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ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 654657

Proj. ECN

2. ECN Category (mark one) Supplemental <input type="radio"/> Direct Revision <input checked="" type="radio"/> Change ECN <input type="radio"/> Temporary <input type="radio"/> Standby <input type="radio"/> Supersedure <input type="radio"/> Cancel/Void <input type="radio"/>	3. Originator's Name, Organization, MSIN, and Telephone No. John Huber, 74800, T4-07, 373-5549		4. USQ Required? <input checked="" type="radio"/> Yes <input type="radio"/> No	5. Date 8/9/99
	6. Project Title/No./Work Order No. Acceptance Test Procedure for Enrafs/102486		7. Bldg./Sys./Fac. No. 200-G	8. Approval Designator Q
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) HNF-SD-WM-ATP-077 Rev 7		10. Related ECN No(s). None	11. Related PO No. N/A
12a. Modification Work <input type="radio"/> Yes (fill out Blk. 12b) <input checked="" type="radio"/> No (NA Blks. 12b, 12c, 12d)	12b. Work Package No. N/A	12c. Modification Work Completed N/A Design Authority/Cog. Engineer Signature & Date	12d. Restored to Original Condition (Temp. or Standby ECNs only) N/A Design Authority/Cog. Engineer Signature & Date	

13a. Description of Change
USQ TF-98-0951 ~~R1~~ R2 *8-16-99*

13b. Design Baseline Document? Yes No

Replace HNF-SD-WM-ATP-077 Revision 7 with revision 8, attached.

14a. Justification (mark one) Criteria Change <input type="radio"/> Design Improvement <input checked="" type="radio"/> Environmental <input type="radio"/> Facility Deactivation <input type="radio"/> As-Found <input type="radio"/> Facilitate Const. <input type="radio"/> Const. Error/Omission <input type="radio"/> Design Error/Omission <input type="radio"/>	14b. Justification Details Force transducer calibration adjusted to mfr's. recommendations. This document revision will not change the Hanford Site collective dose since it has no effect on radiological sources, contamination control, or shielding.
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15. Distribution (include name, MSIN, and no. of copies)

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ENGINEERING CHANGE NOTICE

Page 2 of 2

1. ECN (use no. from pg. 1)

654657

16. Design Verification Required

- Yes
 No

17. Cost Impact

ENGINEERING

- Additional \$ N/A
Savings \$ N/A

CONSTRUCTION

- Additional \$ N/A
Savings \$ N/A

18. Schedule Impact (days)

- Improvement N/A
Delay N/A

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

<p>SDD/DD <input type="checkbox"/></p> <p>Functional Design Criteria <input type="checkbox"/></p> <p>Operating Specification <input type="checkbox"/></p> <p>Criticality Specification <input type="checkbox"/></p> <p>Conceptual Design Report <input type="checkbox"/></p> <p>Equipment Spec. <input type="checkbox"/></p> <p>Const. Spec. <input type="checkbox"/></p> <p>Procurement Spec. <input type="checkbox"/></p> <p>Vendor Information <input type="checkbox"/></p> <p>OM Manual <input type="checkbox"/></p> <p>FSAR/SAR <input type="checkbox"/></p> <p>Safety Equipment List <input type="checkbox"/></p> <p>Radiation Work Permit <input type="checkbox"/></p> <p>Environmental Impact Statement <input type="checkbox"/></p> <p>Environmental Report <input type="checkbox"/></p> <p>Environmental Permit <input type="checkbox"/></p>	<p>Seismic/Stress Analysis <input type="checkbox"/></p> <p>Stress/Design Report <input type="checkbox"/></p> <p>Interface Control Drawing <input type="checkbox"/></p> <p>Calibration Procedure <input type="checkbox"/></p> <p>Installation Procedure <input type="checkbox"/></p> <p>Maintenance Procedure <input type="checkbox"/></p> <p>Engineering Procedure <input type="checkbox"/></p> <p>Operating Instruction <input type="checkbox"/></p> <p>Operating Procedure <input type="checkbox"/></p> <p>Operational Safety Requirement <input type="checkbox"/></p> <p>IEFD Drawing <input type="checkbox"/></p> <p>Cell Arrangement Drawing <input type="checkbox"/></p> <p>Essential Material Specification <input type="checkbox"/></p> <p>Fac. Proc. Samp. Schedule <input type="checkbox"/></p> <p>Inspection Plan <input type="checkbox"/></p> <p>Inventory Adjustment Request <input type="checkbox"/></p>	<p>Tank Calibration Manual <input type="checkbox"/></p> <p>Health Physics Procedure <input type="checkbox"/></p> <p>Spares Multiple Unit Listing <input type="checkbox"/></p> <p>Test Procedures/Specification <input type="checkbox"/></p> <p>Component Index <input type="checkbox"/></p> <p>ASME Coded Item <input type="checkbox"/></p> <p>Human Factor Consideration <input type="checkbox"/></p> <p>Computer Software <input type="checkbox"/></p> <p>Electric Circuit Schedule <input type="checkbox"/></p> <p>ICRS Procedure <input type="checkbox"/></p> <p>Process Control Manual/Plan <input type="checkbox"/></p> <p>Process Flow Chart <input type="checkbox"/></p> <p>Purchase Requisition <input type="checkbox"/></p> <p>Tickler File <input type="checkbox"/></p> <p>None <input checked="" type="checkbox"/></p>
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20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision

Document Number/Revision

Document Number/Revision

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21. Approvals

Signature

Date

Signature

Date

Design Authority N/A

Design Agent _____

Cog. Eng. John Huber 8-10-99

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Cog. Mgr. Rich Larson 8/16/99

QA _____

QA Roger True 8-10-99

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Environ. _____

Other _____

Other _____

DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

ENRAF Series 854 Advanced Technology Gauge (ATG) Acceptance Test Procedure

John Huber

Lockheed Martin Hanford Corporation, Richland, WA 99352
Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200


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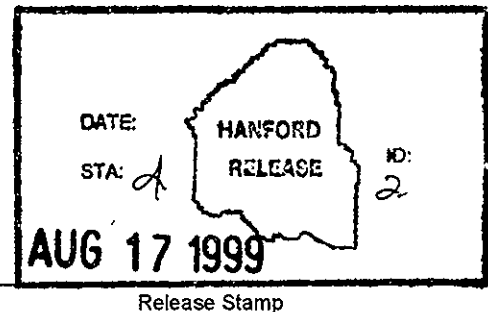
Key Words: Enraf, Densitometer, Gauge, Gage, ATG, 854, Level, LIT,
Level Indicating Transmitter, Density Indicating Transmitter, Logger,
LOGv18

Abstract: This Acceptance Test Procedure determines acceptability of Enraf
Series 854 ATG Level detectors before they are installed in the field.

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Release Approval Date 8/17/99



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RECORD OF REVISION

(1) Document Number
HNF-SD-WM-ATP-077

Page 1

(2) Title
Enraf Series 854 Advanced Technology Gauge (ATG) Acceptance Test Procedure

Change Control Record

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release		
		(5) Cog. Engr.	(6) Cog. Mgr.	Date
0	(7) EDT 141624, 2/18/94	GA Barnes	TL Moore	
0-A	Add Record of Revision page i, replaces pages 2 of 14 and 14 of 14. ECN 602579, 4/15/94	GA Barnes	TL Moore	
0-B	Replaces Record of revision page i, replaces pages 10 of 14 and 14 of 14. ECN 602580, 5/3/94.	GA Barnes	TL Moore	
0-C	Replace ROR page i, replaces pages 4,6,9,12 and 14, add appx. A ECN 608122, 5/24/94	GA Barnes	TL Moore	
1	Replace Rev 0-C with Rev 1, ECN 608122, ECN 613180, 7/20/94	GA Barnes	TL Moore	
2	Replaces rev 1 with rev 2, rev 2 is a complete rewrite, ECN 613319, 1/24/95	GA Barnes	TL Moore	
3	Replaces rev 2 with rev 3, rev 3 is a complete rewrite, ECN 620620, 5/5/95	GA Barnes	TL Moore	
4	Replaces rev 3 with rev 4, rev 4 is a complete rewrite, ECN 631224, 3/27/96	GA Barnes	TL Moore	
5	Replaces rev 4 with rev 5, Rev 5 incorporates test requirements for Enraf Densitometers			
	ECN 631297	JH Huber	JL Homan	
6	Clarified recording of DV in step 2.8.31. Added additional steps in section 2.7			
	ECN 638783, 617152, 613204	JH Huber	JL Homan	
7	Revised Densitometer Acceptance and updated format ECN 638790	JH Huber	RE Larson	
8 RS	Revised force transducer calibration check and eliminated densitometer calibration	<i>[Signature]</i>	<i>RE Larson</i>	<i>8/16/99</i>
	ECN 654657	JH Huber	RE Larson	

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ENRAF SERIES 854 ADVANCED TECHNOLOGY GAUGE (ATG) ACCEPTANCE TEST PROCEDURE

1.0 INSTRUCTIONS

1.1 PURPOSE

This procedure checks the Enraf gauge received at Hanford is completely functional and has received no shipping damage. This procedure does not certify the gauge operation. The manufacturer certifies gauge operation.

1.2 SCOPE

This procedure provides acceptance testing for Enraf Series 854 level gauges used to monitor levels in Hanford Waste Storage Tanks. The test will verify that the gauge functions according to the manufacturer's instructions and specifications and is properly setup prior to being delivered to the tank farm area. This ATP does not set up the gauge for any specific tank, but is generalized to permit testing the gauge prior to installation package preparation.

1.3 REFERENCES

- Instruction Manual Series 854 ATG Level Gauge, Enraf Inc., Part No. 4416.220, Version 2.2 (See CV-31560, vendor information file).
- Instruction Manual 854 ATG Density Software Package, Enraf Inc., Part No. 0000.564.4416.221-40, Version 1.0 (See CV-31560, vendor information file).

1.4 RESPONSIBILITIES

- 1.4.1 The Supervisor/Lead is responsible for coordinating the level gauge testing.
- 1.4.2 Instrument Craft is responsible for performing the testing and recording the test results.
- 1.4.3 Quality Control is responsible for witnessing the tests, signing the data sheets when testing is completed and placing a "green tag" on the gauge after successful completion of the test.
- 1.4.4 Cognizant engineer is responsible for dispositioning exceptions and providing direction during troubleshooting activities.

1.5 DESCRIPTION OF THE SYSTEM

Enraf Series 854 level gauges are certified by Factory Mutual (FM) for National Fire Protection Association (NFPA 70) hazardous Class I, Division 1, Groups B, C, and D Locations. Its level measuring principle is based on the detection of variations in the weight of a displacer suspended in the process fluid. The displacer is connected to a wire wound on a precision measuring drum. A level change causes a change in the weight of the displacer which will be detected by the force transducer. Electronics within the gauge cause a servo motor to adjust the position of the displacer and compute the tank level based on the new position of the displacer drum. The gauge displays the level in decimal inches. Depending on the specific installation, an analog or digital output signal transmits the level data for remote data processing.

1.6 TEST CONDITIONS AND EQUIPMENT REQUIRED

The equipment listed below is required to perform this procedure.

- Computer
- Portable Enraf Terminal (PET) Model No. 847
- Enraf Test Weights (Enraf PN 1854-061)
- Reamer (Enraf PN 4563.030) or #31 drill

- Enraf Extraction Tool (optional)
- RS-232C Interface Modules

1.7 CRITERIA

- 1.7.1 The gauge must accept all commands. If a command is not accepted as described by vendor documentation, the condition must be resolved adequately in the exceptions block.
- 1.7.2 The force transducer must accept calibration. The force transducer within the gauge is the primary component important to gauge operability. Should the force transducer be out of calibration, the gauge will not weigh the displacer properly, causing the gauge to report erroneous levels if at all. In the case of a Level Gauge ATP, the force transducer must report a known test weight within 3 grams of the actual weight inscribed or marked on the test weight.
- 1.7.3 All error codes must be clearable. All operations or activities performed by the gauge must be carried out as expected or described in the test or vendor documentation. If any operation returns an error code, recovery must be possible within a reasonable amount of time and effort.

1.8 DATA SHEET INSTRUCTIONS

- 1.8.1 The Test Execution Data sheet contains five columns.
- 1.8.1.1 Column 1 contains the step number relating to the data.
- 1.8.1.2 Column 2 contains the attribute or feature of the gauge being tested.
- 1.8.1.3 Column 3 contains the expected value as a result of performing the referenced step.
- 1.8.1.4 Column 4 contains space for recording the actual value or data resulting from step performance.
- 1.8.1.5 Column 5 is to be marked "A" for Accept if the expected value was recorded or "R" for reject if a value different from the expected value was recorded. If "R" is entered, a corresponding entry must be made in the Exceptions Data

Sheet. The cognizant engineer shall disposition the exception as described in section 3.0.

1.8.1.6 Column 6 contains space for entering comments or observations.

1.9 TEST CONDUCT

1.9.1 If at anytime during performance of this procedure assistance is needed or required conditions cannot be met, contact the cognizant engineer.

1.9.2 If the measuring drum is dropped onto a hard surface, it must be replaced with a new one. The dropped drum may be discarded.

1.9.3 The drum compartment cover and electronics cover may be removed and/or installed at any time during the test as needed.

2.0 TEST EXECUTION

NOTE:

The commands typed on the PET or computer are shown in square brackets "[]" (The square brackets are NOT to be typed as part of the command). Included is any additional information the command requires. After typing the text within the square brackets, press the ENTER key. If an error is made during the typing of the command, use the backspace (BS) key to delete the error.

After entering a command, the PET or computer will give one of two responses: The first response will show the entered command with an "&" character at the end (i.e. "TG&"). This response tells the user that the gauge accepted the command. The second response will show the two digit command (i.e. TG) followed by a "!" and a three digit error code (i.e. "TG!053"). This command tells the user that the gauge did not accept the command. For a list of error codes, see the Enraf 854 ATG Level Gauge Instruction Manual, section 12.4.

PROCEDURE NOTE

An additional or repeat force transducer calibration may be performed at any time at the Supervisor/Lead's discretion.

2.1 INITIALIZING THE GAUGE

INFORMATION

This section prepares the gauge for testing. It connects power and unlocks the servo motor.

- 2.1.1 Mount the gauge per the 854 ATG Level gauge Instruction Manual. Provide electrical connections to the gauge per the 854 ATG Level Gauge Instruction Manual, the National Fire Protection Association (NFPA 70) National Electrical Code.
- 2.1.2 Install the drum and displacer per Appendix A4.
- 2.1.3 Unlock the servo motor prior to connecting power per the 854 ATG Level Gauge Instruction Manual, Section 8.5.
- 2.1.4 Connect the PET to the optical port located on the side of the gauge housing,
- 2.1.5 Connect the gauge to a 120 Vac (+/- 5 Vac) power source, per the 854 ATG Level Gauge Instruction Manual, Section 4.3.1. The display screen on the gauge will show one dark line. After approximately 20 seconds, the display will show the gauge initializing.
- 2.1.6 Configure the gauge per Appendix A Section COMPUTER SETUP GUIDANCE and Figure 1.

- 2.1.7 In the Logger program, select SEND ITEMS and Ensure F5 equals 1B/2B; IF NOT, THEN <F5>, 1B<ENTER>, 2B <ENTER>.

2.2 CHECKING FOR ERROR CODES

INFORMATION

Record any errors on the data sheet. Correct the errors, or enter it as an exception. For a list of error codes, see the Enraf 854 ATG Level Gauge Instruction Manual.

- 2.2.1 Enter Command [EP] = "XPU error code". Verify that EP000 is displayed. **RECORD VERIFICATION** in the data sheet.
- 2.2.2 Enter Command [ES] = "SPU error code". Verify that ES0000 is displayed. **RECORD VERIFICATION** in the data sheet.

2.3 TESTING THE LEVEL GAUGE OPERABILITY

INFORMATION

This section enters data into the memory of the level gauge. These values place the gauge into generic configuration for use in any tank.

- 2.3.1 Enter Command [UN]. This command unlocks the gauge and allows the displacer to move downward to the floor or other hard surface.

NOTE:

If the displacer does not move downward, check to make sure that the drum moves freely on the bearings. If the drum does not move freely, perform the drum bearing removal/reconditioning procedure in Appendix B. After drum bearing reconditioning or force transducer re-calibration, perform step 2.3.1 again. Document the drum bearing reconditioning or force transducer re-calibration as an exception.

- 2.3.2 Enter Command [W2=ENRAF2]. This command enters protection level 2.
- 2.3.3 Enter the following parameters into the gauge. **VERIFY** proper parameter entry and **RECORD VERIFICATION** that all parameters were entered correctly:
- [TT=+00900.00] ("TANK TOP" parameter)
 - [UR=+00900.00] ("UPPER REFERENCE" parameter)
 - [MH=+00890.00] ("MOTOR HIGH" parameter)
 - [MZ=+00880.00] ("LOCK TEST LIMIT" parameter)
 - [HH=+00870.00] ("HIGH HIGH ALARM" parameter)
 - [HA=+00860.00] ("HIGH ALARM" parameter)
 - [LA=+00006.00] ("LOW ALARM" parameter)
 - [LL=+00003.00] ("LOW LOW ALARM" parameter)
 - [ML=+00001.00] ("MOTOR LIMIT SWITCH LOW" parameter)
 - [RL=+00850.00] ("REFERENCE LEVEL" parameter)
- 2.3.4 Enter command [AR]. This command directs the gauge to accept the current value for "RL".
- 2.3.5 Enter command [EX].

NOTE:

Prior to executing step 2.3.6, verify that the opening to the gauge flange is blocked so that the displacer cannot be raised up into the drum housing.

- 2.3.6 Enter Command [CA]. This command raises the displacer. Verify that the displacer raises up to the gauge flange and stops. **RECORD VERIFICATION** in the data sheet.
- 2.3.7 Enter Command [UN].
- 2.3.8 After the gauge stabilizes, verify that the level reading in the gauge LCD display is reading within 0.10 inches of the RL value programmed in step 2.3.3. **RECORD VERIFICATION** in the data sheet.
- 2.3.9 Enter command [TG]. This command tests the gauge.
- 2.3.10 Verify that the displacer rises a couple of inches and then goes back down to the RL. **RECORD VERIFICATION** in the data sheet.

2.4 DRUM CIRCUMFERENCE VERIFICATION

- 2.4.1 Enter Command [DC]. This command displays the preprogrammed drum circumference. **RECORD** this value on the data sheet.
- 2.4.2 **RECORD** the drum circumference value engraved on the wire drum.
- 2.4.3 Verify that the drum circumference value displayed (DC) is the same as the value for the Drum circumference found engraved on the wire drum. **If** the Drum Circumference value engraved on the wire drum does not exactly match the preprogrammed Drum Circumference (DC) value, **perform** steps 2.4.3 through 2.4.5, **otherwise** go to step 2.5. Note that display on computer is in meters, and engraved value is in millimeters.

NOTE:

**This value is displayed in scientific notation.
The value will look like "DC=+.33000000E+00".**

2.4.4 Enter Command [W2=ENRAF2].

2.4.5 Enter Command [DC=+.XXXXXXXXXE+00]. The value for XXXXXXXXX is the Drum Circumference value engraved on the wire drum. **RECORD** the value in the data sheet.

2.4.6 Enter command [EX].

**2.5 DISPLACER WEIGHT VERIFICATION AND FORCE TRANSDUCER
CALIBRATION**

CAUTION

When removing and replacing weights, displacers and snaps, be sure disconnect power and lock the motor lock, maintain a small amount of tension on the wire, then unlock the motor lock and connect power to continue. This protects the force transducer from damage.

NOTE

The [UN] command may need to be used instead of [CA] in order to raise the lighter test weights.

2.5.1 Raise the displacer to approximately 6" below the gauge flange by entering command [CA]. To stop the displacer, enter command [FR].

- 2.5.2 Enter command [W2=ENRAF2].
- 2.5.3 Enter command [WT=DDD]. This command disables the "wire-rupture" protection.
- 2.5.4 Remove the displacer and snap from the measuring wire.
- 2.5.5 Attach the 25 gram weight to the measuring wire loop. The 25 gram weight is the smallest of weights in the set and has two hooks.
- 2.5.6 Enter command [BT]. This command activates a BALANCE TEST. The BALANCE TEST will take approximately five minutes to complete.
- 2.5.7 After "FR" appears in the gauge's LCD display, PET display or computer display, enter command [BF]. This command will display the frequency measured during the BALANCE TEST. **Record** this frequency (F0) on the data sheet.
- 2.5.8 Attach the 75 gram weight to the 25 gram weight. The 75 gram weight is the second smallest in the set. Note: If there is insufficient room for the test weights to move downward (approximately 12"), perform step 2.5.1 to raise the test weights.
- 2.5.9 Repeat steps 2.5.6 and 2.5.7. **Record** the frequency (F1) on the data sheet.
- 2.5.10 Remove the 75 gram weight and attach the 150 gram weight to the 25 gram weight. The 150 gram weight is the second largest weight in the set. Note: If there is insufficient room for the test weights to move downward (approximately 12"), perform step 2.5.1 to raise the test weights.
- 2.5.11 Repeat steps 2.5.6 and 2.5.7. **Record** the frequency (F2) on the data sheet.
- 2.5.12 Remove the 150 gram weight and attach the 225 gram weight to the 25 gram weight. The 225 gram weight is the largest weight in the set. Note: If there is insufficient room for the test weights to move downward (approximately 12"), perform step 2.5.1 to raise the test weights.
- 2.5.13 Repeat steps 2.5.6 and 2.5.7. **Record** the frequency (F3) on the data sheet.

- 2.5.14 Enter command [W2=ENRAF2].
- 2.5.15 Enter command [F0=+.XXXXXXXXXE+XX]. This command re-programs frequency 0. The value of F0 is the value obtained in step 2.5.7.
- 2.5.16 Repeat step 2.5.15 for frequencies F1, F2 and F3. The values for F1, F2 and F3 are the values obtained in steps 2.5.9, 2.5.11 and 2.5.13 respectively.
- 2.5.17 Enter command [WT=EDE]. This command enables the "wire-rupture" protection.
- 2.5.18 Enter command [EX].
- 2.5.19 Enter command [CA].
- 2.5.20 After the test weights rise a few inches, enter command [FR]. This command stops the test weights.
- 2.5.21 Remove the 25 gram test weight, leaving the 225 gram test weight installed (the snap is not installed at this point).
- 2.5.22 Enter command [MF]. This command measures the motor frequency.
- 2.5.23 After "FR" appears in the gauge's LCD display, PET display or computer display, enter command [WQ]. This command measures the weight of the test weight. **RECORD** the WQ value in the data sheet.
- 2.5.24 Verify that the difference between the WQ value & 225 is within +/- 3 grams. **RECORD** the value on the data sheet.
- 2.5.25 If the value recorded in 2.5.24 is greater than 3 grams or less than -3 grams, contact cognizant engineer for assistance and proceed as directed.
- 2.5.26 **RECORD** the weight engraved on the displacer.
- 2.5.27 Remove the test weight and install the displacer and snap.
- 2.5.28 Enter command [MF] and wait for "FR" to appear in the display.

- 2.5.29 Enter command [WQ] and **RECORD** on the data sheet.
- 2.5.30 **VERIFY** that the WQ value for the displacer and its engraved weight match to within +/- 6 grams by subtracting the WQ value from the engraved value and **RECORD** the value on the data sheet.
- 2.5.31 If the value recorded in 2.5.30 is greater than 6 grams or less than -6 grams, contact the cognizant engineer and proceed as directed (the engrave displacer weight may be incorrect, the force transducer may be damaged or may need to be recalibrated).

2.6 TRANSPORTING THE LEVEL GAUGE

CAUTION

This section prepares the gauge for transport. The motor must be locked to prevent possible damage to the force transducer.

- 2.6.1 If the level gauge display is not in FORMAT B (see the 854 ATG Level Gauge Instruction Manual, Figure 7.3), enter command [W1=ENRAF1]. Once in Protection Level 1, enter command [DF=B] (this command switches the gauge to display format B). Enter command [EX].
- 2.6.2 If using a computer for the testing, log the gauge data onto the computer (see Appendix A, Section LOGGING GAUGE DATA ONTO COMPUTER).
- 2.6.3 Disconnect the gauge from the power source.
- 2.6.4 "Lock" the servo motor, per the 854 ATG Level Gauge Instruction Manual, Section 8.5, prior to transporting the gauge. **RECORD VERIFICATION** motor is locked.
- 2.6.5 Remove the drum snap and displacer, per Appendix A5, prior to transporting the gauge.
- 2.6.6 Transport gauge as needed.

2.7 DATA

- 2.7.1 Mail a copy of the completed data sheets, vender information, and copy of the log file to the Enraf cognizant engineer.
- 2.7.2 Vendor information received with the gauge is to be retained and appended to CVI #31560 by the cognizant engineer

3.0 EXCEPTIONS TO ACCEPTANCE TEST

Exceptions to the test are dispositioned and agreed to by all witnesses or their organizational delegate. Actions taken regarding disposition are noted on the "Exception to Acceptance Test" sheet. Typical dispositions are:

- Test approved with exception (i.e., rerun of the acceptance test unnecessary).
- Entire acceptance test to be repeated after the discrepancy has been corrected.
- ATP step(s) affected to be repeated after the discrepancy has been corrected.

4.0 TEST DATA MANAGEMENT

The test data shall be entered on the attached data sheets. Witness signatures at the bottom of the data sheet indicates that the witness agrees to the accuracy of the data recorded and comparisons made.

Upon successful completion of testing activities, the Test Witnesses will sign the master copy of the DATA SHEETS. An appropriate "Acceptance Test Report" shall be generated to publish the results of testing activities.

4.1 ACCEPTANCE TEST REPORT GUIDANCE

The data sheets, which are completed during the testing activities, will be included in the Acceptance Test Report. If additional gauges are tested using this procedure, a different data sheet will be used for each gauge and added to the ATR as a revision.

TEST EXECUTION DATA SHEET			Page 1 of 2		
Date:		Tank Number:		Gauge Part No.:	
Gauge Serial Number:			Test Performed by:		
Ref. Seq.	Attribute	Expected Value	Actual Value	A/R	Comment
2.2.1	EP	EP000			
2.2.2	ES	ES0000			
2.3.3	PARAMETERS	All Entered Correctly			
2.3.6	CA	Displacer raises			
2.3.8	RL	850 ± .10			
2.3.10	RL	850 ± .10			
2.4.1	DC programmed	As read			
2.4.2	DC engraved	As read			
2.4.5	New DC	DC engraved			
2.5.7	F0	As read			
2.5.9	F1	As read			
2.5.11	F2	As read			
2.5.13	F3	As read			
2.5.23	WQ test weight	225 ± 3 grams			
2.5.24	WQ - 225	+/- 3 grams			
2.5.26	Displacer Weight Engraved/marked	As read			
2.5.29	WQ Displacer	As read			
2.5.30	(2.5.29) – (2.5.26)	+/- 6 grams			
2.6.4	Motor Locked	Locked			

Test Witnesses:

Supervisor/Lead

Date

Quality Control

Date

Instrument Tech.

Date

1617

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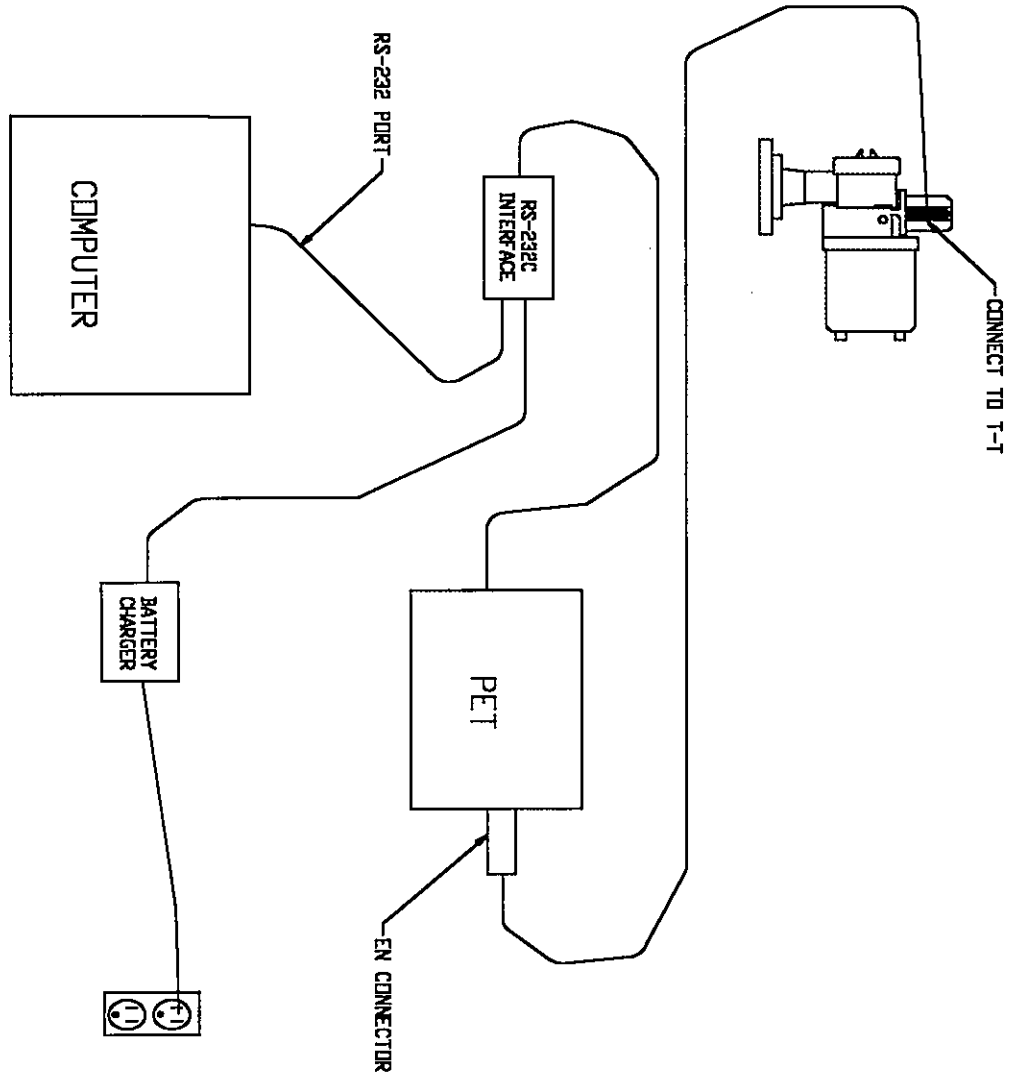


FIGURE 1

APPENDIX A

1. Computer Setup Guidance
2. Changing Level Dimensions
3. Logging Gauge Data onto Computer
4. Installing Drum and Displacer
5. Removing Drum and Displacer

A1 COMPUTER SETUP GUIDANCE:

1. Turn PET ON.
2. Enter the TA command, note the gauge address displayed in the PET display, (i.e. TA05). TURN PET OFF.
3. Disconnect the infrared connector, and connect the computer and PET to the gauge per Figure 1. Power up PET/gauge as required.
4. Place the PET in SETUP MODE by pressing keys control-esc at the same time.
5. Press the down arrow on the PET keyboard until MODE is displayed at the top of the PET display.
 6. Press the right arrow until the cursor is underneath RS232.
7. Press the down arrow until the display on the PET reads "RS-232 Baudrate".
8. Verify (and if necessary correct) the cursor is underneath 1200, each time a 1200 baudrate selection appears.
9. Press the down arrow until the PET display reads SETUP MODE, and then press, control-esc at the same time.
10. Turn on the computer.
11. If in MS-DOS mode, at the c:\> prompt on the computer display, access the logger directory by typing, cd\logger
12. Start the logger program by typing, LOGV18 or selecting the Logger icon in Windows95.
13. Use the computer arrow keys and highlight item #1, "Setup system", then press the enterkey.
14. Highlight item #4, "Gauge address" and press enter.
15. Enter the gauge address noted from step #2 (note the flashing cursor), then press enter.

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16. Verify that the other parameters shown in the "SETUP MENU" display match the parameters shown below. If the parameters don't match, change them using the procedure in steps 14 and 15.

 SETUP MENU

1) RS232C port & Baudrate	(port 1 @ 1200 Baud.)
2) Add header to every file	(N)
3) CiU address	(0)
*4) Gauge Address	(XX)
5) Max. number of records in file LOGV17.CYC	(100)
6) Name cyclusfile	(LOGV17.CYC)
7) Max. number of retries per CIU request	(3)
8) Timeout CIU	(.9 sec.)
9) Turn_around delay	(0 sec.)
A) ITEM directory	(C:\LOGGER\ITEMS\)
B) CYC_file directory	(C:\LOGGER\CYC)
C) LOG_file directory	(C:\LOGGER\LOG)
D) file_to_Field_file directory	(C:\LOGGER\FTF)
E) Library_directory	(C:\LOGGER\LIB)
F) RAM disk	(I)
G) Return to main menu	

*XX is obtained from gauge parameter [TA]

17. Highlight item #G, "Return to main menu", press enter key.
18. A prompt will ask, "Save new setup on disk (y,n)?, type, y for a yes response.
19. Highlight item #2, "Send items", press enter key.
20. Return to section 2.1.7.

A2 CHANGING LEVEL DIMENSIONS:

1. <ESC> from LOGGER'S "MAIN MENU", enter the "SPECIAL MENU".
2. Enter the "CHANGE DIMENSIONS" menu.
3. Enter the gauge's "TRANSMISSION ADDRESS" (TA).

4. Enter "1) LEVEL DIMENSION (XXXXXX)"
5. Enter "TO INCHES"
6. Return to the "MAIN MENU"
7. Return to "SEND ITEMS"

A3 LOGGING GAUGE DATA ONTO COMPUTER:

1. From LOGGER'S "MAIN MENU", enter the "SPECIAL MENU".
2. Enter "1) GAUGE LOGGING ON DISK".
3. Enter the gauge's "TRANSMISSION ADDRESS" (TA).

A4 INSTALLING DRUM AND DISPLACER:

1. Ensure power is disconnected and the motor is locked (locked per 854 ATG Level Gauge Instruction Manual Section 8.5).
2. Ensure the drum compartment cover is removed
3. Check whether the drum shaft is properly positioned in the drum (not bent).
4. If applicable, remove rubber band or tape just enough to expose the end of the wire.
5. Attach the snap to the "ring" on the end of the wire. It may be necessary to pry open the snap's hooks with a tool in order to fit the snap onto the ring.
6. Remove the rubber band or tape completely from the drum while holding the wire onto the drum with finger.
7. Feed the wire through the neck of the gauge (Figure 8.2 of the 854 ATG Level Gauge Instruction Manual).
8. Insert the measuring drum into its bearings.
9. Push the drum towards the magnet cap in such a way that the drum shaft meets the magnet cap. Release the drum. Move the drum in and out, ensuring there is slight freeplay.

10. Attach a test weight or displacer to the wire as applicable.

11. Re-install drum compartment cover if applicable.

A5 REMOVE DRUM AND DISPLACER:

1. Ensure power is disconnected and the motor is locked (locked per 854 ATG Level Gauge Instruction Manual Section 8.5).
2. Ensure the drum compartment cover is removed.
3. Remove any test weights or displacer installed, leaving or installing the snap.
4. Slowly, remove the drum from the drum shaft, re-wrapping the wire into the grooves.
5. Secure wire onto drum with tape or rubber band.
6. Place drum into its Styrofoam shipping box and secure as needed.
7. Ensure outside of styrofoam box is marked for its destination

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APPENDIX B

Drum Bearing Removal/Conditioning

DRUM BEARING REMOVAL/RECONDITIONING

1. Disconnect the gauge from the power source.
2. "Lock" the servo motor, per the 854 ATG Level Gauge Instruction Manual, Section 8.5.
3. Remove the drum and displacer per Appendix A5.
4. Remove the drum shaft bushing from the gauge per the 854 ATG Level Gauge Instruction Manual, Figure 9.3.
5. Remove the bearings (2 black disks on each end of the bushing) from the drum shaft bushing per the 854 ATG Level Gauge Instruction Manual, Figure 9.3.
6. Use the reamer or the #31 drill to ream out both bearings.
7. Reinstall the reconditioned drum bearings into the drum shaft bushing.
8. Reinstall the drum shaft busing into the gauge.
9. Reinstall the drum and displacer, per Appendix A4.
10. "Unlock" the servo motor, per the 854 ATG Level Gauge Instruction Manual, Section 8.5.
11. Connect the gauge to the power source.