Cond, umho/cm	D ¹	I	<0.5	Cation Cond.

4.1.A

CLARIFIER EFFLUENT

Analysis	Frequency	Limits	Desirable	Remarks
pH	3/W	I		Will vary with river pH
Cond, umho/cm	3/W	I		
Turbidity, JTU	3/W	<5.0		Indication of need to change chem. feed
Free Chlorine, ppm	3/W	I	0.5 - 1.0	Insures oxidation of Fe and Mn

4.2.A

CARBON FILTER EFFLUENT

Free Chlorine, ppm	W	0.0		Indicates need for steaming or replacement

4.2.F

CYCLE MAKE-UP DEMINERALIZER EFFLUENT

(CE-1)

pH	W**	6.0 - 8.0		
cond, umho/cm	W**	I	<0.100	
Cl ⁻ , ppb	W**	100	<20	
F ⁻ , ppb	W**	100	<20	
Pb, ppb	W**	<1		
Cu, ppb	W**	<2		
Na, ppb	W**	I		
** Sampled when demin. is in service.				

4.2.F (cont'd) CYCLE MAKE-UP DEMINERALIZER EFFLUENT

1800.2
Revision 3 11/10/76
(CE-1)

Analysis	Frequency	Limits	Desirable	Remarks
SiO ₂ , ppb	W**	20	<5	
Dissolved Oxygen, ppb	W**	<100		
** Sampled when demin. is in service.				

4.2.G

DEMIN. WATER STORAGE TANKS

pH	W	I	6.0 - 8.0	Cond. tanks will follow pH of cond. system
Cond, umho/cm	W	I	<0.5	
Cl ⁻ , ppb	W	I	<20	
F ⁻ , ppb	W	I	<20	
Fe, ppb	M	I	<100	
Na, ppb	R	I		After each mixed bed regen.

4.3.A

RIVER WATER

pH	3/W	I		Used for determining pretreatment chem feed
Cond, umho/cm	3/W	I		Used for determining pretreatment chem feed
Cl ⁻ , ppm	R	I		

204 011

Analysis	Frequency	Limits	Desirable	Remarks
Fe, ppb	W	I		In conjunction with discharge iron sample
Na, ppb	R	I		
Turbidity, JTU	3/W	I		Used for determining pretreatment chem feed
Hardness, ppm	W	I		
Suspended Solids (ppm)	R	I		
Dissolved Solids (ppm)	R	I		

4.3.D

MAKE-UP DEMIN. NEUTRALIZING TANK

pH	R* or before each dump	6.0 - 9.0*		
Fe, ppm	R or before each dump	I		
(ppm) Dissolved Solids	R or before each dump	I		
Total Solids, (ppm)	R or before each dump	I		
Suspended Solids (ppm)	R or before each dump	I		

4.3.E

RIVER WATER DISCHARGE

pH	W ¹ *	6.0 - 9.0*		204 012
Cond, umho/cm	W ¹	I		
Fe, ppm	W ¹	7.0		Industrial Waste Permit

Analysis	Frequency	Limits	Desirable	Remarks
Total Chlorine, ppm	C 2*	0.2 max total * <0.1 max free *		10, 30 & 50 min after start of chlorination
Suspended Solids ppm	W ¹ *	560 *		
Dissolved Solids ppm	W ¹ *	700 *		monthly average <500
Alkalinity, ppm as CaCO ₃	W ¹	I	<100 ppm as CaCO ₃	
1. Also during each neut. regen. waste discharge 2. Daily when monitor is out of service				

4.3.F

MAIN CONDENSER CIRCULATING WATER

pH	W	I	6.5 - 7.0	Depends on Langelier Index
Cond, umho/cm	W	I		Indication of number of conc. cycles
Na, ppb	R	I		Indication of number of conc. cycles
Free Chlorine, ppm	C ¹ *	1 max *	0.5 - 1.0	Measured during chlorination cycle at the blowdown at 10, 30 and 50 minutes after the beginning of the cycle
Langelier Index	W	-0.5 <SI <0.5		
1. Required daily when chlorine monitor is not in service.				

204 013

4.3.G SEWAGE TREATMENT PLANT

Analysis	Frequency	Limits	Desirable	Remarks
PH	W D	I 6.0-9.0		Raw Influent Final Effluent
Total Phosphorus, mg/l	W W	I 2-WA 4-DM		Raw Influent Final Effluent
Dissolved Oxygen, PPM	D D	I > 5-WA		Aeration Tanks Final Effluent
Settleable Solids, %	D D	I I		Aeration Tanks Primary Clarifier
Suspended Solids, mg/l	2/W W	I 30 - WA 60 - DM	1000-4500	Aeration Tanks Final Effluent (Composite-8 Hours)
Free Chlorine, PPM	2/W D	I I	1-2 1	Chlorine Contact Tk Final Effluent
B.O.D., mg/l	W W	I 30-WA 60-DM	150-400	Raw Influent Final Effluent (Composite-8 Hours) Plant Must Reduce BOD By 85%
Turbidity, NTU	D	I		Secondary Clarifier
Total Solids, mg/l	W	I		Aerobic Digester
Fecal Coliform	W	200/100 ml-MA 400/100 ml-MA		Final Effluent

204 014

4.4.A

POTABLE WATER

Revision 3

1800.2

11/10/76

Analysis	Frequency	Limits	Desirable	Remarks
pH	W	I		
Cond, umho/cm	W	I		
Hardness, ppm	W	I		Hot water only
Free Chlorine, ppm	W	>0.2	0.2 - 0.5	
Bacteria count	W	Free of coliform Bacteria		Count made by Certified off-site lab

5.1.A

MISC. WASTE STG. TANK

(CF-131)

pH	W	I		Used in determining treatment
Cond, umho/cm	W	I		Used in determining treatment
Gamma Scan	X	I		
Gross By, uCi/ml	W	I		Used in determining treatment
Total Solids, (ppm)	W	I		Used in determining treatment
Boron, ppm	W	I		

5.1.B

LAUNDRY WASTE STORAGE TANK

(CF-135)

pH	W	I		Used in determining treatment
Cond, umho/cm	W	I		Used in determining treatment

Analysis	Frequency	Limits	Desirable	Remarks
Gamma Scan	R	I		
Gross By, uCi/ml	W	I	$<1.0 \times 10^{-7}$ $\frac{\mu\text{Ci}}{\text{ml}}$	Used in determining treatment
Tritium, uCi/ml	W	I		Used in determining treatment
Total * Solids, (ppm)	W	I		Used in determining treatment
Boron (ppm)	W	I	<25	

5.1.D

WASTE EVAPORATOR CONDENSATE STORAGE TANK

pH	R	I	6.0 - 9.0	Show suitability for recycle. Can also show need for resin replacement
Cond, umho/cm	R	I		" " "
Cl ⁻ , ppm	R	I		" " "
F ⁻ , ppm	R	I		" " "
B, ppm	R	I	<25 ppm	" " "
Gross By, uCi/ml	R	I		" " "
Tritium	R	I		Limits as expressed in HPP 1621
Gamma Scan ($\frac{\mu\text{Ci}}{\text{ml}}$)	R	I		Limits as expressed in HPP 1621