T.O. 1

UNIT 2

FINAL TURNOVER

SYSTEM OR COMPONENT TURNOVER

TO

METROPOLITAN EDISON COMPANY

DATE: 5/6/78

SYSTEM CONDENSATE POLISHING - MTX 24 FINAL

Drawing No. 206

COMPONENTS / Boundaries

PER ATTACHED EOI SHEET
THESE CABLES COMPLETE SYSTEM T/O.

STATUS

TESTING COMPLETED.

MET ED RESPONSIBILITY

Assume complete responisiblity for operation of system or component.

UE&C START UP RESPONSIBILITY

Assist Met. Ed. only if requested.

OFFICIAL COPY

UE&C CONSTRUCTION RESPONSIBILITY

Assist Start Up only if requested.

2 127

CATALYTIC SUPERINTENDENT _____ 5/6/78 Date

UE&C START UP _____ 5/6/78 Date

MET ED SUPERINTENDENT _____ 5/5/78 Date

8011050420

METROPOLITAN EDISON COMPANY Subsidiary of General Public Utilities Corporation

Subject SIGNIFICANT ITEMS AT TIME OF TURNOVER

Location TMI Nuclear Station
Middletown, PA 17057

Date 5/25/78

To MR. L. L. LAWYER

SYSTEM TURNOVER Cond. Polishing HTX-24

1. NONE

2.

3.

4.

5.

OFFICIAL COPY

2 128

INTER-OFFICE MEMORANDUM

II

united engineers & constructors inc

INCOMPLETE WORK LIST

System COND. POLISHING MTX 24 Sheet 1 of

Item	Date and Disposition
① NONE	
	OFFICIAL COPY
	2 129

FORM E01

UNIT 2

EQUIPMENT COMPLETION REPORT

THE FOLLOWING EQUIPMENT OR SYSTEM HAS BEEN CHECKED AND TESTED AS OUTLINED IN THIS MANUAL AND IS READY TO BE ENERGIZED. (ANY EXCEPTIONS TO BE CLEARLY ITEMIZED BELOW.)

NAME OF SYSTEM OR EQUIPMENT Condensate Polisher CO-24 (CABLE CHECK)

CIRCUIT OR FEEDER OR EQUIPMENT NO.	SCHEMATIC DRAWING NO. & REV.	TEST NUMBERS P = PASS F = FAIL 02	09	10	TEST PERFORMED BY & DATE	TEST WITNESSED BY & DATE	COMMENTS OR EXCEPTIONS
M430C	3065 Rev1	P	P	P	S Kakarla 2/10/77	N/A	
M431C	3055 Rev1	P	P	P	S Kakarla 2/10/77		
W132	3055 Rev2	P	P	P	S Kakarla 2/10/77		
IT3322PA	3055 Rev1	P	P	P	S Kakarla 2/10/77		
IT3089C	3055 Rev1	P	P	P	S Kakarla 2/10/77		
IT3090C	3055 Rev1	P	P	P	S Kakarla 2/10/77		
IT3091C	3065 Rev1	P	P	P	S Kakarla 2/10/77		
IT3092C	3055 Rev1	P	P	P	S Kakarla 2/10/77		
~~[illegible]~~	~~[illegible]~~	~~P~~	~~P~~	~~P~~	~~S Kakarla 2/10/77~~		
IT3531C	3055 Rev1	P	P	P	S Kakarla 2/10/77		
IT3087C	3055 Rev1	P	P	P	S Kakarla 2/10/77		
IT3533C	3055 Rev1	P	P	P	S Kakarla 2/10/77	↓	

DESCRIPTION OF TEST NOS.

02 - Integrity of Field Erection, Installation Assembly & Bolted Connection Check.
09 - Termination Integrity Check.
10 - Continuity Check

DEFICIENCY 8006

* Note 8 Function check of Valves WT-V-118 & 119 are checked under Radiation Test Procedures by Met Ed. S Kakarla 4/10/78

2-130

MICROFILM

DOCUMENT INDEX TARGET

DESCRIPTION

MTX 24.2 CONDENSATE POLISHING SYSTEM - ELECTRICAL (55 spaces maximum)

DATE

11-18-76 (18 spaces maximum)

DESCRIPTION CONTINUATION

FILE NUMBER

62:0002:0011:0006:00

(20 spaces maximum)

NOTE: Maximum spaces include all punctuation marks, dashes and spaces between words.

Description continuation should only be used when abbreviations are not appropriate.

REEL NO. _____ BLIP NO. _____

NRC 74 (5-42) 1 74

Pages 1 thru 126

E 06

UNIT 1

united engineers & constructors inc

MOTOR CONTROL CENTER TEST DATA

DATE 10/18/76

BY [illegible]

MCC PANEL 302

UNIT NA Circuit (Left) AMP 1A

MFG. WEST. (Right) NA

Breaker Size 15 Amp Long Time at 3X Inst.

Breaker Size NA Amp Long Time at 3X Inst.
right

Starter Size 1

Ø 1	Ø 2	Ø 3	
NA	NA	NA	Sec.
NA	NA	NA	Amps
NA	NA	NA	Sec.
NA	NA	NA	Amps

Mechanical NEW

Aux. Contacts 1A-1A

Continuity Checked

Aux. Transformer N/A

Control Fuse B-F

Heater Size H33

Current Rating 5.7 - 6.2 Amp

Time at 3X Ave. I Ø1 6.7 Sec. Ø2 NA Ø3 NA

Wiring to ground 200 Megs.

Remarks:

TEST EQUIPMENT. MULTI-AMP MC-1A Serial - 2712

OFFICIAL COPY

Test Performed By: [signature] Date 10/18/76

Test Witnessed By: NA Date

ME - 4

UNIT 2

united engineers & constructors inc

MOTOR BUMPING CHECK LIST

24.2

System WT

Motor Name Hydrogen Pump Number AM-P-1A

Power Source (SWITCHGEAR) Panel 3C5

Cubicle Number BKR 10 & 12

Protection Devices

Switchgear Ref. Design Data NA

	Design	Actual
L.T.D.	NA	NA
S.T.D.	NA	NA
INST.	NA	NA

Motor Control Center Ref. Design Data

Molded Case Breaker	Design	Actual
AMP Rating (switchgear 53E)	15 Amp	15 Amp
Trip Setting	NA	NA
Thermal Overloading		
Mfg/Number	H 33	H 33
Rating	4.72-5.14 Amp	4.72-5.14 Amp

Control Circuits Checked 3/2-12 WJ
Date

Lubrication Checked NA
Date

Megger Records Complete 3/7/12 WJ
Date

Motor Ready for Bumping

Performed By: [signature] Date: 3/23/12

Witnessed By: NA Date:

OFFICIAL COPY

E 06

UNIT 2

united engineers & constructors inc

MOTOR CONTROL CENTER TEST DATA

DATE 11/81

BY H Smith

MCC PANEL 305

UNIT NA Circuit (Left) AUX-1" 16

MFG. WEST (Right) AA

Breaker Size 15 Amp Long Time at 3X Inst.

Breaker Size NA Amp Long Time at 3X Inst.
right

Starter Size 1

	Ø 1	Ø 2	Ø 3	
Amp Long Time at 3X Inst.	AA	AA	AA	Sec. Amps
	NA	AA	AA	
Breaker Size right NA Amp Long Time at 3X Inst.	AA	AA	AA	Sec. Amps
	AA	NA	NA	

Mechanical NEW

Aux. Contacts [illegible]

Continuity [illegible]

Aux. Transformer [illegible]

Control Fuse ACAE.

Heater Size H 33

Current Rating 5.7-6.2 Amps

Time at 3X Ave. I Ø1 [illegible] Ø2 NA Ø3 NA

Wiring to ground 200 Megs.

Remarks:

TEST EQUIPMENT. MULTI-AMP MS-1A Serial - 2712

Test Performed By: [signature] Date 11/81

Test Witnessed By: NA Date

OFFICIAL COPY

ME - 4

UNIT 2

unitec engineers & constructors inc

MOTOR BUMPING CHECK LIST

System WT

Motor Name Hydrogen Pump Number AM-1-1B

Power Source (~~SWGR~~ MCC) Pan 1 305

Cubicle Number BKR 21-23

Protection Devices

Switchgear Ref. Design Data NA

	Design	Actual
L.T.D.	NA	NA
S.T.D.	NA	NA
INST.	NA	NA

Motor Control Center Ref. Design Data

	Design	Actual
Molded Case Breaker		
AMP Rating	15 Amp	15 Amp
Trip Setting	NA	NA
Thermal Overloading		
Mfg/Number	H33	H33
Rating	4.22 - 5.14 Amps	4.22 - 5.14 Amps

Control Circuits Checked 3/27/86 MH
Date

Lubrication Checked NA
Date

Megger Records Complete 3/27/86 MH
Date

Motor Ready for Bumping

Performed By: [signature] Date: 3/27/86

Witnessed By: NA Date:

OFFICIAL COPY

F 06

UNIT 1

united engineers & constructors inc.

MOTOR CONTROL CENTER TEST DATA

DATE 11/13/76

BY H. Schuster

MCC Panel 305

UNIT NA Circuit (Left) AM-P-2

MFG. _____ (Right) NA

Breaker Size 15 Amp Long Time at 3X Inst.

Breaker Size NA Amp Long Time at 3X Inst.
right

Starter Size 1

Ø 1	Ø 2	Ø 3	
NA	NA	NA	Sec. Amps
NA	NA	NA	
NA	NA	NA	Sec. Amps
NA	NA	NA	

Mechanical NEW

Aux. Contacts IN/IN

Continuity Checked

Aux. Transformer NONE

Control Fuse NONE

Heater Size #33

Current Rating 5.7-6.2 Amps

Time at 3X Ave. I Ø1 65 sec Ø2 N.T Ø3 NA

Wiring to ground 200 Megs.

Remarks: _____

TEST EQUIPMENT. MULTI-AMP MS-1A Serial - 2712

Test Performed By: H. Schuster Date 11/16/76

Test Witnessed By: NA Date _____

OFFICIAL COPY

ME - 4

UNIT 2

united engineers & constructors

MOTOR BUMPING CHECK LIST

System W T

Motor Name Ammonia Pump Number AM-P-2

Power Source (~~SWGR/MCC~~) Panel 305

Cubicle Number Sec 5 C7

Protection Devices

Switchgear Ref. Design Data NA

	Design	Actual
L.T.D.	NA	NA
S.T.D.	NA	NA
INST.	NA	NA

Motor Control Center Ref. Design Data

Molded Case Breaker	Design	Actual
AMP Rating	15	15
Trip Setting	NA	NA

Thermal Overloading

Mfg/Number	#33	#33
Rating	4.72 - 5.14 Amp	4.72 - 5.14 Amp

Control Circuits Checked 3-29-76 WPJ
Date

Lubrication Checked NA
Date

Megger Records Complete 3/24/76 WPJ
Date

Motor Ready for Bumping

Performed By: WPJ Date: 3/29/76

Witnessed By: NA Date:

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ME - 4

UNIT 2

united engineers & constructors inc

MOTOR BUMPING CHECK LIST

System WT

Motor Name Amerace Hydraside Pump Number AM-P-3

Power Source ~~Unknown~~ Fed MPT-1A

Cubicle Number Sec 13

Protection Devices

Switchgear Ref. Design Data NA

	Design	Actual
L.T.D.	NA	NA
S.T.D.	NA	NA
INST.	NA	NA

Motor Control Center Ref. Design Data

Molded Case Breaker	Design	Actual
AMP Rating	20	20
Trip Setting	NA	NA

Thermal Overloading

Mfg/Number	C-H H1025	H 1025
Rating	4 Amp	4 Amp

Control Circuits Checked N/R/76 WJ
Date

Lubrication Checked NA WJ
Date

Megger Records Complete 12/8/76 WJ
Date

Motor Ready for Bumping

Performed By: [signature] Date: 12/8/76

Witnessed By: NA Date:

OFFICIAL COPY

E 06

UNIT 2

united engineers & constructors inc

MOTOR CONTROL CENTER TEST DATA

DATE 11/18/76

BY H. Schaffer

MCC LOCAL STARTER

UNIT AH Circuit (Left) AMP AH HYPERMIX MIX TANK PUMP #3

MFG. CH (Right) NA

Breaker Size MPT-1H 20 Amp Amp Long Time at 3X Inst.

Breaker Size right NA Amp Long Time at 3X Inst.

Starter Size 1

Ø 1	Ø 2	Ø 3	
NA	NA	NA	Sec.
12	NA	NA	Amps
NA	NA	NA	Sec.
NA	NA	NA	Amps

Mechanical NEW

Aux. Contacts 1 NO/1 NC

Continuity OK

Aux. Transformer OK

Control Fuse OK

Heater Size 11 Leg

Current Rating 4 Amp

Time at 3X Ave. I Ø1 38 sec Ø2 NA Ø3 NA

Wiring to ground 20 Megs.

Remarks:

TEST EQUIPMENT. MULTI-AMP MS-1A Serial - 2712

Test Performed By: H. Schaffer Date 11/18/76

Test Witnessed By: NA Date

OFFICIAL COPY

ME - 4

UNIT 2

united engineers & constructors inc

MOTOR BUMPING CHECK LIST

System WT

Motor Name AMONIA PUMP Number AM-P-4A

Power Source (SWGR/MCC) 2-31D

Cubicle Number 4B

Protection Devices

Switchgear Ref. Design Data NA

	Design	Actual
L.T.D.	NA	NA
S.T.D.	NA	NA
INST.	NA	NA

Motor Control Center Ref. Design Data 3084 84 22 R1

Molded Case Breaker	Design	Actual
AMP Rating	15	15
Trip Setting	N/A	N/A

Thermal Overloading

Mfg/Number	T-16	T-16
Rating	.89A	.89A

Control Circuits Checked 5-3-76 MRJ
Date

Lubrication Checked NA
Date

Megger Records Complete 5-3-76 MRJ
Date

Motor Ready for Bumping

Performed By: [signature] Date: 5/3/76

Witnessed By: NA Date:

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multi-amp TESTING SERVICES CORPORATION

4271 Bronze Way, Dallas, Texas 75237 • (214) 330-3801

E. R. RIEDLINGER
Project
R. L. BURNS
Manager

MOTOR CONTROL CENTER TEST DATA

THREE MILE ISLAND PROJECT

DATE 12-8-75

BY J. Knox

MCC 2-33D

UNIT 4B CIRCUIT (LEFT) Ammonia Pump AH-P-4A

MFG. ITE (RIGHT) NA

	Ø1	Ø2	Ø3	
Breaker Size EK3-B015 Main or Left — Amp Long Time at 3X Inst.	31	26	24.5	Sec.
				Amps.
Breaker Size NA (Right) Amp Long Time at 3X Inst.	NA	NA	NA	Sec.
				Amps.

Starter Size 1 Mechanical New

Aux. Contracts 2BO - 2BC

Continuity Checked

Aux. Transformer .100KVA

Control Fuse MDX3

Heater Size T-16

Current Rating .89A

Time at 3X Ave. I Ø1 44.5 Sec Ø2 3[illegible] Sec Ø3 51 Sec.

Wiring to Ground 200 Megs.

REMARKS: Set Per Drawing 3084 Sh. 22 Rev. 1 Current curve 1274

TEST EQUIPMENT CB-25 SERIAL NO. 200

ASSOCIATED RESEARCH 1000 VOLT D.C. MEG-CHECK Serial 962

WEATHER 14 °C 58 %RH

OFFICIAL COPY

MAESCO TEST FORM 23-A

2-10

multi-amp TESTING SERVICES CORPORATION

[redacted]

480V INTERNAL POWER WIRING CHECKLIST

MCC 2-31D UNIT 48 COMPONENT AM-P-4A MFR IIE

1. Power wiring meets manufacturers spec. X Sat. ____ Unsat.
2. All screws and bolted connections are tight. X Sat. ____ Unsat.
3. All lugs are properly installed. X Sat. ____ Unsat.
4. Physical condition of insulation. X Sat. ____ Unsat.
5. Explanation of any unsatisfactory condition or other irregularities:

   B&R F.Q. No. 894 IEN-10

6. Ref. dwg. 3084, Sh.22, Rev.1

Performed By J. Knox Date 12-8-75

QC (where appl.) NA Date ____

M/A 239

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ME - 4

UNIT 2

united engineers & constructors inc

MOTOR BUMPING CHECK LIST

System WT

Motor Name AMONIA PUMP Number AM-P 4B

Power Source (SWGR/MCC) 2-37

Cubicle Number 4C

Protection Devices

Switchgear Ref. Design Data NA

	Design	Actual
L.T.D.	NA	NA
S.T.D.	NA	NA
INST.	NA	NA

Motor Control Center Ref. Design Data 3C54 Sh 22 1

Molded Case Breaker

	Design	Actual
AMP Rating	15	15
Trip Setting	N/A	N/A

Thermal Overloading

Mfg/Number	T-16	T-1
Rating	.89A	.89A

Control Circuits Checked 5-3-76 DRS
Date

Lubrication Checked
Date

Megger Records Complete 5-3-76 DRS
Date

Motor Ready for Bumping

Performed By: [signature] Date: 5/3/76

Witnessed By: NA Date:

2-12

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multi-amp TESTING SERVICES CORPORATION

4271 Bronze Way, Dallas, Texas 75237 • (214) 333-3201

MOTOR CONTROL CENTER TEST DATA •

THREE MILE ISLAND PROJECT

DATE 12-8-75

BY J. Knox

MCC 2-31D

UNIT 4C CIRCUIT (LEFT) Ammonia Pump AM-P-4B

MFG. ITE (RIGHT) NA

		Ø1	Ø2	Ø3	
Breaker Size Main or Left HE3-B015	Amp Long Time at 3X Inst.	23	27	25.5	Sec.
					Amps.
Breaker Size (Right) NA	Amp Long Time at 3X Inst.	NA	NA	NA	Sec.
					Amps.

Starter Size 1 Mechanical New

Aux. Contacts 2NO - 2NC

Continuity Checked

Aux. Transformer .100KVA

Control Fuse MDX3

Heater Size T-16

Current Rating .89A

Time at 3X Ave. I Ø1 38 Sec. Ø2 35 Sec Ø3 37.5 Sec.

Wiring to Ground 200 Meg-

REMARKS: Set Per Drawing 3084 Sh. 22 Rev. 1 Current curve 1274

TEST EQUIPMENT CB-25 SERIAL NO. 200

ASSOCIATED RESEARCH 1000 VOLT D.C. MEG-CHECK Serial 962

WEATHER 14 °C 58 %HR

MAESCO TEST FORM 23-A

2-13

OFFICIAL COPY

multi-amp TESTING SERVICES CORPORATION

[redacted]

480V INTERNAL POWER WIRING CHECKLIST

MCC 2-31D UNIT 4C COMPONENT AH-P-4B MFR IIE

1. Power wiring meets manufacturers spec. X Sat. ____ Unsat.
2. All screws and bolted connections are tight. X Sat. ____ Unsat.
3. All lugs are properly installed. X Sat. ____ Unsat.
4. Physical condition of insulation. X Sat. ____ Unsat.
5. Explanation of any unsatisfactory condition or other irregularities:

   B&R P.O. No. 894 IEB-10

6. Ref. dwg. 3084, Sh.22, Rev.1

Performed By J. Knox Date 12-8-75

QC (where appl.) NA Date ____

N/A 238

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2-1L

ME - 4

UNIT 2

united engineers & constructors inc

MOTOR BUMPING CHECK LIST

System WT

Motor Name AMONIA PUMP Number AM-P 4C

Power Source (SWGR/MCC) 2-31D

Cubicle Number 4D

Protection Devices

Switchgear Ref. Design Data NA

	Design	Actual
L.T.D.	NA	NA
S.T.D.	NA	NA
INST.	NA	NA

Motor Control Center Ref. Design Data 3A1 SH 2C R1

Molded Case Breaker

	Design	Actual
AMP Rating	15	15
Trip Setting	N/A	N/A

Thermal Overloading

Mfg/Number	T-16	T-1..
Rating	.89A	.89A

Control Circuits Checked 5-3-76 DKG
Date

Lubrication Checked NA
Date

Megger Records Complete 5-7-76 HFA
Date

Motor Ready for Bumping

Performed By: HFA Date: 5/11/76

Witnessed By: NA Date:

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2-15

multi-amp TESTING SERVICES CORPORATION

1271 Bronco Way, Dallas, Texas 75237 • (214) 333-3201

MOTOR CONTROL CENTER TEST DATA

THREE MILE ISLAND PROJECT

DATE 12-8-75

BY J. Knox

MCC 2-31D

UNIT 4D CIRCUIT (LEFT) Ammonia Pump AN-P-4C

MFG. ITE (RIGHT) NA

			Ø1	Ø2	Ø3	
Breaker Size Main or Left	HK3-B015	Amp Long Time at 3X Inst.	23	20	21.5	Sec.
						Amps.
Breaker Size (Right)	NA	Amp Long Time at 3X Inst.	NA	NA	NA	Sec.
						Amps.

Starter Size 1 Mechanical New

Aux. Contacts 2NO - 2NC

Continuity Checked

Aux. Transformer .100KVA

Control Fuse MDX3

Heater Size T16

Current Rating .89A

Time at 3X Ave. I Ø1 38.5 Sec. Ø2 33 Sec. Ø3 43.5 Sec.

Wiring to Ground 200 Megs

REMARKS: Set Per Drawing 3084 Sh. 22 Rev. 1 Current curve 1274

TEST EQUIPMENT CB-25 SERIAL NO. 200

ASSOCIATED RESEARCH 1000 VOLT D.C MEG-CHECK Serial 962

WEATHER 14 °C 58 %HR

OFFICIAL COPY

MAESCO TEST FORM 23-A

2-K

multi-amp TESTING SERVICES CORPORATION

[illegible] • [illegible] • [illegible]

480V INTERNAL POWER WIRING CHECKLIST

MCC 2-31D UNIT 4D COMPONENT AM-P-4C MFR IYK

1. Power wiring meets manufacturers spec. X Sat. ____ Unsat.
2. All screws and bolted connections are tight. X Sat. ____ Unsat.
3. All lugs are properly installed. X Sat ____ Unsat.
4. Physical condition of insulation. X Sat. ____ Unsat.
5. Explanation of any unsatisfactory condition or other irregularities:

   B&R F.Q. No. 894 THM-10

6. Ref. dwg. 3084, Sh.22, Rev.1

Performed By J. Knox Date 12-8-75

QC (where appl.) NA Date ____

M/A 238

OFFICIAL COPY

ME - 4

UNIT 2

united engineers & constructors inc.

MOTOR BUMPING CHECK LIST

System WT

Motor Name Strainer Circ. Pump Number P13

Power Source (~~SWGR~~/MCC) MCC-2-310

Cubicle Number 3D

Protection Devices

Switchgear Ref. Design Data NA

	Design	Actual
L.T.D.	NA	NA
S.T.D.	NA	NA
INST.	NA	NA

Motor Control Center Ref. Design Data 3c54 54 22 R1

Molded Case Breaker	Design	Actual
AMP Rating	B015	B015
Trip Setting	5	3

Thermal Overloading

Mfg/Number	T24	T24
Rating	1.85 Amp	1.85 Amp

Control Circuits Checked 1/24/17 [illegible]
Date

Lubrication Checked NA
Date

Megger Records Complete 1/24/17 [illegible]
Date

Motor Ready for Bumping

Performed By: [signature] Date: 1/24/17

Witnessed By: NA Date:

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multi-amp TESTING SERVICES CORPORATION

4871 Bronco Way, Dallas, Texas 75237 • (214) 333-3301

MOTOR CONTROL CENTER TEST DATA

THREE MILE ISLAND PROJECT

DATE 12-5-75

BY J. Knox

MCC 2-31D Water Treatment

UNIT 3D CIRCUIT (LEFT) WT-P-13, Condensate Strong Caustic Pump

MFG. ITE (RIGHT) NA

			Ø1	Ø2	Ø3	
Breaker Size Main or Left	B015/3	Amp Long Time at 3X Inst.	29	25	26	Sec.
						Amps.
Breaker Size (Right)	NA	Amp Long Time at 3X Inst.	NA	NA	NA	Sec.
						Amps.

Starter Size 1 Mechanical New

Aux. Contacts 2-NO, 2-NC

Continuity Checked

Aux. Transformer 100VA

Control Fuse MDX3

Heater Size T24

Current Rating 1.85

Time at 3X Ave. I Ø1 36 Ø2 48 Ø3 29

Wiring to Ground 200 Megs.

REMARKS: Set Per Drawing 3034 Sh. 22 Rev. 1 Current curve 1274

TEST EQUIPMENT MS-1, Weston Ammeter SERIAL NO. 1848, 26378

ASSOCIATED RESEARCH 1000 VOLT D.C. MEG-CHECK Serial 962

WEATHER 14°C 58 %HR

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MAESCO TEST FORM 23-A

2-19

First in Electric Power Maintenance Through Engineering Services Personnel Training Test Equipment

multi-amp TESTING SERVICES CORPORATION

4971 Belt Line Rd., Dallas, Texas 75237 • (214) 233-5201 • TWX 910-861-6888

480V INTERNAL POWER WIRING CHECKLIST

MCC 2-31D UNIT 3D COMPONENT WT-P-13 MFR ITE

1. Power wiring meets manufacturers spec. X Sat. ____ Unsat.
2. All screws and bolted connections are tight. X Sat. ____ Unsat.
3. All lugs are properly installed. X Sat ____ Unsat.
4. Physical condition of insulation. X Sat. ____ Unsat.
5. Explanation of any unsatisfactory condition or other irregularities:

   B&R F.Q. No. 894 TBM-10

6. Ref. dwg. 3084, Sh.22, Rev.1

Performed By J. Knox Date 12-5-75

QC (where appl.) NA Date ____

N/A 238

OFFICIAL COPY.

ME - 4

UNIT _____

united engineers & constructors inc.

MOTOR BUMPING CHECK LIST

System WT

Motor Name Stwag Aid Pump Number P14

Power Source (~~BUS~~/MCC) MCC-2-31D

Cubicle Number 6E

Protection Devices

Switchgear Ref. Design Data NA

	Design	Actual
L.T.D.	NA	NA
S.T.D.	NA	NA
INST.	NA	NA

Motor Control Center Ref. Design Data 30 Ft 5A 22 K1

Molded Case Breaker	Design	Actual
AMP Rating	Br 15	Br 15
Trip Setting	3	3

Thermal Overloading

Mfg/Number	T 24	T 24
Rating	1.85 Amp	1.85 Amp

Control Circuits Checked 1/22/77 MH
Date

Lubrication Checked NA
Date

Megger Records Complete 1/22/77 MH
Date

Motor Ready for Bumping

Performed By: MH Date: 1/22/77

Witnessed By: NA Date: _____

OFFICIAL COPY

2-21

multi-amp TESTING SERVICES CORPORATION

4271 Bronze Way, Dallas, Texas 75237 • (214) 333-3201

MOTOR CONTROL CENTER TEST DATA

THREE MILE ISLAND PROJECT

DATE 12-5-75

BY J. Knox

MCC 2-31D Water Treatment

UNIT 3E CIRCUIT (LEFT) FF-P-14 Cond. Strong Acid Pump

MFG. ITE (RIGHT) NA

			Ø1	Ø2	Ø3	
Breaker Size Main or Left	B015/3	Amp Long Time at 3X Inst.	27	26	29	Sec.
						Amps.
Breaker Size (Right)	NA	Amp Long Time at 3X Inst.	NA	NA	NA	Sec.
						Amps.

Starter Size 1 Mechanical New

Aux. Contacts 2-NO - 2-NC

Continuity Checked

Aux. Transformer 100VA

Control Fuse MDX3

Heater Size T24

Current Rating 1.85

Time at 3X Ave. Ø1 47 Ø2 34 Ø3 31

Wiring to Ground 200 Megs.

REMARKS: Set Per Drawing 3044 Sh. 22 Rev. 1 Current curve 1274

TEST EQUIPMENT MS-1, Weston Ammeter SERIAL NO. 1848, 26378

ASSOCIATED RESEARCH 1000 VOLT D.C. MEG-CHECK Serial 962

WEATHER 14 °C 58 %HR

OFFICIAL COPY

MAESCO TEST FORM 23-A

multi-amp TESTING SERVICES CORPORATION
4871 Bonner Way, Dallas, Texas 75237 • (214) 333-2881 • TWX 910-861-4942

480V INTERNAL POWER WIRING CHECKLIST

MCC 2-31D UNIT 3E COMPONENT WT-P-14 MFR ITE

1. Power wiring meets manufacturers spec. X Sat. ____ Unsat.
2. All screws and bolted connections are tight. X Sat. ____ Unsat.
3. All lugs are properly installed. X Sat. ____ Unsat.
4. Physical condition of insulation. X Sat. ____ Unsat.
5. Explanation of any unsatisfactory condition or other irregularities:
   B&R F.Q. No. 894 THW-10
6. Ref. dwg. 3084, Sh.22, Rev.1

Performed By J. Knox Date 12-5-75

QC (where appl.) NA Date ____

M/A 238

ME - 4

UNIT 2

united engineers & constructors inc

MOTOR BUMPING CHECK LIST

System WT

Motor Name SULFATE REGENERATION PUMP Number WT-P-1SA

Power Source (SWGR/MCC) MCC 2-310

Cubicle Number 3F

Protection Devices

Switchgear Ref. Design Data NA

	Design	Actual
L.T.D.	NA	NA
S.T.D.	NA	NA
INST.	NH	NH

Motor Control Center Ref. Design Data 3DK4 SH 22 R1

Molded Case Breaker	Design	Actual
AMP Rating	15	15
Trip Setting	N/A	N/A

Thermal Overloading

Mfg/Number	T-20	T-20
Rating	1.30A	1.30A

Control Circuits Checked 5-4-76 ADRG
Date

Lubrication Checked NA
Date

Megger Records Complete 5-4-76 ADRG
Date

Motor Ready for Bumping

Performed By: [signature] Date: 5/4/76

Witnessed By: NA Date:

2-24

OFFICIAL COPY

multi-amp TESTING SERVICES CORPORATION

4271 Bronze Way, Dallas, Texas 75237 • (214) 333-3201

MOTOR CONTROL CENTER TEST DATA

THREE MILE ISLAND PROJECT

DATE 12-5-75

BY J. Knox

MCC 2-31D Water Treatment

UNIT 3F CIRCUIT (LEFT) WT-P-15A Sulphite Regeneration Pump

MFG IIE (RIGHT) NA

			Ø1	Ø2	Ø3	
Breaker Size Main or Left	B015/3	Amp Long Time at 3X Inst.	27	21	21	Sec.
						Amps.
Breaker Size (Right)	NA	Amp Long Time at 3X Inst.	NA	NA	NA	Sec.
						Amps.
Starter Size	1	Mechanical	New			
		Aux. Contacts	2-NO, 2-NC			
		Continuity	Checked			
		Aux. Transformer	100 VA			
		Control Fuse	MDX3			
		Heater Size	T20			
		Current Rating	1.30A			

Time at 3X Ave. I Ø1 36 Ø2 30 Ø3 26

Wiring to Ground 200 Megs.

REMARKS: Set Per Drawing 3084 Sh. 22 Rev. 1 Current curve 1274

TEST EQUIPMENT MS-1, Weston Ammeter SERIAL NO. 1848, 26378

ASSOCIATED RESEARCH 1000 VOLT D.C. MEG-CHECK Serial 962

WEATHER 14 °C 58 %HR

OFFICIAL COPY

NAESCO TEST FORM 23-4

2:25

First in Electric Power Maintenance Through Engineering Services

multi-amp TESTING SERVICES CORPORATION

[redacted]

480V INTERNAL POWER WIRING CHECKLIST

MCC 2-31D UNIT 3F COMPONENT WT-P-15A MFR ITE

1. Power wiring meets manufacturers spec. X Sat. ____ Unsat.

2. All screws and bolted connections are tight. X Sat. ____ Unsat.

3. All lugs are properly installed. X Sat. ____ Unsat.

4. Physical condition of insulation. X Sat. ____ Unsat.

5. Explanation of any unsatisfactory condition or other irregularities:

B&R F.Q. No. 894 THW-10

6. Ref. dwg. 3084, Sh.22, Rev.1

Performed By J. Knox Date 12-5-75

QC (where appl.) RA Date ____

M/A 238

OFFICIAL COPY

2-26

ME - 4

UNIT 2

united engineers & constructors inc

MOTOR BUMPING CHECK LIST

System WT

Motor Name SULFITE REGENERATION PUMP Number WT-P-1B

Power Source (SWGR/MCC) 2-31D

Cubicle Numb 4A

Protection Devices

Switchgear Ref. Design Data NA

	Design	Actual
L.T.D.	NA	NA
S.T.D.	NA	NA
INST.	NA	NA

Motor Control Center Ref. Design Data 3654 5622 R1

Molded Case Breaker	Design	Actual
AMP Rating	15	15
Trip Setting	N/A	N/A
Thermal Overloading		
Mfg/Number	T-20	T-20
Rating	1.30A	1.30A

Control Circuits Checked 5-4-76 DAS
Date

Lubrication Checked NA
Date

Megger Records Complete 5-4-76 DAS
Date

Motor Ready for Bumping

Performed By [signature] Date: 5/4/76

Witnessed By: NA Date:

OFFICIAL COPY

UNIT 2

(Test Record/Acceptance Form EAF-1)

Tests and Checks Scheduled to Start 2-7-2

united engineers & constructors inc

ELECTRICAL EQUIPMENT/SYSTEM TEST AND CHECK RECORD AND ACCEPTANCE FORM

Metropolitan Edison Company
Three Mile Island
Unit No. 2
J. O. 9459-02

Equipment/System Name and Number: CONDENSATE ASSEMBLIES

Refer to Equipment/System Data Sheet
(Not required for Motors or Wire & Cable)

The test and check forms indicated are attached hereto and are a part of this Electrical Equipment/System Test and Check Record and Acceptance Form:

Electrical Test and Check Form

___ 01	___ 06	A 11	___ 16	___ 21	___ 26
X 02	X 07	___ 12	___ 17	___ 22	___ 27
___ 03	X 08	X 13	___ 18	A 23	X 28
___ 04	X 09	X 14	X 19	___ 24	X 29
A 05	___ 10	___ 15	___ 20	___ 25	___ 30

CERTIFICATION - is hereby made that the Electrical tests and checks indicated above have been performed as directed, in accordance with the "Procedures"; that all of the Electrical tests and checks, required by the "Procedures", have been made; that the results were as stated in the attached records; that the equipment/system is installed in accordance with the contract documents; and that said equipment/system is secured and ready for service.

BY: [signature] 2/12/77
UE&C Inc. (Date)

APPROVED BY [signature] 2/15/77
UE&C Startup Eng. (Date)

OFFICIAL COPY

2-36

UNIT 2

EQUIPMENT COMPLETION REPORT

THE FOLLOWING EQUIPMENT OR SYSTEM HAS BEEN CHECKED AND TESTED AS OUTLINED IN THIS MANUAL AND IS READY TO BE ENERGIZED. (ANY EXCEPTIONS TO BE CLEARLY ITEMIZED BELOW.)

NAME OF SYSTEM OR EQUIPMENT CONDENSATE [illegible] (CABLE CHECK)

CIRCUIT OR FEEDER OR EQUIPMENT NO.	SCHEMATIC DRAWING NO. & REV. LA Dwg	TEST NUMBERS P = PASS F = FAIL 02	09	10	TEST PERFORMED BY & DATE	TEST WITNESSED BY & DATE	COMMENTS OR EXCEPTIONS
M15C	3-25 37 AE	P	P	P	P FEB 6 1977 NA		
M16C	"	P	P	P	P FEB [illegible]		
M16SPA	D38-5 RE	P	P	P	P FEB [illegible]		
M17C	D38-5 RE	P	P	P	P [illegible]		
M17SP	D38-4 RE	P	P	P	P FEB 6 1977		
M17C	D3804 RE	P	P	P	P FEB 6 1977		
M18SP	D38-4 RE	P	P	P	P [illegible]		
M18C	D38-4 RE	P	P	P	P [illegible]		
M19SP	D38-5 RE	P	P	P	P FEB 6 1977		
M19C	D38-5 RE	P	P	P	P FEB 6 1977		
M19SP	D38-5 RE	P	P	P	P [illegible]		
M19C	D38-5 RE	P	P	P	P FEB 6 1977		

DESCRIPTION OF TEST NOS.

02 - Integrity of Field Erection, Installation Assembly & Bolted Connection Check.

09 - Termination Integrity Check

10 - Continuity Check

OFFICIAL COPY

FORM 201

UNIT 2

EQUIPMENT COMPLETION REPORT

THE FOLLOWING EQUIPMENT OR SYSTEM HAS BEEN CHECKED AND TESTED AS OUTLINED IN THIS MANUAL AND IS READY TO BE ENERGIZED. (ANY EXCEPTIONS TO BE CLEARLY ITEMIZED BELOW.)

NAME OF SYSTEM OR EQUIPMENT (CABLE CHECK)

CIRCUIT OR FEEDER OR EQUIPMENT NO.	SCHEMATIC DRAWING NO. & REV.	TEST NUMBERS P = PASS F = FAIL 02	09	10	TEST PERFORMED BY & DATE	TEST WITNESSED BY & DATE	COMMENTS OR EXCEPTIONS
W63C	[illegible]	P	P	P	[illegible] FEB 5 1977	NA	
W64C		P	P	P	[illegible] FEB 5 [illegible]		
W65C		P	P	P	[illegible] FEB [illegible]		
W66C		P	P	P	[illegible] FEB [illegible]		
W67C		P	P	P	[illegible] FEB. 6 1977		
W68C		P	P	P	[illegible] FEB 5 1977		
W69C		P	P	P	[illegible] FEB [illegible]		
W70C		P	P	P	[illegible] FEB. 5 1977		
W71C		P	P	P	[illegible] FEB. 5 1977		
W72C		P	P	P	[illegible] FEB [illegible]		
W73C		P	P	P	[illegible] FEB. 6 1977		
W74C		P	P	P	[illegible] FEB 5 1977		

OFFICIAL COPY

DESCRIPTION OF TEST NOS.

02 - Integrity of Field Erection, Installation Assembly & Bolted Connection Check.
09 - Termination Integrity Check
10 - Continuity Check

FORM 801

UNIT 2

EQUIPMENT COMPLETION REPORT

THE FOLLOWING EQUIPMENT OR SYSTEM HAS BEEN CHECKED AND TESTED AS OUTLINED IN T[illegible] MANUAL AND IS READY TO BE ENERGIZED. (ANY EXCEPTIONS TO BE CLEARLY ITEMIZED BELOW.)

NAME OF SYSTEM OR EQUIPMENT CONDENSATE PUMPS (CABLE CHECK)

CIRCUIT OR FEEDER OR EQUIPMENT NO.	SCHEMATIC DRAWING NO. & REV.	TEST NUMBERS P = PASS F = FAIL 02	09	10	TEST PERFORMED BY & DATE	TEST WITNESSED BY & DATE	COMMENTS OR EXCEPTIONS
MA 100 P	D38[illegible] R1	P	P	P	FEB 5 1977	NA	
MA 101 C	D3[illegible] R2	P	P	P	FEB 5 1977		
MA 106 P	D38-1 R4	P	P	P	FEB 5 [illegible]		
MA 107 C	D38-1 R2	P	P	P	FEB 5 [illegible]77		
MA 108 C	D 38[illegible] R 1	P	P	P	FEB 5 [illegible]77		
MA 111 P	D38-5 R2	P	P	P	FEB 5 [illegible]77		
MA 112 C	D38-1 R5	P	P	P	FEB 5 [illegible]		
MA 113 C	D38-5 R1	P	P	P	FEB 5 1977		
W13 C	D4747 S U	P	P	P	FEB 5 [illegible]77		
W14 C	3-25-3-R5	P	P	P	FEB 5 [illegible]		
W61 C	3-25-35 R4	P	P	P	FEB 5 [illegible]977		
W62 C	3-25-35 R4	P	P	P	FEB 5 [illegible]977		

DESCRIPTION OF TEST NOS.

02 - Integrity of Field Erection, Installation Assembly & Bolted Connection Check. HP Schaefer

09 - Termination Integrity Check

10 - Continuity Check

OFFICIAL COPY

FORM E01

UNIT____

EQUIPMENT COMPLETION REPORT

THE FOLLOWING EQUIPMENT OR SYSTEM HAS BEEN CHECKED AND TESTED AS OUTLINED IN THIS MANUAL AND IS READY TO BE ENERGIZED. (ANY EXCEPTIONS TO BE CLEARLY ITEMIZED BELOW.)

NAME OF SYSTEM OR EQUIPMENT Containment Penetrations (CABLE CHECK)

CIRCUIT OR FEEDER OR EQUIPMENT NO.	SCHEMATIC DRAWING NO. & REV.	TEST NUMBERS P = PASS F = FAIL 02	09	10	TEST PERFORMED BY & DATE	TEST WITNESSED BY & DATE	COMMENTS OR EXCEPTIONS
W75C	3025-32 K3	P	P	P	PT FEB 5 1977	NA	
W76C		P	P	P	PT FEB 5 1977		
W77C		P	P	P	PT FEB 5 1977		
W78C		P	P	P	PT FEB 5 1977		
W79C		P	P	P	PT FEB 5 1977		
W80C		P	P	P	PT FEB 5 1977		
W81C		P	P	P	PT FEB 5 1977		
W82C		P	P	P	PT FEB 5 1977		
W83C		P	P	P	PT FEB 5 1977		
W84C		P	P	P	PT FEB 5 1977		
W85C		P	P	P	PT FEB 5 1977		
W86C	3025-37 K2	P	P	P	PT FEB 5 1977		

DESCRIPTION OF TEST NOS.

02 - Integrity of Field Erection, Installation Assembly & Bolted Connection Check.
09 - Termination Integrity Check
10 - Continuity Check

OFFICIAL COPY

FORM E01

UNIT_____

EQUIPMENT COMPLETION REPORT

THE FOLLOWING EQUIPMENT OR SYSTEM HAS BEEN CHECKED AND TESTED AS OUTLINED IN THIS MANUAL AND IS READY TO BE ENERGIZED. (ANY EXCEPTIONS TO BE CLEARLY ITEMIZED BELOW.)

NAME OF SYSTEM OR EQUIPMENT Containment Purge (CABLE CHECK)

CIRCUIT OR FEEDER OR EQUIPMENT NO.	SCHEMATIC DRAWING NO. & REV.	TEST NUMBERS P = PASS F = FAIL 02	09	10	TEST PERFORMED BY & DATE	TEST WITNESSED BY & DATE	COMMENTS OR EXCEPTIONS
W88C	3025-31 R6	P	P	P	WJ FEB 5 1971	QA	
W89C		P	P	P	WJ FEB 5 1971		
W90C		P	P	P	WJ FEB 5 1971		
W91C		P	P	P	WJ FEB 5 1971		
W92C	3025-31 R6	P	P	P	WJ FEB 5 1971		
W93C		P	P	P	WJ FEB 5 1971		
W94C		P	P	P	WJ FEB 5 1971		
W93C		P	P	P	WJ FEB 5 1971		
W96C		P	P	P	WJ FEB 5 1971		
W97C		P	P	P	WJ FEB 5 1971		
W98C		P	P	P	WJ FEB 5 1971		
W99C		P	P	P	WJ FEB 5 1971		

DESCRIPTION OF TEST NOS.

02 - Integrity of Field Erection, Installation Assembly & Bolted Connection Check. W P Lehnfeld

09 - Termination Integrity Check

10 - Continuity Check

OFFICIAL COPY

FORM E01

UNIT____

EQUIPMENT COMPLETION REPORT

THE FOLLOWING EQUIPMENT OR SYSTEM HAS BEEN CHECKED AND TESTED AS OUTLINED IF THIS MANUAL AND IS READY TO BE ENERGIZED. (ANY EXCEPTIONS TO BE CLEARLY ITEMIZED BELOW.)

NAME OF SYSTEM OR EQUIPMENT CONDENSATE POLISHERS (CABLE CHECK)_____

CIRCUIT OR FEEDER OR EQUIPMENT NO.	SCHEMATIC DRAWING NO. & REV.	TEST NUMBERS P = PASS F = FAIL 02	09	10	TEST PERFORMED BY & DATE	TEST WITNESSED BY & DATE	COMMENTS OR EXCEPTIONS
W100C	3x5-37 R2	P	P	P	FEB. 5 1977	AA	
W101C		P	P	P	FEB 5		
W102C		P	P	P			
W103C		P	P	P	FEB. 5 1977		
W104C		P	P	P	FEB 5		
W105C		P	P	P			
W106C		P	P	P	FEB. 5 1977		
W107C		P	P	P	FEB 5		W Schaf 2/15/77
W108C		P	P	P			
W109C		P	P	P			
W110C		P	P	P	FEB. 6 1977		
W111C		P	P	P	FEB 6		
					FEB		

DESCRIPTION OF TEST NOS.

02 - Integrity of Field Erection, Installation Assembly & Bolted Connection Check. W Schaf

09 - Termination Integrity Check

10 - Continuity Check

OFFICIAL COPY

FORM 801

UNIT____

EQUIPMENT COMPLETION REPORT

THE FOLLOWING EQUIPMENT OR SYSTEM HAS BEEN CHECKED AND TESTED AS OUTLINED IN THIS MANUAL AND IS READY TO BE ENERGIZED. (ANY EXCEPTIONS TO BE CLEARLY ITEMIZED BELOW.)

NAME OF SYSTEM OR EQUIPMENT Solid-State Protection (CABLE CHECK)

CIRCUIT OR FEEDER OR EQUIPMENT NO.	SCHEMATIC DRAWING NO. & REV.	TEST NUMBERS P = PASS F = FAIL 02	09	10	TEST PERFORMED BY & DATE	TEST WITNESSED BY & DATE	COMMENTS OR EXCEPTIONS
W112C	3025-37 Sh	P	P	P	P FEB 5 1977	NA	
W113C		P	P	P	P FEB 5 19[illegible]		
W114C		P	P	P	P FEB		
W115C		P	P	P	P FEB 5 1977		
W116C		P	P	P	P FEB [illegible]		
W134C		P	P	P	P 2/15/77		
					P 2/15/77		

DESCRIPTION OF TEST NOS.

02 - Integrity of Field Erection, Installation Assembly & Bolted Connection Check. HF Schaefer

09 - Termination Integrity Check

10 - Continuity Check

OFFICIAL COPY

FORM EC1

UNIT 2

EQUIPMENT COMPLETION REPORT

THE FOLLOWING EQUIPMENT OR SYSTEM HAS BEEN CHECKED AND TESTED AS OUTLINED IN THIS MANUAL AND IS READY TO BE ENERGIZED. (ANY EXCEPTIONS TO BE CLEARLY ITEMIZED BELOW.)

NAME OF SYSTEM OR EQUIPMENT: LA WATER - Pumphouse (MOTOR CHECKS)

CIRCUIT & FEEDER OR EQUIPMENT NO.	SCHEMATIC DRAWING NO. & REV.	TEST NUMBERS P = PASS F = FAIL												TEST PERFORMED BY & DATE	TEST WITNESSED BY & DATE	COMMENTS OR EXCEPTIONS
	LA P--	02	09	13	14	28	29									
AM-P-1A	D3[illegible] RF	P	P	P	P	P	P							HF FEB. 6 1977	NA	2 Hp Bus
AM-P-1B	D3[illegible] RF	P	P	P	P	P	P							FEB [illegible]		
AM-P-2	D3[illegible] RF	P	P	P	P	P	P							FEB [illegible]		
AM-P-3	3-[illegible]	P	P	P	P	P	P							FEB. 6 1977		
AM-P-4A	D3[illegible]	P	P	P	P	P	P							FEB. 6 1977		
AM-P-4B	D3[illegible]	P	P	P	P	P	P							FEB [illegible]		
AM-P-4C	D3[illegible]	P	P	P	P	P	P							FEB. 6 1977		
WT-P-13	D3[illegible]	P	P	P	P	P	P							FEB 6 1977		
WT-P-14	D3[illegible]	P	P	P	P	P	P							FEB [illegible]		
WT-P-15A	D3[illegible]	P	P	P	P	P	P							FEB. 6 1977		
WT-P-15B	D3[illegible]	P	P	P	P	P	P							FEB. 6 1977		
														FEB. 5 1977		

DESCRIPTION OF TEST NOS.

02 Integrity of Fld. Erection, Installation Ass'y. & Bolted Connection Check
09 Termination Integrity Check
13 Lubrication & Cooling Systems Check
14 Physical Rotation Check
28 Operational Check
29 Nameplate, Ident. Tag, Checks

OFFICIAL COPY

multi-amp TESTING SERVICES CORPORATION

4271 Bronze Way, Dallas, Texas 75237 • (214) 333-3801

MOTOR CONTROL CENTER TEST DATA

THREE MILE ISLAND PROJECT

DATE 12-8-79

BY J. Knox

MCC 2-31D

UNIT 4A CIRCUIT (LEFT) Sulphite Regeneration Pump MT-P-1B

MFG. XXX (RIGHT) NA

Breaker Size Main or Left HE3-B015 Amp Long Time at 3X Inst.

Ø1	Ø2	Ø3	
24.8	18.5	27.5	Sec.
			Amps.

Breaker Size (Right) NA Amp Long Time at 3X Inst.

NA	NA	NA	Sec.
			Amps.

Starter Size 1 Mechanical New

Aux. Contacts 2BO - 2BC

Continuity Checked

Aux. Transformer .100KVA

Control Fuse MDX3

Heater Size T-20

Current Rating 1.30A

Time at 3X Ave. 1 Ø1 36 Sec. Ø2 45 Sec Ø3 32 Sec.

Wiring to ground 200 Megs.

REMARKS: Set Per Drawing 3J84 Sh. 22 Rev. 1 Current curve 1274

TEST EQUIPMENT CB-25 SERIAL NO. 200

ASSOCIATED RESEARCH 1000 VOLT D.C. MEG-CHECK Serial 962

WEATHER 14 °C 58 %HR

OFFICIAL COPY

NAESCO TEST FORM 23-A 2-28

First in Electric Power Maintenance Through Engineering Services Personnel Training

multi-amp TESTING SERVICES CORPORATION

480V INTERNAL POWER WIRING CHECKLIST

MCC 2-31D UNIT 4A COMPONENT WX-P-15B MFR ITE

1. Power wiring meets manufacturers spec. X Sat. ____Unsat.
2. All screws and bolted connections are tight. X Sat. ____Unsat.
3. All lugs are prooerly installed. X Sat. ____Unsat.
4. Physical condition of insulation. X Sat. ____Unsat.
5. Explanation of any unsatisfactory condition or other irregularities:

   THM-10

   B&R F.Q. No. 894

6. Ref. dwg. 3084, Sh.22, Rev.1

Performed By J. K-yx Date 12-8-75

QC (where appl.) KA Date ____

M/A 238

OFFICIAL COPY

ME - 4

UNIT 2

united engineers & constructors inc

MOTOR BUMPING CHECK LIST

System CONDENSATE POLISHER

~~Motor~~ Name HOT WATER TANK Number CO-T-4

Power Source (~~MCR~~/MCC) 2-310

Cubicle Number 5D

Protection Devices

Switchgear Ref. Design Data NA

	Design	Actual
L.T.D.	NA	NA
S.T.D.	NA	NA
INST.	NA	NA

Motor Control Center Ref. Design Data 308+ Sh 22 Rev 1

Molded Case Breaker	Design	Actual
AMP Rating	HE3-B100	HE3-B100
Trip Setting	NA	NA

Thermal Overloading

Mfg/Number	NA	NA
Rating	NA	NA

Control Circuits Checked 12/16/82 WKJ

Date

Lubrication Checked NA

Date

Megger Records Complete 12/16/82 WKJ

Date

Motor Ready for Bumping

Performed By: [signature] Date: 12/16/82

OFFICIAL COPY

Witnessed By: NA Date:

2-30

multi-amp TESTING SERVICES CORPORATION

4271 Bronze Way, Dallas, Texas 75237 • (214) 333-3201

MOTOR CONTROL CENTER TEST DATA

THREE MILE ISLAND PROJECT

DATE 12-5-75

BY J. Knox

MCC 2-31D

UNIT 5D CIRCUIT (LEFT) Caustic Dilution Heater Polisher CO-T-4

MFG. ITE (RIGHT) NA

			Ø1	Ø2	Ø3	
Breaker Size Main or Left	HE3-B100	Amp Long Time at 3X Inst.	52.5	52	37.5	Sec.
			NA	NA	NA	Amps.
Breaker Size (Right)	NA	Amp Long Time at 3X Inst.	NA	NA	NA	Sec.
						Amps.

Starter Size 3 Mechanical New

Aux. Contacts 2NO - 2NC

Continuity Checked

Aux. Transformer .150KVA

Control Fuse 3A

Heater Size NA

Current Rating NA

Time at 3X Ave. I Ø1 NA Ø2 NA Ø3 NA

Wiring to Ground 200 Megs.

REMARKS: Set Per Drawing 3034 Sh. 22 Rev. 1 Current curve NA

TEST EQUIPMENT CB-25 SERIAL NO. 200

ASSOCIATED RESEARCH 1000 VOLT D.C. MEG-CHECK Serial 189

WEATHER 13 °C 76 %HR

OFFICIAL COPY

MAESCO TEST FORM 23-A

multi-amp TESTING SERVICES CORPORATION

[illegible] Dallas, Texas [illegible] • [illegible] • [illegible]

480V INTERNAL POWER WIRING CHECKLIST

MCC 2-31D UNIT 5D COMPONENT CO-T-4 MFR ITE

1. Power wiring meets manufacturers spec. X Sat. ____ Unsat.
2. All screws and bolted connections are tight. X Sat. ____ Unsat.
3. All lugs are properly installed. X Sat. ____ Unsat.
4. Physical condition of insulation. X Sat. ____ Unsat.
5. Explanation of any unsatisfactory condition or other irregularities:

   B&R F.Q. No. 894 THW-4

6. Ref. dwg. 3084, Sh.22, Rev.1

Performed By J. Knox Date 12-5-75

QC (where appl.) NA Date ____

M/A 238

OFFICIAL COPY.

UNIT 2

(Test Record/Acceptance Form EAF-1)

Tests and Checks Scheduled to Start

United engineers & constructors inc

ELECTRICAL EQUIPMENT/SYSTEM TEST AND CHECK RECORD AND ACCEPTANCE FORM

Metropolitan Edison Company
Three Mile Island
Unit No. 2
J. O. 9459-02

Equipment/System Name and Number) Condensate Polishers CO-24

Refer to Equipment/System Data Sheet (Not required for Motors or Wire & Cable

The test and check forms indicated are attached hereto and are a part of this Electrical Equipment/System Test and Check Record and Acceptance Form:

Electrical Test and Check Form

____ 01	____ 06	____ 11	____ 16	____ 21	____ 26
✓ 02	____ 07	____ 12	____ 17	____ 22	____ 27
____ 03	____ 08	____ 13	____ 18	____ 23	____ 28
____ 04	✓ 09	____ 14	____ 19	____ 24	____ 29
____ 05	✓ 10	____ 15	____ 20	____ 25	____ 30

CERTIFICATION - is hereby made that the Electrical tests and checks indicated above have been performed as directed, in accordance with the "Procedures"; that all of the Electrical tests and checks, required by the "Procedures", have been made; that the results were as stated in the attached records; that the equipment/system is installed in accordance with the contract documents; and that said equipment/system is secured and ready for service.

BY: R T Carlson (UE&C Inc.) 11/22/76 (Date)

APPROVED BY _____ (UE&C Startup Eng.) 2/18/77 (Date)

OFFICIAL COPY

FORM E01

UNIT 2

EQUIPMENT COMPLETION REPORT

THE FOLLOWING EQUIPMENT OR SYSTEM HAS BEEN CHECKED AND TESTED AS OUTLINED IN THIS MANUAL AND IS READY TO BE ENERGIZED. (ANY EXCEPTIONS TO BE CLEARLY ITEMIZED BELOW.)

NAME OF SYSTEM OR EQUIPMENT Condensate Polishers (CABLE CHECK)

CIRCUIT OR FEEDER OR EQUIPMENT NO.	SCHEMATIC DRAWING NO. & REV.	TEST NUMBERS P = PASS F = FAIL 02	09	10	TEST PERFORMED BY & DATE	TEST WITNESSED BY & DATE	COMMENTS OR EXCEPTIONS
W86I	3055 Rev 1	P	P	P	RT Carlson 11/22/76	NA	
W87I	3055 Rev 1	P	P	P	RT Carlson 11/22/76	NA	
W88I	3055 Rev 1	P	P	P	RT Carlson 11/22/76	NA	
W96I	3055 Rev 1	P	P	P	RT Carlson 11/22/76	NA	
W97I	3055 Rev 1	P	P	P	RT Carlson 11/22/76	NA	
W102I	3055 Rev 1	P	P	P	RT Carlson 11/22/76	NA	
W106I	3055 Rev 1	P	P	P	RT Carlson 11/22/76	NA	
W108I	3055 Rev 1	P	P	P	RT Carlson 11/22/76	NA	
W109I	3055 Rev 1	P	P	P	RT Carlson 11/22/76	NA	
W110I	3055 Rev 1	P	P	P	RT Carlson 11/22/76	NA	
W111I	3055 Rev 1	P	P	P	RT Carlson 11/22/76	NA	
W112I	3055 Rev 1	P	P	P	RT Carlson 11/22/76	NA	

DESCRIPTION OF TEST NOS.

02 - Integrity of Field Eruction, Installation Assembly & Bolted Connection Check.
09 - Termination Integrity Check
10 - Continuity Check

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2-911

FORM EQ1

UNIT 2

EQUIPMENT COMPLETION REPORT

THE FOLLOWING EQUIPMENT OR SYSTEM HAS BEEN CHECKED AND TESTED AS OUTLINED IN THIS MANUAL AND IS READY TO BE ENERGIZED. (ANY EXCEPTIONS TO BE CLEARLY ITEMIZED BELOW.)

NAME OF SYSTEM OR EQUIPMENT Condensate Polishers (CABLE CHECK)

CIRCUIT OR FEEDER OR EQUIPMENT NO.	SCHEMATIC DRAWING NO. & REV.	TEST NUMBERS P = PASS F = FAIL 02	09	10										TEST PERFORMED BY & DATE	TEST WITNESSED BY & DATE	COMMENTS OR EXCEPTIONS
W 113 I	3055 Rev 1	P	P	P										RT Carlson 11/22/76		
W 114 I	3055 Rev 1	P	P	P										RT Carlson 11/22/76		
W 115 I	3055 Rev 1	P	P	P										RT Carlson 11/22/76		

DESCRIPTION OF TEST NOS.

02 - Integrity of Field Erection, Installation Assembly & Bolted Connection Check.
09 - Termination Integrity Check
10 - Continuity Check

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FORM 201

UNIT 2

EQUIPMENT COMPLETION REPORT

THE FOLLOWING EQUIPMENT OR SYSTEM HAS BEEN CHECKED AND TESTED AS OUTLINED IN THIS MANUAL AND IS READY TO BE ENERGIZED. (ANY EXCEPTIONS TO BE CLEARLY ITEMIZED BELOW.)

NAME OF SYSTEM OR EQUIPMENT MCC 2-51D (MCC CHECK)

CIRCUIT OR FEEDER OR EQUIPMENT NO.	SCHEMATIC DRAWING NO. & REV.	TEST NUMBERS P = PASS F = FAIL 02	05	07	08	19	23	28	29	30	TEST PERFORMED BY & DATE	TEST WITNESSED BY & DATE	COMMENTS OR EXCEPTIONS
WT-P-1B Unit 3D	03E-4 Rev E	P	NA	P	P	P	P	P	P	NA	FEB 5 1977 NA		2 amp fuse
WT-P-1A Unit 4D		P		P	P	P	P	P	P		FEB 5 1977		
WT-P-15A Unit 3F		P		P	P	P	P	P	P		FEB 5 1977		
WT-P-15B Unit 4A		P		P	P	P	P	P	P		FEB 5 1977		
AM-P-4A Unit 3H	P3E-5 Rev 5	P		P	P	P	P	P	P		FEB 5 1977		
AM-P-4B Unit 3G		P		P	P	P	P	P	P		FEB 5 1977		
AM-P-4C Unit 4D		P		P	P	P	P	P	P		FEB. 5 1977		
C-T-4 Unit 3D		P		P	P	P	P	P	P		FEB. 5 1977		

DESCRIPTION OF TEST NOS.

02 Integrity of Fld. Erection, Install. Ass'y. & Bolted Connection Check
05 C.T. & P.T. Tests
07 Phase Rotation Ck. (By Instr. only)
08 Physical Fuse Location ck.
19 Initial Voltage Test
23 Fuse Availability & Size Verif.
28 Operational Check
29 Nameplate, Ident. Tag, Checks
30 Lamp Install., Clean Reflector and Color Cap or lens checks

2-45

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"MEGGER" TEST

Date 3-29-76

Sheet 1

Location TURBINE Bldg

Apparatus Tested HYDRAZINE MOTORS AM-P1A/B

Motor Data:

Mfg. RELIANCE			Type & Frame LUX4			H.P. 1/4
Freq. 60	V. 115/230	R.P.M. 1725	Amps 3.2/1.6	°C - Rise	Code	S.F.
Phase 1	Instr. #		S/N 47652C-GA		N.P. "	

Cable Data: W-14C

Conductor No. & Size 1-12-12	Volts 120	Engineer Safeguards	
Nature of Circuit: FEEDER + CONTROL	System L.A. WATER	Yes	No X

Remarks:

Megger Type: AR

Megger Serial No: E-74

Test V 500

Multiplier	
500 x 1	1000 x 2
500 x 10	2500 x 5

Test	MOTOR #1	MOTOR #2
Date	3-29-76	3-29-76
Time	9:00AM	9:15AM
Temp.	65°F	65°F
Humidity	40%	40%
Weather	CLEAR	CLEAR
POLARIZATION INDEX		
10 Min		
1 Min	✓	✓
ØA - ØB	32	32
ØA - ØC		
ØB - ØC		
Ø - Gnd	200+	200+
Ø - Gnd	200+	200+
ØC - Gnd	N/A	N/A
P - N		
P - PN		
P - PN		
P - Gnd		
N - Gnd		
PN - Gnd		

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Test By: [signature] 2-46 Witnessed By: N/A

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"MEGGER" TEST

Date 3-29-76

Sheet 2

Station TURBINE

Apparatus Tested AMMONIA Pump MOTOR AM-P-2

Motor Data:

Mfg.		Type & Frame				H.P.	
Freq.	60	V. 115/230	R.P.M. 1725	Amps 5.2/2.6	°C - Rise	Code	S.F.
Phase 1	Instr.#		S/N 416520-02	N.F.#			

Cable Data: 4C 1.3 C

Conductor No. & Size 1-12-12	Volts 120	Engineer Safeguards	
Nature of Circuit: FEEDER & CONTROL	System 480 V	Yes	No

Remarks:

Megger Type: AK

Megger Serial No: E-74

Test V 500

Multiplier	
500 x 1	1000 x 2
500 x 10	2500 x 5

Test	Winter & Kinds
Date	3-29-76
Time	9:00 AM
Temp.	65°F
Humidity	40%
Weather	CLEAR
POLARIZATION Index	
10 Min	
1 Min	✓
ØA - ØB	3 ohms
ØA - ØC	
ØB - ØC	
ØA - Gnd	200 Meg
ØB - Gnd	200 Meg
ØC - Gnd	
P - N	
P - PN	
P - PN	
P - Gnd	
N - Gnd	
PN - Gnd	

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Test By: [signature] 2-47 Witnessed By: NO

2

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"MEGGER" TEST

Date 1/24/77

Location Turb Bldg El 281' Sheet 1

Equipment Tested AM-P-3 Ammonia Hydrazine Mix Tank

Motor Data:

Mfg. BALDOR			Type & Frame 78	413			H.P. 1/6
Freq. 60	V. 115/230	R.P.M. 1725	Amps 4.0/2.0	°C - Rise 40	Code M	S.F.	
Phase 1	Instr.# NA		S.N. 34-3-158		N.P.# NA		

Cable Data: M 930C

Conductor No. & Size 1-2-12	Volts 120	Engineer Safeguards	
Nature of Circuit: Power	System MT	Yes	No X

Remarks:

Megger Type: AR 2201 Multiplier: 500 x 1, 1000 x 2

Megger Serial No: 8729 Test V 500 500 x 10, 2500 x 5

Test	Ground
Date	12-8-76
Time	19:00
Temp.	65°F
Humidity	90%
Weather	CLEAR
POLARIZATION INDEX	
10 Min	
1 Min	✓
0A - 0B	3.5 Ohms
0A - 0C	—
0B - 0C	—
0A - Gnd	200 Megohms
0B - Gnd	—
0C - Gnd	—
P - N	
P - PN	
P - PN	
P - Gnd	
N - Gnd	
PN - Gnd	

Test By: [signature] 2-48 Witnessed By: [signature]

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"MEGGER" TEST

Date 12-2-76 4-30-76

System COAGULANT 305'-C"

Sheet

Apparatus Tested AMONIA PUMP AM-P-4A

Motor Data:

ALLIANCE

Type & Frame D M56C H.P. 1/2

Phase 60 HZ V. 230/460 R.P.M. 1725 Amps 2.2/1.1 °C - Rise 40 Code M S.F.

Wire 3 Instr. # S/N N.P. #

Cable Data: MX 90P

Conductor No. & Size 1/3/12 Volts 460 Engineer Safeguards

Nature of Circuit: FEEDER System WT Yes No ✓

Remarks: * MOTOR & CABLE MEGGED TOGETHER FROM MCC

Megger Type: A/E Multiplier: 500 x 1 ✓ | 1000 x 2 | 500 x 10 | 2500 x 5

Megger Serial No: E72 Test V 500

Test		
Date	5-3-76	12-3-76
Time	1100	1147
Temp.	58°	68°F
Humidity	75%	50%
Weather	CLOUDY	OVERCAST
POLARIZATION INDEX		
10 Min		
1 Min		✓
OA - OB	33 Ω *	33 Ω
OA - OC	33 Ω *	33 Ω
OB - OC	33 Ω *	33 Ω
OA - Gnd	200+	> 200 M
OB - Gnd	200+	> 200 M
OC - Gnd	200+	> 200 M
P - N		
P - PN		
P - PN		
P - Gnd		
N - Gnd		
PN - Gnd		

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Tested By: [signature] 5-49 Witnessed By: N/A

2

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"MEGGER" TEST

12-2-76

Date 4-30-76

COAGULATION 305'-0"

Sheet 1

Motor Tested AMCHIM AMF AM-P-4B

Manufacturer RELIANCE

Type & Frame D M36C H.P. 1/2

Ph. 6 PHZ | V. 230/460 | R.P.M. 1725 | Amps 2.2/1.1 | °C - Rise 4 | Code M | S.F.

Fuse 3 | Instr. # | S/N | N. #

Cable Data: MA95P

Conductor No. & Size 12/3/12 | Volts 480 | Engineer Safeguards

Nature of Circuit: FEEDER | System WT | Yes | No ✓

Remarks: MOTOR & CABLE MEGGER'D ROUTINE FAIR AMC

Megger Type: A/R

Megger Serial No: E72

Test V 520

Multiplier: 500 x 1 ✓ | 1000 x 2 | 500 x 10 | 2500 x 5

Test		
Date	5-3-76	12/3/76
Time	1100	1143
Temp.	58°	68° F
Humidity	75%	50%
Weather	CLOUDY	OVERCAST
Absorption Indexes		
10 Min		
1 Min		✓
OA - OB	33 Ω	33 Ω
OA - OC	33 Ω	33 Ω
OB - OC	33 Ω	33 Ω
OA - Gnd	200+	>200M
OB - Gnd	200+	>200M
OC - Gnd	200+	>200M
P - N		
P - PN		
P - N		
P - Gnd		
N - Gnd		
PN - Gnd		

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2-50

Tested By: D Frame CM Chittick

Witnessed By: N/A

2

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"MEGGER" TEST

Date 12-2-76 / 4-30-76

Conduit # 305'-0"

Sheet 1

Circuit Tested AMMONIA PUMP AM-P-4C

Motor Data:

Mfg. KELLY-ME			Type & Frame D		M56C		H.P. 1/2
Cycles 60 HZ	V. 230/460	R.P.M. 1725	Amps 2.2/1.1	°C - Rise 40	Code M		S.F.
Phase 3	Instr. #		S/N		N.E.M.A. #		

Cable Data: MX 100 P

Conductor No. & Size 1/3/12	Volts 460	Engineer Safeguards	
Nature of Circuit: FEEDER	System WT	Yes	No ✓

Remarks: * MOTOR & CABLE MEGGERED TOGETHER FROM MCC
** FOUND OPEN THERMODETECTOR

Megger Type: M/2 — Multiplier: 500 x 1 | 1000 x 2

Megger Serial No: E72 — Test V 500 | 500 x 10 | 2500 x 5

Test		MEG		
Date	5-3-76	12/2/76	12/2/76	
Time	1100	1145	1145	
Temp.	70° F	68° F	68° F	
Humidity	73%		50%	
Weather	CLOUDY	OVERCAST	OVERCAST	
POLARIZATION INDEX				
10 Min				
1 Min		✓	✓	
BA - BB	∞ "	>200 M	33 Ω	
BA - BC	∞ "	>200 M	33 Ω	
BB - BC	35 Ω *	>200	33 Ω	
BA - Gnd	200+		>200 M	
BB - Gnd	200+		>200 M	
BC - Gnd	200+		>200 M	
P - N			N/A	
P - PN				
P - PN				
P - Gr				
N - Gnd				
N - Gnd				

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Test By: D Yeannetti M Kennedy — Witnessed By: N/A

2

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"MEGGER" TEST

Date 12/1/76

Sheet 1

Location Carey Bldg

Apparatus Tested String Counter Comp WT-1-13

Motor Data:

Mfr. Reliance			Type & Frame P	Fr 184SC			H.P. 42
Freq. 60	V. 230/460	R.P.M. 1725	Amps 22/11	°C - Rise 40	Code M		S.F. 1.0
Phase 3	Instr. # 46682		SN NA		N.P. # NA		

Cable Data: MSEP

Conductor No. & Size	1-3-12	Volts 480	Engineer Safeguards
Nature of Circuit:	POWER	System WT	Yes / No ✓

Remarks:

Megger Type: AR 2201

Megger Serial No: 8729

Test V. 500

Multiplier	
500 x 1	1000 x 2
500 x 10	2500 x 5

Test	Megohms to Ground
Date	12/8/76
Time	1:40pm
Temp.	68°F
Humidity	50%
Weather	CLEAR
POLARIZATION INDEX	
10 Min	
1 Min	✓
OA - OB	95 ohms
OA - OC	35 ohms
OB - OC	35 ohms
OA - Gnd	200 Meg
OB - Gnd	200 Meg
OC - Gnd	200 Meg
P - N	
P - PN	
P - PN	
P - Gnd	
N - Gnd	
PN - Gnd	

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Test By: HT Lee

Witnessed By: N/A

2

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"MEGGER" TEST

Date 12/9/76

Station Craig Bldg Sheet 1

Apparatus Tested Strong Acid Evap. WT-P-14

Motor Data:

Mfg. Reliance			Type & Frame P	Fr MS6		H.P. ½	
Freq. 60	V. 234/460	R.P.M. 1725	Amps 2.2/1.1	°C - Rise 40	Code M	S.F. 1.0	
Phase 3	Instr.# 465862W		S/N NA	N.P.# NA			

Cable Data: MA 75P

Conductor No. & Size	1-3-12	Volts 480	Engineer Safeguards
Nature of Circuit:	Power	System WT	Yes / No ✓

Remarks:

		Multiplier	
Megger Type:	AR 2201	500 x 1	100 x 2
Megger Serial No:	8727	Test V 500	500 x 10	2500 x 5

Test	Cable & Leads
Date	12/9/76
Time	1:30 PM
Temp.	68°F
Humidity	50%
Weather	CLEAR
MEGGER READINGS	
10 Min	
1 Min	✓
A - GB	35 ohms
A - C	35 ohms
B - C	35 ohms
A - Gnd	∞
B - Gnd	200 Meg
C - Gnd	200 Meg
[illegible] - N	
[illegible] - PN	
[illegible] - PN	
[illegible] - Gnd	
N - Gnd	
PN - Gnd	

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Test By: [signature]

Witnessed By: N/A

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2

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"MEGGER" TEST

Date 5-4-76

Location COAGULATION RM 305'-0" Sheet

Apparatus Tested SULPHITE REGENERATION PUMP WT-P-15A

Motor Data:

Mfr. Type & Frame K 143T H.P. 3/4

Phase 3 Cycles 60 HZ V. 230/460 R.P.M. 3520 Amps 2.4/1.2 °C - Rise 40 Code M S.F. 1.25

Instr.* N N.P.* MODEL 5K143AL1244

Cable Data: MX106P

Conductor No. & Size 1-3-12 Volts 480 Engineer Safeguards

Nature of Circuit: FEEDER System WT Yes No ✓

Remarks: * MOTOR & CABLE MEGGERED TOGETHER FROM MCC

Megger Type: A/R

Megger Serial No: E72 Test V 500

Multiplier: 500 x 1 | 1000 x 2 | 500 x 10 | 2500 x 5

Test	1							
Date	5-4-76							
Time	1000							
Temp.	60°							
Humidity	40%							
Weather	CLOUDY							
POLARIZATION INDEX								
10 Min								
1 Min								
OA - OB	23 MΩ							
OA - OC	23 MΩ							
OB - OC	23 MΩ							
OA - Gnd	200+							
OB - Gnd	200+							
OC - Gnd	200+							
P - N								
P - PN								
P - PN								
P - Gnd								
N - Gnd								
PN - Gnd								

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Test By: D Crannell Witnessed By: N/A

2

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"MEGGER" TEST

Date 5-4-76

Sheet

Coagulator Room 35'-0"

Apparatus Tested SULPHITE REGENERATION PUMP WT-P-15B

Motor Data:

Type & Frame K 143T H.P. 3/4

Phase 3 | Instr.° | Freq. 60 HZ | V. 23x/460 | R.P.M. 3520 | Amps 2.4/1.2 | °C - Rise 40 | Code M | S.P. 1.25 | S.F. | N.P. MODEL SK143 AL1244T3

Cable Data: MX III P

Conductor No. & Size 1-3-12 | Volts 480 | Engineer Safeguards

Nature of Circuit: FEEDER | System WT | Yes | No ✓

Remarks: * MOTOR & CABLE MEGGERED FROM 5KV FROM MCC

Megger Type: A/K | Multiplier: 500 x 1 | 1000 x 2 | 500 x 10 | 2500 x 5

Megger Serial No: ET2 | Test V 500

Test		
Date	5-4-76	
Time	1000	
Temp.	60°	
Humidity	20%	
Weather	CLEAR	
POLARIZATION INDEX		
10 Min		
1 Min		
ØA - ØB	23Ω *	
ØA - ØC	23Ω *	
ØB - ØC	23Ω *	
ØA - Gnd	200+	
ØB - Gnd	200+	
ØC - Gnd	200+	
P - N		
P - PN		
P - PN		
P - Gnd		
N - Gnd		
PN - Gnd		

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Test By: D Glamick

Witnessed By: N/A

Unit 2

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"MEGGER" TEST

Date 12/10/76

Sheet 1

Location TURB BLDG EL 281'

Apparatus Tested HOT WATER TANK CO-T-4

Motor Data:

Mfg. EMM ELEC. EQUIP CO		Type & Frame AA				H.P. NO
Freq.	V. 480	R.P.M. AA	Amps AA	°C - Rise AO	Code AA	S.F. NO
Phase 3	Instr.# AA	S/N AA		N.P.# 43-551-8540L		

Cable Data MAGSPB

Conductor No. & Size 1-3-4

Volts 480

System WT

Engineer Safeguards: Yes ____ No X

Nature of Circuit: POWER

Remarks:

Megger Type: AR 2201

Megger Serial No: 9729

Test V 500

Multiplier	
500 x 1	1000 x 2
500 x 10	2500 x 5

Test	Heater & cable
Date	12/14/76
Time	1:20 PM
Temp.	70°F
Humidity	65%
Weather	CLOUDY
POLARIZATION INDEX	
10 Min	
1 Min	✓
0A - 0B	2 ohms
0A - 0C	15 ohms
0B - 0C	9 ohms
0A - Gnd	.8 Megohm
0B - Gnd	.5 "
0C - Gnd	.8 "
P - N	
P - PN	
P - PN	
P - Gn	
N - Gnd	
PN - Gnd	

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Test By: W. Lehnert

Witnessed By: AA

MODULE C

(L.A. Dwg. D4050)

INITIAL CONDITIONS

1. Set the following timers: #10 10 minutes; #11 5 minutes; #12 6 minutes; #13 2 minutes; #14 4 minutes; and #15 6 minutes.

2. Set STOP & ALARM-D sel. sw. in STOP & ALARM position.

3. Set MANUAL-AUTO sel. sw. in MANUAL position.

4. Set TIME-EXTEND sel. sw. in TIME position.

PROCEDURE

PASS

1. Depress and release pushbutton "C" and verify that timer #10, the amber MODULE "C" light and relay CR-1 are energized.

2. Verify that the following valves' red OPEN lights are energized:

   2.1 Valve C10 dilute sulfite inlet
   2.2 Valve C13 sulfite and backwash outlet
   2.3 Valve R9 strong sulfite
   2.4 Valve R10 sulfite dilution water

3. After the allocated time for timer #10 has elapsed, verify that timer #11 and relay CR2 are energized.

4. Verify that all valves are closed.

5. After the allocated time for timer #11 has elapsed, verify that timer #12 and relay CR-3 are energized.

6. Verify that the following valves' red OPEN lights are energized:

   6.1 Valve C5C backwash inlet
   6.2 Valve C10 dilute sulfite inlet
   6.3 Valve C13 sulfite and backwash outlet
   6.4 Valve R10 sulfite dilution water

7. After the allocated time for timer #12 has elapsed, verify that timer #13 and relay CR-4 are energized.

8. Verify that the following valves' red OPEN lights are energized:

   8.1 Valve 14A rinse inlet
   8.2 Valve C4 waste outlet

9. After the allocated time for timer #13 has elapsed, verify that timer #14 and relay CR-5 are energized.

PROCEDURE	PASS
10. Verify that the following valves' red OPEN lights are energized:	
10.1 Valve C5B backwash inlet	
10.2 Valve C13 sulfite backwash and outlet	
11. After the allocated time for timer #14 has elapsed, verify that timer #15 and relay CR-6 are energized.	
12. Verify that the following red lights are energized:	
12.1 Valve C5A backwash inlet	
12.2 Valve C12 vent	
12.3 Vibrator	
13. After the allocated time for timer #15 has elapsed, verify that the green MODULE C COMPLETE light is energized after a 3 second delay and the alarm is energized. Silence the alarm.	
14. Verify that REPEAT STEPS 13, 14, and 15 pushbutton initiates steps 13, 14, 15.	
15. Verify that REPEAT STEPS 14 and 15 pushbutton initiates steps 14 and 15.	
16. Verify that REVERSE ORDER 14-15 or 15-14 sel. sw. reverses steps 14 and 15.	
17. Set STOP & ALARM-D sel. sw. in D position and MANUAL-AUTO sel. sw. in AUTO position. Verify that MODULE "D" is initiated.	

FINAL CONDITIONS

1. Set all switches in AUTO position.

12/27/76

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MODULE D

(L.A. Dwg. D-4050)

INITIAL CONDITIONS

1. Set the following timers: #16 15 minutes; #16A 6 minutes; #17 15 minutes; #18 10 minutes; #19 20 minutes; and #20 1 minute.

2. Set STOP & ALARM-F-E switch in STOP & ALARM position.

3. Set MANUAL-AUTO sel. sw. in MANUAL position.

PROCEDURE — PASS

1. Depress and release pushbutton "D" and verify that timer #16, the amber MODULE "D" Light and relay DR1 are energized. — [illegible]

2. Verify that the following valves' red OPEN lights are energized:

   2.1 Valve C4 waste outlet — [illegible]
   2.2 Valve C9 dilute caustic inlet — [illegible]
   2.3 Valve R5 & SV-R-6 caustic block — [illegible]
   2.4 Valve R8 Caustic Dilution water — [illegible]

3. After the allocated time for timer #16 has elapsed, verify that timer 16A and relay DR2 is energized. — [illegible]

4. Verify that the following valves' red OPEN lights are energized:

   4.1 Valve C13 sulphite and backwash outlet — [illegible]
   4.2 Valve C5B backwash inlet 140GPM — [illegible]

5. After the allocated time for timer 16 has elapsed, verify that timer 17 and relay DR3 are energized. — [illegible]

6. Verify that the following valves' red OPEN lights are energized:

   6.1 Valve C4 waste outlet — [illegible]
   6.2 Valve C9 dilute caustic inlet — [illegible]
   6.3 Valve R8 caustic dilution water — [illegible]

7. After the allocated time for timer 17 has elapsed, verify that timer 18 and relay DR4 are energized. — [illegible]

8. Verify that the following valves' red OPEN lights are energized:

   8.1 Valve C4 waste outlet — [illegible]
   8.2 Valve C14A rinse inlet — [illegible]

9. After the allocated time for timer 18 has elapsed, verify that timer 19 and relay DR5 are energized. — [illegible]

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PROCEDURE	PASS
10. Verify that the following valves' red OPEN lights are energized:	
10.1 Valve C3 dilute acid inlet	PS
10.2 Valve C4 waste outlet	PJ
10.3 Valve R1/2 acid block	PJ
10.4 Valve R4 acid dilution water	PJ
11. After the allocated time for timer 19 has elapsed, verify that timer 20 and relay DR6 are energized.	PJ
12. Verify that the following valves' red OPEN light are energized:	
12.1 Valve C3 dilute acid inlet	PJ
12.2 Valve C4 waste outlet	PJ
12.3 Valve R4 acid dilution water	PJ
13. After the allocated time for timer 20 has elapsed. verify that the green MODULE "D" COMPLETE light is energized after 3 seconds delay and the alarm is energized. Silence the alarm.	PJ
14 Set sel. sw. in F position, MANUAL-AUTO switch in AUTO position, and verify that MODULE F is energized.	PJ
15. Reset sequence. Set sel. sw. in E position and verify that MODULE E is initiated.	PJ

FINAL CONDITIONS

1. Set all switches in AUTO position.

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MODULE E

(L.A. Dwg. D4050)

INITIAL CONDITIONS

1. Set timer 28 for 10 minutes and timer 29 for 2 minutes.
2. Set STOP & ALARM-F sel. sw. in STOP & ALARM position.
3. Set MANUAL-AUTO sel. sw. in MANUAL position.

PROCEDURE

	PASS
1 Depress and release pushbutton "E" and verify that timer 28, the amber MODULE E light and relay ER1 are energized.	
2. Verify that the following valves red OPEN lights are energized:	
2.1 Valve C17 full bed ammonia inlet	
2.2 Valve C4 waste outlet	
2.3 Valve R11 strong ammonia	
2.4 Valve R12 ammonia dilution water	
3. After the allocated time for timer 28 has elasped, verify that timer 29 and relay ER2 are energized.	
4. Verify that the following valves red OPEN lights are energized:	
4.1 Valve C17 full bed ammonia inlet	
4.2 Valve C4 waste outlet	
4.3 Valve R12 ammonia dilution water	
4.4 Valve C14B rinse inlet 60GPM	
5. After the allocated time for timer 29 has elasped, verify that the green MODULE E COMPLETE light is energized after a 3 second delay and the alarm is energized. Silence alarm.	
6. Set sel. sw. to "F" position and MANUAL-AUTO switch in AUTO position and verify that MODULE F is initiated.	

FINAL CONDITIONS

1. Set all switches in AUTO position.

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MODULE F

(L.A. Dwg. D4050)

INITIAL CONDITIONS

1. Set the following timers: #12 20 minutes; #21A 4 minutes; #21B 3 minutes; #22 4 minutes.

2. Set STOP & ALARM-G sel. sw. in STOP & ALARM Position.

3. Set MANUAL-AUTO switch in MANUAL position.

PROCEDURE

PASS

1. Depress and release pushbutton "F" and verify that timer 21, the amber MODULE F light and relay FR1 are energized. [PASS]

2. Verify that the following valves' red lights are energized:

   2.1 Valve C7 sluice water [PASS]
   2.2 Valve C8 resin outlet [PASS]
   2.3 Valve C11 transfer air [PASS]
   2.4 Valve S6 rinse outlet [PASS]
   2.5 Valve S2 vent [PASS]

3. After the allocated time for timer 21 has elapsed, verify that timer 21 and relay FR2 are energized. [PASS]

4. Verify that the following valves' red lights are energized:

   4.1 Valve S2 vent [PASS]
   4.2 Valve S11 sluice water [PASS]

5. After the allocated time for timer 21A has elapsed, verify that timer 21B and relay FR3 are energized. [PASS]

6. Verify that the following valves' red lights are energized:

   6.1 Valve S2 vent [PASS]
   6.2 Valve S7 mixing air [PASS]

7. After the allocated time for timer 21B has elapsed, verify that timer 22 and relay FR4 are energized. [PASS]

8. Verify that the following valves' red lights are energized:

   8.1 Valve S2 vent [PASS]
   8.2 Valve S4 waste outlet [PASS]
   8.3 Valve S7 mixing air [PASS]

9. After the allocated time for timer 22 has elapsed, verify that the green MODULE F COMPLETE light is energized after 3 seconds delay, and the alarm is energized. Silence the alarm. [PASS]

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PROCEDURE	PASS
10. Verify that the REPEAT STEPS 21A, 21B, 22 pushbutton is capable of repeating steps 3 to 9.	WJ
11. Set STOP & ALARM-G sel. sw. in the G position and the MANUAL-AUTO Switch in the AUTO position. Verify that MODULE G is initiated.	WJ

FINAL CONDITIONS

1. Set all switches in the AUTO position.

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MODULE G

L.A. Dwg. D4050)

INITIAL CONDITIONS

1. Set the following timers: #23 3 minutes; #24 6 minutes.
2. Set RELEASE-STOP & ALARM-REPEAT CYCLE switch in STOP & ALARM position.
3. Set AUTO-MANUAL Switch in MANUAL position.

PROCEDURE

	PASS
1. Depress and release pushbutton "G" and verify that timer #23, the number MODULE G light and relay GR-1 are energized.	
2. Verify that the following valves' red lights are energized:	
2.1 Valve S2 vent	
2.2 Valve S5A refill and rinse	
3. After the allocated time for timer #23 has elapsed, verify that timer #24 and relay GR2 are energized.	
4. Verify that the following valves' red lights are energized:	
4.1 Valve S5A refill and rinse	
4.2 Valve S6 rinse outlet	
5. After the allocated time for timer #24 has elapsed, verify that the green MODULE G COMPLETE light is energized after a 3 second delay and the alarm is energized. Silence the alarm.	
6. Set AUTO-MANUAL sel. sw. in AUTO position and RELEASE-STOP&ALARM-REPEAT CYCLE sel. sw. in REPEAT CYCLE position. Verify that MODULE J is initiated when pushbutton J is pressed and released.	

FINAL CONDITIONS

1. Set all switches in AUTO position.

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MODULE H

(L.A. Dwgs D4050 and D4051)

INITIAL CONDITIONS

1. Set timers 25, 26, 27 for 5 minutes.
2. Set STOP & ALARM -F-D-C selector switch in STOP & ALARM position.
3. Set MANUAL-AUTO sel. sw. in MANUAL position.
4. All switches in AUTO position.

PROCEDURE	PASS
1. Depress and release pushbutton "H" and verify that timer 25, the amber MODULE H light, and relay CR1 are energized.	
2. Verify that the following red OPEN lights are energized:	
2.1 Valve C6 lancing air	
2.2 Valve C12 vent	
3. After the allocated time for timer 25 has elasped, verify that timer 26 and relay HR2 are energized.	
4. Verify that the following red OPEN lights are energized:	
4.1 Valve C12 vent	
4.2 Valve C5B Backwash Inlet 140 GPM	
4.3 Vibrator energized.	
5. After the allocated time for timer 26 has elapsed, verify that timer 27 and relay HR3 are energized.	
6. Verify that the following red OPEN lights are energized:	
6.1 Valve C4 Waste Outlet	
6.2 Valve C16 Strainer flush	
6.3 Valve [illegible] Rinse/Recovery (Dwg. D3835)	
6.4 Conductivity circuit energized.	
7. Verify that the green MODULE H COMPLETE light is energized after a 3 second delay and the alarm is energized. Silence the alarm.	

PASS

PROCEDURE

8. Set Sel. Sw. to F position and AUTO-MANUAL switch in AUTO position. Verify that MODULE F is initiated. PASS

9. Reset sequence. Set sel. sw. in D position and verify that MODULE D is initiated. PASS

10. Reset sequence. Set sel. sw. in C position and verify that MODULE C is initiated. PASS

FINAL CONDITIONS

1. Set all switches in AUTO position.

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MIX & STORAGE TANK

(L.A. Dwgs. D4051 and D4088)

INITIAL CONDITIONS

1. Set the following electrical switches in the OFF position:

   1.1 Vent
   1.2 Waste Outlet
   1.3 Refill & Rinse
   1.4 Rinse Outlet
   1.5 Mixing Air
   1.6 Motive Air In
   1.7 Sluice water
   1.8 Acid block and bleed valves R1/2/3
   1.9 Acid Dilution water
   1.10 Strong Caustic Block and Bleed valves R 5/6/7
   1.11 Caustic dilution water
   1.12 Strong Ammonia
   1.13 Ammonia Dilution Water
   1.14 Sulphite dilution water
   1.15 Vibrator on

2. Set the following electrical switches in the CLOSED position:

   2.1 Backwash water inlet
   2.2 Backwash outlet

3. 120VAC applied to circuit L9B.

4. Air pressure applied to the above valves and the air valve's selector switch in the AUTO position.

PROCEDURE — PASS

1. Verify that the green CLOSE lights are energized on the above valves with the exception that the red OPEN lights are energized for SVR 3 and 7. HJ

2. Vent valve SVS2

   2.1 Set the sel. sw. in the HAND position and verify that the red OPEN light is energized. HJ

   2.2 Set the sel. sw. in the AUTO Position and verify that the red OPEN light is energized when:

      2.2.1 Relay FR4 is energized. HJ
      2.2.2 Relay FR1 is energized. HJ
      2.2.3 Relay FR3 is energized. HJ
      2.2.4 Relay FR2 is energized. HJ
      2.2.5 Relay CR1 is energized. HJ

PROCEDURE	PASS
3. Waste Outlet valve SVS4	
3.1 Set sel. sw. in the HAND position and verify that the red OPEN light is energized.	
3.2 Set the sel. sw. in the AUTO position and verify that the red OPEN light is energized when relay FR4 is energized.	
4. Refil and Rinse valve SVS5A	
4.1 Set sw. in MANUAL A 200 GPM position and verify that the red OPEN light is energized.	
4.2 Set sw. in AUTO position and verify that the red OPEN light is energized when	
4.2.1 Relay GR1 is energized.	
4.2.1 Relay GR2 is energized.	
5. Rinse Outlet Valve SVS6	
5.1 Set sel sw in the HAND position and verify that the red OPEN light is energized.	
5.2 Set sw. in the AUTO position and verify that the red OPEN light is energized when	
5.2.1 Relay FR1 is energized.	
5.2.2 Relay GR2 is energized.	
6. Mixing Air valve SVS7	
6.1 Set sel. sw. in the HAND position and verify that the red OPEN light is energized.	
6.2 Set sw. in the AUTO position and verify that the red OPEN light is energized when	
6.2.1 Relay FR4 is energized.	
6.2.2 Relay FR3 is energized.	
7. Motive Air In valve SVS1	
7.1 Set sel. sw. is the HAND position and verify that the red OPEN light is energized.	
7.2 Set sw. in AUTO position and verify that the red OPEN light is energized when Relay JR1 is energized.	
8. Backwash Water Inlet valve SVS9	
8.1 Set sel. sw. in the OPEN position and verify that the red OPEN light is energized.	
9. Backwash Outlet valve SVS10	
9.1 Set sel. sw. in the OPEN position and verify that the red OPEN light is energized.	

PROCEDURE	PASS
10. Sluice Water valve SVS11	
10.1 Set sel. sw. in the HAND position and verify that the red OPEN light is energized.	
10.2 Set sel. sw. in the AUTO position and verify that the red OPEN light is energized when	
10.2.1 Relay FR2 is energized.	
10.2.2 Relay FR1 is energized.	
11. Acid Block and Bleed valves SVR1 2/3	
11.1 Energize relay APCR and set sel. sw. in the HAND position and verify that:	
11.1.1 The green CLOSE light is energized for valve R3	
11.1.2 The red OPEN lights are energized for valves R1 and R2	
11.2 Set sel. sw. in the AUTO position and verify that valve R3 red light and valves R1 and R2 green lights are energized when relay DR5 is energized.	
11.3 De-energize relay APCR	
12. Strong Caustic Block and Bleed valves SVR 5/6/7	
12.1 Energize relay CPCR and set sel. sw. in the HAND position and verify that:	
12.1.1 The green CLOSE light is energized for valve R7	
12.1.2 The red OPEN lights are energized for valves R5 and R6	
12.2 Set sel. sw. in the AUTO position and verify that valve R7 green light and valves R5 and R6's red lights are energized when relay DR-1 is energized.	
12.3 De-energize relay CPCR.	
13. Caustic Dilution Watervalve SVR8	
13.1 Set sel. sw. in the HAND position and verify that the red OPEN light is energized.	
13.2 Sel sel. sw. in the AUTO position and verify that the red OPEN light is energized when	
13.2.1 Relay ER1 is energized.	
13.2.2 Relay ER2 is energized.	

PROCEDURE	PASS
14. Sulphite Dilution Water valve SVR10	
14.1 Set sel. sw. in the HAND position and verify that the red OPEN light is energized.	[illegible]
14.2 Set sel. sw. in the AUTO position and verify that the red OPEN light is energized when	
14.2.1 Relay CR1 is energized.	[illegible]
14.2.2 Relay CR3 is energized.	[illegible]
15. Vibrator on Solenoid SSVB	
15.1 Set sel. sw. in the HAND position and verify that the red OPEN light is energized.	[illegible]
15.2 Set sel. sw. in the AUTO position and verify that the red OPEN light is energized when	
15.2.1 Relay CR6 is energized.	[illegible]
15.2.2 Relay HR2 is energized.	[illegible]

FINAL CONDITIONS

Set all switches in OFF or CLOSED position.

[illegible]
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RECEIVING TANK CO-T-3

(L.A. Dwgs. D4051 and D4088)

INITIAL CONDITIONS

1. Set the following electrical switches in the OFF position:

   1.1 Dilute Acid Inlet
   1.2 Waste Outlet
   1.3 Backwash Inlet
   1.4 Lancing Air
   1.5 Sluice water
   1.6 Resin outlet
   1.7 Dilute Caustic inlet
   1.8 Dilute sulphite inlet
   1.9 Transfer air
   1.10 Vent
   1.11 Sulphite & backwash outlet
   1.12 Rinse inlet
   1.13 Resin inlet from M&S tank
   1.14 Strainer Flush
   1.15 Ful bed ammonia inlet
   1.16 Cation bed ammonia inlet

2. 120 VAC applied to circuit L9B.

3. Air prossure applied to the valves and the above air valves' selector switch in the AUTO position.

PASS

PROCEDURE

1. Verify that the green CLOSE lights are energized on the above valves. [signature]

2. DILUTE ACID INLET VALVE SV-C-3

   2.1 Set the sel. sw. in the HAND position and verify that the red OPEN light is energized. [signature]

   2.2 Set the sel. sw. in the AUTO position and verify that the red OPEN light is energized when: [signature]

      2.1.1 Relay DR5 is energized.
      2.1.2 Relay DR6 is energized.

3. WASTE OUTLET VALVE SV-C-4

   3.1 Set the sel. sw. in the HAND position and verify that the red OPEN light is energized. [signature]

   3.2 Set the sel. sw. in the AUTO position and verify that the red OPEN light is energized when:

PROCEDURE

PASS

3.2.1 Relay JR1 is energized.

3.2.2 " DR1 " "
3.2.3 " DR3 " "
3.2.4 " DR4 " "
3.2.5 " DR5 " "
3.2.6 " DR6 " "
3.2.7 " ER1 " "
3.2.8 " ER2 " "
3.2.9 " CR4 " "
3.2.10 " HR3 " "

4. BACKWASH INLET VALVE SV-C-5A/B/C

4.1 Set the sel. sw. in the MANUAL A 100 GPM position and verify that the red OPEN and green CLOSE lights are energized.

4.2 Set the sel. sw. in the MANUAL B 140 GPM position and verify that the red and green lights are energized.

4.3 Set the sel. sw. in the MANUAL C 28 GPM position and verify that both lights are energized.

4.4 Set the sel. sw. in the AUTO position

4.4.1 Verify that solenoid SV-C-5A and both lights are energized when:

(a) Relay CR6 is energized.
(b) " HR5 " "
(c)

4.4.2 Verify that solenoid SV-C-5B and both lights are energized when:

(a) Relay HR2 is energized.
(b) " CR5 " "
(c) " DR2 " "

4.4.3 Verify that solenoid SV-C-5C and both lights are energized when:

(a) Relay CR3 is energized.

5. LANCING AIR VALVE SV-C-6

5.1 Set sel. sw. in HAND position and verify that red OPEN light is energized.

5.2 Set sel. sw. in AUTO position and verify that the red OPEN light is lit when relay HR1 is energized.

PROCEDURE | PASS

11.2.1 Relay CR5 is energized.

11.2.2 " HR2 " "
11.2.3 " HR1 "
11.2.4 " JR-1 " "

12. SULPHITE & BACKWASH OUTLET VALVE SV-C-13

12.1 Set sel. sw. in HAND position and verify that red OPEN light is energized.

12.2 Set sel. sw. in AUTO position and verify that red OPEN light is lit when

12.2.1 Relay HR5 is energized.
12.2.2 " CR1 "
12.2.3 " CR3 "
12.2.4 " CR5 "
12.2.5 " ER2 "

13. RESIN INLET TO RECEIVING TANK VALVE SV-C-1

13.1 Set sel. sw. in the CLOSED position and verify that the green CLOSE light is energized.

13.2 Set sel. sw. in the OPEN position and verify that the red OPEN light is lit when relay LOR-1 is not energized.

13.3 Verify that the green CLOSE light is lit when LOR-1 is energized.

14. RINSE INLET VALVE SV-C-14A/B/C

14.1 Set sel. sw. in the 120GPM position and verify the red OPEN and green CLOSE lights are energized.

14.2 Set sel. sw. in 60 GPM position and verify that the red OPEN and green CLOSE lights are energized.

14.3 Set sel. sw. in the AUTO position

14.3.1 Verify that solenoid SV-C-14A is energized when

(a) Relay DR4 is energized.
(b) Relay CR4 is energized.

14.3.2 Verify that solenoid SV-C-14B is energized when relay ER2 is energized.

15. RESIN INLET FROM M&S TANK VALVE SV-C-15

15.1 Set sel. sw. in HAND position and verify that red OPEN light is energized.

15.2 Set sel. sw. in AUTO position and verify that the red OPEN light is energized when relay JR1 is energized.

PROCEDURE	PASS
16. STRAINER FLUSH VALVE SV-C-16	
16.1 Set sel. sw. in HAND position and verify that the red OPEN light is energized.	
16.2 Set sel. sw. in AUTO position and verify that the red OPEN light is energized when relay HR3 is energized.	
17. FULL BED AMMONIA INLET VALVE SV-C-17	
17.1 Set sel. sw. in HAND position and verify that the red OPEN light is energized.	
17.2 Set sel. sw. in AUTO position and verify that the red OPEN light is energized when relay LR1 is not energized and	
17.2.1 Relay ER2 is energized.	
17.2.2 Relay ER1 is energized.	
18. CATION BED AMMONIA INLET VALVE SV-C-2	
18.1 Set sel. sw. in HAND position and verify that the red OPEN light is energized.	
18.2 Set sel. sw. in AUTO position and verify that the red OPEN light is energized when relay LR1 is energized and	
18.2.1 Relay ER2 is energized.	
18.2.2 Relay ER1 is energized.	

FINAL CONDITIONS

1. Set all switches in AUTO position.

ELECTRICAL CONTROL AND INTERLO

TEST PROCEDURE

AMMONIA HYDROXIDE PUMP AM-P-2

INTRODUCTION

The following test procedure is to determine if the control and interlock system performs as indicated by L.A. Dwg. D3801 Dwg. D4714 Sh. _____ Rev. F Rev. D. Satisfactory performance of the system is based upon successful completion of the following test and is indicated by the tester's initials in the pass column.

PREREQUISITE

All start up checks, as outlined in "Testing and Checking of Mechanical and Electrical Equipment", TP 250/2, must be completed prior to performing the following tests.

POWER REQUIREMENTS

1. 120 VAC power is obtained from distribution panel at control panel 305
2. Bkrs 5 & 7 AM-P-2

INITIAL CONDITIONS

1. Open power links at Ammonia Hydroxide Tank control box.
2. Set RUN-STOP selector switch at pnl 305 in the STOP position.
3. No liquid in tank.

PROCEDURE	PASS
1. Verify that the green STOP light is energized at pnl 305.	
2. Verify that the amber Ammonia Hydroxide TANK LOW LEVEL light is energized.	
3. Verify that annunciator window 1-2 is glowing brightly and the alarm is energized. Silence the alarm.	
4. Fill tank with liquid and verify:	
4.1 The amber LOW LEVEL light is not energized.	
4.2 Window 1-2 is flashing dimly.	
4.3 Clear window 1-2 alarm.	
5. Set both pump sel. sw. in RUN position and verify that the red RUN light is energized.	

FINAL CONDITIONS

1. Set pump sel. sw. in STOP position.
2. Close power links for pump.

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ELECTRICAL CONTROL AND INTERLOCK

TEST PROCEDURE

HYDRAZINE PUMPS AM-P-1A/B

INTRODUCTION

The following test procedure is to determine if the control and interlock system performs as indicated by Dwg. L.A. Dwg. D3801 D4650 Sh. _____ Rev. F Rev. F. Satisfactory performance of the system is based upon successful completion of the following test and is indicated by the tester's initials in the pass column.

PREREQUISITE

All start up checks, as outlined in "Testing and Checking of Mechanical and Electrical Equipment", TP 250/2, must be completed prior to performing the following tests.

POWER REQUIREMENTS

1. 120 VAC power is obtained from distribution pnl at Control pnl 305.

   Bkr 10 and 12 AM-P-1A

   Bkr 21 and 23 AM-P-1B

INITIAL CONDITIONS

1. Open power links at Hydrazine tank control box.
2. Set RUN-STOP selector switch at pnl 305 in the STOP position for both pumps.
3. No liquid in tank.

PROCEDURE

	PASS
1. Verify that the green STOP lights are energized at pnl 305:	
1.1 AM-P-1A	
1.2 AM-P-1B	
2. Verify that the amber HYDRAZINE TANK LOW LEVEL light is energized.	
3. Verify that annunciator window 1-1 is glowing brightly and the alarm is energized. Silence the alarm.	

PROCEDURE	PASS
6. SLUICE WATER VALVE SV-C-7	
6.1 Set sel. sw. in HAND position and verify that red OPEN light is energized.	
6.2 Set sel. sw. in AUTO position and verify that the red OPEN light is lit when relay FR1 is energized.	
7. RESIN OUTLET VALVE SV-C-8	
7.1 Set sel. sw. in HAND position and verify that red OPEN light is energized.	
7.2 Set sel. sw. in AUTO position and verify that the red OPEN light is lit when relay FR1 is energized.	
8. DILUTE CAUSTIC INLET VALVE SV-C-9	
8.1 Set sel. sw. in HAND position and verify that red OPEN light is energized.	
8.2 Set sel. sw. in AUTO position and verify that the red OPEN light is lit when	
8.2.1 Relay DR1 is energized.	
8.2.2 Relay DR3 is energized.	
9. DILUTE SULPHITE INLET VALVE SV-C-10	
9.1 Set sel. sw. in HAND position and verify that red OPEN light is energized.	
9.2 Set sel. sw. in AUTO position and verify that the red OPEN light is lit when	
9.2.1 Relay CR1 is energized.	
9.2.2 Relay CR3 is energized.	
10. TRANSFER AIR VALVE SV-C-11	
10.1 Set sel. sw. in HAND position and verify that red OPEN light is energized.	
10.2 Set sel. sw. in AUTO position and verify that the red OPEN light is lit when relay FR1 is energized.	
11. VENT VALVE SV-C-12	
11.1 Set sel. sw. in HAND position and verify that red OPEN light is energized.	
11.2 Set sel. sw. in AUTO position and verify that the red OPEN light is energized when:	

ELECTRICAL CONTROL AND INTERLOCK

TEST PROCEDURE

HOT WATER TANK CO-T-4

INTRODUCTION

The following test procedure is to determine if the control and interlock system performs as indicated by Dwg. LA D3805 Sh. - Rev. I . Satisfactory performance of the system is based upon successful completion of the following test and is indicated by the tester's initials in the pass column.

PREREQUISITE

All start up checks, as outlined in "Testing and Checking of Mechanical and Electrical Equipment", TP 250/2, must be completed prior to performing the following tests.

POWER REQUIREMENTS

1. 480 VAC power is obtained from MCC-31D Unit 5D.

INITIAL CONDITIONS

1. No liquid in tank.
2. Heater leads lifted at MCC.
3. Thermostat set at 200°F.

PROCEDURE

	PASS
1. Verify that the heater's green OFF light is energized.	MJ
2. Set HEATER switch to the ON position and verify that the green OFF light is energized.	MJ
3. Fill tank with liquid and verify that:	
3.1 Red HEATER On light on panel 304 is energized.	MJ
3.2 Red indicating light on low level switch is energized.	MJ
4. Verify that thermostat is capable of de-energizing heaters.	MJ
5. Verify that the green HEATER OFF light is energized when heaters circuits are de-energized. (thermostat set below ambient temperature.)	MJ

FINAL CONDITIONS

1. Maintain liquid in tank.
2. Reconnect heater leads at MCC.

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UE&C Test & Start Up Engr. DATE

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PROCEDURE

PASS

4. Energize Hydrazine tank low level relay R1 and verify:

   4.1 The amber LOW LEVEL light is not energized. MA

   4.2 Window 1-1 is flashing dimly. MA

   4.3 Clear window 1-1 alarm. MA

5. Set both pumps selector switches in RUN position and energize hydrazine pump starter cutoff relay R1. Verify that the red RUN light is energized.

   5.1 AM-P-1A MA

   5.2 AM-P-1B MA

FINAL CONDITIONS

1. Set pump Sel. Switches in STOP position.

2. De-energize R1 relays.

3. Close power links for both pumps.

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ELECTRICAL CONTROL AND INTERLOCK

TEST PROCEDURE

AMMONIA HYDROXIDE MIX TANK PUMP AM-P-3

INTRODUCTION

The following test procedure is to determine if the control and interlock system performs as indicated by Dwg. 3077 Sh. 20A Rev. 1. Satisfactory performance of the system is based upon successful completion of the following test and is indicated by the tester's initials in the pass column.

PREREQUISITE

All start up checks, as outlined in "Testing and Checking of Mechanical and Electrical Equipment", TP 250/2, must be completed prior to performing the following tests.

POWER REQUIREMENTS

120VAC is obtained from panel MPT-1A bkr. 13

INITIAL CONDITIONS

1. Remove thermal overload at starter.

PROCEDURE	PASS
1. Verify that green STOP light is energized at starter.	MKJ
2. Press START button and verify that red RUN light is energized.	MKJ

FINAL CONDITIONS

1. Replace thermal overload.

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TEST PROCEDURE

AMONIA PUMP AM-P-4A

INTRODUCTION

The following test procedure is to determine if the control and interlock system performs as indicated by Dwg. LA D 3805 Sh. _____ Rev. F . Satisfactory performance of the system is based upon successful completion of the following test and is indicated by the tester's initials in the pass column. Items which do not meet test requirements will be indicated by initial in fail column and it will be resolved by established procedure as outlined in Testing and Checking of Mechanical and Electrical Equipment Manual.

PREREQUISITE

All start up checks, as outlined in "Testing and Checking of Mechanical and Electrical Equipment", TP 250/2, must be completed prior to performing the following tests.

POWER REQUIREMENTS

480 VAC Power is Obtained from MCC 2-31D UNIT 4B

INITIAL CONDITION

1. Remove Motor Leads from Terminal Block in MCC
2. Ammonia Tank Empty
3. Relays ACR and ER1 not Energized

PROCEDURE	PASS	FAIL
1. Pump Mode Selector Switch in OFF Position.		
1.1 Verify that Neither the Red RUN or Green STOP light is energized.	WJ	
1.2 Install Jumper Across ACR Relay Contacts ___(Wire marks 2635 - 2636).		
Verify That the Green STOP Light is Energized.	WJ	
2. Pump Mode Selector Switch in HAND Position		
2.1 Verify That the red RUN Light is Energized.	WJ	
3. Pump Mode Selector Switch in AUTO Position		

2-81

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PROCEDURE (CONT'D)

	PASS	FAIL
3.1 Verify that the Green STOP Light is Energized.	W1	
3.2 Actuate Relay EX1 and Verify that the Red EXH light is Energized.	W1	

FINAL CONDITIONS

1. Remove EX1 Relay Jumper
2. Reconnect Motor Leads.

W. Likely 12/6/76

UESC TEST & START UP ENG. DATE

TEST PROCEDURE

AMONIA PUMP AM-P-4B

INTRODUCTION

The following test procedure is to determine if the control and interlock system performs as indicated by Dwg. LA D 3805 Sh. _____ Rev. 1 . Satisfactory performance of the system is based upon successful completion of the following test and is indicated by the tester's initials in the pass column. Items which do not meet test requirements will be indicated by initial in fail column and it will be resolved by established procedure as outlined in Testing and Checking of Mechanical and Electrical Equipment Manual.

PREREQUISITE

All start up checks, as outlined in "Testing and Checking of Mechanical and Electrical Equipment", TP 250/2, must be completed prior to performing the following tests.

POWER REQUIREMENTS

480 VAC Power is Obtained from MCC 2-31D UNIT 4C

INITIAL CONDITION

1. Remove Motor Leads from Terminal Block in MCC
2. Amonia Tank Empty
3. Relays ACR and ER1 not Energized

PROCEDURE	PASS	FAIL
1. Pump Mode Selector Switch in OFF Position.		
1.1 Verify that Neither the Red RUN or Green STOP light is energized.	MFG	
1.2 Install Jumper Across ACR Relay Contacts ___(Wire marks 2640 & 2641).	MFG	
Verify That the Green STOP Light is Energized.	MFG	
2. Pump Mode Selector Switch in HAND Position	MFG	
2.1 Verify That the red RUN Light is Energized.	MFG	
3. Pump Mode Selector Switch in AUTO Position		

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PROCEDURE (CONT'D)

	PASS	FAIL
3.1 Verify that the Green STOP Light is Energized.		
3.2 Actuate Relay ER1 and Verify that the Red RUN light is Energized.		

FINAL CONDITIONS

1. Remove ACR Relay Jumper
2. Reconnect Motor Leads.

D Grannell 5-3-76

UE&C TEST & START UP ENG. DATE

This procedure reverified on 12/2/76
MC Schneider

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TEST PROCEDURE

AMONIA PUMP AM-P-4C

INTRODUCTION

The following test procedure is to determine if the control and interlock system performs as indicated by Dwg. LA D 3805 Sh. _____ Rev. I . Satisfactory performance of the system is based upon successful completion of the following test and is indicated by the tester's initials in the pass column. Items which do not meet test requirements will be indicated by initis in fail column and it will be resolved by established procedure as outlined in Testing and Checking of Mechanical and Electrical Equipment Manual.

PREREQUISITE

All start up checks, as outlined in "Testing and Checking of Mechanical and Electrical Equipment", TP 250/2, must be completed prior to performing the following tests.

POWER REQUIREMENTS

480 VAC Power is Obtained from MCC 2-31D UNIT 4D

INITIAL CONDITION

1. Remove Motor Leads from Terminal Block in MCC
2. Amonia Tank Empty
3. Relays ACR and ER1 not Energized

PROCEDURE	PASS	FAIL
1. Pump Mode Selector Switch in OFF Position.	WEA	
1.1 Verify that Neither the Red RUN or Green STOP light is energized.	DCS	___
1.2 Install Jumper Across ACR Relay Contacts ___(Wire marks 2645 -2696).	WEA	
Verify That the Green STOP Light is Energized.	DCS	___
2. Pump Mode Selector Switch in HAND Position	WEA	
2.1 Verify That the red RUN Light is Energized.	DCS	___
3. Pump Mode Selector Switch in AUTO Position		

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PROCEDURE (CONT'D)

	PASS	FAIL
3.1 Verify that the Green STOP Light is Energized.	MKG DCH	
3.2 Actuate Relay ER1 and Verify that the Red RUN light is Energized.	MKG DCH	

FINAL CONDITIONS

1. Remove ECR Relay Jumper
2. Reconnect Motor Leads.

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UE&C TEST & START UP ENG. DATE

This procedure revised on 12/2/76
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ELECTRICAL CONTROL AND INTERLO

TEST PROCEDURE

MIXED BED ACID PUMP WT-P-11

INTRODUCTION

The following test procedure is to determine if the control and interlock system performs as indicated by Dwg. * Sh._____Rev._____. Satisfactory performance of the system is based upon successful completion of the following test and is indicated by the tester's initials in the pass column.

* L.A. Dwg. D3805 Rev. I L.A. Dwg. 476/ Rev. R
L.A. Dwg. D3804 Rev. I

PREREQUISITE

All start up checks, as outlined in "Testing and Checking of Mechanical and Electrical Equipment", TP 250/2, must be completed prior to performing the following tests.

POWER REQUIREMENTS

1. 480VAC power is obtained from MCC 2-31D unit 2D.

INITIAL CONDITIONS

1. Disconnect wire 1633 at Acid and Caustic Dilution Water Flow recorder (Panel 304).
2. Energize 120VAC circuit L9A (panel 304).
3. Lift motor leads at MCC 2-31D.
4. WT-P-11 selector switch in POLISHER AUTO position (Panel 305).
5. WT-P-14 selector switch in OFF position (Panel 304).

NOTE:

This procedure pertains only to the POLISHER AUTO position on WT-P-11 selector switch on Panel 305. The other sections of the selector switch were checked under MIX-49.

PROCEDURE

PASS

1. Verify that the following lights are energized:
   - 1.1 Amber MIXED BED OFF NORMAL (Panel 305). WJ
   - 1.2 Red SPARE PUMP IN USE (Panel 304). WJ
   - 1.3 WT-P-11 green STOP (Panel 305). WJ
   - 1.4 WT-P-14 green STOP (Panel 304). WJ

PROCEDURE	PASS
2. Verify that the following red RUN lights are lit only when relays APCR and DR5 are energized (WT-P-14 sel. sw. in OFF position):	
2.1 WT-P-11	MJ
2.2 WT-P-14	MJ
3. Verify that both pumps green CLOSE lights are lit when relays APCR and DR5 are energized and WT-P-14 sel. sw. (panel 304) is in either AUTO or HAND position.	MJ
4. Verify the following lights are de-energized when relay 12 (panel 305) is energized:	
4.1 WT-P-11 green STOP	MJ
4.2 WT-P-14 green STOP	MJ
4.3 Amber MIXED BED PUMP OFF NORMAL (Panel 305)	MJ
4.4 Red SPARE PUMP IN USE (Panel 304)	MJ

FINAL CONDITIONS

1. Reconnect wire 1633 at recorder.
2. Reconnect motor leads.

UE&C Test & Start Up Engr. 1/12/77 DATE

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ELECTRICAL CONTROL AND INTERLOCK

TEST PROCEDURE

MIXED BED STRONG CAUSTIC PUMP WT-P-12

INTRODUCTION

The following test procedure is to determine if the control and interlock system performs as indicated by Dwg.____*____ Sh._____Rev._____. Satisfactory performance of the system is based upon successful completion of the following test and is indicated by the tester's initials in the pass column.

*L.A. Dwg. 25804 Rev. I
L.A. Dwg. 24767 Rev. B

PREREQUISITE

All start up checks, as outlined in "Testing and Checking of Mechanical and Electrical Equipment", TP 250/2, must be completed prior to performing the following tests.

POWER REQUIREMENTS

1. 480VAC power is obtained from MCC 2-31D Unit 3C

INITIAL CONDITIONS

1. Energize 120VAC Circuit L9A (pnl 304).
2. Lift motor leads at MCC 2-31D.
3. WT-P-12 sel. sw. in Polisher AUTO position.
4. WT-P-13 sel. sw. in OFF position.

NOTE:

This procedure pertains only to the Polisher AUTO position on WT-P-12 Selector Switch located on Panel 305. The other sections of the Selector Switch were checked under MIX-49.

PROCEDURE

	ASS
1. Verify that the following lights are energized:	
1.1 Amber MIXED BED PUMP OFF NORMAL (Panel 305).	
1.2 Red SPARE PUMP IN USE (Panel 304).	
1.3 WT-P-12 green STOP (Panel 305).	
1.4 WT-P-13 green STOP (Panel 304).	

multi-amp TESTING SERVICES CORPORATION

4271 Bronze Way, Dallas, Texas 75237 • (214) 333-3001

MOTOR CONTROL CENTER TEST DATA

THREE MILE ISLAND PROJECT

DATE 12-8-75

BY J. Eggs

MCC 2-31D

UNIT 4A CIRCUIT (LEFT) Sulphite Regeneration Pump WT-P-15B

MFG. ITE (RIGHT) EA

			Ø1	Ø2	Ø3	
Breaker Size Main or Left HK3-8015	Amp Long Time at 3X		24.8	18.5	27.5	Sec.
	Inst.					Amps.
Breaker Size (Right) NA	Amp Long Time at 3X		NA	NA	NA	Sec.
	Inst.					Amps.

Starter Size 1 Mechanical New

Aux. Contacts 2BO - 2BC

Continuity Checked

Aux. Transformer .100KVA

Control Fu[illegible] MDX3

Heater Size T-20

Current Rating 1.30A

Time at 3X Ave. I Ø1 36 Sec. Ø2 45 Sec Ø3 32 Sec.

Wiring to Ground 200 Megs.

REMARKS: Set Per Drawing 3J84 Sh. 22 Rev. 1 Current curve 1274

TEST EQUIPMENT CB-25 SERIAL NO. 200

ASSOCIATED RESEARCH 1000 VOLT D.C. MEG-CHECK Serial 962

WEATHER 14 °C 58 %HR

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NAESCO TEST FORM 23-A 2-28

PROCEDURE

PASS

2. Verify that the following red RUN lights are lit only when relays CPCR and DR1 are energized. (WT-P-13 sel. sw. in the OFF position.)

   2.1 WT-P-12 (Panel 305). [illegible]

   2.2 WT-P-13 (panel 304). [illegible]

3. Verify that both pumps green CLOSE lights are lit when relays CPCR and DR1 are energized and WT-P-13 sel. sw. is in either the HAND or AUTO position. [illegible]

4. Verify that the following lights are de-energized when relay 13 (Panel 305) is energized:

   4.1 WT-P-12 green STOP [illegible]

   4.2 WT-P-13 green STOP [illegible]

   4.3 Amber MIXED BED PUMP OFF NORMAL [illegible]

   4.4 Red SPARE PUMP IN USE [illegible]

FINAL CONDITIONS

1. Reconnect motor leads.

[signature] 1/22/97

UE&C Test & Start Up Engr. DATE

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ELECTRICAL CONTROL AND INTERLO

TEST PROCEDURE

CONDENSATE PLANT STRONG CAUSTIC PUMP
WT-P-13

INTRODUCTION

The following test procedure is to determine if the control and interlock system performs as indicated by L.A. Dwg. D3804 Sh. - Rev. I. Satisfactory performance of the system is based upon successful completion of the following test and is indicated by the tester's initials in the pass column.

PREREQUISITE

All start up checks, as outlined in "Testing and Checking of Mechanical and Electrical Equipment", TP 250/2, must be completed prior to performing the following tests.

POWER REQUIREMENTS

1. 480VAC power is obtained from MCC 2-31D Unit 3D.

INITIAL CONDITIONS

1. Lift motor leads at MCC.
2. WT-P-13 selector switch in OFF position.
3. Relay SCPR (pnl 304) not energized.

PROCEDURE	PASS
1. Verify that the green STOP light is lit only when relay CPCR (pnl 304) is energized.	
2. Verify that the green STOP light is not lit when	
2.1 Relays R13 (pnl 305) and CPCR (pnl 304) are energized.	
2.2 Relay SCPR (pnl 304) is energized.	
3. Set pump sel. sw. in HAND position and verify that the red RUN light is energized when	
3.1 Relay SCPR is not energized.	
3.2 Relay R13 is not energized.	
3.3 Relay CPCR is energized.	
4. Set pump sel. sw. in AUTO position and verify that the red RUN light is lit when relay DR1 is energized.	

FINAL CONDITIONS

1. Reconnect motor leads.

1/22/77
UE&C Test & Start Up Engr. DATE

ELECTRICAL CONTROL AND INTERLOCK

TEST PROCEDURE

CONDENSATE PLANT STRONG ACID PUMP WT-P-14

INTRODUCTION

The following test procedure is to determine if the control and interlock system performs as indicated by L.A. Dwg. D3804 Sh. - Rev. I. Satisfactory performance of the system is based upon successful completion of the following test and is indicated by the tester's initials in the pass column.

PREREQUISITE

All start up checks, as outlined in "Testing and Checking of Mechanical and Electrical Equipment", TP 250/2, must be completed prior to performing the following tests.

POWER REQUIREMENTS

1. 480VAC power is obtained from MCC 2-31D unit 3E.

INITIAL CONDITIONS

1. Lift motor leads at MCC.
2. WT-P-14 sel. sw. in OFF position.
3. Relay SAPR (pnl 304) not energized.

PROCEDURE

	PASS
1. Verify that the green STOP light is lit only when relay APCR is energized.	
2. Verify that the green STOP light is not lit when	
2.1 Relays R12 (pnl 305) and APCR (pnl 304) are energized.	
2.2 Relay SAPR (pnl 304) is energized.	
3. Set pump sel. sw. in HAND position and verify that the red RUN light is energized when	
3.1 Relay SAPR is not energized.	
3.2 Relay R12 is not energized.	
3.3 Relay APCR is energized.	
4. Set pump sel. sw. in AUTO position and verify that the red RUN light is lit when relay DR5 is energized.	

FINAL CONDITIONS

1. Reconnect motor leads.

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UE&C Test & Start Up Engr. DATE

ELECTRICAL CONTROL AND INTERLOCK

TEST PROCEDURE

SULPHITE REGENERATION PUMP
WT-P-1A

INTRODUCTION

The following test procedure is to determine if the control and interlock system performs as indicated by Dwg. 3804 Sh. - Rev. I. Satisfactory performance of the system is based upon successful completion of the following test and is indicated by the tester's initials in the pass column. Items which do not meet test requirements will be indicated by initial in fail column and it will be resolved by established procedure as outlined in Testing and Checking of Mechanical and Electrical Equipment Manual.

PREREQUISITE

All start up checks, as outlined in "Testing and Checking of Mechanical and Electrical Equipment", TP 250/2, must be completed prior to performing the following tests.

POWER REQUIREMENTS

480 VAC power from MCC 2-31D Unit 3F.

INITIAL CONDITIONS

1. Circuit Breaker off.
2. Motor leads removed.
3. Relay CR1 de-energized.
4. Pump mode selector OFF.

PROCEDURE	PASS	FAIL
1. Turn on circuit breaker and verify the green STOP light is energized.	DG	—
2. Pump mode selector in HAND position and verify the red RUN light is energized.	DG	—
3. Pump mode selector in AUTO position. Actuate CR1 relay and verify the RED run light is energized.	DG	—

FINAL CONDITIONS

1. Pump mode selector OFF.
2. Circuit Breaker OFF.
3. Re connect motor leads.

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D Gramell 5-4-76
UE&C Test & Start Up Engr. DATE

ELECTRICAL CONTROL AND INTERLOCK

TEST PROCEDURE

SULPHITE REGENERATION PUMP
WT-P-15B

INTRODUCTION

The following test procedure is to determine if the control and interlock system performs as indicated by Dwg. 3804 Sh. - Rev. I. Satisfactory performance of the system is based upon successful completion of the following test and is indicated by the tester's initials in the pass column. Items which do not meet test requirements will be indicated by initial in fail column and it will be resolved by established procedure as outlined in Testing and Checking of Mechanical and Electrical Equipment Manual.

PREREQUISITE

All start up checks, as outlined in "Testing and Checking of Mechanical and Electrical Equipment", TP 250/2, must be completed prior to performing the following tests.

POWER REQUIREMENTS

480 VAC power from MCC 2-31D Unit 4A.

INITIAL CONDITIONS

1. Circuit Breaker off.
2. Motor leads ~~~~.
3. Relay CR1 de-energized.
4. Pump mode selector OFF.

PROCEDURE	PASS	FAIL
1. Turn on circuit breaker and verify the green STOP light is energized.	DG	
2. Pump mode selector in HAND position and verify the red RUN light is energized	DG	
3. Pump mode selector in AUTO position. Actuate CR1 relay and verify the RED run light is energized.	DG	

FINAL CONDITIONS

1. Pump mode selector OFF.
2. Circuit Breaker OFF.
3. Reconnect motor leads.

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UE&C Test & Start Up Engr. DATE

POLISHER # 1
(L.A. Dwg. D-3837 Rev. D)

INITIAL CONDITIONS

1. Set the following electrical switches in the CLOSED position:

   1.1 Inlet and bypass valve

   1.2 Outlet

   1.3 Vent

   1.4 Air inlet

   1.5 Resin inlet

   1.6 Recycle

   1.7 Sluice water inlet

   1.8 Resin outlet

2. 120 VAC applied to circuit 7A.

3. Air pressure applied to the valves and the above air valve's selector switch in the AUTO position.

PROCEDURE	PASS
1. Verify that the green CLOSE lights are energized on the following valves:	
1.1 Inlet	✓
1.2 Inlet bypass	✓
1.3 Outlet	✓
1.4 Vent	✓
1.5 Air inlet	✓
1.6 Resin inlet	✓
1.7 Recycle	✓
1.8 Sluice Water inlet	✓
1.9 Resin outlet	✓
2. Verify that the white STAND BY light is energized.	✓

PROCEDURE	PASS
3. Set the INLET valve's electrical switch in the OPEN position and verify that:	
3.1 Bypass Inlet valve's red OPEN light is energized.	
3.2 Inlet valve's red OPEN light is energized approx. 180 seconds after step 3.1.	
3.3 White STAND BY light is de-energized.	
4. Set the OUTLET valve's electrical switch in the OPEN position and verify that:	
4.1 Red OPEN light is energized.	
4.2 Red SERVICE light is energized.	
5. Set the VENT valve's electrical swtich in the OPEN position and verify that the red OPEN light is energized.	
6. Set the AIR INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
7. Set the RESIN INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
8. Set the RECYCLE valve's switch electrical in the OPEN position and verify that the red OPEN light is energized.	
9. Set the SLUICE WATER INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
10. Set the RESIN OUTLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
11. Set the INLET, OUTLET, AIR INLET, SLUICE WATER INLET, and RESIN OUT electrical switches in the CLOSE position. Set the RECYCLE, VENT, and RESIN IN electrical switches in the OPEN position. Verify that the white TRANSFER IN light is energized.	
12. Set the INLET and RECYCLE electrical switches in the OPEN position. Set the OUTLET electrical switch in the CLOSE position. Verify that the green RECYCLE light is energized.	
13. Set the AIR INLET, SLUICE WATER IN, RESIN OUTLET, electrical switches in the OPEN position. Set the RESIN IN, INLET, OUTLET, VENT, RECYCLE electrical switches in the CLOSE position. Verify thatthe amber TRANSFER OUT light is energized.	
14. RINSE POLISHER TO WASTE valve MC1:	
14.1 Set selector sw. in CLOSED position and verify that green indicating light is energized.	
14.2 Set selector sw. in OPEN position and verify that red indicating light is energized.	

PROCEDURE | PASS

15. RECYCLE valve MC2:

15.1 Set sel. sw. in CLOSED position and verify that green indicating light is energized. MM

15.2 Set sel. sw. in OPEN position and verify that red indicating light is energized. MM

ALARM SECTION

1. 2nd POLISHER EXHAUSTED alarm window 19-2 (dwg. D-3835 line 3 -

1.1 Set valve's electrical sel. switches so that the amber TRANSFER OUT light is energized. Set gallonage counter to the OFF position. Verify that the alarm window and the red POLISHER EXHAUSTED lights are flashing brightly. MM

1.2 Depress Annunicator alarm SILENCE button and verify that alarm lights have a bright steady glow. MM

1.3 Set counter to read 10 counts. Verify that the alarm lights are flashing dimly. MM

1.4 Verify that alarm lights can be extinguished by depressing the annunciator RESET button MM

2. 2nd POLISHER LOW FLOW alarm window 18-2 (dwg. D-3835 line 3-

2.1 Circuit L9A not energized and OUTLET valve's electrical sel. sw. in the OPEN position. Energize circuit L9A and verify that after approx. 3 minutes the alarm window and the red LOW FLOW lights are flashing brightly. MM

2.2 Depress annunciator ALARM SILENCE button and verify that the alarm lights have a bright steady glow. MM

2.3 Set OUTLET valve electrical swtich in the CLOSED position. Depress the annunciator ALARM SILENCE button and verify that the alarm lights are flashing dimly. MM

3.4 Verify that the alarm lights can be extinguished by depressing the annunciator RESET button. MM

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PROCEDURE PAGE

3. 2 POLISHER HIGH CONDUCTIVITY alarm window 9-1 (Dwg. D4088 line 6-113)

3.1 Verify that there is no continuity between contacts L-C on polisher # 9 in rear of Beckman-Honeywell conductivity recorder. [illegible]

3.2 Install jumper across contacts L-C and set OUTLET valve switch in OPEN position. Remove jumper and verify that alarm window and red HIGH COND. lights are flashing brightly. [illegible]

3.3 Depress ALARM SILENCE button and verify that the alarm lights have a bright steady glow. [illegible]

3.4 Set OUTLET valve's electrical sw. in the CLOSE position. Verify that the alarm lights are flashing dimly. [illegible]

3.5 Verify that the alarm lights can be extinguished by depressing the RESET button. [illegible]

4. 2 POLISHED HIGH PRESSURE DROP RESIN TRAP alarm window 9-1 (dwg. D4767 line 7-15)

4.1 Open contacts 629-630 at differential pressure switch. Verify that alarm window and red HIGH D/P lights are flashing brightly. [illegible]

4.2 Depress ALARM SILENCE button and verify that the alarm lights have a bright steady glow. [illegible]

4.3 Close contacts and verify that the alarm lights are flashing dimly. [illegible]

4.4 Verify that the alarm lights can be extinguished by depressing the RESET button. [illegible]

[illegible] 12/9/82

POLISHER # 1
(L.A. Dwg. D-3836 Rev. D)

INITIAL CONDITIONS

1. Set the following electrical switches in the CLOSED position:

   1.1 Inlet and bypass valve

   1.2 Outlet

   1.3 Vent

   1.4 Air inlet

   1.5 Resin inlet

   1.6 Recycle

   1.7 Sluice water inlet

   1.8 Resin outlet

2. 120 VAC applied to circuit 7A.

3. Air pressure applied to the valves and the above air valve's selector switch in the AUTO position.

PROCEDURE

	PASS
1. Verify that the green CLOSE lights are energized on the following valves:	
1.1 Inlet	[illegible]
1.2 Inlet bypass	[illegible]
1.3 Outlet	[illegible]
1.4 Vent	[illegible]
1.5 Air inlet	[illegible]
1.6 Resin inlet	[illegible]
1.7 Recycle	[illegible]
1.8 Sluice Water inlet	[illegible]
1.9 Resin outlet	[illegible]
2. Verify that the white STAND BY light is energized.	[illegible]

PROCEDURE	PARS
3. Set the INLET valve's electrical switch in the OPEN position and verify that:	
3.1 Bypass Inlet valve's red OPEN light is energized.	
3.2 Inlet valve's red OPEN light is energized approx. 180 seconds after step 3.1.	
3.3 White STAND BY light is de-energized.	
4. Set the OUTLET valve's electrical switch in the OPEN position and verify that:	
4.1 Red OPEN light is energized.	
4.2 Red SERVICE light is energized.	
5. Set the VENT valve's electrical swtich in the OPEN position and verify that the red OPEN light is energized.	
6. Set the AIR INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
7. Set the RESIN INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
8. Set the RECYCLE valve's switch electrical in the OPEN position and verify that the red OPEN light is energized.	
9. Set the SLUICE WATER INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
10. Set the RESIN OUTLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
11. Set the INLET, OUTLET, AIR INLET, SLUICE WATER INLET, and RESIN OUT electrical switches in the CLOSE position. Set the RECYCLE, VENT, and RESIN IN electrical switches in the OPEN position. Verify that the white TRANSFER IN light is energized.	
12. Set the INLET and RECYCLE electrical switches in the OPEN position. Set the OUTLET electrical switch in the CLOSE position. Verify that the green RECYCLE light is energized.	
13. Set the AIR INLET, SLUICE WATER IN, RESIN OUTLET, electrical switches in the OPEN position. Set the RESIN IN, INLET, OUTLET, VENT, RECYCLE electrical switches in the CLOSE position. Verify thatthe amber TRANSFER OUT light is energized.	
14. RINSE POLISHER TO WASTE valve MC1:	
14.1 Set selector sw. in CLOSED position and verify that green indicating light is energized.	
14.2 Set selector sw. in OPEN position and verify that red indicating light is energized.	

PROCEDURE

PASS

15. RECYCLE valve MC2:

15.1 Set sel. sw. in CLOSED position and verify that green indicating light is energized. MJ

15.2 Set sel. sw. in OPEN position and verify that red indicating light is energized. MJ

ALARM SECTION

1. 2A POLISHER EXHAUSTED alarm window 3-2 (dwg. D-3835 line 3-2)

1.1 Set valve's electrical sel. switches so that the amber TRANSFER OUT light is energized. Set gallonage counter to the OFF position. Verify that the alarm window and the red POLISHER EXHAUSTED lights are flashing brightly. MJ

1.2 Depress Annunicator alarm SILENCE button and verify that alarm lights have a bright steady glow. MJ

1.3 Set counter to read 10 counts. Verify that the alarm lights are flashing dimly. MJ

1.4 Verify that alarm lights can be extinguished by depressing the annunciator RESET button. MJ

2. 2A POLISHER LOW FLOW alarm window 2-2 (dwg. D-3835 line 3-2)

2.1 Circuit L9A not energized and OUTLET valve's electrical sel. sw. in the OPEN position. Energize circuit L9A and verify that after approx. 3 minutes the alarm window and the red LOW FLOW lights are flashing brightly. MJ

2.2 Depress annunciator ALARM SILENCE button and verify that the alarm lights have a bright steady glow. MJ

2.3 Set OUTLET valve electrical swtich in the CLOSED position. Depress the annunciator ALARM SILENCE button and verify that the alarm lights are flashing dimly. MJ

3.4 Verify that the alarm lights can be extinguished by depressing the annunciator RESET button. MJ

PROCEDURE	PASS

3. 2A POLISHER HIGH CONDUCTIVITY alarm window 2-1 (Dwg. D4088 line 6-24)

3.1 Verify that there is no continuity between contacts L-C on polisher # 1 in rear of Beckman-Honeywell conductivity recorder. #1

3.2 Install jumper across contacts L-C and set OUTLET valve switch in OPEN position. Remove jumper and verify that alarm window and red HIGH COND. lights are flashing brightly. #1

3.3 Depress ALARM SILENCE button and verify that the alarm lights have a bright steady glow. #1

3.4 Set OUTLET valve's electrical sw. in the CLOSE position. Verify that the alarm lights are flashing dimly. #1

3.5 Verify that the alarm lights can be extinguished by depressing the RESET button. #1

4. 2A POLISHER HIGH PRESSURE DROP RESIN TRAP alarm window 3-1 (dwg. D4767 line 7-1)

4.1 Open contacts 1641 - 1642 at differential pressure switch. Verify that alarm window and red HIGH D/P lights are flashing brightly. #1

4.2 Depress ALARM SILENCE button and verify that the alarm lights have a bright steady glow. #1

4.3 Close contacts and verify that the alarm lights are flashing dimly. #1

4.4 Verify that the alarm lights can be extinguished by depressing the RESET button. #1

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POLISHER # 2
(L.A. Dwg. D-3836 Rev. D)

INITIAL CONDITIONS

1. Set the following electrical switches in the CLOSED position:

   1.1 Inlet and bypass valve

   1.2 Outlet

   1.3 Vent

   1.4 Air inlet

   1.5 Resin inlet

   1.6 Recycle

   1.7 Sluice water inlet

   1.8 Resin outlet

2. 120 VAC applied to circuit 7A.

3. Air pressure applied to the valves and the above air valve's selector switch in the AUTO position.

PROCEDURE	PASS
1. Verify that the green CLOSE lights are energized on the following valves:	
1.1 Inlet	[illegible]
1.2 Inlet bypass	[illegible]
1.3 Outlet	[illegible]
1.4 Vent	[illegible]
1.5 Air inlet	[illegible]
1.6 Resin inlet	[illegible]
1.7 Recycle	[illegible]
1.8 Sluice Water inlet	[illegible]
1.9 Resin outlet	[illegible]
2. Verify that the white STAND BY light is energized.	[illegible]

PROCEDURE	PASS
3. Set the INLET valve's electrical switch in the OPEN position and verify that:	
3.1 Bypass Inlet valve's red OPEN light is energized.	
3.2 Inlet valve's red OPEN light is energized approx. 180 seconds after step 3.1.	
3.3 White STAND BY light is de-energized.	
4. Set the OUTLET valve's electrical switch in the OPEN position and verify that:	
4.1 Red OPEN light is energized.	
4.2 Red SERVICE light is energized.	
5. Set the VENT valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
6. Set the AIR INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
7. Set the RESIN INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
8. Set the RECYCLE valve's switch electrical in the OPEN position and verify that the red OPEN light is energized.	
9. Set the SLUICE WATER INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
10. Set the RESIN OUTLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
11. Set the INLET, OUTLET, AIR INLET, SLUICE WATER INLET, and RESIN OUT electrical switches in the CLOSE position. Set the RECYCLE, VENT, and RESIN IN electrical switches in the OPEN position. Verify that the white TRANSFER IN light is energized.	
12. Set the INLET and RECYCLE electrical switches in the OPEN position. Set the OUTLET electrical switch in the CLOSE position. Verify that the green RECYCLE light is energized.	
13. Set the AIR INLET, SLUICE WATER IN, RESIN OUTLET, electrical switches in the OPEN position. Set the RESIN IN, INLET, OUTLET, VENT, RECYCLE electrical switches in the CLOSE position. Verify thatthe amber TRANSFER OUT light is energized.	
14. RINSE POLISHER TO WASTE valve M.1:	
14.1 Set selector sw. in CLOSED position and verify that green indicating light is energized.	
14.2 Set selector sw. in OPEN position and verify that red indicating light is energized.	

PROCEDURE | PASS

15. RECYCLE valve MC2:

15.1 Set sel. sw. in CLOSED position and verify that green indicating light is energized. MJ

15.2 Set sel. sw. in OPEN position and verify that red indicating light is energized. MJ

ALARM SECTION

1. 2S POLISHER EXHAUSTED alarm window 5-2 (dwg. D-3835 line 3-46)

1.1 Set valve's electrical sel. switches so that the amber TRANSFER OUT light is energized. Set gallonage counter to the OFF position. Verify that the alarm window and the red POLISHER EXHAUSTED lights are flashing brightly. MJ

1.2 Depress Annunicator alarm SILENCE button and verify that alarm lights have a bright steady glow. MJ

1.3 Set counter to read 10 counts. Verify that the alarm lights are flashing dimly. MJ

1.4 Verify that alarm lights can be extinguished by depressing the annunciator RESET button. MJ

2. 2S POLISHER LOW FLOW alarm window 4-2 (dwg. D-3835 line 3-47)

2.1 Circuit L9A not energized and OUTLET valve's electrical sel. sw. in the OPEN position. Energize circuit L9A and verify that after approx. 3 minutes the alarm window and the red LOW FLOW lights are flashing brightly. MJ

2.2 Depress annunciator ALARM SILENCE button and verify that the alarm lights have a bright steady glow. MJ

2.3 Set OUTLET valve electrical swtich in the CLOSED position. Depress the annunciator ALARM SILENCE button and verify that the alarm lights are flashing dimly. MJ

3.4 Verify that the alarm lights can be extinguished by depressing the annunciator RESET button. MJ

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3. 2A POLISHER HIGH CONDUCTIVITY alarm window 4 -1 (Dwg. D4088 line 6-95)

3.1 Verify that there is no continuity between contacts L-C on polisher # 2 in rear of Beckman-Honeywell conductivity recorder. [illegible]

3.2 Install jumper across contacts L-C and set OUTLET valve switch in OPEN position. Remove jumper and verify that alarm window and red HIGH COND. lights are flashing brightly. [illegible]

3.3 Depress ALARM SILENCE button and verify that the alarm lights have a bright steady glow. [illegible]

3.4 Set OUTLET valve's electrical sw. in the CLOSE position. Verify that the alarm lights are flashing dimly. [illegible]

3.5 Verify that the alarm lights can be extinguished by depressing the RESET button. [illegible]

4. 2A POLISHER HIGH PRESSURE DROP RESIN TRAP alarm window 5 -1 (dwg. D4767 line 7-3)

4.1 Open contacts 1665 - 1666 at differential pressure switch. Verify that alarm window and red HIGH D/P lights are flashing brightly. [illegible]

4.2 Depress ALARM SILENCE button and verify that the alarm lights have a bright steady glow. [illegible]

4.3 Close contacts and verify that the alarm lights are flashing dimly. [illegible]

4.4 Verify that the alarm lights can be extinguished by depressing the RESET button. [illegible]

[illegible] 12/6/96

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POLISHER # 3
(L.A. Dwg. D-3836 Rev. D)

INITIAL CONDITIONS

1. Set the following electrical switches in the CLOSED position:

   1.1 Inlet and bypass valve

   1.2 Outlet

   1.3 Vent

   1.4 Air inlet

   1.5 Resin inlet

   1.6 Recycle

   1.7 Sluice water inlet

   1.8 Resin outlet

2. 120 VAC applied to circuit 7A.

3. Air pressure applied to the valves and the above air valve's selector switch in the AUTO position.

PROCEDURE

	PASS
1. Verify that the green CLOSE lights are energized on the following valves:	
1.1 Inlet	M
1.2 Inlet bypass	M
1.3 Outlet	M
1.4 Vent	M
1.5 Air inlet	M
1.6 Resin inlet	M
1.7 Recycle	M
1.8 Sluice Water inlet	M
1.9 Resin outlet	M
2. Verify that the white STAND BY light is energized.	M

PROCEDURE	PASS
3. Set the INLET valve's electrical switch in the OPEN position and verify that:	
3.1 Bypass Inlet valve's red OPEN light is energized.	
3.2 Inlet valve's red OPEN light is energized approx. 180 seconds after step 3.1.	
3.3 White STAND BY light is de-energized.	
4. Set the OUTLET valve's electrical switch in the OPEN position and verify that:	
4.1 Red OPEN light is energized.	
4.2 Red SERVICE light is energized.	
5. Set the VENT valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
6. Set the AIR INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
7. Set the RESIN INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
8. Set the RECYCLE valve's switch electrical in the OPEN position and verify that the red OPEN light is energized.	
9. Set the SLUICE WATER INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
10. Set the RESIN OUTLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
11. Set the INLET, OUTLET, AIR INLET, SLUICE WATER INLET, and RESIN OUT electrical switches in the CLOSE position. Set the RECYCLE, VENT, and RESIN IN electrical switches in the OPEN position. Verify that the white TRANSFER IN light is energized.	
12. Set the INLET and RECYCLE electrical switches in the OPEN position. Set the OUTLET electrical switch in the CLOSE position. Verify that the green RECYCLE light is energized.	
13. Set the AIR INLET, SLUICE WATER IN, RESIN OUTLET, electrical switches in the OPEN position. Set the RESIN IN, INLET, OUTLET, VENT, RECYCLE electrical switches in the CLOSE position. Verify thatthe amber TRANSFER OUT light is energized.	
14. RINSE POLISHER TO WASTE valve MC1:	
14.1 Set selector sw. in CLOSED position and verify that green indicating light is energized.	
14.2 Set selector sw. in OPEN position and verify that red indicating light is energized.	

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PROCEDURE PASS

15. RECYCLE valve MC2:

15.1 Set sel. sw. in CLOSED position and verify that green indicating light is energized. RJ

15.2 Set sel. sw. in OPEN position and verify that red indicating light is energized. RJ

ALARM SECTION

1. 2C POLISHER EXHAUSTED alarm window 7-2 (dwg. D-3835 line 3-2)

1.1 Set valve's electrical sel. switches so that the amber TRANSFER OUT light is energized. Set gallonage counter to the OFF position. Verify that the alarm window and the red POLISHER EXHAUSTED lights are flashing brightly. RJ

1.2 Depress Annunicator alarm SILENCE button and verify that alarm lights have a bright steady glow. RJ

1.3 Set counter to read 10 counts. Verify that the alarm lights are flashing dimly. RJ

1.4 Verify that alarm lights can be extinguished by depressing the annunciator RESET button. RJ

2. 2C POLISHER LOW FLOW alarm window 6-2 (dwg. D-3835 line 3-3)

2.1 Circuit L9A not energized and OUTLET valve's electrical sel. sw. in the OPEN position. Energize circuit L9A and verify that after approx. 3 minutes the alarm window and the red LOW FLOW lights are flashing brightly. RJ

2.2 Depress annunciator ALARM SILENCE button and verify that the alarm lights have a bright steady glow. RJ

2.3 Set OUTLET valve electrical switch in the CLOSED position. Depress the annunciator ALARM SILENCE button and verify that the alarm lights are flashing dimly. RJ

3.4 Verify that the alarm lights can be extinguished by depressing the annunciator RESET button. RJ

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3. 2 5 POLISHER HIGH CONDUCTIVITY alarm window 6 -1 (Dwg. D4088 line 6-7)

3.1 Verify that there is no continuity between contacts L-C on polisher # 3 in rear of Beckman-Honeywell conductivity recorder. [illegible]

3.2 Install jumper across contacts L-C and set OUTLET valve switch in OPEN position. Remove jumper and verify that alarm window and red HIGH COND. lights are flashing brightly. [illegible]

3.3 Depress ALARM SILENCE button and verify that the alarm lights have a bright steady glow. [illegible]

3.4 Set OUTLET valve's electrical sw. in the CLOSE position. Verify that the alarm lights are flashing dimly. [illegible]

3.5 Verify that the alarm lights can be extinguished by depressing the RESET button. [illegible]

4. 2 _ POLISHED HIGH PRESSURE DROP RESIN TRAP alarm window 7 -1 (dwg. D4767 line 7-5)

4.1 Open contacts [illegible] at differential pressure switch. Verify that alarm window and red HIGH D/P lights are flashing brightly. [illegible]

4.2 Depress ALARM SILENCE button and verify that the alarm lights have a bright steady glow. [illegible]

4.3 Close contacts and verify that the alarm lights are flashing dimly. [illegible]

4.4 Verify that the alarm lights can be extinguished by depressing the RESET button. [illegible]

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POLISHER # 4
(L.A. Dwg. D-38360 Rev. D)

INITIAL CONDITIONS

1. Set the following electrical switches in the CLOSED position:

   1.1 Inlet and bypass valve

   1.2 Outlet

   1.3 Vent

   1.4 Air inlet

   1.5 Resin inlet

   1.6 Recycle

   1.7 Sluice water inlet

   1.8 Resin outlet

2. 120 VAC applied to circuit 7A.

3. Air pressure applied to the valves and the above air valve's selector switch in the AUTO position.

PROCEDURE	PASS
1. Verify that the green CLOSE lights are energized on the following valves:	
1.1 Inlet	[illegible]
1.2 Inlet bypass	[illegible]
1.3 Outlet	[illegible]
1.4 Vent	[illegible]
1.5 Air inlet	[illegible]
1.6 Resin inlet	[illegible]
1.7 Recycle	[illegible]
1.8 Sluice Water inlet	[illegible]
1.9 Resin outlet	[illegible]
2. Verify that the white STAND BY light is energized.	[illegible]

3. Set the INLET valve's electrical switch in the OPEN position and verify that:

   3.1 Bypass Inlet valve's red OPEN light is energized.

   3.2 Inlet valve's red OPEN light is energized approx. 180 seconds after step 3.1.

   3.3 White STAND BY light is de-energized.

4. Set the OUTLET valve's electrical switch in the OPEN position and verify that:

   4.1 Red OPEN light is energized.

   4.2 Red SERVICE light is energized.

5. Set the VENT valve's electrical swtich in the OPEN position and verify that the red OPEN light is energized.

6. Set the AIR INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.

7. Set the RESIN INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.

8. Set the RECYCLE valve's switch electrical in the OPEN position and verify that the red OPEN light is energized.

9. Set the SLUICE WATER INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.

10. Set the RESIN OUTLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.

11. Set the INLET, OUTLET, AIR INLET, SLUICE WATER INLET, and RESIN OUT electrical switches in the CLOSE position. Set the RECYCLE, VENT, and RESIN IN electrical switches in the OPEN position. Verify that the white TRANSFER IN light is energized.

12. Set the INLET and RECYCLE electrical switches in the OPEN position. Set the OUTLET electrical switch in the CLOSE position. Verify that the green RECYCLE light is energized.

13. Set the AIR INLET, SLUICE WATER IN, RESIN OUTLET, electrical switches in the OPEN position. Set the RESIN IN, INLET, OUTLET, VENT, RECYCLE electrical switches in the CLOSE position. Verify thatthe amber TRANSFER OUT light is energized.

14. RINSE POLISHER TO WASTE valve HC1:

   14.1 Set selector sw. in CLOSED position and verify that green indicating light is energized.

   14.2 Set selector sw. in OPEN position and verify that red indicating light is energized.

2-112

PROCEDURE | PASS

15. RECYCLE valve MC2:

15.1 Set sel. sw. in CLOSED position and verify that green indicating light is energized. MJ

15.2 Set sel. sw. in OPEN position and verify that red indicating light is energized. MJ

ALARM SECTION

1. 2D POLISHER EXHAUSTED alarm window 9-2 (dwg. D-3835 line 3-34)

1.1 Set valve's electrical sel. switches so that the amber TRANSFER OUT light is energized. Set gallonage counter to the OFF position. Verify that the alarm window and the red POLISHER EXHAUSTED lights are flashing brightly. MJ

1.2 Depress Annunciator alarm SILENCE button and verify that alarm lights have a bright steady glow. MJ

1.3 Set counter to read 10 counts. Verify that the alarm lights are flashing dimly. MJ

1.4 Verify that alarm lights can be extinguished by depressing the annunciator RESET button. MJ

2. 2D POLISHER LOW FLOW alarm window 9-2 (dwg. D-3835 line 3 37)

2.1 Circuit L9A not energized and OUTLET valve's electrical sel. sw. in the OPEN position. Energize circuit L9A and verify that after approx. 3 minutes the alarm window and the red LOW FLOW lights are flashing brightly. MJ

2.2 Depress annunciator ALARM SILENCE button and verify that the alarm lights have a bright steady glow. MJ

2.3 Set OUTLET valve electrical swtich in the CLOSED position. Depress the annunciator ALARM SILENCE button and verify that the alarm lights are flashing dimly. MJ

3.4 Verify that the alarm lights can be extinguished by depressing the annunciator RESET button. MJ

PROCEDURE	PASS

3. 2 POLISHER HIGH CONDUCTIVITY alarm window 8-1 (Dwg. D4088 line 6-(e1))

3.1 Verify that there is no continuity between contacts L-C on polisher # 4 in rear of Beckman-Honeywell conductivity recorder. [illegible]

3.2 Install jumper across contacts L-C and set OUTLET valve switch in OPEN position. Remove jumper and verify that alarm window and red HIGH COND. lights are flashing brightly. [illegible]

3.3 Depress ALARM SILENCE button and verify that the alarm lights have a bright steady glow. [illegible]

3.4 Set OUTLET valve's electrical sw. in the CLOSE position. Verify that the alarm lights are flashing dimly [illegible]

3.5 Verify that the alarm lights can be extinguished by depressing the RESET button. [illegible]

4. 2 POLISHED HIGH PRESSURE DROP RESIN TRAP alarm window 9-1 (dwg. D4767 line 7-7)

4.1 Open contacts 1613 - 1614 at differential pressure switch. Verify that alarm window and red HIGH D/P lights are flashing brightly. [illegible]

4.2 Depress ALARM SILENCE button and verify that the alarm lights have a bright steady glow. [illegible]

4.3 Close contacts and verify that the alarm lights are flashing dimly. [illegible]

4.4 Verify that the alarm lights can be extinguished by depressing the RESET button. [illegible]

[illegible] 12/3/82

POLISHER # 6
(L.A. Dwg. D-3837 Rev. D)

INITIAL CONDITIONS

1. Set the following electrical switches in the CLOSED position:

   1.1 Inlet and bypass valve

   1.2 Outlet

   1.3 Vent

   1.4 Air inlet

   1.5 Resin inlet

   1.6 Recycle

   1.7 Sluice water inlet

   1.8 Resin outlet

2. 120 VAC applied to circuit 7A.

3. Air pressure applied to the valves and the above air valve's selector switch in the AUTO position.

PROCEDURE	PASS
1. Verify that the green CLOSE lights are energized on the following valves:	
1.1 Inlet	[illegible]
1.2 Inlet bypass	[illegible]
1.3 Outlet	[illegible]
1.4 Vent	[illegible]
1.5 Air inlet	[illegible]
1.6 Resin inlet	[illegible]
1.7 Recycle	[illegible]
1.8 Sluice Water inlet	[illegible]
1.9 Resin outlet	[illegible]
2 Verify that the white STAND BY light is energized.	[illegible]

3. Set the INLET valve's electrical switch in the OPEN position and verify that:

   3.1 Bypass Inlet valve's red OPEN light is energized.

   3.2 Inlet valve's red OPEN light is energized approx. 180 seconds after step 3.1.

   3.3 White STAND BY light is de-energized.

4. Set the OUTLET valve's electrical switch in the OPEN position and verify that:

   4.1 Red OPEN light is energized.

   4.2 Red SERVICE light is energized.

5. Set the VENT valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.

6. Set the AIR INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.

7. Set the RESIN INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.

8. Set the RECYCLE valve's switch electrical in the OPEN position and verify that the red OPEN light is energized.

9. Set the SLUICE WATER INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.

10. Set the RESIN OUTLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.

11. Set the INLET, OUTLET, AIR INLET, SLUICE WATER INLET, and RESIN OUT electrical switches in the CLOSE position. Set the RECYCLE, VENT, and RESIN IN electrical switches in the OPEN position. Verify that the white TRANSFER IN light is energized.

12. Set the INLET and RECYCLE electrical switches in the OPEN position. Set the OUTLET electrical switch in the CLOSE position. Verify that the green RECYCLE light is energized.

13. Set the AIR INLET, SLUICE WATER IN, RESIN OUTLET, electrical switches in the OPEN position. Set the RESIN IN, INLET, OUTLET, VENT, RECYCLE electrical switches in the CLOSE position. Verify thatthe amber TRANSFER OUT light is energized.

14. RINSE POLISHER TO WASTE valve 'C1:

   14.1 Set selector sw. in CLOSED position and verify that green indicating light is energized.

   14.2 Set selector sw. in OPEN position and verify that red indicating light is energized.

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PROCEDURE | PASS

15. RECYCLE valve MC2:

15.1 Set sel. sw. in CLOSED position and verify that green indicating light is energized. MJ

15.2 Set sel. sw. in OPEN position and verify that red indicating light is energized. MJ

ALARM SECTION

1. 2# POLISHER EXHAUSTED alarm window 13-2 (dwg. D-3835 line 3-42)

1.1 Set valve's electrical sel. switches so that the amber TRANSFER OUT light is energized. Set gallonage counter to the OFF position. Verify that the alarm window and the red POLISHER EXHAUSTED lights are flashing brightly. MJ

1.2 Depress Annunicator alarm SILENCE button and verify that alarm lights have a bright steady glow. MJ

1.3 Set counter to read 10 counts. Verify that the alarm lights are flashing dimly. MJ

1.4 Verify that alarm lights can be extinguished by depressing the annunciator RESET button. MJ

2. 2# POLISHER LOW FLOW alarm window 12-2 (dwg. D-3835 line 3-45)

2.1 Circuit L9A not energized and OUTLET valve's electrical sel. sw. in the OPEN position. Energize circuit L9A and verify that after approx. 3 minutes the alarm window and the red LOW FLOW lights are flashing brightly. MJ

2.2 Depress annunciator ALARM SILENCE button and verify that the alarm lights have a bright steady glow. MJ

2.3 Set OUTLET valve electrical swtich in the CLOSED position. Depress the annunciator ALARM SILENCE button and verify that the alarm lights are flashing dimly. MJ

3.4 Verify that the alarm lights can be extinguished by depressing the annunciator RESET button. MJ

2-117

PROCEDURE	PASS

3. 2E POLISHER HIGH CONDUCTIVITY alarm window 12-1 (Dwg. D4088 line 6-4)

3.1 Verify that there is no continuity between contacts L-C on polisher # 5 in rear of Beckman-Honeywell conductivity recorder. MJ

3.2 Install jumper across contacts L-C and set OUTLET valve switch in OPEN position. Remove jumper and verify that alarm window and red HIGH COND. lights are flashing brightly. MJ

3.3 Depress ALARM SILENCE button and verify that the alarm lights have a bright steady glow. MJ

3.4 Set OUTLET valve's electrical sw. in the CLOSE position. Verify that the alarm lights are flashing dimly. MJ

3.5 Verify that the alarm lights can be extinguished by depressing the RESET button. MJ

4. 2E POLISHED HIGH PRESSURE DROP RESIN TRAP alarm window 13-1 (dwg. D4767 line 7-9)

4.1 Open contacts 1617-1619 at differential pressure switch. Verify that alarm window and red HIGH D/P lights are flashing brightly. MJ

4.2 Depress ALARM SILENCE button and verify that the alarm lights have a bright steady glow. MJ

4.3 Close contacts and verify that the alarm lights are flashing dimly. MJ

4.4 Verify that the alarm lights can be extinguished by depressing the RESET button. MJ

H P Schaf 12/8/76

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POLISHER # 6
(L.A. Dwg. D-3837 Rev. D)

INITIAL CONDITIONS

1. Set the following electrical switches in the CLOSED position:

   1.1 Inlet and bypass valve

   1.2 Outlet

   1.3 Vent

   1.4 Air inlet

   1.5 Resin inlet

   1.6 Recycle

   1.7 Sluice water inlet

   1.8 Resin outlet

2. 120 VAC applied to circuit 7A.

3. Air pressure applied to the valves and the above air valve's selector switch in the AUTO position.

PROCEDURE	PASS
1. Verify that the green CLOSE lights are energized on the following valves:	
1.1 Inlet	[illegible]
1.2 Inlet bypass	[illegible]
1.3 Outlet	[illegible]
1.4 Vent	[illegible]
1.5 Air inlet	[illegible]
1.6 Resin inlet	[illegible]
1.7 Recycle	[illegible]
1.8 Sluice Water inlet	[illegible]
1.9 Resin outlet	[illegible]
2. Verify that the white STAND B. light is energized.	[illegible]

PROCEDURE	PASS
3. Set the INLET valve's electrical switch in the OPEN position and verify that:	
3.1 Bypass Inlet valve's red OPEN light is energized.	
3.2 Inlet valve's red OPEN light is energized approx. 180 seconds after step 3.1.	
3.3 White STAND BY light is de-energized.	
4. Set the OUTLET valve's electrical switch in the OPEN position and verify that:	
4.1 Red OPEN light is energized.	
4.2 Red SERVICE light is energized.	
5. Set the VENT valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
6. Set the AIR INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
7. Set the RESIN INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
8. Set the RECYCLE valve's switch electrical in the OPEN position and verify that the red OPEN light is energized.	
9. Set the SLUICE WATER INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
10. Set the RESIN OUTLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
11. Set the INLET, OUTLET, AIR INLET, SLUICE WATER INLET, and RESIN OUT electrical switches in the CLOSE position. Set the RECYCLE, VENT, and RESIN IN electrical switches in the OPEN position. Verify that the white TRANSFER IN light is energized.	
12. Set the INLET and RECYCLE electrical switches in the OPEN position. Set the OUTLET electrical switch in the CLOSE position. Verify that the green RECYCLE light is energized.	
13. Set the AIR INLET, SLUICE WATER IN, RESIN OUTLET, electrical switches in the OPEN position. Set the RESIN IN, INLET, OUTLET, VENT, RECYCLE electrical switches in the CLOSE position. Verify thatthe amber TRANSFER OUT light is energized.	
14. RINSE POLISHER TO WASTE valve MC1:	
14.1 Set selector sw. in CLOSED position and verify that green indicating light is energized.	
14.2 Set selector sw. in OPEN position and verify that red indicating light is energized.	

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PROCEDURE | PASS

15. RECYCLE valve [illegible]:

15.1 Set sel. sw. in CLOSED position and verify that green indicating light is energized. [illegible]

15.2 Set sel. sw. in OPEN position and verify that red indicating light is energized. [illegible]

ALARM SECTION

1. 2[illegible] POLISHER EXHAUSTED alarm window 15-2 (dwg. D-3835 line 3 -[illegible])

1.1 Set valve's electrical sel. switches so that the amber TRANSFER OUT light is energized. Set gallonage counter to the OFF position. Verify that the alarm window and the red POLISHER EXHAUSTED lights are flashing brightly. [illegible]

1.2 Depress Annunicator alarm SILENCE button and verify that alarm lights have a bright steady glow. [illegible]

1.3 Set counter to read 10 counts. Verify that the alarm lights are flashing dimly. [illegible]

1.4 Verify that alarm lights can be extinguished by depressing the annunciator RESET button. [illegible]

2. 2[illegible] POLISHER LOW FLOW alarm window 14-2 (dwg. D-3835 line 3 -[illegible])

2.1 Circuit L9A not energized and OUTLET valve's electrical sel. sw. in the OPEN position. Energize circuit L9A and verify that after approx. 3 minutes the alarm window and the red LOW FLOW lights are flashing brightly. [illegible]

2.2 Depress annunciator ALARM SILENCE button and verify that the alarm lights have a bright steady glow. [illegible]

2.3 Set OUTLET valve electrical swtich in the CLOSED position. Depress the annunciator ALARM SILENCE button and verify that the alarm lights are flashing dimly. [illegible]

3.4 Verify that the alarm lights can be extinguished by depressing the annunciator RESET button. [illegible]

PROCEDURE PAGE

3. 2E POLISHER HIGH CONDUCTIVITY alarm window 14-1 (Dwg. D4068 line 6-181)

3.1 Verify that there is no continuity between contacts L-C on polisher # 6 in rear of Beckman-Honeywell conductivity recorder. HPL

3.2 Install jumper across contacts L-C and set OUTLET valve switch in OPEN position. Remove jumper and verify that alarm window and red HIGH COND. lights are flashing brightly. HPL

3.3 Depress ALARM SILENCE button and verify that the alarm lights have a bright steady glow. HPL

3.4 Set OUTLET valve's electrical sw. in the CLOSE position. Verify that the alarm lights are flashing dimly. HPL

3.5 Verify that the alarm lights can be extinguished by depressing the RESET button. HPL

4. 2E POLISHED HIGH PRESSURE DROP RESIN TRAP alarm window 15-1 (dwg. D4767 line 7-11)

4.1 Open contacts 1621 - 1622 at differential pressure switch. Verify that alarm window and red HIGH D/P lights are flashing brightly. HPL

4.2 Depress ALARM SILENCE button and verify that the alarm lights have a bright steady glow. HPL

4.3 Close contacts and verify that the alarm lights are flashing dimly. HPL

4.4 Verify that the alarm lights can be extinguished by depressing the RESET button. HPL

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POLISHER # 7
(L.A. Dwg. D-3837 Rev. D)

INITIAL CONDITIONS

1. Set the following electrical switches in the CLOSED position:

   1.1 Inlet and bypass valve

   1.2 Outlet

   1.3 Vent

   1.4 Air inlet

   1.5 Resin inlet

   1.6 Recycle

   1.7 Sluice water inlet

   1.8 Resin outlet

2. 120 VAC applied to circuit 7A.

3. Air pressure applied to the valves and the above air valve's selector switch in the AUTO position.

PROCEDURE	PASS
1. Verify that the green CLOSE lights are energized on the following valves:	
1.1 Inlet	
1.2 Inlet bypass	
1.3 Outlet	
1.4 Vent	
1.5 Air inlet	
1.6 Resin inlet	
1.7 Recycle	
1.8 Sluice Water inlet	
1.9 Resin outlet	
2. Verify that the white STAND BY light is energized.	

PROCEDURE	PASS
3. Set the INLET valve's electrical switch in the OPEN position and verify that:	
3.1 Bypass Inlet valve's red OPEN light is energized.	
3.2 Inlet valve's red OPEN light is energized approx. 180 seconds after step 3.1.	
3.3 White STAND BY light is de-energized.	
4. Set the OUTLET valve's electrical switch in the OPEN position and verify that:	
4.1 Red OPEN light is energized.	
4.2 Red SERVICE light is energized.	
5. Set the VENT valve's electrical swtich in the OPEN position and verify that the red OPEN light is energized.	
6. Set the AIR INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
7. Set the RESIN INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
8. Set the RECYCLE valve's switch electrical in the OPEN position and verify that the red OPEN light is energized.	
9. Set the SLUICE WATER INLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
10. Set the RESIN OUTLET valve's electrical switch in the OPEN position and verify that the red OPEN light is energized.	
11. Set the INLET, OUTLET, AIR INLET, SLUICE WATER INLET, and RESIN OUT electrical switches in the CLOSE position. Set the RECYCLE, VENT, and RESIN IN electrical switches in the OPEN position. Verify that the white TRANSFER IN light is energized	
12. Set the INLET and RECYCLE electrical switches in the OPEN position. Set the OUTLET electrical switch in the CLOSE position. Verify that the green RECYCLE light is energized.	
13. Set the AIR INLET, SLUICE WATER IN, RESIN OUTLET, electrical switches in the OPEN position. Set the RESIN IN, INLET, OUTLET, VENT, RECYCLE electrical switches in the CLOSE position. Verify thatthe amber TRANSFER OUT light is energized.	
14. RINSE POLISHER TO WASTE valve MC1:	
14.1 Set selector sw. in CLOSED position and verify that green indicating light is energized.	
14.2 Set selector sw. in OPEN position and verify that red indicating light is energized.	

PROCEDURE

PAGE

15. RECYCLE valve MC2:

15.1 Set sel. sw. in CLOSED position and verify that green indicating light is energized.

15.2 Set sel. sw. in OPEN position and verify that red indicating light is energized.

ALARM SECTION

1. 2G POLISHER EXHAUSTED alarm window 17-2 (dwg. D-3835 line 3-60)

1.1 Set valve's electrical sel. switches so that the amber TRANSFER OUT light is energized. Set gallonage counter to the OFF position. Verify that the alarm window and the red POLISHER EXHAUSTED lights are flashing brightly.

1.2 Depress Annunicator alarm SILENCE button and verify that alarm lights have a bright steady glow.

1.3 Set counter to read 10 counts. Verify that the alarm lights are flashing dimly.

1.4 Verify that alarm lights can be extinguished by depressing the annunciator RESET button.

2. 2F POLISHER LOW FLOW alarm window 16-2 (dwg. D-3835 line 3-60)

2.1 Circuit L9A not energized and OUTLET valve's electrical sel. sw. in the OPEN position. Energize circuit L9A and verify that after approx. 3 minutes the alarm window and the red LOW FLOW lights are flashing brightly.

2.2 Depress annunciator ALARM SILENCE button and verify that the alarm lights have a bright steady glow.

2.3 Set OUTLET valve electrical swtich in the CLOSED position. Depress the annunciator ALARM SILENCE button and verify that the alarm lights are flashing dimly.

3.4 Verify that the alarm lights can be extinguished by depressing the annunciator RESET button.

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PROCEDURE

PAGE

3. 2 POLISHER HIGH CONDUCTIVITY alarm window 6 -1 (Dwg. D4088 line 6-11)

3.1 Verify that there is no continuity between contacts L-C on polisher # 7 in rear of Beckman-Honeywell conductivity recorder. [illegible]

3.2 Install jumper across contacts L-C and set OUTLET valve switch in OPEN position. Remove jumper and verify that alarm window and red HIGH COND. lights are flashing brightly. [illegible]

3.3 Depress ALARM SILENCE button and verify that the alarm lights have a bright steady glow. [illegible]

3.4 Set OUTLET valve's electrical sw. in the CLOSE position. Verify that the alarm lights are flashing dimly. [illegible]

3.5 Verify that the alarm lights can be extinguished by depressing the RESET button. [illegible]

4. 2 POLISHED HIGH PRESSURE DROP RESIN TRAP alarm window 7 -1 (dwg. D4767 line 7-13)

4.1 Open contacts 1625 - 1626 at differential pressure switch. Verify that alarm window and red HIGH D/P lights are flashing brightly. [illegible]

4.2 Depress ALARM SILENCE button and verify that the alarm lights have a bright steady glow. [illegible]

4.3 Close contacts and verify that the alarm lights are flashing dimly. [illegible]

4.4 Verify that the alarm lights can be extinguished by depressing the RESET button. [illegible]

[illegible] 12/5/96

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