Sta. 4 (C)

APR 25 1997

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT No. 610596

2. To: (Receiving Organization) SST Retrieval Engineering		3. From: (Originating Organization) SST Retrieval Engineer		4. Related EDT No.: 606399	
5. Proj./Prog./Dept./Div.: W-320		6. Design Authority/ Design Agent/Cog. Engr.: J.W. Bailey/J.R. Bellomy		7. Purchase Order No.: N/A	
8. Originator Remarks: Supporting Document Approval and Initial Release				9. Equip./Component No.: Interfarm Electrical Cathodic Protection	
				10. System/Bldg./Facility: 200 E Area, Tank	
11. Receiver Remarks: 11A. Design Baseline Document? [X] Yes [] No				12. Major Assm. Dwg. No.: H-2-818706, sht 1 H-2-818707, sht 1 H-2-818709, sht 1	
				13. Permit/Permit Application No.: N/A	
				14. Required Response Date: N/A	

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	HNF-SD-W320-ATR-001	ALL	0	Cathodic Protection - Rectifier 46	SQ	1	N/A	N/A

16. Approval Designator (F)		Reason for Transmittal (G)		Disposition (H) & (I)	
E, S, Q, D or N/A (see WMC-CM-3-5, Sec.12.7)		1. Approval 4. Review 2. Release 5. Post-Review 3. Information 6. Dist. (Receipt Acknow. Required)		1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 3. Disapproved w/comment 6. Receipt acknowledged	

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)									
(G) Reason	(H) Disp.	(J) Name	(K) Signature (M) MSIN	(L) Date	(G) Reason	(H) Disp.	(J) Name	(K) Signature (M) MSIN	(L) Date
1	1	Design Authority	<i>[Signature]</i>	4/23/97	1	1	R.R. Bevins S2-48	<i>[Signature]</i>	4/24/97
1	1	Design Agent	<i>[Signature]</i>	4/24/97	3	1	K.B. Ferlan S2-48		
1	1	Cog. Eng.	<i>[Signature]</i>	4/23/97	3	1	Project Files R1-29		
1	1	Cog. Mgr.	<i>[Signature]</i>	4/23/97	3		Central Files A3-88		
1	1	QA	<i>[Signature]</i>	4/24/97					
1	1	Safety	<i>[Signature]</i>	4/24/97					
		Env.							

18. R.R. Bevins <i>[Signature]</i> Signature of EDT Originator Date 4/23/97		19. N/A Authorized Representative for Receiving Organization Date		20. J.W. Bailey <i>[Signature]</i> Design Authority/ Cognizant Manager Date 4/24/97		21. DOE APPROVAL (if required) Ctrl. No. [] Approved [] Approved w/comments [] Disapproved w/comments	
--	--	---	--	---	--	--	--

HNF-

HFN-SD-W320-ATR-001, Rev. 0

CLW
4/25/97

Cathodic Protection-Rectifier 46

J. R. Bellomy

SGN Eurisys Services Corporation (SESC), Richland, WA 99352

U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 610596

UC: 510

Org Code: S1100

Charge Code: D2M2N

B&R Code: EW3130010

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4/25/97

Key Words: Project W-320, Interfarm Cathodic Protection, Rectifier 46

Abstract: Acceptance Test Report for the interfarm cathodic protection
-Addition of rectifier 46, Project W-320

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Release Approval

4/25/97
Date

Approved for Public Release

TEST TITLE Cathodic Protection - Rectifier 46LOCATION 200-E Area (Near corner of 7th Avenue and Buffalo Avenue)PROJECT NUMBER W-320WORK ORDER ER4319PROJECT TITLE Tank 241-C-106 Sluicing

Prepared By
ICF Kaiser Hanford Company
Richland, Washington

For the U.S. Department of Energy
Contract DE-AC06-93RL12359

PROCEDURE APPROVAL

ICF KAISER HANFORD COMPANY (ICF KH)

<u>A.R. Shewchuk</u> <i>ARD</i>	<u>4-14-95</u> <u>10-10-94</u>	<u>J. E. Breed</u> <i>S.D. F. J.E. Breed</i>	<u>4/14/95</u> <u>10-10-94</u>
Originator	Date	Technical Documents	Date
<u>C. Dublett</u> <i>mcb for a. Sublett</i>	<u>4-14-95</u> <u>10-19-94</u>	<u>L. Schubert</u> <i>CDE 4/14/95</i>	<u>10-10-94</u> <u>10-10-94</u>
Checker	Date	Safety	Date
<u>RF Wiering</u> <i>RFEM 4/17/95</i>	<u>11-4-94</u> <u>11-4-94</u>	<u>C. Norton</u> <i>4-18-95</i>	<u>11-3-94</u> <u>11-3-94</u>
Environmental	Date	Quality Engineering	Date
<u>FW Buckala</u> <i>FW 4/18/95</i>	<u>11/11/94</u> <u>11/11/94</u>		
Project Management	Date		

Westinghouse Hanford Company (WHC)

<u>William M. Lane</u>	<u>4/18/95</u> <u>4/18/95</u>	<u>J. Winters</u>	<u>4-18-95</u> <u>4-18-95</u>
Projects Department	Date	Quality Assurance	Date
<u>BL</u>	<u>4/27/95</u> <u>4/27/95</u>	<u>T.N. Shan</u>	<u>4-19-95</u> <u>4-19-95</u>
Safety	Date	Operations	Date

(2) 4/28/97

EXECUTION AND TEST APPROVAL

EXECUTED BY
MICHAEL J. KAMOS *Michael J. Ramos* 4-16-97
JEFF LARITAN *Jeff Laritan* 3-11-97
Test Director/Organization
Clayton S. FOWD
FLOYD S. FOWD
Recorder/Organization
E. F. ENLOIE FOWD
4-15-97

WILLIAM H. CARLEY *William H. Carley* FOR ED. BOETTGER 4-16-97
HARLEN R. JOHNSON 3-10-97
Test Operator/Organization
Date

WITNESSES

WITNESSES
N/A
Witness/Organization
Date
N/A
Witness/Organization
Date

E. F. ENLOIE *E. F. Enloie* 4-16-97
Clayton S. FOWD
FLOYD S. FOWD
Title III Inspector
Date
N/A
Witness/Organization
Date

A-E APPROVAL

ICF Kaiser Hanford Company (ICF KH)

Without exceptions _____ With exceptions resolved ☒ With exceptions outstanding _____
Karl J. Feinman *Karl J. Feinman* 4/16/97
Acceptance Inspection 3/11/97 Date
Kerry S. Allen *Kerry S. Allen* 4/16/97 3/13/97 Date
Project Manager

TEST APPROVAL AND ACCEPTANCE

Westinghouse Hanford Company (WHC)

Without exceptions _____ With exceptions resolved ☒ With exceptions outstanding _____
J. W. Linton *J. W. Linton* 4-16-97
LEAD TEST ENGINEER 4-16-97
<Title or Department> Date
TERRY J. BOWMAN *Terry J. Bowman* 4-16-97
W-320 START-UP MGR 4-16-97
<Title or Department> Date
TERRY J. BOWMAN
Cathodic Protection Engineer
TERRY J. BOWMAN
4-18-97
DATE

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NOTE: At completion of test, enter pages added during performance of test to this Table of Contents.

1 PURPOSE

This Acceptance Test Procedure (ATP) has been prepared to demonstrate that the cathodic protection system functions as required by project criteria.

2 REFERENCES

2.1 DRAWINGS

H-2-818706, Sh 1, Rev 0 Electrical - Cathodic Protection Plan #1
H-2-818707, Sh 1, Rev 0 Electrical - Cathodic Protection Plan #2
H-2-818709, Sh 1, Rev 0 Electrical - Cathodic Protection Details

2.2 SPECIFICATIONS

W-320-C1, Rev 0 Construction Specification (Section 16640)

2.3 ENGINEERING CHANGE NOTICES (ECN)

Prior to final test approval, enter ECNs written against this ATP.

3 RESPONSIBILITIES

3.1 GENERAL

Each company or organization participating in this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The designees shall become familiar with this ATP and the systems involved to the extent that they can perform their assigned duties.

3.2 WHC PROJECT ENGINEER

- 3.2.1 Designates a Test Director.
- 3.2.2 Coordinates testing with the Facility Manager.
- 3.2.3 Acts as liaison between the participants in acceptance testing.
- 3.2.4 Distributes the approved testing schedule before start of testing.
- 3.2.5 Schedules and conducts a pretest kickoff meeting with test participants when necessary.
- 3.2.6 Notifies the persons performing and witnessing the test 2 days before the start of testing.
- 3.2.7 Schedules a dry run when necessary.
- 3.2.8 Notifies concerned parties when a change is made in the testing schedule.

- 3.2.9 Signs Execution and Test Approval page when test is approved and accepted.
- 3.2.10 Takes necessary action to clear exceptions to the test.
- 3.2.11 Signs Exception Form when exception has been resolved.
- 3.2.12 Provides a distribution list for the approved and accepted ATP(ATR).
- 3.3 TEST DIRECTOR
 - 3.3.1 Coordinates and directs acceptance testing.
 - 3.3.2 Confirms that field testing and inspection of the system or portion of the system to be tested has been completed.
 - 3.3.3 Stops any test which, in his or her judgment, may cause damage to the system until the problem has been resolved.
 - 3.3.4 After verifying there is no adverse impact, may alter the sequence in which systems or subsystems are tested.
 - 3.3.5 Ensures that required environmental conditions are maintained.
 - 3.3.6 If a test is to be suspended for a period of time, ensures that the system is left in a safe mode.
 - 3.3.7 Before restarting suspended test, re-verifies the test prerequisites.
 - 3.3.8 Initiates ECNs to document required changes to the ATP.
 - 3.3.9 Reviews recorded data, discrepancies, and exceptions.
 - 3.3.10 Obtains information or changes necessary to clear or resolve objections during the performance of the test.
 - 3.3.11 Signs Execution and Test Approval page when test has been performed.
 - 3.3.12 Signs Exception Form when exception has been resolved.
 - 3.3.13 Obtains required signatures on the ATP Master prior to reproduction and distribution.
- 3.4 WITNESSES (Provided by Participating Organizations. One witness shall be a Title III acceptance inspector.)
 - 3.4.1 Witness the tests.
 - 3.4.2 Review results of testing.
 - 3.4.3 Assist the Test Director when requested.
 - 3.4.4 Sign Execution and Test Approval page when test has been performed.
 - 3.4.5 Sign Exception Form when exception has been resolved.

- 3.5 RECORDER (Provided by ICF KH)
- 3.5.1 Prepares a Field copy from the ATP Master.
 - 3.5.2 Records names of all designated personnel on Field copy of ATP prior to start of testing.
 - 3.5.3 Records test instrument identification numbers and calibration expiration dates.
 - 3.5.4 Initials and dates every test step on the Field copy as it is completed next to the step number or on a data sheet, when provided. Records test data. On data sheets where there is not room for both the initial and date, date may be entered at bottom of column.
 - 3.5.5 Records objections and exceptions on an Exception form. Uses additional Exception forms as needed. Notifies the Test Director at time the objection is made.
 - 3.5.6 Signs Execution and Test Approval page when test has been performed.
 - 3.5.7 After test is finished, assigns alpha numeric page numbers to added data sheets and Exception forms. Records page numbers in the Table of Contents.
 - 3.5.8 Transfers Field copy entries for each step to the Master in ink or type, signs, and dates. Transmits the completed Master to the Test Director for approval signature routing. Transmits the Field copy to Construction Document Control for inclusion in the official project file.
 - 3.5.9 Signs Exception Form when exception has been resolved and transmits to Test Director.
- 3.6 TEST OPERATOR
- 3.6.1 Performs test under direction of the Test Director.
 - 3.6.2 Provides labor, equipment, and test instruments required for performing tests which have not been designated as being provided by others.
 - 3.6.3 Requests in writing from the Test Director those services, materials, or equipment that have been designated as being supplied by others.
 - 3.6.4 Confirms that all equipment required for performing test will be available at the start of testing.
 - 3.6.5 Signs the Execution and Test Approval page.
- 3.7 DESIGN ENGINEER ACCEPTANCE INSPECTION
- 3.7.1 Evaluate results.
 - 3.7.2 Sign for A-E Approval on Execution and Test Approval page.

4 CHANGE CONTROL

Required changes to this ATP must be processed on ECNs in accordance with company procedures. If a need for change is discovered in the course of running the test, the test shall be stopped until the ECN is approved. However, this does not prevent the running of another portion of the test unaffected by the change.

5 EXECUTION

5.1 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves and others from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects.

5.2 PERFORMANCE

5.2.1 Conduct testing in accordance with ICF KH Procedure CON 3.5 (Performance and Recording of Acceptance Test Procedures).

5.2.2 Perform test following the steps and requirements of this procedure.

6 EXCEPTIONS

6.1 GENERAL

Exceptions to the required test results are sequentially numbered and recorded on individual Exception forms. This enables case-by-case resolution and approval of each exception.

Errors/exceptions in the ATP itself shall NOT be processed as test exceptions (see Section 4 CHANGE CONTROL).

6.2 RECORDING

6.2.1 Number each exception sequentially as it occurs and record it on an Exception Form (KEH-428), sample appended.

6.2.2 Enter name and organization of objecting party for each exception.

6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

Record the action taken to resolve each exception. Action taken may not be the same as planned action.

6.3.1 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Form.

6.3.2 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Form.

6.4 APPROVAL AND ACCEPTANCE

WHC provides final approval and acceptance of exceptions by checking one of the following on Exception Form:

6.4.1 Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.

6.4.2 Exception Accepted-As-Is: Requires detailed explanation.

6.4.3 Other: Requires detailed explanation.

WHC signs and dates the Exception Form and obtains other WHC internal approvals, if required.

6.5 DISTRIBUTION

A copy of the approved Exception Form is distributed to each participant. The signed original is attached to the ATP Master.

7 PREREQUISITES, EQUIPMENT/INSTRUMENTS, AND ABBREVIATIONS

7.1 PREREQUISITES

The following conditions shall exist at start of testing for that portion of the system being tested.

7.1.1 Buried interfarm piping and the cathodic protection system have been inspected for compliance with construction documents.

7.1.2 Reference documents (including this ATP) have been verified for correct revision number and outstanding ECNs.

7.1.3 A Prejob Safety Analysis has been prepared and a Prejob Safety Meeting has been conducted.

7.1.4 Test instruments (except Waveform Analyzer) have a valid calibration stamp attached. Test instrument identification numbers and calibration expiration dates have been recorded in Para 7.2.

7.2 EQUIPMENT/INSTRUMENTS

Supplied by Test Operator unless otherwise noted. {Delete items not required. Add any additional necessary items.}

7.2.1 Voltohmmeter (VOM): Digital, portable, 0-150 V ac/dc.

⁸¹²⁻⁴⁵⁻⁰⁸⁻⁰¹¹
Instrument No. _____ Expiration Date 9-25-96

⁹⁵⁴⁻⁰⁸⁻⁰⁸⁻⁰⁰⁵
7.2.2 Waveform Analyzer: Hand held instrument with display of ON-OFF pipe-to-soil potential, DC potential or AC potential, MCMiller Co, Model WFA-1. ^{5/28/97}

- 7.2.3 Test leads with insulated covers for wire clips.
- 7.2.4 Portable test reel, containing a minimum of 200 feet of test wire, 600 V, No. 18 AWG minimum.
- 7.2.5 Portable copper-copper sulphate reference electrode.
- 7.2.6 Pipe locator.

7.3 ABBREVIATIONS

ECN Engineering Change Notice

- 8.1 The following steps will verify (1) rectifier nameplate data, (2) rectifier input wiring is correctly terminated and color coded, and (3) anode header cable, anode loop cable, and negative return cables are labeled and connected in accordance with the design.

9/18/96 8.1.1 Record nameplate data for Rectifier 46.

Make	<u>GOOD-ALL ELECTRIC</u>
Model	<u>CSOYSA 24-12 GLMPT2</u>
Serial Number	<u>95C3223</u>
AC Line Input Voltage	<u>120</u>
AC Line Frequency	<u>60 Hz</u>
Number of Phases	<u>1</u>
DC Output Voltage	<u>24</u>
DC Output Current	<u>12</u>

9/18/96

- 8.1.2 Verify the following on rectifier:

9/18/96

- 8.1.2.1 Tank gasket is not damaged and is in place.

9/18/96

- 8.1.2.2 There are no loose electrical connections or frayed wires.

9/18/96

- 8.1.2.3 There are no oil leaks.

9/18/96

- 8.1.3 Verify disconnect switch at rectifier is OPEN.

EXCEPTION #1

- 8.1.4 Using a VOM, verify no dc voltage at rectifier output terminals.

9/18/96

- 8.1.5 Verify rectifier case is filled with oil to the indicated level and that oil is CLEAR.

- 8.1.6 Verify ac supply wiring from disconnect switch is terminated on ac input terminals of rectifier.

9/18/96

- 8.1.6.1 Line 1 (Red or Black).

9/18/96

- 8.1.6.2 Neutral (White or Gray).

9/18/96

- 8.1.6.3 Ground (Green)

- 8.1.7 Verify rectifier output cables are properly labeled.

9/18/96

- 8.1.7.1 (+) HR46 (Anode Header Cable)

9/18/96

- 8.1.7.2 (+) LR46 (Anode Loop Cable)

- JS 9/18/96 8.1.7.3 (-) R46 (Negative return cable)
- 8.1.8 Verify Anode Header Cable and Anode Loop Cable are terminated at rectifier positive terminals.
- JS 9/18/96 8.1.8.1 (+) HR46 (Anode Header Cable)
- JS 9/18/96 8.1.8.2 (+) LR46 (Anode Loop Cable)
- 8.1.9 Verify Negative Return Cable is terminated at rectifier negative terminal.
- JS 9/18/96 8.1.9.1 (-) R46
- JS 9/18/96 8.1.10 Verify rectifier frame is connected to ground rod.
- JS 9/18/96 8.1.11 Verify Anode Header Cable (+) HR46 and Anode Loop Cable (+) LR46 are connected together at Anode Junction Box AJB (46-1) and AJB (46-2).

8.2 The following steps will verify continuity of the Anode Header Cable and the Anode Loop Cable.

- JS 9/18/96 8.2.1 Record the following VOM data:
Manufacturer	<u>JOHN FLUKK</u>
Model	<u>8060A</u>
Serial Number	<u>812-45-08-011</u>
Calibration Sticker Data	<u>9-25-96</u>
- JS 9/18/96 8.2.2 Disconnect Anode Header Cable (+) HR46 and Anode Loop Cable (+) LR46 in Anode Junction Box AJB (46-1) and AJB (46-2).
- JS 9/18/96 8.2.3 Using VOM, verify continuity (less than one ohm) across Anode Header Cable (+) HR46 and Anode Loop Cable (+) LR46 in Anode Junction Box AJB (46-1) and AJB (46-2).
- JS 9/18/96 8.2.4 Reconnect Anode Header Cable (+) HR46 and Anode Loop Cable (+) LR46 that were disconnected in Step 8.2.2.

NOTE: The steps shown in Paragraphs 8.3 and 8.4 may be done concurrently.

8.3 The following steps will verify pipe test conductors are (1) terminated on designated terminals in accordance with the Drawings and (2) labeled correctly with the pipe number or reference electrode. Record terminal number to which each conductor is connected.

- JS 9/18/96 8.3.1 Test Station T(46-1)
4-inch SL-100-M9
w/6" ENC-M26a	Terminals <u>1</u> and <u>2</u>

4-inch SN-200-M9
w/6" ENC-M26a

Terminals 3 and 4

Reference Electrode

Terminal 5

Test Station T(46-2)

4-inch SL-100-M9
w/6" ENC-M26a

Terminals 1 and 2

4-inch SN-200-M9
w/6" ENC-M26a

Terminals 3 and 4

Delete
ECN W320-110

~~U.G. Line~~

~~Terminals _____ and _____~~

Reference Electrode

Terminal 5

Test Station T(46-3)

4-inch SL-100-M9
w/6" ENC-M26a

Terminals 3 and 4

4-inch SN-200-M9
w/6" ENC-M26a

Terminals 1 and 2

30-inch CMP

Terminals 7 and 8

Reference Electrode

Terminal 5

Test Station T(46-4)

4-inch SL-100-M9
w/6" ENC-M26a

Terminals 1 and 2

4-inch SN-200-M9
w/6" ENC-M26a

Terminals 3 and 4

8-inch RW

Terminals 7 and 8

Reference Electrode

Terminal 5

Test Station T(46-5)

4-inch SL-100-M9
w/6" ENC-M26a

Terminals 1 and 2

4-inch SN-200-M9
w/6" ENC-M26a

Terminals 3 and 4

Delete
ECN W320-110

~~U.G. Line~~

~~Terminals _____ and _____~~

Reference Electrode

Terminal 5

8.3.6

Test Station T(46-6)

4-inch SL-100-M9
w/6" ENC-M26a

Terminals ____ and ____

4-inch SN-200-M9
w/6" ENC-M26a

Terminals ____ and ____

12-inch RW

Terminals ____ and ____

Reference Electrode

Terminal ____

8.3.7

Test Station T(46-7)

4-inch SL-100-M9
w/6" ENC-M26a

Terminals ____ and ____

4-inch SN-200-M9
w/6" ENC-M26a

Terminals ____ and ____

12-inch RW

Terminals ____ and ____

Reference Electrode

Terminal ____

8.3.8

Test Station T(46-8)

4-inch SL-100-M9
w/6" ENC-M26a

Terminals ____ and ____

4-inch SN-200-M9
w/6" ENC-M26a

Terminals ____ and ____

4-inch COND DR

Terminals ____ and ____

Reference Electrode

Terminal ____

8.3.9

Test Station T(46-9)

4-inch SL-100-M9
w/6" ENC-M26aTerminals 1 and 24-inch SN-200-M9
w/6" ENC-M26aTerminals 3 and 4

3-inch V113

Terminals ____ and ____

Reference Electrode

Terminal 5

8.3.10

Test Station T(46-10)

4-inch SL-100-M9
w/6" ENC-M26a

Terminals ____ and ____

4-inch SN-200-M9
w/6" ENC-M26a

Terminals ____ and ____

8.3.11

*Delete
ECN W320-110*

4-inch COND DR

Terminals _____ and _____

Reference Electrode

Terminal _____

Test Station T(46-11)

4-inch SL-100-M9
w/6" ENC-M26a

Terminals 1 and 2

4-inch SN-200-M9
w/6" ENC-M26a

Terminals 3 and 4

U.G. Line

Terminals _____ and _____

Reference Electrode

Terminal 5

8.3.12

Test Station T(46-12)

4-inch SL-100-M9
w/6" ENC-M26a

Terminals _____ and _____

4-inch SN-200-M9
w/6" ENC-M26a

Terminals _____ and _____

12-inch RW

Terminals _____ and _____

Reference Electrode

Terminal _____

8.3.13

Test Station T(46-13)

4-inch SL-100-M9
w/6" ENC-M26a

Terminals _____ and _____

4-inch SN-200-M9
w/6" ENC-M26a

Terminals _____ and _____

U.G. Line

Terminals _____ and _____

U.G. Line

Terminals _____ and _____

Reference Electrode

Terminal _____

8.3.14

Test Station T(46-14)

4-inch SL-100-M9
w/6" ENC-M26a

Terminals 1 and 2

4-inch SN-200-M9
w/6" ENC-M26a

Terminals 3 and 4

3-inch V-714 w/6" ENC

Terminals 6 and 7

U.G. Line

Terminals _____ and _____

Reference Electrode

Terminal 5

1 9/19/96

EXCEPTION # 3

*Delete
ECN W320-110*

8.3.15

Test Station T(46-15)

U.G. Line

Terminals _____ and _____

U.G. Line

Terminals _____ and _____

U.G. Line

Terminals _____ and _____

Reference Electrode

Terminal _____

8.4

Using a VOM, measure and record resistance between each set of pipe test conductors that are identified as being connected to the same pipe. Resistance measured shall be less than 1 ohm.

8.4.1

Record the following VOM data:

Manufacturer

FLUKKFLUKK

Model

8024B8060ASerial Number MARE # 0225812-45-08-011Calibration Sticker Data 4-30-979-25-96

8.4.2

Test Station T(46-1)

4-inch SL-100-M9 w/6" ENC-M26a

.10 ohms

4-inch SN-200-M9 w/6" ENC-M26a

.11 ohms

8.4.3

Test Station T(46-2)

4-inch SL-100-M9 w/6" ENC-M26a

.12 ohms

4-inch SN-200-M9 w/6" ENC-M26a

.12 ohms~~U.G. Line~~~~_____ ohms~~

8.4.4

Test Station T(46-3)

4-inch SL-100-M9 w/6" ENC-M26a

.16 ohms

4-inch SN-200-M9 w/6" ENC-M26a

.15 ohms

30-inch CMP

-.0000 ohms

8.4.5

Test Station T(46-4)

4-inch SL-100-M9 w/6" ENC-M26a

.15 ohms

4-inch SN-200-M9 w/6" ENC-M26a

.16 ohms

8-inch RW

.18 ohms

8.4.6

Test Station T(46-5)

4-inch SL-100-M9 w/6" ENC-M26a

.12 ohms

W320001.ATP.614

- 15 -

HNFC-SD-W320-ATR-001
Rev 0
04/11/95

4-inch SN-200-M9 w/6" ENC-M26a

.12 ohms

Delete ECN 110 1/3/06/7
U.G. Line

 ohms

8.4.7 Test Station T(46-6)

4-inch SL-100-M9 w/6" ENC-M26a

 ohms

4-inch SN-200-M9 w/6" ENC-M26a

 ohms

12-inch RW

 ohms

8.4.8 Test Station T(46-7)

4-inch SL-100-M9 w/6" ENC-M26a

 ohms

4-inch SN-200-M9 w/6" ENC-M26a

 ohms

12-inch RW

 ohms

8.4.9 Test Station T(46-8)

4-inch SL-100-M9 w/6" ENC-M26a

 ohms

4-inch SN-200-M9 w/6" ENC-M26a

 ohms

4-inch COND DR

 ohms

8.4.10 Test Station T(46-9)

4-inch SL-100-M9 w/6" ENC-M26a

 ohms

4-inch SN-200-M9 w/6" ENC-M26a

.10 ohms

3-inch V113

 ohms

8.4.11 Test Station T(46-10)

4-inch SL-100-M9 w/6" ENC-M26a

 ohms

4-inch SN-200-M9 w/6" ENC-M26a

 ohms

4-inch COND DR

 ohms

8.4.12 Test Station T(46-11)

4-inch SL-100-M9 w/6" ENC-M26a

.12 ohms

4-inch SN-200-M9 w/6" ENC-M26a

.10 ohms

U.G. Line

 ohms

8.4.13 Test Station T(46-12)

4-inch SL-100-M9 w/6" ENC-M26a

 ohms

4-inch SN-200-M9 w/6" ENC-M26a

_____ ohms

12-inch RW

_____ ohms

8.4.14

Test Station T(46-13)

4-inch SL-100-M9 w/6" ENC-M26a

_____ ohms

4-inch SN-200-M9 w/6" ENC-M26a

_____ ohms

U.G. Line

_____ ohms

U.G. Line

_____ ohms

8.4.15

Test Station T(46-14)

4-inch SL-100-M9 w/6" ENC-M26a

_____ ohms

4-inch SN-200-M9 w/6" ENC-M26a

_____ ohms

3-inch V-714 w/6" ENC

_____ ohms

U.G. Line

_____ ohms

8.4.16

Test Station T(46-15)

U.G. Line

_____ ohms

U.G. Line

_____ ohms

U.G. Line

_____ ohms

8.5

The following steps will provide the native potential of each new pipe using both the permanent reference electrode and a portable reference electrode for comparison.

NOTE:

Connect the pipe test conductor to the positive terminal of the Wave Form Analyzer and the lead from the permanent or portable reference electrode to the common terminal of the Wave Form Analyzer. Turn the mode switch, on the Wave Form Analyzer, to the DC position. (Place the portable reference electrode directly above the pipe for those tests that require the use of the portable reference electrode).

8.5.1

Test Station T(46-1)

Permanent Reference Electrode and 4-inch SL-100-M9 w/6" ENC-M26a

Volts
4-14-97
330 -0.327

Portable Reference Electrode and 4-inch SL-100-M9 w/6" ENC-M26a

4-14-97
347 -0.367

Permanent Reference Electrode and 4-inch SN-200-M9 w/6" ENC-M26a

4-14-97
330 -0.327

8.5.a
(ECN-624)

OPEN THE INPUT CIRCUIT BREAKER ON EXISTING RECTIFIERS 11 AND 14. WAIT A MINIMUM OF 96 HOURS PRIOR TO PERFORMANCE OF NEXT STEP.

Portable Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

~~342~~ 4-14-97
-0.366

Test Station T(46-2)

Permanent Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

~~-0.347~~
-0.347 4-14-97

Portable Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

~~-0.372~~
-0.372 4-14-97

Permanent Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

~~-0.347~~
-0.347 4-14-97

Portable Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

~~-0.371~~
-0.371 4-14-97

Test Station T(46-3)

Permanent Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

~~-0.312~~
-0.312 4-14-97

Portable Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

~~-0.394~~
-0.394 4-14-97

Permanent Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

~~-0.312~~
-0.312 4-14-97

Portable Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

~~-0.393~~
-0.393 4-14-97

Test Station T(46-4)

Permanent Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

~~-0.318~~
-0.318 4-14-97

Portable Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

~~-0.342~~
-0.342 4-14-97

Permanent Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

~~-0.318~~
-0.318 4-14-97

Portable Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

~~-0.342~~
-0.342 4-14-97

Test Station T(46-5)

Permanent Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

~~-0.334~~
-0.334 4-14-97

Portable Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

~~-0.357~~
-0.357 4-14-97

Permanent Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

~~-0.334~~
-0.334 4-14-97

OK 4-14-97
4 9/14/97 8.5.2

OK 4-14-97
4 9/14/97 8.5.3

OK 4-14-97
4 9/14/97 8.5.4

OK 4-14-97
4 9/14/97 8.5.5

Portable Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

-1.357
~~2.365~~
4-14-97

8.5.6

Test Station T(46-6)

Permanent Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Portable Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Permanent Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

Portable Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

8.5.7

Test Station T(46-7)

Permanent Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Portable Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Permanent Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

Portable Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

8.5.8

Test Station T(46-8)

Permanent Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Portable Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Permanent Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

Portable Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

8.5.9

Test Station T(46-9)

Permanent Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Portable Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Permanent Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

-0.290
~~0.442~~ 320
-0.303
~~0.204~~ 320
-0.290
~~0.320~~ 320
4-14-97

Portable Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

-.302
~~-.304~~ 304
54-14-97

8.5.10

Test Station T(46-10)

Permanent Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Portable Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Permanent Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

Portable Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

8.5.11

Test Station T(46-11)

Permanent Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Portable Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Permanent Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

Portable Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

-.357
~~-.440~~ 44-97
-.380
~~-.425~~ 4-14-97
-.357
~~-.411~~ 4-14-97
-.380
~~-.425~~ 4-14-97

8.5.12

Test Station T(46-12)

Permanent Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Portable Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Permanent Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

Portable Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

8.5.13

Test Station T(46-13)

Permanent Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Portable Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Permanent Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

Delete
ECN W320-118

4-14-97
4/19/97

Delete
ECN W320-110

Delete
 4-14-97 ECN W320-110
 1/20/96

~~Portable Reference Electrode and 4-inch
 SN-200-M9 w/6" ENC-M26a~~

8.5.14

Test Station T(46-14)

Permanent Reference Electrode and 4-inch
 SL-100-M9 w/6" ENC-M26a

Portable Reference Electrode and 4-inch
 SL-100-M9 w/6" ENC-M26a

Permanent Reference Electrode and 4-inch
 SN-200-M9 w/6" ENC-M26a

Portable Reference Electrode and 4-inch
 SN-200-M9 w/6" ENC-M26a

Handwritten notes:
 - .503
 563 4-14-97
 - .497
 584 4-14-97
 - .503
 563 4-14-97
 - .495
 583 4-14-97

8.6

The following steps will verify proper operation of Rectifier 46.

1 9/20/96

8.6.1

Verify Rectifier 46 input circuit breaker is OPEN.

1 9/20/96

8.6.2

Verify all COARSE and FINE output transformer taps on rectifier are set at the lowest levels (Coarse - A and Fine - 1).

1 9/20/96

8.6.3

Close circuit breaker in Distribution Panelboard, Control/Lunch Trailer.

1 9/20/96

8.6.4

Close rectifier input circuit breaker and disconnect switch at rectifier. Using meter on rectifier, record volts and amperes, and then open input circuit breaker. Set fine tap to next higher setting and leave coarse tap as previously set. Close input circuit breaker again and record volts and amperes, then open the input circuit breaker. Continue adjusting the output of the rectifier in steps until either the dc volts or dc amperes (whichever is first) approaches, but does not exceed, the nameplate rating of rectifier.

Transformer Taps
 Coarse Fine

dc Output
 Volts Amp

A	1	<u>.2</u>	<u>.3</u>
A	2	<u>1.5</u>	<u>.8</u>
A	3	<u>3.0</u>	<u>1.4</u>
A	4	<u>4.5</u>	<u>2.1</u>
A	5	<u>5.9</u>	<u>2.8</u>
B	1	<u>7.4</u>	<u>3.5</u>
B	2	<u>8.8</u>	<u>4.1</u>
B	3	<u>10.3</u>	<u>4.8</u>

Handwritten: 4/23/97

B	4	<u>11.7</u>	<u>5.5</u>
B	5	<u>13.1</u>	<u>6.2</u>
C	1	<u>14.2</u>	<u>6.9</u>
C	2	<u>16.0</u>	<u>7.5</u>
C	3	<u>17.4</u>	<u>8.2</u>
C	4	<u>18.8</u>	<u>8.9</u>
C	5	<u>20.1</u>	<u>9.6</u>
D	1	<u>21.6</u>	<u>10.3</u>
D	2	<u>23.0</u>	<u>10.9</u>
D	3	<u>24.7</u>	<u>11.6</u>
D	4	<u>NA</u>	<u>NA</u>
D	5	<u>NA</u>	<u>NA</u>

SET. →
IN ACCORDANCE
TO B.C.4

1/9/20/96

8.6.5 Open rectifier input circuit breaker.

8.7

The following steps will verify that if either the Anode Header Cable or the Anode Loop Cable is severed, the cathodic protection system will continue to function properly.

1/9/20/96

8.7.1 Close rectifier input circuit breaker and record the current shown on the rectifier ammeter. 10.9 amperes.

1/9/20/96

8.7.2 Open rectifier input circuit breaker.

1/9/20/96

8.7.3 Disconnect Anode Header Cable (+) HR46 from positive terminal of rectifier, leaving Anode Loop Cable (+) LR46 connected.

1/9/20/96

8.7.4 Close rectifier input circuit breaker and record the current shown on the rectifier ammeter. 4.6 amperes.

1/9/20/96

8.7.5 Open rectifier input circuit breaker and disconnect Anode Loop Cable (+) LR46 and reconnect Anode Header Cable (+) HR46.

1/9/20/96

8.7.6 Close rectifier input circuit breaker and record the current shown on the rectifier ammeter. 7.1 amperes.

1/9/20/96

8.7.7 Open rectifier input circuit breaker and reconnect Anode Loop Cable (+) LR46.

8.8

The following steps will verify proper operation of the ground bed system.

1/9/20/96

8.8.1 Verify the Mode switch, on the Wave Form Analyzer, is in the OFF position.

- 1 9/20/92 8.8.2 Connect positive terminal of the Wave Form Analyzer to a protected pipeline test conductor through a portable test reel at various convenient test stations for the following procedure.
- 1 9/20/92 8.8.3 Connect common terminal of the Wave Form Analyzer to a portable copper-copper sulfate reference electrode.
- 1 9/20/92 8.8.4 Turn the Mode switch, on the Wave Form Analyzer, from the OFF position to the DC position.
- 1 9/20/92 8.8.5 Record the following portable reference electrode data:
- Manufacturer MC MILLER
- Model and type RE-3A COPPER-COPPER SULFATE
- 1 9/20/92 8.8.6 Close rectifier input circuit breaker, place the portable reference electrode over each anode location and measure pipe to soil potential using the Wave Form Analyzer. Record pipe to soil potential at each anode location. Values should be more negative than (-)0.85 V dc (ie, (-)0.86 V dc).

NOTE: A pipe locator may be used to locate anodes if necessary.

1 9/20/92 8.8.7

Anode	Volts	Anode	Volts
A(46-1)	<u>- 9.67</u>	A(46-24)	<u>- 8.91</u>
A(46-2)	<u>- 7.21</u>	A(46-25)	<u>- 7.00</u>
A(46-3)	<u>- 7.15</u>	A(46-26)	<u>- 5.82</u>
A(46-4)	<u>- 8.15</u>	A(46-27)	<u>- 7.75</u>
A(46-5)	<u>- 7.45</u>	A(46-28)	<u>- 6.42</u>
A(46-6)	<u>- 8.36</u>	A(46-29)	<u>- 4.72</u>
A(46-7)	<u>- 6.80</u>	A(46-30)	<u>- 7.64</u>
A(46-8)	<u>- 7.250</u>	A(46-31)	<u>- 7.44</u>
A(46-9)	<u>- 6.99</u>	A(46-32)	<u>- 7.50</u>
A(46-10)	<u>- 4.69</u>	A(46-33)	<u>- 5.14</u>
A(46-11)	<u>- 4.48</u>	A(46-34)	<u>- 6.78</u>
A(46-12)	<u>- 4.86</u>	A(46-35)	<u>- 8.57</u>
A(46-13)	<u>- 3.66</u>	A(46-36)	<u>- 7.73</u>
A(46-14)	<u>- 3.30</u>	A(46-37)	<u>- 4.72</u>
7' south of survey point A(46-15)	<u>- 6.12</u>	A(46-38)	<u>- 9.70</u>
A(46-16)	<u>- 11.28</u>	A(46-39)	<u>- 9.18</u>

Anode	Volts	Anode	Volts
A(46-17)	-10.68	A(46-40)	-8.03
A(46-18)	-9.58	A(46-41)	-6.17
A(46-19)	-6.78	A(46-42)	-6.80
A(46-20)	-5.69	A(46-43)	-6.67
A(46-21)	-5.17	A(46-44)	-6.38
A(46-22)	-5.78	A(46-45)	-6.84
A(46-23)	-7.54	A(46-46)	-5.56

- 8.8.8 Turn the Mode switch, on the Wave Form Analyzer, to the OFF position and disconnect leads.
- 8.8.9 Open the disconnect switch at the rectifier.
- 8.9 The following steps will verify proper operation of the cathodic protection system:

- 8.9.1 Position the ten position DIP switch on the Pulse Generator (located in the rectifier control panel) as follows: SW1, 2, and 3 in the OFF position and SW4, 5, 6, 7, 8, 9, and 10 in the ON position.

- 8.9.2 ~~DELETE~~ ECN-624 Open the input circuit breaker on existing Rectifier 11, located approximately 50 feet south of Building 241-AN-271 and in Rectifier 14, located outside the "A" Tank Farm fence near the northwest corner.

- 8.9.3 Close Rectifier 46 input circuit breaker and the disconnect switch at the rectifier and verify the rectifier has been energized for 24 hours prior to the following test.

- 8.9.4 Measure and record the ON and OFF pipe-to-soil potential of each protected pipe by use of the Waveform Analyzer. ~~For~~ ^{DELIVER} ~~protected pipe the OFF values should be equal to or more~~ ^{ECN-299} ~~negative than (-)0.85V dc or the ON values should be 100 mV~~ ~~more negative than the OFF values.~~ If these values are not attainable by use of the existing permanent reference electrode a portable reference electrode may be used. For unprotected pipe, there is no criteria and the values will be recorded for record purposes. The unprotected pipes are designated below by an asterisk.

NOTE: Connect positive terminal of the Waveform Analyzer to the reference electrode terminal and the common terminal on the Waveform Analyzer to the pipe test conductor terminal. Turn the Mode switch from the OFF position to the WFA position, record values, then turn to the OFF position. ~~*SEE PAGE 24A~~ ^{ECN-624}

8.9.4
* ADD ECN-277

For protected pipe the OFF value should be equal to or ~~greater than~~ ^{greater than} (-)0.85 Vdc or the OFF value should be 100mV more negative than the native potential as previously recorded.

~~8.9.3a~~ 8.9.3a Verify proper operation of the pulse generator by connecting a VOM across the DC shunt on the output of the rectifier and observe a sudden variation in current corresponding to cycle of rectifier pulse generator (approximately every four seconds).

ECN- 624

SEE PAGE 24

ECN-624 NOTE: SEE PAGE 24

Voltage readings obtained during this test are displayed on the WFA as positive values, and should be interpreted and recorded as negative values.

24-A

HAF
WHE SD-W320-ATR-001
REV D
04/11/95

~~SE~~ 4-15-97 8.9.4.1
EXCEPTION #4

Test Station T(46-1)

-3.777 -1.144
Volts ~~SE~~ 4-15-97

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

ON ~~+3.84~~ OFF ~~+3.84~~
~~+1.13~~ ~~+1.13~~

Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

ON ~~+3.83~~ OFF ~~+3.83~~
~~-3.500~~ ~~-1.110~~
~~SE~~ 4-15-97

Test Station T(46-2)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Volts ~~SE~~ 4-15-97
ON ~~+4.02~~ OFF ~~+4.02~~
~~-4.640~~ ~~-1.130~~

Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

ON ~~+4.02~~ OFF ~~+4.02~~
~~-4.640~~ ~~-1.070~~
~~SE~~ 4-15-97

~~Reference Electrode and U.G. Line *~~

ON ~~_____~~ OFF ~~_____~~

Test Station T(46-3)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

-2.940 -0.930
Volts

ON ~~+3.89~~ OFF ~~+3.89~~
~~+1.07~~ ~~+1.07~~

Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

-2.940 -0.930
ON ~~+3.11~~ OFF ~~+3.11~~

Reference Electrode and 30-inch CMP *

-0.960 -0.650
ON ~~+3.84~~ OFF ~~+3.84~~

Test Station T(46-4)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Volts ~~SE~~ 4-15-97
ON ~~+4.31~~ OFF ~~+4.31~~
~~-4.380~~ ~~-1.100~~

Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

ON ~~+4.31~~ OFF ~~+4.31~~
~~-4.380~~ ~~-1.100~~
~~SE~~ 4-15-97

Reference Electrode and 8-inch RW *

ON ~~+4.34~~ OFF ~~+4.34~~
~~-4.340~~ ~~-1.040~~
~~SE~~ 4-15-97

Test Station T(46-5)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Volts ~~SE~~ 4-15-97
ON ~~+3.91~~ OFF ~~+3.91~~
~~-3.385~~ ~~-0.974~~

Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

ON ~~+3.91~~ OFF ~~+3.91~~
~~-3.374~~ ~~-0.974~~
~~SE~~ 4-15-97

Reference Electrode and U.G. Line *

ON ~~_____~~ OFF ~~_____~~

Test Station T(46-6)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Volts
ON ~~_____~~ OFF ~~_____~~

Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

ON ~~_____~~ OFF ~~_____~~

Reference Electrode and 12-inch RW *

ON ~~_____~~ OFF ~~_____~~

~~SE~~ 4-15-97 8.9.4.2
EXCEPTION #4

Test Station T(46-2)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Volts ~~SE~~ 4-15-97
ON ~~+4.02~~ OFF ~~+4.02~~
~~-4.640~~ ~~-1.130~~

Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

ON ~~+4.02~~ OFF ~~+4.02~~
~~-4.640~~ ~~-1.070~~
~~SE~~ 4-15-97

~~Reference Electrode and U.G. Line *~~

ON ~~_____~~ OFF ~~_____~~

Test Station T(46-3)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

-2.940 -0.930
Volts

ON ~~+3.89~~ OFF ~~+3.89~~
~~+1.07~~ ~~+1.07~~

Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

-2.940 -0.930
ON ~~+3.11~~ OFF ~~+3.11~~

Reference Electrode and 30-inch CMP *

-0.960 -0.650
ON ~~+3.84~~ OFF ~~+3.84~~

Test Station T(46-4)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Volts ~~SE~~ 4-15-97
ON ~~+4.31~~ OFF ~~+4.31~~
~~-4.380~~ ~~-1.100~~

Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

ON ~~+4.31~~ OFF ~~+4.31~~
~~-4.380~~ ~~-1.100~~
~~SE~~ 4-15-97

Reference Electrode and 8-inch RW *

ON ~~+4.34~~ OFF ~~+4.34~~
~~-4.340~~ ~~-1.040~~
~~SE~~ 4-15-97

Test Station T(46-5)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Volts ~~SE~~ 4-15-97
ON ~~+3.91~~ OFF ~~+3.91~~
~~-3.385~~ ~~-0.974~~

Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

ON ~~+3.91~~ OFF ~~+3.91~~
~~-3.374~~ ~~-0.974~~
~~SE~~ 4-15-97

Reference Electrode and U.G. Line *

ON ~~_____~~ OFF ~~_____~~

Test Station T(46-6)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Volts
ON ~~_____~~ OFF ~~_____~~

Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

ON ~~_____~~ OFF ~~_____~~

Reference Electrode and 12-inch RW *

ON ~~_____~~ OFF ~~_____~~

~~SE~~ 4-15-97 Delete
ECN W320-110
EXCEPTION #4

~~SE~~ 4-15-97
EXCEPTION #4

~~SE~~ 4-15-97 8.9.4.5
EXCEPTION #4

Delete
ECN W320-110

8.9.4.7

Test Station T(46-7)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26aVolts
ON _____ OFF _____Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

ON _____ OFF _____

Reference Electrode and 12-inch RW *

ON _____ OFF _____

8.9.4.8

Test Station T(46-8)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26aVolts
ON _____ OFF _____Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

ON _____ OFF _____

Reference Electrode and 4-inch COND DR *

ON _____ OFF _____

8.9.4.9

Test Station T(46-9)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26aVolts
ON ~~3.36~~ OFF ~~3.62~~
- 3.350 - 1.024Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26aON ~~3.46~~ OFF ~~3.6~~
- 3.338 - 1.020

Reference Electrode and 3-inch V113 *

ON _____ OFF _____

8.9.4.10

Test Station T(46-10)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26aVolts
ON _____ OFF _____Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

ON _____ OFF _____

Reference Electrode and 4-inch COND DR *

ON _____ OFF _____

8.9.4.11

Test Station T(46-11)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26aVolts
ON ~~3.68~~ OFF ~~3.74~~
- 3.363 - 1.091Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26aON ~~3.43~~ OFF ~~3.68~~
- 3.351 - 1.091

Reference Electrode and U.G. Line *

ON _____ OFF _____

8.9.4.12

Test Station T(46-12)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26aVolts
ON _____ OFF _____

Delete
ECN W320-110

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8.9.4.13

Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

ON OFF

Reference Electrode and 12-inch RW *

ON OFF

Test Station T(46-13)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Volts
ON OFF

Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

ON OFF

Reference Electrode and U.G. Line *

ON OFF

Reference Electrode and U.G. Line *

ON OFF

8.9.4.14

Test Station T(46-14)

Reference Electrode and 4-inch
SL-100-M9 w/6" ENC-M26a

Volts
ON ~~3.20~~ OFF ~~3.20~~ 8.5
-3.201 -1.098 4-15-97

Reference Electrode and 4-inch
SN-200-M9 w/6" ENC-M26a

ON ~~3.20~~ OFF ~~3.20~~ 8.5
-3.193 -1.096 4-15-97

Reference Electrode and 3-inch V-714
w/6" ENC *

ON ~~4.20~~ OFF ~~4.20~~ 8.5
-4.184 -1.109 4-15-97

Reference Electrode and U.G. Line *

ON OFF

8.9.4.15

Test Station T(46-15)

Reference Electrode and U.G. Line *

Volts
ON OFF

Reference Electrode and U.G. Line *

ON OFF

Reference Electrode and U.G. Line *

ON OFF

Delete
ECN W320-110

ECN-624
8.9.4.15a
SEE BELOW

8.9.4.16

Turn the Mode switch, on the Wave Form Analyzer, to the OFF position and disconnect leads.

8.9.4.17

Open disconnect switch at the rectifier.

8.9.4.18

Close the input circuit breaker on existing Rectifiers 11 and 14 that were opened in previous Step.

8.9.5

Testing complete, secure from test.

END OF TEST

4-15-97 8.9.4.15a
ECN-624

Verify continued proper operation of the pulse generator by connecting a VOM across the DC shunt on the output of the rectifier and observe a sudden variation in current corresponding to cycle of rectifier pulse generator (approximately every four seconds).

EXCEPTION NO.		Project No.		ATP No.		Rev.	
Recorded by			Organization		Date Recorded		ATP Page No.
Step No.		Requirement					
Description of Problem							
Objector 1 (Name/Organization)				Objector 2 (Name/Organization)			
Planned Action							
Action Taken							
RETEST EXECUTION AND ACCEPTANCE							
Retest Installation Contractor		Date		Recorder		Date	
Witness 1 (Name/Organization)		Date		Witness 2 (Name/Organization)		Date	
Field Engineering		Date		Test Director (Name/Organization)		Date	
Design Engineering (Author of ATP)		Date		A-E Project Engineer		Date	
APPROVAL AND ACCEPTANCE – OPERATING CONTRACTOR							
☐ Retest Approved and Accepted ☐ Exception Accepted-as-is* ☐ Other*							
* Explanation							
Approver 1		Date		Approver 2		Date	
Approver 3		Date		Approver 4		Date	

KEH-428 (6-85)

W320001.ATP.614

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 Rev 0
 04/11/95

ATP No. WHC-SDD-W-320-ATP-001

Appendix A

Exceptions

EXCEPTION NO. <u>1</u>		Project No. <u>W-320</u>		ATP No. <u>WMC-SD-W320-ATP-001</u>		Rev. <u>0</u>	
Recorded by <u>FLOYD SNYDER</u>		Organization <u>ICF KID</u>		Date Recorded <u>9/23/96</u>		ATP Page No. <u>10</u>	
Step No. <u>8.1.4</u>		Requirement <u>VOLLEY NO DC VOLTAGE AT RECTIFIER OUTPUT TERMINALS</u>					
Description of Problem <u>WHEN TESTING THE RECTIFIER OUT PUT TERMINALS A VOLTAGE OF .4 VOLT WAS DETECTED. THIS IS GREATER THAN NO VOLTAGE.</u>							
Objector 1 (Name/Organization) <u>JEFF WHITMAN ICF KID</u>				Objector 2 (Name/Organization) <u>F.L. SNYDER ICF KID</u>			
Planned Action <u>NONE - Accept As Is</u> <i>J. Krasnik</i> <u>per G.P. McDonald 10/11/96</u>							
Action Taken <u>-NONE-</u>							
RETEST EXECUTION AND ACCEPTANCE							
Retest Installation Contractor <u>William H. Cowley</u>		Date <u>3-10-97</u>		Recorder <u>[Signature]</u>		Date <u>3/10/97</u>	
Witness 1 (Name/Organization) <u>[Signature] AI TITLE</u>		Date <u>3/10/97</u>		Witness 2 (Name/Organization)		Date	
Field Engineering <u>[Signature]</u>		Date <u>3/10/97</u>		Test Director (Name/Organization) <u>[Signature]</u>		Date <u>3-10-97</u>	
Design Engineering (Author of ATP) <u>[Signature]</u>		Date <u>3/12/97</u>		A/E Project Engineer <u>Kenny S. Allen</u>		Date <u>3/13/97</u>	
APPROVAL AND ACCEPTANCE - OPERATING CONTRACTOR							
☐ Retest Approved and Accepted ☒ Exception Accepted-as-is* ☐ Other*							
* Explanation <u>THIS STEP IS FOR PERSONNEL SAFETY. THE MEASURED VOLTAGE OF 0.4 VOLTS WAS MOST LIKELY INSTRUMENT ERROR AND POSES NO SAFETY RISK TO PERSONNEL. J. Krasnik for G.P. McDonald 10/11/96</u>							
Approver 1 <u>[Signature]</u>		Date <u>1/8/96</u>		Approver 2 <u>TERRY BOWMAN</u>		Date <u>4/14/97</u>	
Approver 3		Date		Approver 4		Date	

EXCEPTION NO. 2	Project No. W-320	ATP No. WNC-SD-W320-ATP-001	Rev. 0
Recorded by FLOYD SNYDER	Organization ICF/KH	Date Recorded 9/23/96	ATP Page No. 15, 16
Step No. 8.4.4, 8.4.10	Requirement RECORD RESISTANCE BETWEEN EACH SET OF TEST CONDUCTORS.		
Description of Problem READING FOR 30" CMP (8.4.4) INDICATED AN OPEN LINE.			
READING FOR 4" SL-100-M9 W/6" ENC-M262 (8.4.10) INDICATED AN OPEN LINE.			
Objector 1 (Name/Organization) JEFF WHATTAM / ICF/KH		Objector 2 (Name/Organization) FLOYD SNYDER / ICF/KH	
Planned Action Investigate and rework as necessary. Continuity is required for testing purposes. JH for G.P. McDonald 10/11/96			
Action Taken RETEST AFTER CORRECTIVE ACTION AT CONSTRUCTION PROVIDED ^{9/10/97} CONTINUITY			
RETEST EXECUTION AND ACCEPTANCE			
Retest Installation Contractor William H. Lawley	Date 3-10-97	Recorder Floyd Snyder AI	Date 3/10/97
Witness 1 (Name/Organization) Floyd Snyder AI TITLE 3	Date 3/10/97	Witness 2 (Name/Organization)	Date
Field Engineering [Signature]	Date 3/10/97	Test Director (Name/Organization) [Signature]	Date 3/10/97
Design Engineering (Author of ATP) J. Kasmir	Date 3/12/97	Project Engineer Ken S Allen	Date 3/13/97
APPROVAL AND ACCEPTANCE - OPERATING CONTRACTOR			
☒ Retest Approved and Accepted ☐ Exception Accepted-as-is* ☐ Other*			
* Explanation			
Approver 1	Date	Approver 2	Date
Approver 3	Date	Approver 4	Date
		4/13/97	

JMC
3/12/97

The following retesting was accomplished on 2/28/97 to resolve the exception on ATP-001.

Exception 2: Planed action is repair and retest.

The 30" CMP leads were reexcavated repairs made to the leads and rebackfilled.

Retesting was accomplished with the following results:

Page 15 8.4.4 30-inch CMP .3 ohms
Page 16 8.4.10 4-inch SL-100-M9 w/6" ENC-M26a .30 ohms

Exception 3: Planed action is to complete the installation of the 3" V-714 w/6" Enc. The UG line was deleted in other parts of the ATP and was missed on page 16 by ECN 110, ECN needed to complete.

V-714 was installed into test station 46-14.

Tests of the V-714 in test station had the following results:

Page 14 8.3.14 3" V-714 w/6" Enc Terminals 6 and 7
Page 17 8.4.15 3" V-714 w/6" Enc .7 ohms

Exception 4: Planed action is to complete the installation of 3" V-714, Repair the 30" CMP and ECN needed to for 3" V113 deleted per ECN 110.

The 30" CMP was repaired and the 3" V-714 line was installed in test station 46-14, will need to have wire markers installed and permanent labels installed at terminals (Punch list).

Page 24 8.9.4 requires the Wave Form Analyzer to be connected with the Positive terminal of the Analyzer to the reference electrode terminal and the common terminal to the pipe test conductor terminal. This connection will cause Positive results, by reversing they would be negative. The results should be considered negative when considering acceptance.

Test of the items were as follows:

Page 25 8.9.4.3 Test Station T(46-3)

Reference Electrode and 30-inch CMP ON + .981 OFF + .976
Portable Electrode and 30-inch CMP ON +2.073 OFF +2.070

Reference Electrode and SL-100-M9 ON + .829 OFF + .828
Reference Electrode and SL-100-M9 ON +2.074 OFF +2.074

Page 27 8.9.4.14 Test Station T(46-14)

Reference Electrode and 3" V-714 ON +4.280 OFF +3.530

Page 26 8.9.4.9 Test Station T(46-9)

V113 has been deleted per ECN 110 need ECN for this test.

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EXCEPTION NO. 3		Project No. W 320		ATP No. WHC-SD-W320-ATP-001		Rev. 0	
Recorded by F.L. Snydon		Organization ICFKH		Date Recorded 9/23/96		ATP Page No. 14, 16, 17	
Step No. 8.3.14, 8.4.6, 8.4.15		Requirement RECORD DATA FOR 3" V714 W/6" EXC, U.G. LINE, 3" V714 W/6" EXC.					
Description of Problem TEST STATIONS DO NOT HAVE THESE INSTALLED.							
Objector 1 (Name/Organization) JEFF WHITMAN ICFKH				Objector 2 (Name/Organization) F.L. Snydon ICFKH			
Planned Action Rework as required. These lines require monitoring. JWH for G.P. McRae 10/11/96							
Action Taken UG. LINE DELETED BY ECU 110. 8.3.14 V714 LAMDED ON TERMINALS 6 & 7 8.4.15 RETEST AFTER CORRECTION BY CONSTRUCTION PROVIDED ACCEPTABLE RESULTS. SEE ATTACHED TEST RESULTS							
RETEST EXECUTION AND ACCEPTANCE							
Retest Installation Contractor William H. Lawley		Date 3-10-97		Recorder Clayd Snydon		Date 3/10/97	
Witness 1 (Name/Organization) Clayd Snydon AS TITEL III		Date 3/10/97		Witness 2 (Name/Organization)		Date	
Field Engineering [Signature]		Date 3/10/97		Test Director (Name/Organization) [Signature]		Date 3/10/97	
Design Engineering (Author of ATP) [Signature]		Date 3/12/97		A-E Project Engineer Kerry F. Allen		Date 3/13/97	
APPROVAL AND ACCEPTANCE - OPERATING CONTRACTOR							
☒ Retest Approved and Accepted ☐ Exception Accepted-as-is* ☐ Other*							
* Explanation							
Approver 1		Date		Approver 2		Date	
Approver 3		Date		Approver 4 HNF (W) 4/23/97		Date	

EXCEPTION NO. 4		Project No. W-320		ATP No. WHC-SD-W320-ATP-001		Rev. 0		
Recorded by F.L. Snyder			Organization ICF/KN		Date Recorded 4/23/97		ATP Page No. 24, 25, 26, 27	
Step No. 5.9.4.14		Requirement RECORD PIPE TO SOIL POTENTIAL WITH WFA FORM ANALYSIS (WFA)						
Description of Problem								
1. WFA CONNECTED WITH POS. TERM TO REF ELECTRODE & COMMON TO PIPES GIVES POSITIVE VALUES								
2. 30" CMP (REF 5.4.4) NO VALUES OBTAINED.								
3. REF ELECTRODES & 3" V113 AND 3" V714 W/6" ENC NOT INSTALLED								
Objector 1 (Name/Organization) JEFF WHITMAN ICF/KN				Objector 2 (Name/Organization) F.L. Snyder ICF/KN				
Planned Action								
1) WFA IS required to be connected with (+) terminal connected to the reference cell. Readings are displayed as positive and interpreted as negative per instruction manual for WFA. 2) & 3) Rework as required. Approved for G.P. McDonald 10/14/96								
Action Taken								
SEE ATTACHED RETEST DATA FOR COMPLETION.								
RETEST EXECUTION AND ACCEPTANCE								
Retest Installation Contractor William H. Carley		Date 3-10-97		Recorder Daryl Snyder		Date 3/10/97		
Witness 1 (Name/Organization) Daryl Snyder ICF/KN		Date 3/10/97		Witness 2 (Name/Organization)		Date		
Field Engineering [Signature]		Date 3/10/97		Test Director (Name/Organization) [Signature]		Date 3/10/97		
Design Engineering (Author of ATP) [Signature]		Date 3/12/97		ATP Project Engineer Kerry S. Allen		Date 3/13/97		
APPROVAL AND ACCEPTANCE - OPERATING CONTRACTOR								
☒ Items 2 & 3 Retest Approved and Accepted				☒ Item 1 Exception Accepted-as-is*				
☐ Other*								
* Explanation See item no. 1 under Planned Action								
Approver 1 T.J. Bowman		Date 4/16/97		Approver 2		Date		
Approver 3 TERRY BOWMAN		Date		Approver 4 4/23/97		Date		

PPG 4/28/97

The following retesting was accomplished on 2/28/97 to resolve the exception on ATP-001.

Exception 2: Planed action is repair and retest.

The 30" CMP leads were reexcavated repairs made to the leads and rebackfilled.

Retesting was accomplished with the following results:

Page 15 8.4.4 30-inch CMP 3 ohms
Page 16 8.4.10 4-inch SL-100-M9 w/6" ENC-M26a 30 ohms

Exception 3: Planed action is to complete the installation of the 3" V-714 w/6" Enc. The UG line was deleted in other parts of the ATP and was missed on page 16 by ECN 110, ECN needed to complete.

V-714 was installed into test station 46-14.

Tests of the V-714 in test station had the following results:

Page 14 8.3.14 3" V-714 w/6" Enc Terminals 6 and 7
Page 17 8.4.15 3" V-714 w/6" Enc .7 ohms

Exception 4: Planed action is to complete the installation of 3" V-714, Repair the 30" CMP and ECN needed to for 3" V113 deleted per ECN 110.

The 30" CMP was repaired and the 3" V-714 line was installed in test station 46-14, will need to have wire markers installed and permanent labels installed at terminals (Punch list).

Page 24 8.9.4 requires the Wave Form Analyzer to be connected with the Positive terminal of the Analyzer to the reference electrode terminal and the common terminal to the pipe test conductor terminal. This connection will cause Positive results, by reversing they would be negative. The results should be considered negative when considering acceptance.

Test of the items were as follows:

Page 25 8.9.4.3 Test Station T(46-3)
Reference Electrode and 30-inch CMP ON + .981 OFF + .976
Portable Electrode and 30-inch CMP ON +2.073 OFF +2.070

Reference Electrode and SL-100-M9 ON + .829 OFF + .828
Reference Electrode and SL-100-M9 ON +2.074 OFF +2.074

Page 27 8.9.4.14 Test Station T(46-14)
Reference Electrode and 3" V-714 ON +4.280 OFF +3.530

Page 26 8.9.4.9 Test Station T(46-9)
V113 has been deleted per ECN 110 need ECN for this test.

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