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Title/Desc:

TEST REPORT CAUSTIC ADDITION SYSTEM OPERABILITY
TEST PROCEDURE [241AN107]

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OCT 13 1995

ENGINEERING DATA TRANSMITTAL

1. EDT No 610873

2. To: (Receiving Organization) Distribution		3. From: (Originating Organization) Test Engineering		4. Related EDT No.: 609012	
5. Proj./Prog./Dept./Div.: 107AN Caustic Addition Project		6. Cog. Engr.: R.S. Nicholson 373-2986		7. Purchase Order No.: N/A	
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				10. System/Bldg./Facility: 241-AN	
				12. Major Assm. Dwg. No.: N/A	
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1	1	Cog. Eng. R. Nicholson	<i>R. Nicholson</i>	10/12/95	S5-05	R. Reed			R1-51	3	
1	1	Cog. Mgr. G. Hanson	<i>G. Hanson</i>	10/12/95	S5-05	G. Leshikar			S2-24	3	
1	1	K. Carothers	<i>K. Carothers</i>	10/12/95	R1-51						
1	1	G. Paintner	<i>G. Paintner</i>	10-12-95	S4-43						
1	1	M. Harding	<i>M. Harding</i>	10-12-95	S5-07						
3		R.E. Parazin			R1-51						
3		D. Larsen			R1-51						

18. Signature of EDT Originator <i>R.E. Parazin</i> Date: 10/12/95		19. Authorized Representative for Receiving Organization <i>K. Carothers</i> Date: 10/12/95		20. Cognizant Manager <i>G.N. Hanson</i> Date: 10/12/95		21. DOE APPROVAL (if required) Ctrl. No. <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments	
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RELEASE AUTHORIZATION

Document Number: WHC-SD-WM-OTR-167, REV 0

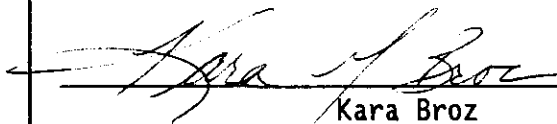
Document Title: Test Report - Caustic Addition System Operability
Test Procedure

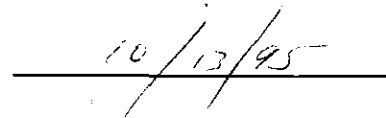
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**This document was reviewed following the
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WHC Information Release Administration Specialist:


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10/13/95

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SUPPORTING DOCUMENT		1. Total Pages 51
<p>2. Title</p> <p>Test Report - Caustic Addition System Operability Test Procedure</p>	<p>3. Number</p> <p>WHC-SD-WM-OTR-167</p>	<p>4. Rev No.</p> <p>. 0</p>
<p>5. Key Words</p> <p>AN-107 Caustic Addition 241-AN-274 Pump Control Building Mixer Pump</p>	<p>6. Author</p> <p>Name: R.E. Parazin</p> <p><i>R.E. Parazin</i> 10-12-95 Signature</p> <p>Organization/Charge Code 77640/N2L11</p>	
<p>7. Abstract</p> <p>This Operability Test Report documents the test results of test procedure WHC-SD-WM-OTR-167 "Caustic Addition System Operability Test Procedure". The objective of the test was to verify the operability of the 241-AN-107 Caustic Addition System. The objective of the test was met.</p>		
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TEST REPORT

**CAUSTIC ADDITION SYSTEM
OPERABILITY TEST PROCEDURE**

R.E. Parazin

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Appendix A:WHC-SD-WM-OTP-167 (signed-off copy)

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1.0 INTRODUCTION

Acceptance and pre-operational testing of the 241-AN-107 Caustic Addition and Entrainment system was conducted during October and November of 1994 by Westinghouse Engineering in the rotating equipment shop (272E). Several test exceptions were noted during that test, some that required modifications to the equipment (see WHC-SD-WM-TRP-222 for details).

After the majority of the exceptions noted during the original test were resolved, additional testing was performed in December of 1994, primarily by representatives of East Tank Farms Operations, in accordance with test procedure WHC-SD-WM-OTP-167, Caustic Addition System Operability Test Procedure.

2.0 TEST DESCRIPTION

A copy of the work-completed test procedure (WHC-SD-WM-OTP-167) is included as appendix A of this document. A description of the caustic addition system, a description of the equipment involved in the test, the test set-up, and the procedural test steps are all contained in that test procedure.

3.0 TEST RESULTS

A signed-off copy of the work-complete test procedure including exception sheets is attached as appendix A of this document. The test was completed with a total of eleven exceptions, many of them minor, all of which have been resolved. For a complete description of the test exceptions and resolutions see pages (A-35 through A-45).

The primary objectives of the test procedure were as follows:

- To verify satisfactory operational performance of the 241-AN-107 Caustic Addition and Entrainment System.
- To provide an opportunity for Tank Farms Operations, Maintenance, and Training personnel to become familiar with the caustic addition equipment, its set-up, and its operation prior to installation in 241-AN-107.

Those objectives have been met.

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APPENDIX A

**WHC-SD-WM-OTP-135
(Signed-Off Copy)**

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NOV 29 1994

ENGINEERING DATA TRANSMITTAL

Page 1 of 1
1. EDT 609012

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11. Receiver Remarks:		10. System/Bldg./Facility: 241-AN-107
		12. Major Assm. Dwg. No.: H-2-85264 Sheet 1,2,3 Rev. 0
		13. Permit/Permit Application No.: N/A
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1	1	Cog. Eng. RE Parazin	<i>RE Parazin</i>	11-29-94	R1-51	DB Cole			R3-27	3	
1	1	Cog. Mgr. GT Bear	<i>G. Bear</i>	11-29-94	R1-51	DW Scrapper			R1-51	3	
1	1	QA HK Ananda	<i>H. Ananda</i>	11-29-94	S1-57	MO Cost			S5-03	3	
3		KG Carothers			R1-51	Bob Godwin			S5-03	3	
1	1	GP Paintner	<i>GP Paintner</i>	11-29-94	S2-02	JW Jenkins			S2-24	3	
1	1	GA Leshika	<i>G. Leshika</i>	11-29-94	S2-24	JG Proason			S4-58	3	
1	1	CM Winkler	<i>C. Winkler</i>	11-29-94	S5-07	Central files			L8-04	3	

18. Signature of EDT Originator <i>See Block 17</i> Date	19. Authorized Representative for Receiving Organization Date	20. JSTI (2) <i>See Block 17</i> Date	21. ODE APPROVAL Ctrl. No. 18-07 (required) [] Approved [] Approved w/ comments [] Disapproved w/ comments
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RELEASE AUTHORIZATION

Document Number: WHC-SD-WM-OTP-167, REV 0

Document Title: Caustic Addition System Operability Test Procedure

Release Date: 11/28/94

This document was reviewed following the procedures described in WHC-CM-3-4 and is:

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:


Kara M. Broz

November 29, 1994

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SUPPORTING DOCUMENT		1. Total Pages 33
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5. Key Words Caustic Addition, Mixer Pump, Bran & Luebbe, Barrett Haentgens, Hazleton, Tank 241-AN-107 <i>KOB 11/28/94</i>	6. Author Name: R. E. Parazin <i>R. E. Parazin 11/29/94</i> Signature Organization/Charge Code 7CH30/N2L11	
7. Abstract This test procedure provides instructions for performing operational testing of the major components of the 241-AN-107 Caustic Addition System by WHC and Kaiser personnel at the Rotating Equipment Shop run-in pit (Bldg. 272E).		
		8. RELEASE STAMP OFFICIAL RELEASE 2 BY WHC DATE NOV 29 1994 <i>He 4</i>

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

**CAUSTIC ADDITION SYSTEM
OPERABILITY TEST PROCEDURE**

**WHC-SD-WM-OTP-167
REVISION: 0**

NOVEMBER 1994

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CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

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CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

1.0 TEST PLAN

1.1 SYSTEM DESCRIPTION

A caustic addition and entrainment system is to be installed at Double-Shell Tank (DST) 241-AN-107 for the purpose of increasing the free hydroxide ion concentration of the waste. The system consists of the following major components:

- A 75 horsepower rotating submersible mixer pump. The mixer pump will be installed in the central pump pit of 241-AN-107 and used as a platform to inject, mix, and entrain caustic material with the existing waste.
- A caustic injection skid containing a metering pump and monitoring system. The caustic metering pump will discharge caustic soda solution at a known flow rate. The monitoring system will track the quantity of caustic solution added over a given time period.
- A portable mixer pump control building containing electrical and instrumentation equipment for controlling system operation.

1.2 SCOPE

This test procedure provides instructions for operational testing of the caustic addition and entrainment system at the Rotating Equipment Shop run-in pit (Bldg. 272E). This test procedure is to be performed after completion of Test Procedure WHC-SD-WM-TC-062 Rev.0 Pumping System for Caustic Addition Project. Additional operational testing will be performed once the caustic addition equipment has been installed in the field.

1.3 RESPONSIBILITIES

1.3.1 The following personnel will be required for the performance of this procedure:

- 1.3.1.1 Test Manager: The individual assigned direct responsibility for the performance, preparation, and adequacy of the test.
- 1.3.1.2 Test Director: The engineer assigned responsibility for performance of the test.
- 1.3.1.3 Cognizant Electrical Engineer: The electrical engineer assigned by management to be responsible for the proper performance of the caustic addition equipment.

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1.3.1.4 Cognizant Mechanical Engineer: The mechanical engineer assigned by management to be responsible for the proper performance of the caustic addition equipment.

1.3.2 Only personnel designated and/or approved by the Test Manager are allowed to direct/conduct testing per this procedure.

1.3.3 A representative from East Tank Farm Operations shall act as test director or co-test director during performance of this procedure.

1.3.4 Only cognizant, qualified, and essential personnel as identified by the test director are allowed access to the test area during performance of the test.

1.3.5 Administrative changes to this procedure to correct typographical errors, and other non-technical/non-scope changes, may be made as red-line changes by the acting Test Director, with concurrence from the Cognizant Engineers. All major changes to this procedure shall be implemented by ECN, and shall receive the approval signatures appropriate to the approval designation of the change.

1.3.6 The order of procedure steps may be altered with concurrence from the Test Director and Cognizant Engineers.

1.3.7 If, during testing, any indicated parameter, control function, or display is not correct or appears to be malfunctioning, then the engineer conducting this test shall make a determination as to the feasibility of continued testing. A record of all noted deficiencies shall be kept on Attachment 2 "Test Exception Sheet".

1.3.8 At the completion of all testing, final approval of the test results and test exception resolutions (if necessary) shall be documented on Attachment 3, "Final Procedure Acceptance Sheet".

1.4 OBJECTIVES

1.4.1 To verify satisfactory operational performance of the 241-AN-107 Caustic Addition and Entrainment System.

1.4.2 To provide an opportunity for Tank Farms Operations, Maintenance, and Training personnel to become familiar with the caustic addition equipment, its set-up, and its operation prior to installation in 241-AN-107.

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CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

2.0 SAFETY

- 2.1 Standard WHC/KEH safety requirements and safe practices followed by the 272E shop shall be in effect during this test procedure. This includes the use of protective eyewear at all times.
- 2.2 The Test Director has the authority to remove spectator personnel not essential to the test during performance of the test, if in his determination, their presence adds to the potential for injury.
- 2.3 Before conducting the test procedure the test director shall ensure that personnel conducting the test are familiar with the equipment and controls.
- 2.4 Only qualified Electricians are allowed to open, work on, and/or test within an energized electrical panel.
- 2.5 The pumping system shall not be left unattended while in operation.

3.0 TOOLS EQUIPMENT AND SUPPLIES

The following ancillary equipment is required to complete this test:

- Water hose capable of mating with a 2" PUREX nozzle.
- Flashlights (with powerful beam)
- Short hose (<6' long) with both ends capable of mating with Kamvalock quick-couplings.
- Hose (2" Diameter) with one end capable of mating with a 2" PUREX nozzle and one end capable of mating with a Kamvalock quick-coupling.
- Area Barricade Ropes/Tape
- Fire Extinguisher, Class A-B-C

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

4.0 PRE-TEST REQUIREMENTS

NOTE: It is assumed that the caustic addition and entrainment equipment (pump, control building, addition skid) has been installed and set-up in the 272E rotating equipment shop prior to performing this procedure. Explicit instructions for installation of the caustic addition equipment can be found in test procedure WHC-SD-WM-TC-062 Rev.0.

The vibration, strain, and temperature instrumentation were calibrated in October of 1994 and do not require further calibrations until October of 1995. Quality Control Verification of these calibrations was performed in October of 1994 during test procedure WHC-SD-TC-062 Rev.0, additional QC verification is not necessary.

4.1 The TEST DIRECTOR shall verify the following:

4.1.1 Test procedure WHC-SD-WM-TC-062 has been completed.

CL Will 12-6-94

4.1.2 The run-in pit shield and shop submersible pump have been installed in the Bldg. 272E pit.

CL Will 12-6-94

4.2 The COGNIZANT MECHANICAL ENGINEER shall verify the following:

4.2.1 The mixer pump and mixer pump stand are properly aligned.

J.A. Serbuka 12-6-94

4.2.2 The pump stand has been properly attached to the pump pit support steel.

J.A. Serbuka 12-6-94

4.2.3 The rotating drive mechanism has been properly installed on the pump column.

J.A. Serbuka 12-6-94

4.3 The COGNIZANT ELECTRICAL ENGINEER shall verify the following:

4.3.1 The pump control building frame is securely grounded to facility ground.

J.A. Serbuka 12-6-94

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- 4.3.2 Electrical connections between the pump control building and mixer pump have been completed. 12-6
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[Signature]
- 4.3.3 Electrical connections between the pump control building and caustic injection skid have been completed. 12-6
-94
[Signature]
- 4.3.4 The factory jumper between the Allen-Bradley VSD control and the signal wiring terminal block has been removed. 12-6
-94
[Signature]
- 4.3.5 All components are in the OFF or 0% position. 12-6
-94
[Signature]
- 4.3.6 Main power has been connected to the pump control building. 12-6
-94
[Signature]
- 4.3.7 The following hardware has been programmed:
 - 4.3.7.1 Eaton Corp. Variable Speed Drive. 12-6
-94
[Signature]
 - 4.3.7.2 Autotech Co. Position Controller. 12-6
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[Signature]
 - 4.3.7.3 Beta Products Annunciator Panel. 12-6
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[Signature]
 - 4.3.7.4 Allen-Bradley Variable Speed Drive. 12-6
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[Signature]
 - 4.3.7.5 Caustic Skid Yokogawa Flowmeter. 12-6
-94
[Signature]
 - 4.3.7.6 Caustic Skid Yokogawa Chart Recorder. 12-6
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[Signature]
 - 4.3.7.7 Caustic Skid Panalarm Annunciator. 12-6
-94
[Signature]
- 4.4 The COGNIZANT ELECTRICAL ENGINEER shall ensure distribution panels DP-AN-004 and DP-AN-005 are powered up and all alarms cleared. 12-6
-94
[Signature]

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

5.0 TEST PROCEDURE

CONVENIENCE EQUIPMENT PERFORMANCE VERIFICATION

Pump Control Building

NOTE: The TEST DIRECTOR shall initial each step as it is performed unless otherwise indicated.

- cm 5.1 Switch the pump control building interior light switch to ON and verify the interior lights illuminate.
- cm 5.2 Switch the pump control building interior light switch to OFF and verify the interior lights shut off.
- cm 5.3 Switch the pump control building floodlight switch to ON and verify the exterior floodlights illuminate.
- cm 5.4 Switch the pump building floodlight switch to OFF and verify the exterior floodlights shut off.
- cm 5.5 Set HVAC control panel to the following settings:

MODE	OFF
TEMPERATURE	12
EXHAUST	CLOSED
ENERGY SAVER	OFF
AIRFLOW	AS DESIRED

NOTE: Steps 5.6-5.13 may be performed by the Test Director placing his hand in the HVAC air stream to feel for temperature/flowrate changes. The use of a thermometer or other test equipment is not required.

- cm 5.6 Turn MODE switch to FAN and verify air is circulated within the control building.
- cm 5.7 Turn MODE switch to LOW COOL and verify the temperature of the recirculated air decreases.
- cm 5.8 Turn MODE switch to MED COOL and verify the flowrate of the recirculated air increases.
- cm 5.9 Turn MODE switch to HIGH COOL and verify the flowrate of the recirculated air increases.
- cm 5.10 Turn MODE switch to FAN.

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

- cmw 5.11 Turn TEMPERATURE dial to a setting of 4.
- cmw 5.12 Turn MODE switch to LOW HEAT and verify the temperature of the recirculated air increases.
- cmw 5.13 Turn MODE switch to HIGH HEAT and verify the flowrate of the recirculated air increases.
- cmw 5.14 Turn MODE switch to OFF and verify the HVAC unit stops operating.
- 5.15 Verify the following pump control building receptacles are readily accessible (unobstructed):
 - cmw 5.15.1 Receptacle Pair located on panel DP-AN-005.
 - cmw 5.15.2 Receptacle Pair located on Annunciator panel ANN-001.
 - cmw 5.15.3 Receptacle Pair located on Cabinet TB-3A.
 - cmw 5.15.4 Receptacle Pair located on the exterior of the south wall.
- cmw 5.16 Plug an electrical appliance into one of the building receptacles and briefly observe its operation to verify power is being supplied.

Injection Skid

- cmw 5.17 Turn SWITCH #1 to ON and verify the roof mounted floodlight illuminates.
- cmw 5.18 Turn SWITCH #1 to OFF and verify the roof mounted floodlight turns off.
- cmw 5.19 Turn SWITCH #2 to ON and verify the floor mounted floodlight illuminates.
- cmw 5.20 Turn SWITCH #2 to OFF and verify the floor mounted floodlight turns off.

CAUSTIC INJECTION SYSTEM PERFORMANCE VERIFICATION

Test Set-Up

- 5.21 The COGNIZANT MECHANICAL ENGINEER shall ensure the following:
 - cmw 5.21.1 Hose is connected between fitting V-114 and the caustic addition riser atop the mixer pump.
 - cmw 5.21.2 Hose is connected between fittings V-113A and V-113B.
 - cmw 5.21.3 Hose is run between the water supply valve (faucet) and the 150 gallon tank.

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CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

CMW 5.22 The COGNIZANT ELECTRICAL ENGINEER shall ensure the metering pump/mixer pump interlock has been temporarily by-passed (jumper across terminals 16 and 17 of the Allen-Bradley VSD).

CMW 5.23 Set the caustic skid valves as shown in the following valve lineup (see Figure 3 for details): *Note - V-113A + B are difficult to determine whether open or closed. Need better indication*

INITIAL VALVE LINEUP

Valve	Position	Valve	Position	Valve	Position
V-100	CLOSED	PRV-105	N/A	V-110	CLOSED
V-101	OPEN	V-106	CLOSED	V-112	CLOSED
V-102	OPEN	V-107	CLOSED	V-113A	OPEN
V-103	OPEN	V-108	OPEN	V-113B	OPEN
V-104	OPEN	V-109	CLOSED		

CMW 5.24 The COGNIZANT MECHANICAL ENGINEER shall ensure the 150 gallon tank is approximately half filled with water.

CAUTION: Dry operation of the metering pump OR operation of the metering pump against a closed valve could cause damage.

CMW 5.25 Open valve V-100 (this allows gravity to fill the suction piping with fluid).

Pump Start-up/Low Pressure and Temperature Alarms

NOTE: When the Caustic Addition metering pump is first started-up the low pressure and low heat alarms will annunciate.

5.26 Start the caustic addition metering pump in the following manner:

- CMW* 5.26.1 Ensure the Red PUMP E-STOP button (located on panel TB-3A) is pulled out.
- CMW* 5.26.2 Ensure the PUMP SPEED dial (located on panel TB-3A) is set at 70%.
- CMW* 5.26.3 The COGNIZANT ELECTRICAL ENGINEER shall ensure panel TB-3A is powered down then re-energized in order to reset all alarms.
- CMW* 5.26.4 Verify the audible alarm horn annunciates.
- CMW* 5.26.5 Verify the Amber strobe light located on top of the electrical control skid begins flashing.

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

- CMW 5.26.6 Press the black ALARM SILENCE pushbutton (located on panel TB-3A) and verify the alarm horn and strobe light turn off.
- CMW 5.26.7 Verify the TT-01 LOW TEMPERATURE and PT-01 LOW PRESSURE alarm lamps (located on panel TB-3A) are blinking.
- CMW 5.26.8 Press the ACK pushbutton (located on panel TB-3A) to acknowledge the alarms.
- CMW 5.26.9 Press the FL RST pushbutton (located on panel TB-3A) and verify the alarm lamp blink-rate decreases.
- CMW 5.26.10 Press the RST pushbutton (located on panel TB-3A) and verify the alarm lamps stop blinking and remain illuminated.
- CMW 5.26.11 Press the Green START pushbutton (located on panel TB-3A).

NOTE: The TT-01 LOW TEMPERATURE and PT-01 LOW PRESSURE alarm lamps (located on panel TB-3A) will remain illuminated for the duration of the test due to limitations caused by using facility water as the test fluid.

System Performance

- CMW 5.27 The COGNIZANT MECHANICAL ENGINEER shall ensure the water supply flowrate is adjusted to keep the tank water level reasonably constant.
- CMW 5.28 Verify the Strip Chart Recorder Bar Display (located on panel TB-3A) is illuminated and the Red Bar (FT-01) indicates a flowrate of 5 gpm to 20 gpm.
- CMW 5.29 Verify the TEMPERATURE display on panel TB-3A is functioning and reads between 55°F and 75°F.
- CMW 5.30 Verify the PRESSURE display on panel TB-3A is functioning and reads between 3 psi and 15 psi.
- CMW 5.31 Verify Pressure Indicator PI-102 (located on the caustic addition skid) is functioning and reads between 3 psi and 15 psi.
- CMW 5.32 Verify the skid mounted flowmeter FIQ-100 is set to total flow and indicates an increasing flow.

Pump Emergency Stop

- CMW 5.33 Press the Red PUMP E-STOP pushbutton on panel TB-3A and verify the caustic addition metering pump stops.

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CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

- cmw 5.34 Pull the Red PUMP E-STOP pushbutton back out.
- cmw 5.35 Restart the caustic addition metering pump by pressing the green START pushbutton (located on panel TB-3A).
- cmw 5.36 If necessary reset alarms by using the ACK, FL RST, and RST pushbuttons (located on panel TB-3A).
Note - we had a low pressure alarm during the test while closing valve V-104 we cleared the alarm at 30 psi
Exception -
- cmw 5.37 Slowly Close Valve V-104 (closing the valve allows pressure to build up in the line) until the panel TB-3A audible alarm horn annunciates.
- cmw 5.38 Fully open valve V-104.
- cmw 5.39 Verify the PT-01 HIGH PRESSURE lamp on panel TB-3A is illuminated.
- X 5.40 Silence and Reset the alarm by using the ALARM SILENCE, ACK, FL RST, and RST pushbuttons (located on panel TB-3A). *Did not receive alarm - Exception*
- cmw 5.41 Verify the PT-01 HIGH PRESSURE lamp (located on panel TB-3A) remains illuminated (not blinking).
- cmw 5.42 Verify the PT-01 HIGH PRESSURE lamp shuts off.
- cmw 5.43 The COGNIZANT MECHANICAL ENGINEER shall ensure the Water Supply Valve (faucet) is shut off.
- cmw 5.44 Wait until the 150 gallon tank is almost empty then Press the PUMP E-STOP pushbutton (located on panel TB-3A).
- cmw 5.45 Close valve V-100 (stops the flow of water from the 150 gallon tank).
Noted no guard on pump shaft - identical as issue
- cmw 5.46 Drain Pan Overfill Alarm *5.45.3 cmw*
 5.46 The COGNIZANT MECHANICAL ENGINEER shall ensure the following:
 - cmw 5.46.1 Hose has been run from valve V-112 to the run-in pump pit.
 - cmw 5.46.2 A water supply hose has been moved to the drain pan.
 - cmw 5.46.3 The water supply (faucet) has been turned on to fill the skid drain pan.
- X 5.47 *Received a Flushing alarm on panel, but no horn or amber light on top*
 Wait until the panel TB-3A audible alarm horn annunciates.
- cmw 5.48 The COGNIZANT MECHANICAL ENGINEER shall ensure the water supply valve (faucet) is closed.

Note - 2 inches of water in skid before alarm - seems a little much
How will be empty skid so rain water will not accumulate & freeze.

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CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

5.49 Verify the following:

- cmw 5.49.1 The skid drain pan has not overflowed with water.
- cmw 5.49.2 The LSH-01 alarm light (located on panel TB-3A) is illuminated.
- X 5.50 Silence and reset the alarm by using the ALARM SILENCE, ACK, FL RST, and RST pushbuttons (located on panel TB-3A).
- cmw 5.51 Verify the LSH-01 alarm light remains illuminated (not blinking).
- cmw 5.52 Open valve V-112 to drain water from the skid drain pan.
- cmw 5.53 Wait until the water level drops below the alarm level then verify the LSH-01 alarm light shuts off.
- cmw 5.54 Close valve V-112 when the caustic skid pan has been drained.

High Temperature Alarm

- cmw 5.55 The COGNIZANT ELECTRICAL ENGINEER shall ensure the temperature high alarm point is set 5°F below the current temperature readout in order to trip the high temperature alarm.
- 5.56 Verify the following:
 - X 5.56.1 The audible alarm horn is sounding.
 - cmw 5.56.2 The TT-01 HIGH TEMPERATURE light (located on panel TB-3A) is illuminated.
- cmw 5.57 ^{No Horn again} Silence and reset the alarm by used the ALARM SILENCE, ACK, FL RST, and RST pushbuttons (located on panel TB-3A).
- cmw 5.58 Verify the TT-01 HIGH TEMPERATURE light remains illuminated (not blinking).
- cmw 5.59 The COGNIZANT ELECTRICAL ENGINEER shall ensure the heat trace high alarm point is reset to its original value.
- cmw 5.60 Verify the TT-01 HIGH TEMPERATURE light shuts off.

Need plexiglass cover on emergency stop on outside of building

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

MIXER PUMP ROTATIONAL MOTOR PERFORMANCE VERIFICATION

Test Set-up

- This done because system is set 10° greater 100° that control because you can't get to 0*
- cmw 5.61 The COGNIZANT MECHANICAL ENGINEER shall ensure the mixer pump is indexed at 90°.
 - cmw 5.62 The COGNIZANT ELECTRICAL ENGINEER shall ensure the Autotech automatic position controller has been properly programmed.
 - cmw 5.63 Verify the Autotech Corp. Position Controller located on panel TB-2A indicates a position of 100 (corresponds to 90°).
 - cmw 5.64 Verify the red M2 STOPPED LIGHT (located on panel TB-2A) is illuminated.
 - cmw 5.65 Verify Switch SW-1 (located on panel TB-2A) is in the ~~STOP~~ position.
OFF

System Performance

CAUTION: DO NOT rotate the mixer pump outside the 17° to 183° envelope.

- cmw 5.66 Turn switch SW-1 (located on panel TB-2A) to the FORWARD position and hold.
- cmw 5.67 Wait until the Position Controller indicates a position of 110 (corresponds to 100°) then turn switch SW-1 back to the STOP position.
- cmw 5.68 The COGNIZANT MECHANICAL ENGINEER shall verify the mixer pump is now indexed at 100°.
- cmw 5.69 Turn switch SW-1 to the REVERSE position and hold.
- cmw 5.70 Wait until the Position Controller indicates a position of 90 (corresponds to 80°) then turn switch SW-1 back to the STOP position.
- cmw 5.71 The COGNIZANT MECHANICAL ENGINEER shall verify the mixer pump is now indexed at 80°.

MIXER PUMP VARIABLE SPEED DRIVE PERFORMANCE VERIFICATION

Test Set-up

- cmw 5.72 The COGNIZANT MECHANICAL ENGINEER shall ensure a run-in pit water depth of approximately 27' to 30'.

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CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

- CW 5.73 The COGNIZANT ELECTRICAL ENGINEER shall ensure the by-pass jumpers for the metering pump/mixer pump interlocks are removed (terminals 16 and 17 of the Allen Bradley VSD).

Start-up

NOTE: The pushbuttons labeled AUTO, AUTO REF, and MAN REF should not be touched during this procedure. If any of those pushbuttons are accidentally pressed, contact the cognizant electrical engineer for assistance.

- CW 5.74 Verify the PUMP E-STOP pushbutton located on panel VSD-AN-001 is pulled out.
- CW 5.75 Verify the PUMP E-STOP pushbutton located by the main door is pulled out.
- CW 5.76 Press the variable speed drive control pad OFF pushbutton (located on panel VSD-AN-001).
- CW 5.77 Verify the control pad view screen reads "S.P. 00.00" (corresponds to a speed of 0%). *Speed Set*
- CW 5.78 Press the variable speed drive control pad ~~SET~~ SPEED pushbutton.
- CW 5.79 Verify the screen reads "S.T. 100.00" (corresponds to a speed of 100%).
- CW 5.80 Press the HAND pushbutton and verify the RUN light illuminates (both located on the mixer pump VSD control pad).
- CW 5.81 Press the SPEED pushbutton (located on the mixer pump VSD control pad) and verify the screen reads "S.P. 100.00" (corresponds to a speed of 100%).
- CW 5.82 Verify a slight agitation is visible on the surface of the water in the run-in pit.

Amperage Indicator

- CW 5.83 Press the M AMPS pushbutton (located on the mixer pump VSD control pad) to display the pump amperage.
- CW 5.84 Verify the mixer pump amperage is approximately 53 amps. *51.8 amps*

Shut-down

- CW 5.85 Press the OFF pushbutton (located on the mixer pump VSD control pad) to stop the pump.
- CW 5.86 Verify the STOPPING light (located on panel VSD-AN-001) begins blinking then shuts off.

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

CW 5.87 Verify the RUN light is off.

CAUTION: When stopping and starting the mixer pump allow approximately 2 minutes between motor starts to permit heat to dissipate from the motor windings.

Speed Controller

CW 5.88 Press the ~~SET~~ ^{speed set} SPEED pushbutton.

CW 5.89 Press and hold the down arrow pushbutton (located on the mixer pump VSO control pad) until the screen reads approximately "S.T. 80.00" (corresponds to a speed of 80%).

CW 5.90 Press the HAND pushbutton to start the pump.

CW 5.91 Verify the screen displays a value near 80.00 (corresponds to a speed of 80%).

CW 5.92 Press the OFF pushbutton to stop the mixer pump.

Emergency Stop Pushbuttons

CW 5.93 Press the HAND pushbutton and verify the RUN light illuminates.

CW 5.94 Allow the mixer pump time to ramp up to full speed then press the PUMP E-STOP button located on panel VSD-AN-001.

CW 5.95 Verify the RUN light is no longer illuminated.

CW 5.96 Press the HAND pushbutton and verify the pump will not start with the red PUMP E-STOP button engaged (RUN light does not illuminate).

CW 5.97 Pull the PUMP E-STOP button back out.

NOTE: After an E-stop or an interlock has been engaged the OFF pushbutton on panel VSD-AN-001 must be pressed before the mixer pump will restart.

CW 5.98 Press the OFF pushbutton.

CW 5.99 Press the HAND pushbutton then verify the RUN light illuminates.

CW 5.100 Allow the mixer pump time to ramp up to full speed then press the red E-STOP button located on the exterior of the pump control building near the entrance.

CW 5.101 Verify the RUN light is no longer illuminated.

GAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

- CMW 5.102 Press the OFF pushbutton.
- CMW 5.103 Press the HAND pushbutton and verify the pump will not start with the PUMP E-STOP button engaged (RUN light does not illuminate).
- CMW 5.104 Pull the red E-STOP button back out.
- CMW 5.105 Press the OFF pushbutton.
- CMW 5.106 Press the HAND pushbutton to restart the mixer pump then verify the RUN light illuminates.

Motor Moisture Interlock

- TB-1
5x6*
- for back button*
- There is a problem with the same run here need to verify*
- CMW 5.107 The COGNIZANT ELECTRICAL ENGINEER shall ensure a temporary jumper is installed across TBX-AN-2C terminals 5 and 6 to simulate a high moisture condition.
Done with the induction relay instead of jumper
 - 5.108 Verify the following:
 - CMW 5.108.1 The mixer pump stops operating (RUN light shuts off).
 - CMW 5.108.2 The mixer pump FAULT light (located on panel VSD-AN-001) illuminates.
 - CMW 5.108.3 The audible alarm horn on panel ANN-001 annunciates.
 - CMW 5.108.4 The 75 HP MOTOR MOISTURE lamp (located on panel ANN-001) begins blinking.
 - CMW 5.109 Press the ACK pushbutton on panel ANN-001 and verify the alarm horn stops sounding.
 - CMW 5.110 Press the RST pushbutton on panel ANN-001 and verify the alarm lamp stops blinking and remains illuminated.
 - CMW 5.111 The COGNIZANT ELECTRICAL ENGINEER shall ensure the jumper is removed.
 - CMW 5.112 Verify the 75 HP MOTOR MOISTURE lamp shuts off.
 - CMW 5.113 Verify the FAULT light (located on panel VSD-AN-001) shuts off.
 - CMW 5.114 Press the OFF pushbutton (located on the mixer pump VSD control pad).
 - CMW 5.115 Press the HAND pushbutton to restart the mixer pump then verify the RUN light illuminates.

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

Motor Temperature Interlock

- CMW 5.116 The COGNIZANT ELECTRICAL ENGINEER shall ensure the digital temperature indicator DI-3 AL2 alarm point is set ~~below~~ ^{at} the current readout value.
- 5.117 Verify the following:
- CMW 5.117.1 The mixer pump stops operating (RUN light shuts off).
- CMW 5.117.2 The mixer pump FAULT light (located on panel VSD-AN-001) illuminates.
- CMW 5.117.3 The audible alarm horn annunciates.
- CMW 5.117.4 The 75 HP MOTOR TEMPERATURE lamp (located on panel ANN-001) begins blinking.
- CMW 5.118 Silence and reset the alarm by pressing the ACK and RST pushbuttons (located on panel ANN-001).
- CMW 5.119 Verify the 75 HP MOTOR TEMPERATURE lamp remains illuminated.
- CMW 5.120 The COGNIZANT ELECTRICAL ENGINEER shall ensure the digital temperature indicator DI-3 AL2 alarm point is reset to its original value.
- CMW 5.121 Verify the 75 HP MOTOR TEMPERATURE lamp (panel ANN-001) and mixer pump FAULT light (panel VSD-AN-001) shut off. *ATN plug OFF*
- CMW 5.122 Press the OFF pushbutton (located on the mixer pump VSD control pad).
- CMW 5.123 Press the HAND pushbutton to restart the mixer pump then verify the RUN light illuminates.

Motor Compression Interlock

- CMW 5.124 The COGNIZANT ELECTRICAL ENGINEER shall set the digital strain indicator DI-1 AL2 alarm point below the current readout value.
- 5.125 Verify the following:
- CMW 5.125.1 The mixer pump shuts off (RUN light shuts off).
- CMW 5.125.2 The mixer pump FAULT light (located on panel VSD-AN-001) illuminates.
- CMW 5.125.3 The audible alarm horn annunciates.
- CMW 5.125.4 The 75 HP MOTOR COMPRESSION lamp (located on panel ANN-001) begins blinking.

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CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

- CMW 5.126 Silence and reset the alarm by pressing the ACK and RST pushbuttons (located on panel ANN-001).
- CMW 5.127 Verify the 75 HP MOTOR COMPRESSION lamp remains illuminated.
- CMW 5.128 The COGNIZANT ELECTRICAL ENGINEER shall ensure the digital strain indicator DI-1 AL2 alarm point is reset to its original value.
- CMW 5.129 Verify the 75 HP MOTOR COMPRESSION lamp (panel ANN-001) and mixer pump FAULT light (panel VSO-AN-001) shut off.
- CMW 5.130 Press the OFF pushbutton (located on the mixer pump VSD control pad).
- CMW 5.131 Press the HAND pushbutton to restart the mixer pump then verify the RUN light illuminates.

Motor Tension Interlock

- CMW 5.132 The COGNIZANT ELECTRICAL ENGINEER shall set the digital strain indicator DI-1 AL1 alarm point above the current readout value.
- 5.133 Verify the following:
 - CMW 5.133.1 The mixer pump shuts off (RUN light shuts off).
 - CMW 5.133.2 The mixer pump FAULT light (located on panel VSD-AN-001) illuminates.
 - CMW 5.133.3 The audible alarm horn annunciates.
 - CMW 5.133.4 The 75 HP MOTOR TENSION lamp (located on panel ANN-001) begins blinking.
- CMW 5.134 Silence and reset the alarm by pressing the ACK and RST pushbuttons (located on panel ANN-001).
- CMW 5.135 Verify the 75 HP MOTOR TENSION lamp remains illuminated.
- CMW 5.136 The COGNIZANT ELECTRICAL ENGINEER shall ensure the digital strain indicator DI-1 AL1 alarm point is reset to its original value.
- CMW 5.137 Verify the 75 HP MOTOR TENSION lamp (panel ANN-001) and mixer pump FAULT light (panel VSD-AN-001) shut off.
- CMW 5.138 Press the OFF pushbutton (located on the mixer pump VSD control pad).
- CMW 5.139 Press the HAND pushbutton to restart the mixer pump then verify the RUN light illuminates.

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

- Motor Vibration Interlock *Not working properly because of interference from power wire - jumper installed from Relay K7 terminals #1 & 2*
- ~~X~~ 5.140 The COGNIZANT ELECTRICAL ENGINEER shall ensure a temporary connection is made between a TB-1A X2 terminal and K7 terminal B. *Note required because vibration monitor interlock problem will cause the interlock to work w/o jumper*
- 5.141 Verify the following:
- CM 5.141.1 The mixer pump shuts off (RUN light shuts off).
 - CM 5.141.2 The mixer pump FAULT light (located on panel VSD-AN-001) illuminates.
 - CM 5.141.3 The audible alarm horn annunciates.
 - CM 5.141.4 The 75 HP MOTOR VIBRATION lamp (located on panel ANN-001) begins blinking.
- CM 5.142 Silence and reset the alarm by pressing the ACK and RST pushbuttons (located on panel ANN-001).
- CM 5.143 Verify the 75 HP MOTOR VIBRATION lamp remains illuminated.
- ~~X~~ 5.144 The COGNIZANT ELECTRICAL ENGINEER shall ensure the temporary connection is removed. *See 5.140*
- CM 5.145 Verify the 75 HP MOTOR VIBRATION lamp (panel ANN-001) and mixer pump FAULT light (panel VSD-AN-001) shut off.
- CM 5.146 Press the OFF pushbutton (located on the mixer pump VSD control pad).
- CM 5.147 Press the HAND pushbutton to restart the mixer pump then verify the RUN light illuminates.
- ~~CM~~ 5.148a *Vibration Monitor VM-1 needs to be reset inside Cabinet TB-1A before Alarm will clear*
- Tank 241-AN-107 High Pressure Interlock *Note K11 & K12 relays need to be powered from 271-AN*
- CM 5.148 The COGNIZANT ELECTRICAL ENGINEER shall ensure power is removed from relay K11 (de-energized).
- CM 5.149 Verify the following:
- CM 5.149.1 The mixer pump shuts off (RUN light shuts off).
 - CM 5.149.2 The mixer pump FAULT light (located on panel VSD-AN-001) illuminates.
 - CM 5.149.3 The audible alarm horn annunciates.
 - CM 5.149.4 The TANK HIGH PRESSURE PA-107-2-1 lamp (located on panel ANN-001) begins blinking.

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

- CM 5.150 Silence and reset the alarm by pressing the ACK and RST pushbuttons (located on panel ANN-001).
- CM 5.151 Verify the TANK HIGH PRESSURE PA-107-2-1 lamp remains illuminated.
- CM 5.152 The COGNIZANT ELECTRICAL ENGINEER shall ensure power is restored to relay K11 (energized).
- CM 5.153 Verify the TANK HIGH PRESSURE PA-107-2-1 lamp (panel ANN-001) and mixer pump FAULT light (panel VSD-AN-001) shut off.
- CM 5.154 Press the OFF pushbutton (located on the mixer pump VSD control pad).
- CM 5.155 Press the HAND pushbutton to restart the mixer pump then verify the RUN light illuminates.

Tank Farm Area Radiation Interlock

- CM 5.156 The COGNIZANT ELECTRICAL ENGINEER shall ensure power is removed from relay K12 (de-energized).
- 5.157 Verify the following:
 - CM 5.157.1 The mixer pump shuts off (RUN light shuts off).
 - CM 5.157.2 The mixer pump FAULT light (located on panel VSD-AN-001) illuminates.
 - CM 5.157.3 The audible alarm horn annunciates.
 - CM 5.157.4 The AREA RADIATION RA-241-AN-1-3 lamp (located on panel ANN-001) begins blinking.
- CM 5.158 Silence and reset the alarm by pressing the ACK and RST pushbuttons (located on panel ANN-001)..
- CM 5.159 Verify the AREA RADIATION RA-241-AN-1-3 lamp remains illuminated.
- CM 5.160 The COGNIZANT ELECTRICAL ENGINEER shall ensure power is restored to relay K12 (energized).
- CM 5.161 Verify the AREA RADIATION RA-241-AN-1-3 lamp (panel ANN-001) and mixer pump FAULT light (panel VSD-AN-001) shut off.
- CM 5.162 Press the OFF pushbutton (located on the mixer pump VSD control pad).
- CM 5.163 Press the HAND pushbutton to restart the mixer pump then verify the RUN light illuminates.

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

Pit 07A Leak Detection Interlock

- OMW 5.164 ~~The COGNIZANT ELECTRICAL ENGINEER shall ensure a temporary connection is made between a TB-2A X1 terminal and K13 terminal A.~~
Place jumper between TBx-AN-2C T&Y Terminals 506
- 5.165 Verify the following:
 - OMW 5.165.1 The mixer pump shuts off (RUN light shuts off).
 - OMW 5.165.2 The mixer pump FAULT light (located on panel VSD-AN-001) illuminates.
 - OMW 5.165.3 The audible alarm horn annunciates.
 - OMW 5.165.4 The PIT-07A LEAK LDA-107-2 lamp (located on panel ANN-001) begins blinking.
- OMW 5.166 Silence and reset the alarm by pressing the ACK and RST pushbuttons (located on panel ANN-001).
- OMW 5.167 Verify the PIT-07A LEAK LDA-107-2 lamp remains illuminated.
- OMW 5.168 The COGNIZANT ELECTRICAL ENGINEER shall ensure the temporary connection is removed.
- OMW 5.169 Verify the PIT-07A LEAK LDA-107-2 lamp (panel ANN-001) and mixer pump FAULT light (panel VSD-AN-001) shut off.
- OMW 5.170 Press the OFF pushbutton (located on the mixer pump VSD control pad).

INTEGRATED SYSTEM PERFORMANCE VERIFICATION

Test Set-up

- OMW 5.171 Set the Caustic Injection Skid valves as follows:

INITIAL VALVE LINEUP

Valve	Position	Valve	Position	Valve	Position
V-100	CLOSED	PRV-105	N/A	V-110	CLOSED
V-101	OPEN	V-106	CLOSED	V-112	CLOSED
V-102	OPEN	V-107	CLOSED		
V-103	OPEN	V-108	OPEN		
V-104	OPEN	V-109	CLOSED		

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

5.172 The COGNIZANT MECHANICAL ENGINEER shall ensure the following:

- CMW 5.172.1 Hose is connected between valve V-114 and the caustic addition riser.
- CMW 5.172.2 Hose is connected between fittings V-113B and V-113A.
- CMW 5.172.3 Hose is run from the water supply valve (faucet) to the 150 Gallon tank.
- CMW 5.172.4 The 150 Gallon tank is approximately half filled with water.

System Start-up

- CMW 5.173 Press the HAND pushbutton (located on panel VSD-AN-001) to start the mixer pump and verify the RUN light illuminates.
- CMW 5.174 Open valve V-100 (allows water to start flowing from the 150 gallon tank through the caustic addition system).
- CMW 5.175 Start the caustic addition metering pump in the following manner:
 - CMW 5.175.1 Press the Red PUMP E-STOP button on control panel TB-3A in then pull it back out.
 - CMW 5.175.2 Ensure the PUMP SPEED dial (located on panel TB-3A) is set at 70%.
 - CMW 5.175.3 Press the Green START pushbutton (located on panel TB-3A).
 - CMW 5.175.4 Reset the LOW TEMPERATURE and LOW PRESSURE alarms with the ALARM SILENCE, ACK, FL RST, and RST pushbuttons (located on panel TB-3A).
 - CMW 5.175.5 Verify the Strip Chart Recorder (located on panel TB-3A) Bar Display indicates a flowrate of 5 gpm to 20 gpm.
- CMW 5.176 The COGNIZANT MECHANICAL ENGINEER shall ensure the water supply valve (faucet) is opened to maintain the 150 gallon tank water level reasonable constant.

System Operation

- CMW 5.177 Verify a slight agitation is observed of the water in the run-in pit.
- CMW 5.178 The pump may be rotated by jog switch SW-1 (located on panel TB-2A) as desired by the test director (within the 17°-183° safety envelope).

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

NOTE: The caustic addition system can be run as long as desired. The duration of the functional run-in test shall be at the discretion of the Test Director.

System Shutdown

- OMW 5.179 The COGNIZANT MECHANICAL ENGINEER shall ensure the water supply valve (faucet) is closed.
- OMW 5.180 When the 150 gallon tank is nearly empty press the OFF pushbutton on panel VSD-AN-001 to shut down the mixer pump.
- OMW 5.181 Verify the metering pump has also shut down.
- OMW 5.182 Close V-100 (stops the flow of water from the 150 gallon tank).
- OMW 5.183 Press the Green START pushbutton on panel TB-3A and verify the metering pump will not start.

Piping System Drain Down

- OMW 5.184 Open Valves V-109 and V-110 and verify liquid is draining into the 10 gallon tank.
- OMW 5.185 Wait until liquid stops draining into the 10 gallon tank then verify the 10 gallon tank has not overflowed.
- OMW 5.186 Open V-107 and verify liquid is draining into the skid pan.
- OMW 5.187 Close V-107.

• Need to ensure limit switches are field checked
 • Need Junction Boxes installed on the skid for wire connections

POST-TEST MAINTENANCE

- OMW 5.188 The COGNIZANT ELECTRICAL ENGINEER shall ensure the caustic addition equipment is powered down.
- OMW 5.189 The COGNIZANT MECHANICAL ENGINEER shall ensure that hoses have been detached/removed as necessary.

Testing as directed by this procedure has been completed, and discrepancies, if any, have been list on Attachment 2, Exception List.

Test Director Ch. White Date 12-13-94

Note: Horn is too Loud !!
 . Need ~~retent~~ remote prog shutdown alarm for mixer pump.

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CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

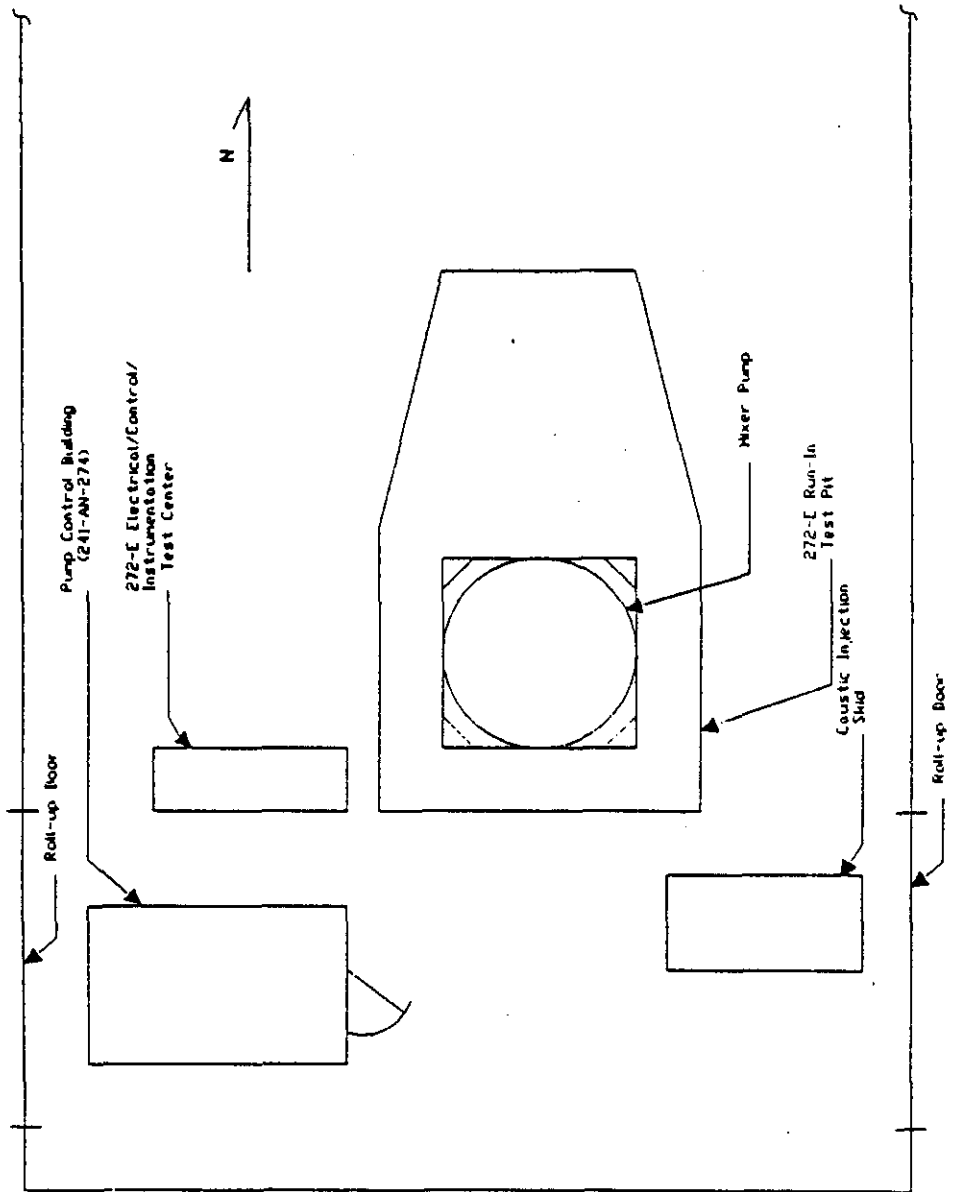


Figure 1 - Pumping System Test Setup at 272-E

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CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

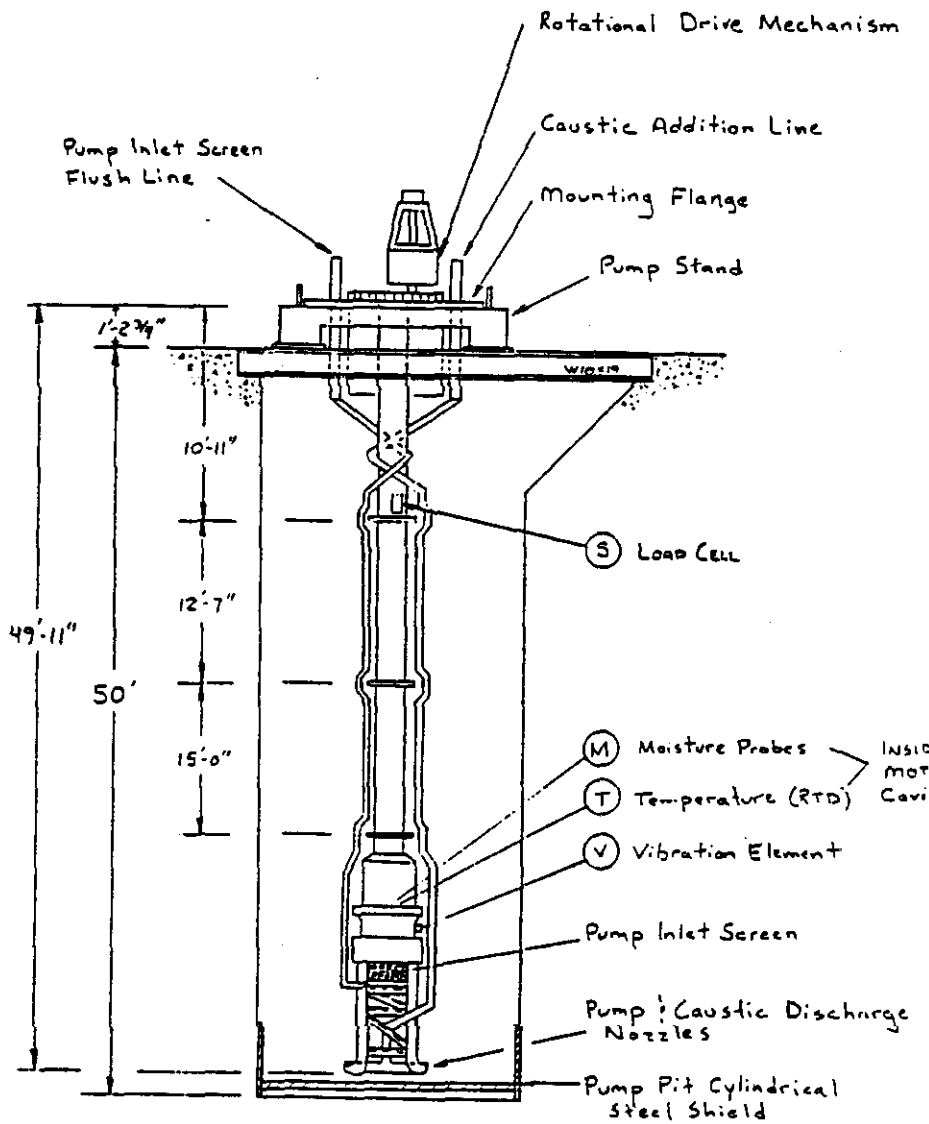
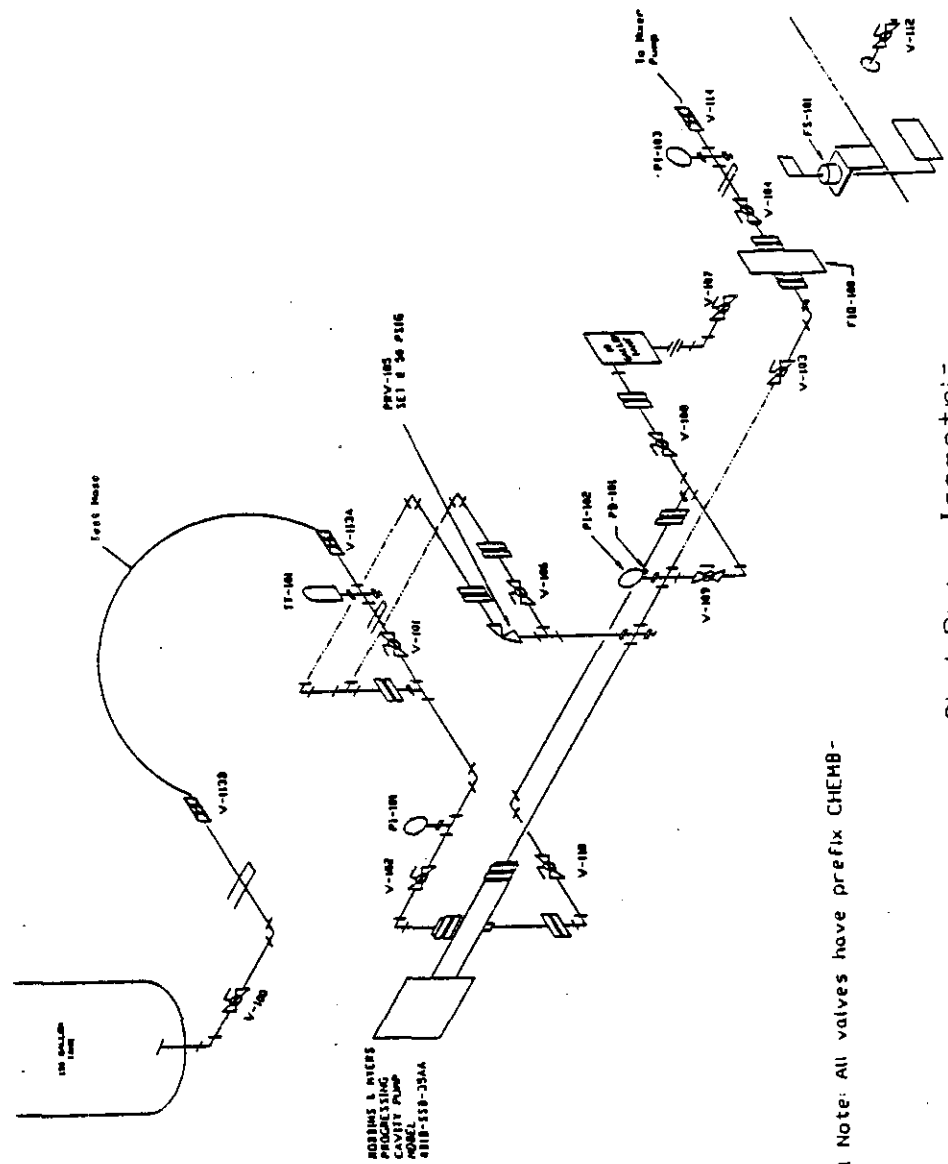


Figure 2: Mixer Pump Setup In Test Pit at 272-E
(Not to scale)

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CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE



General Note: All valves have prefix CHEMB-

Figure 3 - Caustic Addition Skid Piping Isometric

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

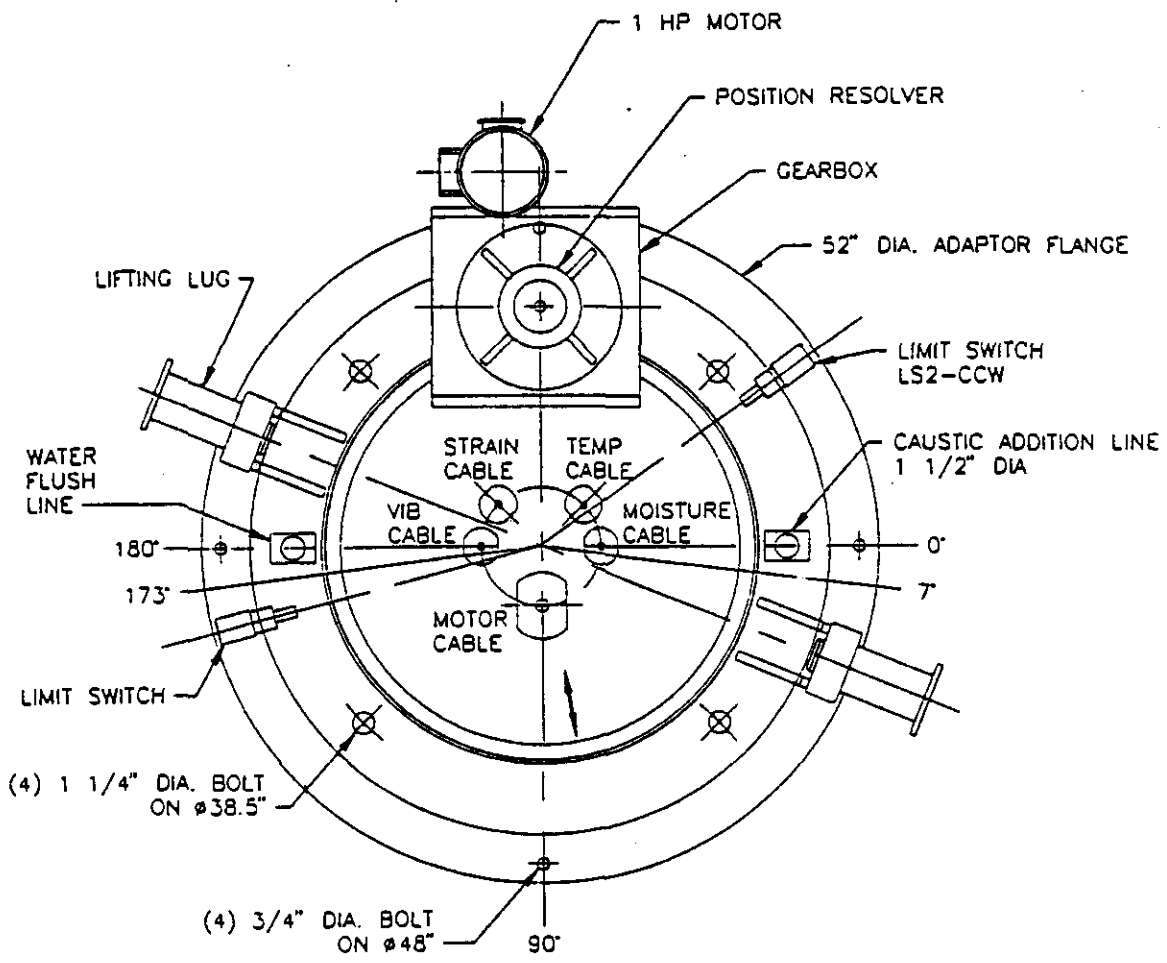


FIGURE 4
MIXER PUMP TURNTABLE ASSEMBLY
PLAN VIEW

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CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

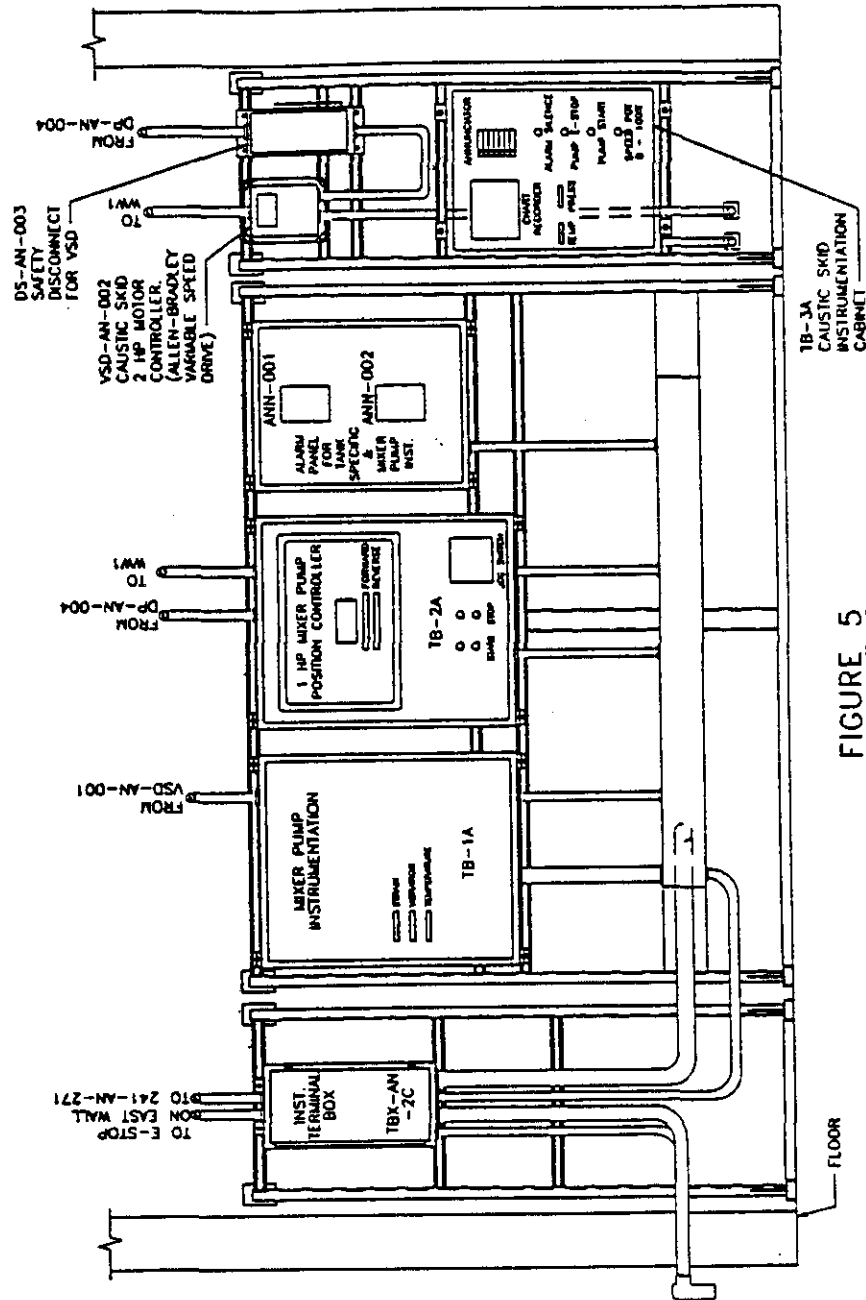
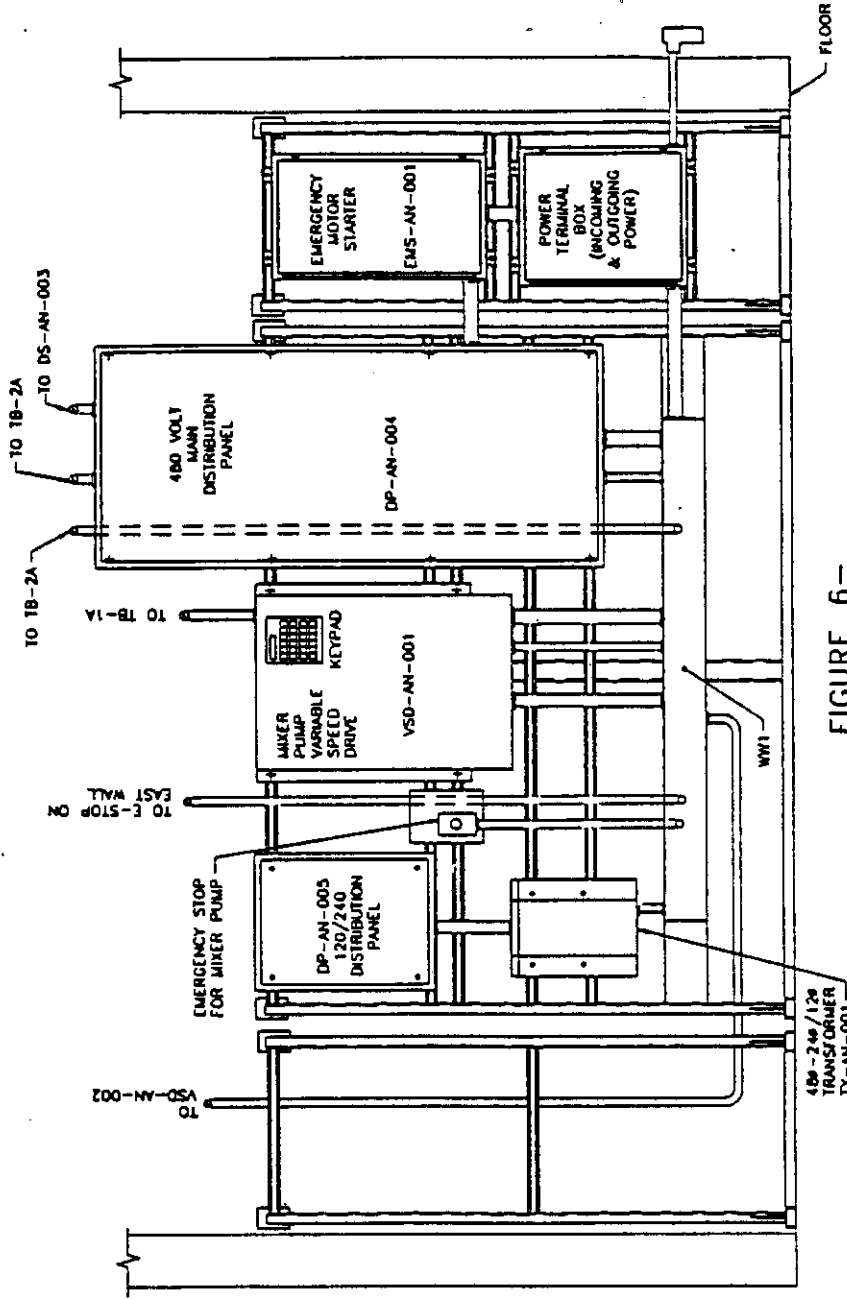


FIGURE 5
PUMP CONTROL BUILDING
INSTRUMENTATION RACK LAYOUT

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE



**FIGURE 6-
PUMP CONTROL BUILDING
POWER RACK LAYOUT**

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

EXCEPTION SHEET NUMBER 1

Procedure Step: 5.23

Reproduce this page as necessary

Description of Problem:

The OPEN and CLOSED positions for valves V-113A and V-113B are not clearly identified.

Exception Resolution:

Values are now clearly identified.

Test Director DE Pounds 9/26/95

East Tank Farms Operations Morgan D. Handley 09-26-95

Equipment Cognizant Engineer Robert Antton 9/26/95

Quality Control Engineer John J. Vail 9/28/95

Attachment 2: Test Exception List

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

EXCEPTION SHEET NUMBER 2

Procedure Step: 5.37

Reproduce this page as necessary

Description of Problem:

A note under step 5.26.11 states "the PT-01 LOW PRESSURE alarm lamp will remain illuminated for the duration of the test due to limitations caused by using facility water as the test fluid." As valve V-104 was closed during step 5.37 the PT-01 LOW PRESSURE alarm lamp cleared at a pressure of 30 psi.

Exception Resolution:

The PT-01 LOW PRESSURE alarm setpoint was set at 30 psi, as the pressure in the line built to 30 psi the alarm cleared as it was supposed to. This was an oversight in the preparation of the test procedure, not an equipment malfunction.

Test Director Cl Dill 12-13-94

East Tank Farms Operations Cl Dill 12-13-94

Equipment Cognizant Engineer RE Dunning 12-13-94

Quality Control Engineer A Haon 12-13-94 REV 169

Attachment 2: Test Exception List

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

EXCEPTION SHEET NUMBER 3

Procedure Step: 5.40 5.47 5.50 5.56.1 Reproduce this page as necessary

Description of Problem:

The audible alarm horn on panel TB-3A did not annunciate during testing of the following caustic addition skid alarms:

- PT-01 HIGH PRESSURE (step 5.40)
- LSH-01 (step 5.47 and 5.50)
- TT-01 HIGH TEMPERATURE (step 5.56.1)

Exception Resolution:

System is designed this way. Audible alarm will not activate when new alarms come in. This is O.K. because system will not be operated in alarm conditions —

Test Director Ch Kluck 12-13-94

East Tank Farms Operations Ch Kluck 12-13-94

Equipment Cognizant Engineer JE Dumas 12-13-94

Quality Control Engineer J. Haan 12/13/94 KEY 168

Attachment 2: Test Exception List

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

EXCEPTION SHEET NUMBER 4

Procedure Step: 5.45

Reproduce this page as necessary

Description of Problem:

While performing step 5.45 it was observed that there was no guard around the caustic addition skid metering pump rotating shaft. A guard should be put in place for skid operator protection.

Exception Resolution:

A guard was installed.

Test Director D E Purdy 9-26-95

East Tank Farms Operations Morgan A. Harsling 9-26-95

Equipment Cognizant Engineer Robert K. Smith 9/26/95

Quality Control Engineer John V. ... 9/28/95

Attachment 2: Test Exception List

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

EXCEPTION SHEET NUMBER 5

Procedure Step: 5.60

Reproduce this page as necessary

Description of Problem:

During performance of step 5.60 it was observed that there was no cover on the Emergency Stop Pushbutton located on the outside of the control skid. A cover should be installed to guard against inadvertent engagement of the E-Stop during operation.

Exception Resolution:

This cover has been installed

Test Director R. E. Parris 9-26-95

East Tank Farms Operations Morgan D. Harding 9-26-95

Equipment Cognizant Engineer Robert P. Baker 9/26/95

Quality Control Engineer John J. Dell 9/28/95

Attachment 2: Test Exception List

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

EXCEPTION SHEET NUMBER 6

Procedure Step: 5.113-5.114
5.121-5.122
5.129-5.130
5.137-5.138

Reproduce this page as necessary

Description of Problem:

In the test procedure for the mixer pump interlocks the mixer pump FAULT light (panel VSD-AN-001) is supposed to be verified shut off PRIOR to pushing the OFF pushbutton (panel VSD-AN-001). For the following interlocks the mixer pump FAULT light remains illuminated until AFTER the OFF pushbutton had been pressed:

Motor Moisture Interlock (steps 5.113 and 5.114)

Motor Temperature Interlock (steps 5.121 and 5.122)

Motor Compression Interlock (step 5.129 and 5.130)

Motor Tension Interlock (steps 5.137 and 5.138)

Exception Resolution:

Only a procedure sequence problem. System O.K.

Test Director Ch Wick 12-13-94

East Tank Farms Operations Ch Wick 12-13-94

Equipment Cognizant Engineer RG Parris 12-13-94

Quality Control Engineer Litton 12/13/94 (153)

Attachment 2: Test Exception List

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CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

EXCEPTION SHEET NUMBER 7

Procedure Step: 5.140-5.147

Reproduce this page as necessary

Description of Problem:

A relay had been removed disabling the Pump Vibration Interlock. Performance of test procedure steps 5.140 - 5.147 was impossible.

Exception Resolution:

12/13/94 - Interlock was checked - vibration indicator is still not working properly. REP.

The relay was put back in place. Test steps were performed.

Test Director J. E. [Signature] 9-26-95

East Tank Farms Operations Morgan D. Harding 9-26-95

Equipment Cognizant Engineer [Signature] 9/26/95

Quality Control Engineer [Signature] 10/12/95

Attachment 2: Test Exception List

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

EXCEPTION SHEET NUMBER 8

Procedure Step: 5.187

Reproduce this page as necessary

Description of Problem:

After performance of step 5.187 it was noted that testing of the overtravel limit switch interlocks had not been performed.


Exception Resolution:

Performed the limit switch test. Switches shut down pump as required.

Test Director Ch Wick 12-13-94

East Tank Farms Operations Ch Wick 12-13-94

Equipment Cognizant Engineer Q. S. Pardo 12-13-94

Quality Control Engineer Alfonso 12/13/94 

Attachment 2: Test Exception List

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

EXCEPTION SHEET NUMBER 2

Procedure Step: 5.187

Reproduce this page as necessary

Description of Problem:

After performance of step 5.187 it was noted that junction boxes required to clean up the caustic addition skid wiring had not yet been installed.

Exception Resolution:

Junction boxes have now been installed.

Test Director

R.S. Perara 9-26-95

East Tank Farms Operations

Margan D. Hardin 9-26-95

Equipment Cognizant Engineer

Robert Schultz 9/26/95

Quality Control Engineer

John J. Veech 9/21/95

Attachment 2: Test Exception List

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

EXCEPTION SHEET NUMBER 10

Procedure Step: 5.189

Reproduce this page as necessary

Description of Problem:

After performance of step 5.188 it was noted that the alarm horn on panel TB-3A is too loud and should be replaced.

Exception Resolution:

Horn has been replaced.

Test Director R. E. [Signature] 9/26/95

East Tank Farms Operations _____

Equipment Cognizant Engineer [Signature] 9/26/95

Quality Control Engineer [Signature] 9/28/95

Attachment 2: Test Exception List

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

EXCEPTION SHEET NUMBER 11.

Procedure Step: 5.188

Reproduce this page as necessary

Description of Problem:

After performance of step 5.188 it was noted that there is no remote alarm signal from the control skid. The addition of a remote signal would significantly reduce the amount of operator coverage required to operate the mixer pump.

Exception Resolution:

This is a non-issue because AN-Farm will be constantly occupied while 241-AN-107 mixer pump is operating

Test Director R. E. Prange 9/26/95

East Tank Farms Operations _____

Equipment Cognizant Engineer Richard Natchan 9/26/95

Quality Control Engineer John J. Udd 9/28/95

Attachment 2: Test Exception List

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CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

EXCEPTION SHEET NUMBER _____

Procedure Step: _____ Reproduce this page as necessary

Description of Problem:

Exception Resolution:

Test Director _____

East Tank Farms Operations _____

Equipment Cognizant Engineer _____

Quality Control Engineer _____

Attachment 2: Test Exception List

CAUSTIC ADDITION SYSTEM OPERABILITY TEST PROCEDURE

Completion of this procedure has demonstrated that:

- The major components of the caustic addition system (pump, addition skid, and control building) function properly together.
- The controls for the caustic addition equipment are configured in such a manner that field operation of the equipment will not be unduly difficult.
- A record of all noted deficiencies was kept on Attachment 2, Exception List. All recorded exceptions have been resolved, the resolutions approved, and any necessary retesting has been completed.

Approved By:

M. D. Hardy

 G. M. Winkler, East Tank Farm Operations
M. D. Harding

 R. E. Parazin, Test Engineering
 R. S. Nicholson, Plant
M. W.

 G. T. Bear, Test Engineering Manager
 G. N. Hanson, Plant
G. N. Hanson

 H. K. Ananda, Quality Assurance Engineer
 J. J. Veroverber

10-12-95

 Date
10/12/95

 Date
10/12/95

 Date
10/12/95

 Date

Attachment 3: Final Procedure Acceptance Sheet

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