

76

1-10-11 LPI WQP
 Reagents: 100.0°
 STD: 100.0°
 Resin: 70.0°

1-11-11 Installed new electrodes Unit 3 MAIN steam Nat Analyzer
 - Calibrated U3 MAIN steam Nat
 Slope = 57.0
 E₀ = -53.7

1-12-11 Calibrated U3 Boiler Nat Analyzer Slope = 87%
 Calibrated U3 CPD Nat Analyzer Slope = 110%

1-13-11 - Replaced Rof. Electrode U2 main steam Nat Analyzer
 - Calibrated U2 MAIN steam Nat Analyzer
 Slope = 49.1
 E₀ = -72.4

1-14-11 Changed reagents for U-2 CPD silica analyzer

1-18-11 New STD U3 CPD Silica Analyzer
 LPI WQP check
 Reagents 8V STD 90 Resin 50

1-19-11 CALIBRATED Demin Nat Analyzer
 Slope = 57.9
 E₀ = -22.3
 - New DIPA

1-25-11 New Reagents U3 Boiler SiO₂ Analyzer
 - New Resin U3 CPD CAT COND Analyzer
 LPI WQP check
 Resin = 100 STD 80% Reagents = 79%

Wold 000392

	1-26-11	- New Resin U2 Econ, CPD, 21, 22 gal, MAIN steam cation cond. Analyzers
		- Cleaned Stainless Steel Filter at LPI
		- New Silica Std Demin SiO ₂ Analyzer
Analyzer		- Calibrated U1 main steam Nat Analyzer Slope 59.2 E ₀ -52.3
	1-27-11	Calibrated U2 main steam Nat Analyzer Slope 59.0 E ₀ -44.1
	1-28-11	New Reagents U1 Boiler SiO ₂ analyzer " " Demin " Analyzer
	2-3-11	New Resin U3 Boiler CAT, COND. Analyzer LPI WRP check Resin 50% STD 7070 Reagent = 62%
	2-8-11	New SiO ₂ STD's U1 CPD, U2 Boiler
	2-10-11	- Replaced Resin U3 Econ Inlet Cat Cond. Analyzer - New Reagents + STD's U2 CPD SiO ₂ analyzer
	2-15-11	Calibrated U3 main steam Nat Analyzer - Slope 59.5 E ₀ = -46.5
		New Resin U3 main steam + 31 gal cat cond. Analyzers
	2-17-11	Calibrated Demin Nat Analyzer Slope = 59.0 E ₀ -20.9

78

2-17-11 LPI WQP check
Resin 75 STD-60 Reagents 27

2-21-11 - Replaced reagents @ LPI WQP. SiO_2 analyzer
Resin 50% STD 50 Reagent - 100
- New SiO_2 STD U1 Boiler SiO_2 analyzer

2-22-11 New pH electrodes LPI @ Sherco pH analyzer

3-1-11 New Resin U2 BLR + Eon CAT COND Analyzers

3-2-11 LPI WQP check
Resin 100% Reagent 96% STD 30%

3-8-11 Calibrated U1 + U2 MAIN Steam Nat Analyzers
U1 Slope 59.3 U2 Slope 58.8
 E_0 -54.0 E_0 -44.6

3-9-11 - Calibrated U3 Nat Analyzers: Boiler Slope 88
CPD Slope 110
- new Reagents U3 ^{CPD} Boiler SiO_2 analyzer

3-10-11 - Replaced U3 Boiler SiO_2 Reagents

3-10-11 *LPI WQP check
Resin 60 Reagent 73 STD 20
- Calibrated Nat Analyzers
U1 Boiler 99% U2 BLR 93%
U1 CPD 114% U2 CPD 106%

3-15-11 LPI WQP ✓
 SiO_2 reaq → 65% Std → 10% Resin → 45%

Wold 000394

3-17-11	- New Resin U1 Econ CAT COND Analyzer - New Reagents Demin SiO ₂ analyzer - Calibrated U3 MAIN Steam Nat Analyzer Slope = 59.3 Slope = -43.8
3-18-11	LPI WRP check Resin 100% Reagent 65% STD 10%
3-22-11	Calibrated Demin Nat Analyzer Slope 58.3 E ₀ -19.2
3-24-11	New Resin U1 CPD + Econ CAT COND. Analyzers New STD @ LPI SiO ₂ Analyzer Reagent = 55% STD 100 Resin 70%
3-30-11	New Resin U1 + U2 MAIN Steam CAT COND Analyzers - New Reagents U2 CPD SiO ₂ Analyzer
3-31-11	New Resin LPI WRP
4-1-11	New SiO ₂ STD U3 CPD + U1 CPD New Resin 12 pol CAT COND Analyzer
4-4-11	Unit 2 Econ. In. Cation Cond- resin replaced.
4-5-11	Sherco LPI Silica Analyzer New: tubing module Molybdate 3 solenoid valve upper tubing Sample cell cover assembly Reagents & std Calibrated → 518 ppb

80

4-7-11 Replaced cation resin in Unit 3 Polisher 31

4-8-11 Cleaned filter @ LPI WRP
 Back in service after an outage 4-4 thru 4-7
 All is back to normal - over there and @ Sherco.
 Resin \rightarrow 70% SiO_2 reagent \rightarrow 32% std \rightarrow 80%
 Spec Cond. @ Sherco was in alarm reading $> 20 \mu\text{S}$.
 I&C had calibrated everything yesterday. Meter
 was left one decimal point off.

Cleaned samples cells on SiO_2 analyzers: Unit 1 & 2 Boilers

4-11-11 LPI WRP \checkmark
 Replaced SiO_2 reagents: std \rightarrow 70%
 Resin \rightarrow 50%

4-12-11 New cation resin in Unit 2 Polisher 21

4-12-11 Unit 3 Sodium Analyzer Calibration

Sample	Slope	E_0
Boiler	84%	
CPD	111%	
M. Steam	59.1%	-45.4

4-13-11 Main Steam Sodium Analyzer Calibration

Unit	Slope	E_0
Unit 1	59.3	-53.4
Unit 2	57.4	-46.1

New cation resin in Unit 2 Polisher 22

4-14-11 Sodium Analyzer Calibrations

Unit 1		Unit 2	
Sample	Slope	Sample	Slope
Boiler	99%	Boiler	90%
CPD	110%	CPD	100%

81

4-15-11 LPI WQP ✓
GOOD! Reag → 94% Std → 70% RES → 35%

New cation resin for Sherco LPI WQP
" " " " " Unit 2 CPD

4-18-11 LPI WQP ✓
Good Reag → 91% Std → 60% RES → 25%

New cation resin for Unit 1 Econ. In.

4-19-11 LPI WQP - new cation resin

Unit 2 Boiler SiO_2 → new reagents & std.
" 1 CPD " → new std, only

Demin Sodium Analyzer Calibrated
Replaced: DIPA, tubing & O-rings
Calibrated → Slope = 59.2 $E_0 = -15.0$

4-20-11 Replaced cation resin for Unit 1 & 2 Boiler

4-27-11 New reagent for Unit 1 Boiler SiO_2
" " & std for Unit 2 CPD SiO_2
new " for Demin SiO_2

New resin for Unit 3 Boiler cation
Pol 33 "
Econ "

4-28-11 LPI WQP ✓
Good!
Levels: Reag. 72%
Std. 50%
Resin 60%

Wold 000397

82

5-2-11 New reagents in Unit 3 Boiler SiO₂ analyzer
 Cleaned Boiler pH pot → full of magnetite - Unit 3
 Replaced cation resin in Unit 1 Pol. 11
 Unit 2 Main Steam

5-3-11 LPI WQP ✓
 Good! Res → 62% Std → 40% Res → 40%

5-4-11 Replaced cation resin in Unit 1 Main Steam

5-6-11 New cation resin: Unit 1 Polisher 12
 LPI
 LPI WQP ✓
 Good!
 New resin (100%) SiO₂ reagent → 59% Std → 40%

New in-line filters on Unit 3 Blr & CPD Na⁺ analyzers

5-9-11 Replaced reagents in Unit 3 CPD SiO₂ analyzer.
 New cation resin for Unit 3: Boiler, Survey and MTC.

5-12-11 New reagents in Demin SiO₂ analyzer

5-13-11 Cleaned Demin SiO₂ analyzer: sample cell, cover assembly, stir bar, photo cell holder, o-rings.
 Replaced all upper tubing. Reading a neg. value.
 New Unit 2 Econ Inlet cation resin.

5-17-11 New cation resin: Unit 1 Econ & CPD
 Unit 2 Pol. 21 & 22

	5-19-11	Replaced interference filter in Demin SiO ₂ analyzer			
		Sodium Analyzer Calibration			
		<u>DATE</u>	<u>UNIT</u>	<u>SAMPLE</u>	<u>SLOPE</u>
		5-19-11	Unit 3	Main Steam	58.6
		"	"	Boiler	81%
		"	"	CPD	107%
		5-19-11		Demin	58.5
		5-20-11	Unit 1	Main Steam	57.8
		5-20-11	"	Boiler	100ppb
		5-23-11	"	CPD	100ppb
		5-23-11	Unit 2	Main Steam	58.4
		5-20-11	"	Boiler	100%
		5-20-11	"	CPD	100%
lyzers	5-19-11	New cation resin in Unit 2 CPD			
		LPI WQP ✓			
		Good! Rea- 40% Std- 20% Resin- 65%			
	5-20-11	Replaced reagents (only) in Unit 1 CPD SiO ₂ analyzer			
		New in-line filters for Unit 1 Boiler & CPD Na analyzer			
		New sodium analyzer installed & cal'd on Unit 1 Boiler			
IE.	5-23-11	New sodium analyzer installed & cal'd on Unit 1 CPD			
		New D.O. probe Unit One #55340			
	5-24-11	LPI WQP ✓			
		Good. Replaced cation resin-100% Rea>32% Std>30%			

84

5-24-11 Replaced reagents in Unit 2 CPD SiO₂ analyzer

5-27-11 Replaced SiO₂ reagents @ LPI
Resin → 95% Rea → 100% Std → 30%

5-31-11 New resin in Unit 1 & 2 M. Strm. Cation Col's.
Replaced ~~the~~ Sherco LPI SiO₂ reagents & stds
Unit 3 CPD SiO₂
"Unable to calibrate."
Checked reagents delivery - Good
Replaced sample cell
Checked interference filter - Good
Replaced reagents & std
Recalibrated → 497 ppb

6-3-11 LPI WAP ✓ - Good!
Resin → 60% Reag → 89% Std → 20%
New resin in Unit 1 Boiler cat. col.
Replaced reagent only in Unit 2 Boiler SiO₂ analyzer

6-7-11 New cation resin Unit 2: Boiler
Unit 1: Pol. 11
Replaced SiO₂ reagent in Unit 1 Boiler SiO₂ anal.
LPI WAP ✓
Good! Reag → 82% Std → 10% Resin → 40%
New SiO₂ std in Unit 3 Boiler SiO₂ anal.
Replaced cation resin Unit 3: Pol. 33
Econ In.

6-8-11	New cation resin Unit 3: Pol 31 & M. Steam
6-10-11	LPI WQP ✓ Good. New cation resin installed.
6-13-11	Replaced Unit 1 Pol. 12 cation resin.
6-15-11	Unit 3 Na Analyzer Calibrations: Main Steam Slope → 58.5 E_0 → -30.6 Boiler 82% CPD 100%
6-16-11	Demin Na^+ Analyzer Etched electrode & calibrated Slope → 57.9 E_0 → -12.8
6-17-11	Replaced cation resin Unit 2: Econ. In CPD New SiO_2 std @ LPI LPI WQP ✓ Good Resin: 80% Std: 100% Reag: 88% In need of an overhaul!
6-20-11	Changed reagents in Unit 2 CPD SiO_2 analyzer.
6-21-11	Unit 1 Main Steam Na^+ New DIWA & tubing Replaced fill sol'n for ref. elec. Etched Na elec. Calibrated: Slope → 58.5 E_0 → -55.3 Unit 2 Main Steam Na^+ Etched electrode & calibrated Slope: 57.3 E_0 : -50.2
6-22-11	LPI WQP ✓ Good! Reag → 57% Std → 90% Resin → 50%

86

6-23-11	Replaced cation resin: Unit 1 Survey Sherco LPI Cation
	Unit 2 Sodium Analyzers Calibrated Boiler Slope \rightarrow 92% CPD " \rightarrow 100%
6-24-11	New cation resin in Unit 1 Survey Unit 2 Pol 21 & 22
	Replaced interference filter in Unit 2 Boiler SiO ₂ analyzer
6-27-11	Replaced reagents in Unit 3 CPD SiO ₂ anal.
6-28-11	New cation resin for Unit 2 Main Steam.
6-30-11	LPI WQP \checkmark New cation resin. SiO ₂ : 47% - Reag Std - 80%
7-5-11	Replaced standard for U-2 Boiler silica
7-6-11	LPI WQP \checkmark Resin 65% Reagents - 34% Standard 70%
7-7-11	Changed resin in U-1 CPD cation column Changed standard for U-1 CPD silica U-2 CPD silica
7-11-11	Changed reagent for LPI Silica analyzer - LPI side Resin - 45% Reagents - 100% Standard - 70%

Wold 000402

87

7-12-11 Replaced the standard for U-3 CPD silica analyzer

7-13-11 Tried to calibrate U-3 Main Steam sodium analyzer.
 Ended up changing out measuring electrode & reference electrode,
 changed out standards and filling solution. Finally had to
 reset electronics.
 Slope = 57.7 $E_0 = -73.2$

Changed reagents in U-1 Boiler silica analyzer

7-14-11 Changed resin for U-3 CPD cation column
 U-3 sample survey column

Changed reagents for LPI silica analyzer (Shorro side)

Changed resin for LPI cation column (LPI side)

Resin - 100% Reagents - 94% Standard - 60%

Refilled PIPA bottles on U-1 Swan Na analyzer

7-18-11 Changed resin in U-1 Main Steam cation column
 #11 Polisher cation column
 #12 Polisher cation column.
 U-2 Economizer cation column.

Calibrated Demin Na^+ analyzer Slope = 55.2 $E_0 = -13.3$

Changed out reagents for U-2 Boiler silica analyzers

Changed out reagents for U-3 CPD silica analyzer

Wold 000403

88

7-20-11 Calibrated Unit 1 Sodium analyzers (Swan's)
 CPD = offset 120.6 mV slope 59.47 mV
 Boiler = offset 115.1 mV slope 58.71 mV

7-21-11 Calibrated Unit 1 Main Steam sodium analyzer
 slope = 59.4 $E_0 = -52.5$

Replaced air pump on Unit 2 Main Steam sodium analyzer
 Calibrated U-2 Main Steam sodium analyzer
 slope = 59.1 $E_0 = -39.1$

7-22-11 Changed resin in U-1 Boiler cation column.

Changed resin in U-2 Main Steam cation column

LPI WQP ✓

Resin - 60% Reagent - 81% Standard - 50%

Changed resin in U-2 Boiler cation column

Changed reagents in U-1 CPD silica analyzer

7-26-11 Changed resin in U-2 Survey cation column

Changed resin in U-2 CPD cation column

Changed reagents in U-2 CPD silica analyzer

Changed reagents in U-3 Boiler silica analyzer

Changed resin in #32 polisher cation column

7-28-11 LPI WQP ✓
Resin - 35% Reagents - 72% Standard - 40%

Changed resin in 21 Polisher cation column.
22 Polisher cation column.

7-29-11 Changed resin in LPI cation column (Sherco side)

8-3-11 Changed resin in LPI cation column (LPI side)

LPI WQP ✓
Resin - 100% Reagents - 62% Standard - 30%

Calibrated U-3 Boiler & CPD Na analyzers.
Boiler - 87%
CPD - 100%

8-5-11 New Swan Na⁺ analyzers installed for U-2

After calibration: CPD & offset = 125.00 slope = 61.77
Boiler & offset = 118.20 slope = 58.12

8-9-11 LPI WQP
Resin = 75%
Reagents = 50%
Std. = 30%

8-11-11 Replaced the standard for U-2 Boiler silica analyzer

Calibrated U-3 Main Steam sodium analyzer
slope = 59.4 E₀ = -63.9

8-12-11 Changed reagents in U-3 CPD silica analyzer.

90

8-16-11 Calibrated the Demineralizer sodium analyzer
slope = 58.8 $E_0 = -11.3$

LPI WQP ✓
Resin - 40% Reagents - 40% Standard - 20%

8-17-11 Changed resin in U-1 CPD cation column
U-1 Economizer cation column

8-18-11 Changed resin in U-2 Economizer cation column

Changed resin in LPI cation column (LPI side)
Changed reagents and standard in LPI silica analyzer (LPI side)

LPI WQP ✓
Resin - 100% Reagents - 100% Standard - 100%

Changed reagents in U-1 Boiler silica analyzer
U-2 CPD silica analyzer

8-23-11 Changed resin in U-1 Main Steam cation column

Calibrated U-1 Main Steam sodium analyzer
Slope = 58.6 $E_0 = -54.7$

Calibrated U-2 Main Steam sodium analyzer
Slope = 59.8 $E_0 = -37.5$

Changed resin in #21 Polisher cation column.

91

8-24-11 Changed standard in U-3 Boiler silica analyzer

LPI WAP ✓

Resin - 70% Reagents - 90% Standard - 90%

8-25-11 Changed resin in U-2 Main Steam cation column.

8-30-11 Changed resin in #11 Polisher cation column.

Changed resin in #12 Polisher cation column.

Changed resin in #22 Polisher cation column.

8-31-11 Calibrated U1 Na analyzers

Boiler - Offset = 115.30 Slope = 59.42

CPD - Offset = 127.22 Slope = 62.37

LPI WAP ✓

Resin 90% Reagents - 78% Standard - 80%

Changed reagents in U-2 Boiler silica analyzer

9-1-11 Changed reagents in U-3 Boiler silica analyzer

9-2-11 Changed reagents in U-1 CPD silica analyzer

9-6-11 Changed resin in U-2 CPD cation column.

U-2 Boiler cation column.

Changed resin in LPI cation column (LPI side)

LPI WAP ✓

Resin - 100% Reagents - 68% Standard - 70%

Wold 000407

92

- 9-7-11 Changed resin in LPI cation column (shecco side)
Changed reagents & standard for U-2 CPD silica analyzer
Changed standard for U-2 Boiler silica analyzer
Changed resin in #31 Polisher cation column
U-3 Main Steam cation column.
Calibrated U-2 Sodium analyzers
CPD - Offset = 121.31 Slope = 59.10
Boiler - Offset = 121.09 Slope = 59.25
Changed reagents for U-3 CPD silica analyzer
- 9-13-11 LPI WQP ✓
Resin - 70% Reagents - 57% Standard - 60%
- 9-14-11 Changed resin in U-2 Economizer cation column.
Calibrated the Demineralizer sodium analyzer
Slope = 55.8 $E_0 = -10.9$
- 9-20-11 LPI WQP ✓
Resin - 40% Reagents - 45% Standard - 50%
- 9-21-11 Calibrated U-1 Main Steam Na analyzer
Slope = 58.8 $E_0 = -54.4$
Calibrated U-2 Main Steam Na analyzer
Slope = 58.8 $E_0 = -40.9$
- 9-23-11 Changed reagents for U-1 Boiler silica analyzer

93

9-27-11 Changed resin in U-1 Economizer cation column
 U-1 Boiler cation column
 U-1 Main Steam cation column

Changed resin in LPI cation column (LPI side)

LPI WQP ✓

Resin - 100% Reagents - 34% Standard - 40%

Changed reagents and added more standard to
 Demin silica analyzer.

9-28-11 Flushed reagent lines of U-3 silica analyzers

Changed standard for U-3 CPD silica analyzer

Calibrated U-1 Na analyzers

Boiler - offset = 114.81 Slope = 58.70

CPD - offset = 118.36 Slope = 59.09

9-29-11 Changed resin in U-2 Main Steam cation column.

#21 Polisher cation column.

U-1 Sample Survey cation column.

U-2 Sample Survey cation column.

9-30-11 Changed reagents in U-2 CPD silica analyzer

10-5-11 LPI WQP

Resin = 70 %

Reagents = 100 %

STD = 30 %

94

10-17-11 Calibrated U-1 Sodium Analyzer
 CPD offset: 116.8 Slope: 58.6
 Boiler offset: 113.2 Slope: 58.3

Calibrated U-2 Na Analyzer
 CPD offset: 120.4 Slope: 58.7
 Boiler offset: 58.7 119.2 Slope: 58.5

10-17-11 LPI WQP
 Changed Resin & S_i Standards
 Resin = 100%
 Reagents = 78%
 STD = 100%

10-18-11 Calibrated Demin Na Analyzer
 Slope = 55.0 E₀ = -4.5

10-24-11 LPI WQP
 Resin: 75%
 Reagents: 70%
 STD: 90%

10-31-11 Rebuilt U-3 CPD Silica Analyzer
 AXH New-solvent module
 - Lamp
 - Interference filter
 - Reagent + STD Filters
 - Flow Cell
 - Flow Cell cap
 - All New Tubing

11-3-11 LPI WQP
 AXH Resin = 50
 STD = 80
 Resin = 35

95

11-3-11 AKH	Rebuttal U-3 Boiler Silica Analyzer NEW - Solvent module - Lamp - Interference Filter - Reagent & STD. filters - Flow Cell - Flow Cell Car - All new tubing - NEW #2 & #3 Solenoids
11/7/11 AKH	LPI WQP Reagents = 40.0° Resin = 100.0° Changed STD = 70.0°
11/11/11	LPI WQP Reagents = 100.0° STD = 70.0° Resin = 75.0°
11/17/11	LPI WQP Reagents = 90.0° STD = 60.0° Resin = 60.0°
11/22/11	LPI WQP Reagents 82 % Std 50 % Resin 40 %
11/22/11 AKH	U3 Silica Analyzers were flushed thoroughly with DF and then purged with air. - Sample cell flushed - Reagent lines - Standard line

Wold 000411

96

11-22-11 ~~LPI WQP~~
 AKH Calibrated U-1 Sodium Analyzers
 CPD - offset: 117.8 mV Slope: 58.9 mV
 Boiler - offset: 114.2 mV Slope: 58.4 mV

11-22-11 Calibrated U-2 Na⁺ Analyzers
 CPD - offset: 120.8 mV Slope: 57.9
 Boiler - offset: 118.9 mV Slope: 58.2

Calibrated demin Na⁺ Analyzer
 Slope: E₀

11/28/11 LPI WQP
 Reag: 72.1°
 Resin: 100.1°
 STD: 40.1°

11-30-11 Replaced Filter at LPI.
 AKH Replaced & calibrated PH Electrodes.

12-8-11 Rebuilt LPI Silica Analyzer (At LPI)

AKH NEW - Solvent module
 - Lamp, Interference Filter
 - Reag & STD tubing & filter
 - Flow cell & Cell cap
 - All New tubing.

12-15-11 LPI WQP
 AKH Reag: 47.1°
 STD: 10.1°
 Resin: 30.1°

0

97

12-19-11 Calibrated V-1 Sodium Analyzers
 AKH CPD offset = 115.1 mv Slope = 58.6 mv
 Boiler offset = 111.2 mv Slope = 58.5 mv
 Main Steam ~~offset~~ Slope = 58.9 mv $E_0 = -39.7$

12-19-11 Calibrated V-2 Sodium Analyzers
 AKH CPD offset = 116.3 mv Slope = 58.8 mv
 Boiler offset = 116.0 mv Slope = 58.1 mv
 Main Steam Slope = 59.1 mv $E_0 = -39.7$

12-19-11 Calibrated Demin Sodium Analyzer.

12-20-11 LPI WQP
 AKH Reag: 100 %
 STD: 100 %
 Resin 100 %

12-29-11 LPI WQP
 Reag: 85 %
 Resin: 65 %
 STD: 90 %

98

2012

1-4-12

LPI WQP check

Resin - 40

Reagent - 75

STD - 50

1-9-12

LPI WQP check

Resin - 100

Reagent - 67

STD - 70

1-10-12

New Resin LPI CAT COND Analyzer @ SHERCO

1-12-12

New Resin U1 CPD CAT COND Analyzer

1-16-12

New Reagents U2 CPD SiO_2 analyzer

1-17-12

New SiO_2 STD U1 CPD SiO_2 analyzer- Calibrated Dumas Nat Analyzer slope 57.7 E_0 13.8

1-18-12

LPI check

Resin 70 90

Reagent - 54

STD - 60

Calibrated U1 + U2 Nat Analyzers

- replaced DIP A

1-19-12

Calibrated U1 + U2 main steam Nat Analyzers

1 - 58.4

2 slope = 58.0

 $E_0 = 5.7$ $E_0 = -43.6$

1-23-12

New Reagents U2 Boiler SiO_2 analyzer

1-11-12	<u>LPI Check</u> Resin = 40 Reagent = 42 STD = 50
1-25-12	New Resin 21 pol C.C. Analyzer New Resin WI BUR, Econ, C.C. Analyzer
2-1-12	New Resin U2 Econ, MAIN ST, CPD, 22 pol, CC Analyzers New Resin WI MAIN steam, 11 pol, 12 pol New STD WI CPD SiO ₂ analyzer New Reagents LPI SiO ₂ analyzer @ SHERCO
1-31-12	<u>LPI WQP Check</u> Resin 100 % Reagent 41 % STD 40 %
2-8-12	LPI WQP Check Resin - 70 Reagent - 27 STD - 30 New Reagents Demin SiO ₂ Analyzer
2-15-12	New Reagents @ LPI 100 % Resin - 30 STD - 20
2-16-12	New Resin U2 Burke C.C. Analyzer New Reagents U2 CPD SiO ₂ analyzer
2-21-12	LPI WQP Check Resin - 100 Reagent - 90 STD - 10

100

2-20-12	Calibrated Damon Nat Analyzer New DIPA + Tubing Slope 59.7 E ₀ 2.2
2-22-12	Calibrated U1 Nat Analyzers MAIN Steam Slope 59.3 E ₀ -54.2
	Calibrated U2 MAIN Steam Nat Analyzer Slope 54.8 E ₀ -51.1
2-23-12	Calibrated U1 + U2 Nat Analyzers, BUR + CPD
2-28-12	<u>LPI WQP Check</u> Resin 70% Reagents 78% STD - 100%
3-7-12	LPI WQP Check Resin - 30 Reagents 64 STD - 90
3-12-12	LPI WQP Check Resin - 57% STD - 80% Resin - 20%
3-13-12	New Resin 21, 22 pd, ^{U2} CPD, ^{U2} ECON carb cond Analyzer
3-14-12	LPI WQP Check Reagents 54 STD 80 Resin - 100

Wold 000416

3-20 - New Reagents LPI Sil₂ analyzer @ Shrus
 - New Resin U₂ MAIN Steam C.C. Analyzer

3-21 Calibrated U₂ CPD + CLR Nat Analyzers

Calibrated Damin Nat Analyzer

Slope 58.2

E₀ - 21.2

3-22-12 LPI WQP check

Resin 60

Reagents 41

STD 70

3-27-12 Calibrated U₂ main steam Nat Analyzer

3-28-12 LPI WQP CHECK

Resin 40

Reagent 20

STD 20

- Analyzer "Unable to Calibrate"

- Replaced cell cover

- Replaced moly solenoid valve

- Replaced moly reagent filter

- Calibrated now twice at 486 ppb "OK"

- Left New Bottle of STD at LPI

4-2-12 LPI WQP ✓

new cation resin

4-6-12 New cation resin in Sherco LPI

LPI WQP ✓

Good

Resin 90% Reag 65% Std 40%

102

4-9-12 Replaced reagents (only) in Unit 2 CPD SiO₂ analyzer.

4-12-12 LPI WQP ✓
Good Resin → 70% Std → 40% Rea → 65%

4-17-12 LPI WQP ✓
Resin - 50% Std - 100% Reagents - 100%

4-18-12 Installed new electrodes on U-2 Main Steam Sodium analyzer
After calibration: Slope = 57.9
E₀ = -59.1

4-25-12 Unit 1 Boiler Silica Analyzer - Complete overhaul

4-26-12 Unit 1 CPD Silica Analyzer - Complete overhaul

4-27-12 LPI WQP ✓
Reag → 85% Std → 80% Res → 25%

New resin U-1 CPD Cation Col.

4-29-12 Calibrated Econ. In. pH Meter

New resin U-1 Econ In Cation Col.
" " U-2 CPD " "

SWAN Sodium Analyzer Calibrations

UNIT	SAMPLE	SLOPE
1	Boiler	58.48
1	CPD	57.52
2	Boiler	58.78
2	CPD	59.13

4-30-12 New resin U-2 Main Steam Cation Col.
↳ cleaned flow cell

4-30-12	Cleaned flow cell on Econ. In Unit 2 Cond. meters		
5-1-12	Calibrated Unit 1 Main Steam Na ⁺ Analyzer SLOPE → 61.5 E ₀ → -47.3		
5-2-12	Calibrated Demin Na ⁺ Analyzer SLOPE → 58.6 E ₀ → 4.4 [?]		
5-4-12	Replaced cat. resin U-1 Pol. 12 Replaced in-line filter on U-1 Boiler SiO ₂ Rich replaced in-line filter on U-1 Boiler Na. 5-2-12 New SiO ₂ reagents in U-2 CPD SiO ₂ analyzer.		
5-7-12	LPI WQP ✓ - GOOD! Reag → 67% Std → 60% Resin → 80%		
5-10-12	New cation resin for U-1 M. Steam Cat. Col.		
5-14-12	Replaced: Reagents LPI Sherco SiO ₂ analyzer Cation resin → Pol. 12		
5-16-12	LPI WQP ✓ - GOOD! Reagent → 51% STD → 50% Resin → 50%		
5-18-12	New reagents in Demin Silica Analyzer		
5-22-12	Replaced LPI Sherco cation resin.		
5-23-12	swan Na ⁺ Analyzer Calibrations		
	<u>Unit 1</u>	<u>SLOPE</u>	<u>Unit 2</u>
	Boiler	58.69	Boiler
	CPD	58.90	CPD
			<u>SLOPE</u>
			60.51
			59.52

104

5-24-12 New Cation resin: Unit 1 - Econ IÜ.
Unit 2 - Econ In; Pol 21 & 22

Demin Silica Analyzer - new std.

LPI WQP \checkmark - Good

Reag \rightarrow 50% (adjusted) Std \rightarrow 50% (adjusted) Resin - 100%
Replaced cation resin -

5-29-12 LPI WQP \checkmark - Good
Reag 40% Std - 40% Resin - 80%

Unit 2

New in-line filters on Swan Na analyzers 81r & CPD

Boiler $\text{SiO}_2 \rightarrow$ 'unable to cal', 437 ppb
Cleaned sample cell & stir bar
Recalibrated \rightarrow 503 ppb

5-30-12 Calibrated Unit 2 Main Steam Sodium Analyzer
Slope \rightarrow 59.8 $E_0 \rightarrow$ -50.5

Unit 2 SiO_2 analyzers

CPD \rightarrow Reagents & std } replaced
Boiler \rightarrow Reagents

6-1-12 New cation resin Unit 1 CPD

6-6-12 LPI silica \rightarrow troubleshooting:

Replaced: Molybdate selenoid \rightarrow was delivering 0.2 mls
Reagents & std and cap on Moly bottle

Calibrated: 497 ppb

May still have a software/electronic problem. ???

Wold 000420

105

6-9-12	Unit 1 Boiler - new cation resin	
6-8-12	Unit 1 Pol 11 & 12 - new cation resin Unit 2 Main Steam - new cation resin	
6-13-12	New cation resin Unit 2 CPD	6-14-12 Boiler & CPD U-1 New SiO ₂ reag. ^{is}
	Unit 1 Main Steam Sodium Analyzer Etched electrode & calibrated Slope → 59.8 E ₀ → -55.7	
6-18-12	LPI WQP ✓ Replaced cation resin Reag → 80% STD → 60%	
6-19-12	Unit #1 Boiler Sodium Analyzer Acid cleaned the mixing block to clean out boiler chem clean crud. Etched electrode Calibrated Slope → 58.3 58.3	
	Unit #1 CPD Sodium Analyzer Calibrated Slope → 58.6	
	Unit 2 Boiler & CPD Sodium Analyzer Calibrations: Blr Slope → CPD Slope →	
	New Cation Resin for Unit 2 Econ. In.	
6-20-12	LPI WQP ✓ Cond. readings very erratic (???) SiO ₂ : Reag. → 77% Std → 60% Resin → 90%	
6-27-12	LPI WQP ✓ Outage over there SiO ₂ : Reag. → 66% Std → 50% Resin → 75%	

Wold 000421

106

6-28-12 New cation resin Unit 1 Boiler
 " " " LPI, Sherco WQP

7-3-12 Replaced all reagents and standard for LPI silica analyzer (Sherco side)

Replaced silica standard for U-2 CPD analyzer

Replaced resin for #21 Polisher
 #22 Polisher
 U-1 Main Steam
 U-1 Economizer

LPI WQP ✓
 Resin - 45% Reagents - 57% Std - 40%

7-5-12 Replaced resin for #11 Polisher
 #12 Polisher
 U-2 Main Steam

Replaced reagents and standard for demin Silica analyzer

7-10-12 Replaced resin at LPI
 LPI WQP ✓
 Resin - 100% Reagents - 51% Std - 40%

Calibrated U-2 Main Steam Sodium Analyzer
 Slope = 58.2 $E_0 = -54.9$

7-13-12 Replace reagents for U-2 Boiler silica analyzer

7-16-12 LPI WQP ✓
 Resin - 65% Reagents - 41% Std - 30%

107

7-17-12 Calibrated U-1 Main Steam Sodium Analyzer
Slope = 60.1 $E_0 = -53.1$

PUBLIC DOCUMENT
NOT-PUBLIC DATA HAS BEEN EXCISED

Northern States Power Company

MPUC Docket No. E999/AA-18-373, et al.
OAH Docket No. 65-2500-38476
Exhibit____(DGD-2), Schedule 7

Schedule 7

Exhibit____(DGD-2), Schedule 7 has been marked Not-Public in its entirety. This Schedule was provided by M&M Engineering Associates, Inc. and responds to a report by James D. Schultz (Schultz Report), on behalf of General Electric (GE) and subject to a confidentiality agreement. GE considers the Schultz Report to constitute confidential and proprietary information to GE. Therefore, the Company considers this Schedule to be trade secret data as defined by Minn. Stat. § 13.37(1)(b) and Xcel Energy maintains this information as a trade secret pursuant to Minn. Rule 7829.0500, subp 3.

Pursuant to Minn. R. 7829.0500, subp. 3, the Company provides the following description of the excised material:

1. **Nature of the Material:** Remarks on the Steam Chemistry Claims Raised by James D. Schultz, in his Expert Opinion
2. **Authors:** David G. Daniels, M&M Engineering Associates, Inc.
3. **Importance:** Responds to confidential and proprietary information of GE and that is subject to a confidentiality agreement between the Company and GE.
4. **Date the Information was Prepared:** April 18, 2016