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1	/	Cog./Proj. Eng M Gimera	<i>Michael Gimera</i>	9/22/94	L7-05						
1	/	Cog./Proj. Eng. Mgr. RE Bauer	<i>RE Bauer</i>	9/27/94	L6-37						
1	/	QA ML McElroy	<i>M. L. McElroy</i>	9/24/94	S1-57						
1	/	Safety LS Krogsrud	<i>LS Krogsrud</i>	9/29/94	R3-08						
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Document Number: WHC-SD-WM-ATR-081, REV. 0

Document Title: Software Acceptance Test Report for Tank 101-SY Void Fraction Instrument

Release Date: 9/29/94

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

APPROVED FOR PUBLIC RELEASE

* * * * *

WHC Information Release Administration Specialist:

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(Signature)

9/29/94

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101-SY Void Fraction Instrument

3. Number

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6. Author

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Name (Type or Print)

Michael Gimera

Signature

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7. Abstract

Provides the report for the void fraction instrument acceptance test.

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9. Impact Level

QS

10.

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**SOFTWARE
ACCEPTANCE TEST REPORT
FOR
TANK 101-SY VOID FRACTION INSTRUMENT**

IMPACT LEVEL QS

Issued by
TWRS Safety Programs Engineering Support
September 1994

Westinghouse Hanford Company

MASTER

TABLE OF CONTENTS

SECTION	PAGE
1. INTRODUCTION	3
1.1. Purpose	3
1.2. Scope	3
1.3. Definitions and Abbreviations	3
2. DESCRIPTION OF TEST	3
3. TEST RESULTS	4
4. CONCLUSIONS	7
5. TEST DATA SHEETS	7

**SOFTWARE ACCEPTANCE TEST REPORT
FOR
TANK 101-SY VOID FRACTION INSTRUMENT**

1. INTRODUCTION

1.1. PURPOSE

This document presents the results of the acceptance test for the software that was developed to operate the void fraction instrument for Tank 101-SY. Together with the ATP, this document satisfies the requirements in EP 4.1, "Design Verification Requirements." The selected method of design verification is qualification testing.

1.2. SCOPE

The testing described in this document covers the software that controls and acquires data for the 101-SY void fraction instrument. In addition to the software, this testing verifies and validates the data acquisition and control hardware for the void fraction instrument. A separate acceptance test will be performed for the mechanical features not related to software.

1.3. DEFINITIONS AND ABBREVIATIONS

ATP Acceptance Test Procedure

ATR Acceptance Test Report

EP Standard Engineering Practice (WHC-CM-6-1)

SRS Software Requirements Specification

2. DESCRIPTION OF TEST

The software acceptance test that is the subject of this document tests the features of the software described in WHC-SD-WM-CSRS-020, Rev. 0, "Software Requirements Specification for 101-SY Void Fraction Instrument," herein referred to as the SRS. Related hardware is indirectly tested.

Additional test descriptions and procedures are discussed in the document WHC-SD-WM-ATP-081, Rev. 0, "Software Acceptance Test Procedure for Tank 101-SY Void Fraction Instrument."

The test was performed September 16, 1994 in the 306E Laboratory at the 300 Area. The test performers were M. Gimera and T. I. Stokes. The test witness was E. N. Wegener from Quality Assurance.

3. TEST RESULTS

The results of the testing are presented below. Actual test data sheets are included in Section 5. The numbering of the tests reflects the numbering in the ATP, therefore, beginning with test 3.1.2 does not mean that a test was skipped.

Test 3.1.2 Initialization

The software initialized properly and the front panel was displayed on the computer screen.

Conclusion - software passed this test.

Test 3.1.3 Two-Way Solenoid Valves

Each of the two-way solenoid valves were checked in this test. As each valve was opened and closed, the color of the valve's icon was noted and the pressure downstream of the valve was checked. All valves were found to operate as expected.

As shown on the exceptions page, some changes were made in the testing of the valves.

The final design of the pneumatics locates pressure indicator PE3 behind a 200 psi regulator. The 500 psi line downstream of valve YV1 should be monitored with pressure indicator PE9 instead. This change affects steps three and four of this test.

Preliminary testing in the lab resulted in the observation that venting pressures through an empty water tank consumed too much nitrogen. When it is necessary to vent lines, the venting is done through the sample chamber. The water tank was filled with water to conserve nitrogen.

In step seven the pressure in the water tank, the pressure at PE8, was recorded before opening valve YV7. The pressure should have been slightly above atmospheric pressure and the color of YV7 should be red to indicate that it is closed. In step eight YV7 is opened. Step nine should record PE8 at approximately 200 psi and the color of YV7 should be green. YV8 should remain closed and its icon should be red.

Steps 12 through 18 were skipped because YV8 was tested in step ten.

In step 25 the expected color of YV11 is red.

Conclusion - software passed this test.

Test 3.1.4 Three-Way Solenoid Valves

Each of the four three-way solenoid valves were tested for opening and closing similar to the two-way solenoid valves. It should be noted however that the expected venting pressures of 35 psi are minimum pressures. The actual pressures, ~41 psi, are acceptable.

In step two, the expected horizontal position of the forearm is 90° to the mast. In step five in-line with the mast is the same as vertical.

The results of these test were as expected with no exceptions.

Conclusion - software passed this test.

Test 3.1.6 Temperature Indicators

The temperature indicators were tested by comparing the indicated temperature to a calibrated thermocouple, then increasing the readings of both the indicator's sensor and the thermocouple with a heat gun while noting the increase in temperatures. This test shows the response of each temperature indicator. Accuracy was determined from the calibration data obtained when the sensors and signal conditioners were tested in the Standards Lab.

Due to accessibility, some difficulty was experienced in heating the sensors in the cabinets (TE1) and pressurization chamber (TE3 and TE4).

The pressurization chamber has RTDs mounted inside. Heat was applied to the outside of the chamber and the calibrated thermocouples. The readings from TE3 and TE4 show that the air inside the chamber did not increase to the same temperature as the air outside the chamber. However, the temperatures did increase showing that the indicators on the front panel were reading the correct sensors.

It was not possible to test TE5, TE6 and TE7 as they are located inside the mast and could not be effectively heated.

Conclusion - software passed this test.

Test 3.1.8 Elevation Indicator

During development it was determined that the ultrasonic elevation sensor was not functioning properly. Therefore, the ultrasonic elevation sensor was not a subject of the acceptance test and the sensor was replaced with a linear displacement transducer. This linear displacement transducer is commonly referred to as a string pot.

After installation of the string pot, a 50 foot tape measure was used to test the new device. With the tape fastened to the floor, the cable from the string pot was stretched to the 50 foot mark of the tape and the Zero Level Gauge command was given to the software. The elevation reading immediately changed to zero.

Various measurements were made by moving the cable along the tape measure and comparing the reading on the front panel of the software to the position on the tape. A summary of these measurements are shown below:

Tape Measure	Elevation Reading	Reading converted to feet and inches
50 ft	0.0 inches	
37 ft	155.2 inches	12' 11.2"
27 ft	275.6 inches	22' 11.6"
21 ft	347.3 inches	28' 11.3"
15 ft	420.4 inches	35' 0.4"
10 ft	480.0 inches	40' 0.0"
5 ft	540.5 inches	45' 0.5"
1 ft	587.2 inches	48' 11.2"

The intended operation of the elevation reading is to display in inches the difference between a reference point and the current position. The measurement should increase as the position approaches the string pot, corresponding to a higher value as the instrument is inserted into the tank. As can be seen from the table above, each measurement is within a fraction of an inch of the expected value and the software functions as specified.

Conclusion - software passed this test.

Test 3.1.9 Water Level Indicator

Water level is measured with a differential pressure transducer. The tank will never read more than 20% full when it is laying on its side. Since it can be tested in the lab only on its side just two points were tested - completely empty and completely full. The tests were successful.

Conclusion - software passed this test.

Test 3.1.11 Wash and Dry Lines Sequence

The only exception to this test was that the time for a wash and the time for a nitrogen air dry were changed from two seconds to 25 seconds, respectively. This was a change to the design after the ATP was released.

Note that PE9 was used instead of PE3 to monitor the 500 psi line. This change was discussed in Test 3.1.3.

Conclusion - software passed this test.

Test 3.1.12 Test Sequence

Testing showed that the test sequence fully complied with design requirements with no exceptions.

Note that PE9 was used instead of PE3 to monitor the 500 psi line. This change was discussed in Test 3.1.3.

Conclusion - software passed this test.

Test 3.1.13 Record Data Sequence

The record data sequence writes information from the front panel to a file. Testing showed that the software wrote all information from the front panel except the flowmeter reading and pressures PIT1, PIT2 and PIT3. The flowmeter reading is not required, but the pressures are. The software was modified to write PIT1, PIT2 and PIT3 to the file. This feature was successfully retested September 19, 1994.

Conclusion - software passed this test.

4. CONCLUSIONS

This acceptance test is considered successful.

5. TEST DATA SHEETS

The test data sheets are included on the following pages.

TANK 101-SY VOID FRACTION INSTRUMENT
SOFTWARE ACCEPTANCE TEST
DATA SHEETS

Test Performer: Michael Gimera
QA/QC Witness: ERNIE WISGIBER
Date of Test: 9/16/94

Step	Description	Data	Expected
Test 3.1.2 Initialization <i>mg 9/16/94</i>			
6	Does ^{void fraction} viscometer front panel show on screen?	☒ Y N	Y
Test 3.1.3 Two-Way Solenoid Valves			
2	Reading of pressure indicator PE2	<u>606.27</u> psi	600 psi
After opening YV1: <i>mg 9/16/94</i>			
3	Reading of pressure indicator PE3 <i>9</i>	<u>498.8</u> psi	500 psi
3	Color of YV1	Red ☒ Green	Green
After closing YV1:			
4	Reading of pressure indicator PE3 <i>mg 9/16/94</i>	<u>16.11</u> psi	~15 psi
4	Color of YV1	☒ Red Green	Red
After opening YV7:			
7	Reading of pressure indicator PE8	<u>19.6</u> psi	200 psi
7	Color of YV7	☒ Red Green	Green
7	Color of YV8	☒ Red Green	Red

Michael Gimera
Test Performer

9/16/94
QA/QC Witness

After closing YV7 and opening YV8:

9	Reading of pressure indicator PE8	<u>203.08</u> psi	~15 psi
9	Color of YV7	Red <u>Green</u>	Red
9	Color of YV8	<u>Red</u> Green	Green

After closing YV8:

11	Color of YV8	<u>Red</u> <u>Green</u> ^{in 9/16/94}	Red
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After opening YV7:

14	Reading of pressure indicator PE8 ^{mg 9/16/94}	<u> </u> psi	200 psi
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After closing YV9:

17	Reading of PE8 decays to 15 psi ^{mg 9/16/94}	Y N	Y
---------------	--	--------	---

Before opening YV10:

19	Reading of pressure indicator PIT1	<u>15.7</u> psi	~15 psi
19	Reading of pressure indicator PIT2	<u>15.9</u> psi	~15 psi
19	Reading of pressure indicator PIT3	<u>14.2</u> psi	~15 psi
19	Color of YV10	<u>Red</u> Green	Red
19	Color of YV11	<u>Red</u> Green	Red

After opening solenoid valve YV10:

21	Reading of pressure indicator PIT1	<u>496.9</u> psi	500 psi
21	Reading of pressure indicator PIT2	<u>497.2</u> psi	500 psi
21	Reading of pressure indicator PIT3	<u>14.2</u> psi	~15 psi
21	Color of YV10	Red <u>Green</u>	Green
21	Color of YV11	<u>Red</u> Green	Red

Michael J. Givens
Test Performer

9/16/94
QA/QC Witness

After opening solenoid valve YV11:

23	Reading of pressure indicator PIT1	<u>471.1</u> psi	500 psi
23	Reading of pressure indicator PIT2	<u>471.4</u> psi	500 psi
23	Reading of pressure indicator PIT3	<u>470.7</u> psi	500 psi
23	Color of YV10	Red <u>Green</u>	Green
23	Color of YV11	Red <u>Green</u>	Green

After closing solenoid valve YV10:

25	Reading of PIT1 decays to 15 psi	<u>Y</u> N	Y
25	Reading of PIT2 decays to 15 psi	<u>Y</u> N	Y
25	Reading of PIT3 decays to 15 psi	<u>Y</u> N	Y
25	Color of YV10	<u>Red</u> Green	Red
25	Color of YV11	<u>Red</u> <u>Green</u>	Green

mj 9/16/94

After closing solenoid valve YV11:

27	Color of YV11	<u>Red</u> Green	Red
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Test 3.1.4 Three-Way Solenoid Valves

After opening solenoid valve YV2:

2	Reading of pressure indicator PE4	<u>499.59</u> psi	500 psi
2	Reading of pressure indicator PE5	<u>41.26</u> psi	35 psi
2	Value of flowmeter	<u>1477.6</u>	
2	Color of YV2	Red-Green-Green <u>Green-Red-Green</u>	G-R-G
2	Color of YV3	<u>Red-Green-Green</u> Green-Red-Green	R-G-G
2	Position of forearm	<u>90° angle to mast</u>	horizontal

Michael J. Garcia
Test Performer

9/16/94
QA/QC Witness

After closing solenoid valve YV2:

4	Reading of pressure indicator PE4	<u>41.43</u> psi	35 psi
4	Reading of pressure indicator PE5	<u>498.52</u> psi	500 psi
4	Value of flowmeter	<u>1473.4</u>	
4	Color of YV2	<u>Red-Green-Green</u> Green-Red-Green	R-G-G
4	Color of YV3	Red-Green-Green <u>Green-Red-Green</u>	G-R-G
4	Position of forearm	<u>in-line with mast</u>	vertical

After closing solenoid valve YV5:

6	Reading of pressure indicator PE6	<u>43.39</u> psi	35 psi
6	Reading of pressure indicator PE7	<u>498.92</u> psi	500 psi
6	Value of flowmeter	<u>1476.8</u>	
6	Color of YV4	<u>Red-Green-Green</u> Green-Red-Green	R-G-G
6	Color of YV5	Red-Green-Green <u>Green-Red-Green</u>	G-R-G
6	Position of sample chamber cover	<u>CLOSED</u>	closed

After opening solenoid valve YV5:

8	Reading of pressure indicator PE6	<u>498.81</u> psi	500 psi
8	Reading of pressure indicator PE7	<u>41.47</u> psi	35 psi
8	Value of flowmeter	<u>1477.2</u>	
8	Color of YV4	Red-Green-Green <u>Green-Red-Green</u>	G-R-G
8	Color of YV5	<u>Red-Green-Green</u> Green-Red-Green	R-G-G
8	Position of sample chamber cover	<u>OPEN</u>	open

Michael J. Jimenez
Test Performer

9/16/94
QA/QC Witness

Test 3.1.6 Temperature Indicators

Temperature indicators TE1 and TE2:

2	Temperature reading of TE1	<u>23.86</u> °C
2	Temperature reading of TE2	<u>24.02</u> °C
2	Temperature reading of thermometer	<u>24.0</u> °C

After applying heat:

4	Temperature reading of TE1	<u>47.61</u> °C
4	Temperature reading of TE2	<u>56.83</u> °C
4	Temperature reading of thermometer	<u>55.0</u> °C

Temperature indicators TE3 and TE4:

6	Temperature reading of TE3	<u>23.36</u> °C
6	Temperature reading of TE4	<u>23.21</u> °C
6	Temperature reading of thermometer	<u>22.0</u> °C

After applying heat:

8	Temperature reading of TE3	<u>30.88</u> °C
8	Temperature reading of TE4	<u>34.72</u> °C
8	Temperature reading of thermometer	<u>48.0</u> °C

Temperature indicator TE5:

10	Temperature reading of TE5	_____ °C
10	Temperature reading of thermometer	_____ °C

After applying heat:

12	Temperature reading of TE5	_____ °C
12	Temperature reading of thermometer	_____ °C

Apichan S. Limera
Test Performer

9/16/94
QA/QC Witness

Temperature indicator TE6:

13 Temperature reading of TE6 _____ °C

13 Temperature reading of thermometer _____ °C

After applying heat:

13 Temperature reading of TE6 _____ °C

13 Temperature reading of thermometer _____ °C

Temperature indicator TE7:

13 Temperature reading of TE7 _____ °C

13 Temperature reading of thermometer _____ °C

After applying heat:

13 Temperature reading of TE7 _____ °C

13 Temperature reading of thermometer _____ °C

Temperature indicator TE8:

13 Temperature reading of TE8 21.47 °C13 Temperature reading of thermometer 21 °C

After applying heat:

13 Temperature reading of TE8 85.45 °C13 Temperature reading of thermometer 70.00 °C

Temperature indicator TE9:

13 Temperature reading of TE9 20.95 °C13 Temperature reading of thermometer 21 °C

Michael Jimenez
Test Performer

9/16/94
QA/QC Witness

After applying heat:

13 Temperature reading of TE9 74.31 °C

13 Temperature reading of thermometer 70.00 °C

Test 3.1.8 Elevation Indicator

4 Initial position of target from scale _____ inches 1 foot

4 Initial position of target from front panel _____ inches 0 inches

After movement of approximately five feet:

6 Position of target from scale _____ inches 6 feet

6 Position of target from front panel _____ inches 60 inches

After movement of another five feet:

7 Position of target from scale _____ inches 11 feet

7 Position of target from front panel _____ inches 120 inches

After movement of another five feet:

7 Position of target from scale _____ inches 16 feet

7 Position of target from front panel _____ inches 180 inches

After movement of another five feet:

7 Position of target from scale _____ inches 21 feet

7 Position of target from front panel _____ inches 240 inches

After movement of another five feet:

7 Position of target from scale _____ inches 26 feet

7 Position of target from front panel _____ inches 300 inches

Michael J. Sirena
Test Performer

QA/QC Witness

9/16/94

my
9/16/94 After movement of another five feet:

7 Position of target from scale _____ inches 31 feet

7 Position of target from front panel _____ inches 360 inches

After movement of another five feet:

7 Position of target from scale _____ inches 36 feet

7 Position of target from front panel _____ inches 420 inches

After movement of another five feet:

7 Position of target from scale _____ inches 41 feet

7 Position of target from front panel _____ inches 480 inches

After movement of another five feet:

7 Position of target from scale _____ inches 46 feet

7 Position of target from front panel _____ inches 540 inches

After movement of another five feet:

7 Position of target from scale _____ inches 51 feet

7 Position of target from front panel _____ inches 600 inches

After movement of another five feet:

7 Position of target from scale _____ inches 56 feet

7 Position of target from front panel _____ inches 660 inches

After movement of another five feet:

7 Position of target from scale _____ inches 61 feet

7 Position of target from front panel _____ inches 720 inches

Michael J. Finney
Test Performer

9/16/94
QA/QC Witness

Test 3.1.9 Water Level Indicator

1	Initial level of water tank	<u>EMPTY</u>	empty
5	Level of tank after adding one gallon	<u>1/5 OF TANK</u>	half
9	Level of tank after adding another gallon	full	full <i>mg 9/25/94</i>

Test 3.1.11 Wash and Dry Lines Sequence

1	Reading of pressure indicator PE3 <i>9-16-94</i>	<u>500.31</u> psi	500 psi
1	Reading of pressure indicator PE8	<u>194.</u> psi	200 psi
3	☒ Solenoid valve YV10 opens and solenoid valve YV11 closes.		
3	☒ Solenoid valve YV9 opens for <i>25 mg 9/16/94</i> two seconds.		
3	☒ Solenoid valve YV11 opens.		
3	☒ Solenoid valves YV10 and YV11 close after <i>25 9/16/94</i> two seconds.		

Test 3.1.12 Test Sequence

1	Reading of pressure indicator PE3 <i>9-16-94</i>	<u>500.31</u> <i>9-16-94</i> <u>202.16</u> psi
1	Reading of pressure indicator PE8	<u>202.16</u> <i>9-16-94</i> <u>500.31</u> psi
3	☒ Solenoid valve YV5 is energized and solenoid valve YV4 is de-energized.	
3	☒ Solenoid valves YV10 and YV11 are closed.	
3	☒ Solenoid valve YV10 opens.	
3	☒ Solenoid valve YV10 closes when pressure stabilizes.	
3	☒ Solenoid valve YV11 opens after temperature stabilizes.	
3	☒ Solenoid valve YV11 closes after pressure stabilizes.	
3	☒ Solenoid valve YV4 is energized and solenoid valve YV5 is de-energized.	

Michael J. Amira
Test Performer

9/16/94
QA/QC Witness

Test 3.1.13 Record Data Sequence

Information from front panel:

1	Reading of pressure indicator PE1	<u>451.3</u>	psi
1	Reading of pressure indicator PE2	<u>590.71</u>	psi
1	Reading of pressure indicator PE3	<u>201.50</u>	psi
1	Reading of pressure indicator PE4	<u>499.84</u>	psi
1	Reading of pressure indicator PE5	<u>40.74</u>	psi
1	Reading of pressure indicator PE6	<u>505.06</u>	psi
1	Reading of pressure indicator PE7	<u>41.22</u>	psi
1	Reading of pressure indicator PE8	<u>201.57</u>	psi
1	Reading of pressure indicator PE9	<u>498.8</u>	psi
1	Reading of pressure indicator PIT1	<u>114.4</u>	psi
1	Reading of pressure indicator PIT2	<u>114.6</u>	psi
1	Reading of pressure indicator PIT3	<u>15.8</u>	psi
1	Reading of temperature indicator TE1	<u>22.66</u>	°C
1	Reading of temperature indicator TE2	<u>22.74</u>	°C
1	Reading of temperature indicator TE3	<u>25.91</u>	°C
1	Reading of temperature indicator TE4	<u>25.87</u>	°C
1	Reading of temperature indicator TE5	<u>21.36</u>	°C
1	Reading of temperature indicator TE6	<u>21.10</u>	°C
1	Reading of temperature indicator TE7	<u>21.07</u>	°C
1	Reading of temperature indicator TE8	<u>24.54</u>	°C
1	Reading of temperature indicator TE9	<u>23.94</u>	°C

Michael Jimera
Test Performer

9/16/99
QA/QC Witness

1	Reading of flowmeter	<u>1476</u>		
1	Reading of elevation indicator	<u>-23</u>	inch	
1	Color of solenoid valve YV1	Red	<u>Green</u>	
1	Color of solenoid valve YV2	Red-Green-Green	<u>Green-Red-Green</u>	
1	Color of solenoid valve YV3	<u>Red-Green-Green</u>	Green-Red-Green	
1	Color of solenoid valve YV4	Red-Green-Green	<u>Green-Red-Green</u>	
1	Color of solenoid valve YV5	<u>Red-Green-Green</u>	Green-Red-Green	
1	Color of solenoid valve YV6	<u>Red</u>	Green	
1	Color of solenoid valve YV7	Red	<u>Green</u>	
1	Color of solenoid valve YV8	<u>Red</u>	Green	
1	Color of solenoid valve YV9	<u>Red</u>	Green	
1	Color of solenoid valve YV10	<u>Red</u>	Green	
1	Color of solenoid valve YV11	<u>Red</u>	Green	
5	Do values in file agree with front panel values?	<u>Y</u>	N	Y
10	Was a second set of data written to the file?	<u>Y</u>	N	Y

PIT1, PIT2, PIT3, flowmeter
are not written to file. mg 9/16/94

Software was corrected to record PIT1, PIT2 and
PIT3 to the file. This feature was also tested.

mg 9/19/94

9-19-94

Michael Jimenez
Test Performer

9/16/94
QA/QC Witness

EXCEPTIONS TO SOFTWARE ACCEPTANCE TEST
FOR
TANK 101-SY VOID FRACTION INSTRUMENT

EXCEPTIONS			CORRECTION APPROVAL		
Para. No.	Date	Description	Org.	Initials	Date
3.1.3 Step 3	9/16/94	Use PE9 instead of PE3 to monitor 500 psi line pressure.	M. Gimera	MG	9/16/94
3.1.3 Step 4	9/16/94	Do not open YV8 and YV9. The pressure will be vented through the sample chamber.	M. Gimera	MG	9/16/94
3.1.3 Step 6	9/16/94	Skip this step. YV7 will be checked by recording the pressure before opening then after opening.	M. Gimera	MG	9/16/94
3.1.3 Step 7	9/16/94	Expected value is approximately atmospheric pressure.	M. Gimera	MG	9/16/94
3.1.3 Step 8	9/16/94	Open valve YV7 and leave YV8 closed.	M. Gimera	MG	9/16/94
3.1.3 Step 9	9/16/94	Expected value for PE8 is approximately 200 psi.	M. Gimera	MG	9/16/94
3.1.3 Step 10	9/16/94	Close YV7. Place a bucket under the drain and open YV8.	M. Gimera	MG	9/16/94
3.1.3 Step 11	9/16/94	Record color of YV8 (should be green) then close YV8.	M. Gimera	MG	9/16/94
3.1.3	9/16/94	Skip steps 12 through 18.	M. Gimera	MG	9/16/94
3.1.6	9/16/94	It may not be practical to change temperatures of TE5 through TE7 as they are located in the mast. Skip tests of TE5 through TE7.	M. Gimera	MG	9/16/94
3.1.8	9/16/94	The elevation sensor is not fully functional. Elevation measurements will instead be made by marks on the mast. Skip 3.1.8.	M. Gimera	MG	9/16/94
3.1.9	9/16/94	The water tank is on its side and can never read full in this position. For step 3 fill the water tank completely. The expected level in step 5 is about 1/8 full. Skip steps 6 through 9.	M. Gimera	MG	9/16/94
3.1.10 Step 3	9/16/94	The expected times are about 25 seconds, not 2 seconds.	M. Gimera	MG	9/16/94

TEST APPROVED WITH EXCEPTIONS

Michael Gimera
Cognizant Engineer

Quality Assurance

9/16/94
Date

9/16/94
Date