8/3/80

PHILADELPHIA ELECTRIC COMPANY

PEACH BOTTOM UNIT 2

SURVEILLANCE TEST

ST 20.039 LLRT HPCI STEAM SUPPLY _____

TECHNICAL SPECIFICATION:
4.7.A.2.F, Table 3.7.4

Penetration Number N-11

Penetration Leak Rate _____ cc/min

LLRT Total _____ cc/min

Test Frequency:

Each operating cycle, but in no case greater than two years.

Test Results:

A. All of the asterisked steps were completed SATISFACTORILY.

PERFORMED BY: _____ _____
SIGNATURE TIME/DATE

_____ _____
SIGNATURE (SHIFT SUPERVISION) TIME/DATE

B. One or more of the asterisked steps was completed UNSATISFACTORILY. Refer to Tech. Spec. 3.7.A.

MRF _____

_____ _____
SIGNATURE TIME/DATE

_____ _____
SIGNATURE (SHIFT SUPERVISION) TIME/DATE

IMMEDIATELY NOTIFY PLANT SUPERINTENDENT OR ALTERNATE.

_____ _____
NAME OF PERSON NOTIFIED TIME/DATE

_____
SIGNATURE (SHIFT SUPERINTENDENT OR SUPERVISOR)

Additional action required if other portions of test did not function properly or other discrepancies were noted during test.

1. MRF submitted: MRF _____
2. Other:

_____ _____
SIGNATURE DATE

REVIEWED BY:

_____ _____
PLANT STAFF SUPERVISION DATE

PURPOSE:

The purpose of this test is to determine the leakage rate of the primary containment penetrations and isolation valves.

REFERENCE.

1. Technical Specifications
2. 10CFR50, Appendix J
3. Various P&ID's

PRERFQUISITES:

1. Plant conditions are such that testing will not interfere with planned operations. Request permission of shift supervision to begin this test.

   _____
   Shift Supervision

2. RWP obtained if required. _____

3. Safety permit issued if required, as determined by Results Engineer or alternate.

   Yes_____ No_____

   If Yes: Permit No._____

GENERAL LLRT PROCEDURE:

1. Read specific procedure. Follow procedure for system blocking (if required), draining, and valve line up. _____

2. With the box set up for a "FLOW IN TEST" and connected to the penetration test tap, perform ST 20.116 LLRT Test Taps. Record leakage on the test data sheet in the rear of this test. _____

3. Calculate test pressure as follows. Document calculations and reasoning below:

a) Determine the maximum back pressure against any isolation boundary being tested (existing at start of test or developing as the result of a water leg existing on the vent path). _____psig

b) Determine the maximum back pressure against any non-isolation boundary or isolation boundary not being tested. _____psig

IF THE PRESSURE CALCULATED IN STEP 3b) IS LARGE e.g., REACTOR PRESSURE, CONDUCT A FLOW OUT TEST TO MEASURE THE INLEAKAGE CONTRIBUTION AND ADD THIS TO LEAK TEST RESULTS. 3b) PRESSURE CAN THEN BE REGARDED AS ZERO.

c) Add 49.2 psi to the pressure determined in Step 3a. _____psig

d) Test pressure is the greater of Step 3b or Step 3c. _____psig (Test Pressure)

IF USING AN ABSOLUTE PRESSURE GAGE COMPLETE STEP 3e. WRITE "PSIA" ON DATA SHEET IN COMMENTS SECTION.

e) 0.4912 x barometer + test pressure _____psia (Test Pressure)

Test Pressure Calculations:

4. Pressurize the test volume to the test pressure determined in Step 3 using service air (use N_2 or electrical penetrations and bellows).

5. Perform LLRT using one of the following three methods.

A. Flow In Test

1) Test box outlet connected to test volume test tap. Test tap valves open.

2) Test box inlet connected to service air supply (use N_2 on electrical penetrations and bellows).

3) Allign test box valves as follows:

V1 open_____	V9 Closed_____
V2 open_____	V10 Open _____
V4 closed_____	V11 Open _____
V5 open_____	V12 Open _____
V6 closed_____	

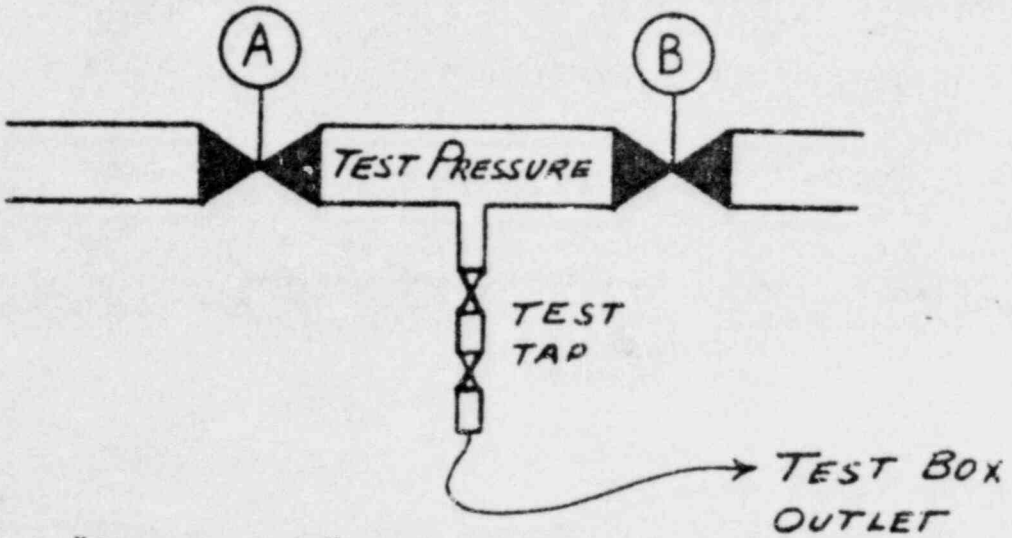
(Circle to indicate status)

F11 (V7A, V8A)	in service	out of service
F12 (V7B, V8B)	in service	out of service
F13 (V7C, V8C)	in service	out of service

4) Adjust PCV 1 to obtain pressure between supply pressure and test pressure on P1-1.

5) Adjust PCV 2 to obtain test pressure on P1-2.

6) Read and record on data sheet INDICATED flow and pressure (P1-2) for one hour after stabilization.



Typical "Flow In Test" set up. Test boundary is valves A & B.
Leakage is measured as the "Flow In" required to maintain test pressure.

B. Flow Out Test

1) Test box SUPPLY VENT connected to DOWNSTREAM test tap via a drain bottle. Downstream test tap valves open.

2) Dsconnect air supply to test box.

3) Align test box valves as follows:

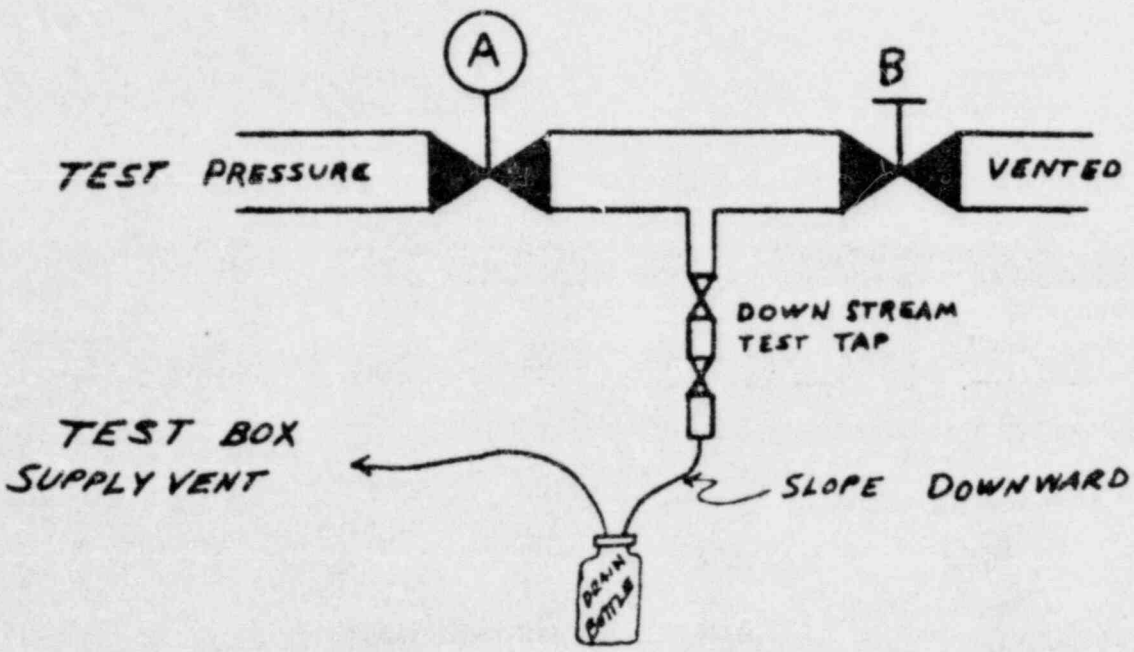
V1 Closed_____	V9 Closed_____
V2 Closed_____	V10 Open _____
V4 Open _____	V11 Closed_____
V5 Open _____	V12 Open _____
V6 Closed_____	

(Circle to indicate status)

F11 (V7A, V8A)	in service	out of service
F12 (V7B, V8B)	in service	out of service
F13 (V7C, V8C)	in service	out of service

AIR EXHAUSTING AT BOX OUTLET IS POTENTIALLY CONTAMINATED.

4) Read and record on data sheet INDICATED flow and pressure (P1-2) for one hour after stabilization.



Typical "Flow Out Test" set up. Valve A is being tested. Valve B blocks leakage vent path causing leakage to "vent" through box rotameter. Judgment must be exercised to select a tight "downstream boundary". Also tubing to test box should be less than 10 feet in length.

C. Pressure Decay Test

1) Allow test volume pressurization to continue to 1 psi above test pressure.

2) Disconnect test box air supply.

3) Allign test box valves as follows:

V1 Closed _____	V7A Closed_____	V8C Closed_____
V2 Closed _____	V7B Closed_____	V9 Open _____
V4 Closed _____	V7C Closed_____	V10 Open _____
V5 Open _____	V8A Closed_____	V11 Closed _____
V6 Open _____	V8B Closed_____	V12 Open _____

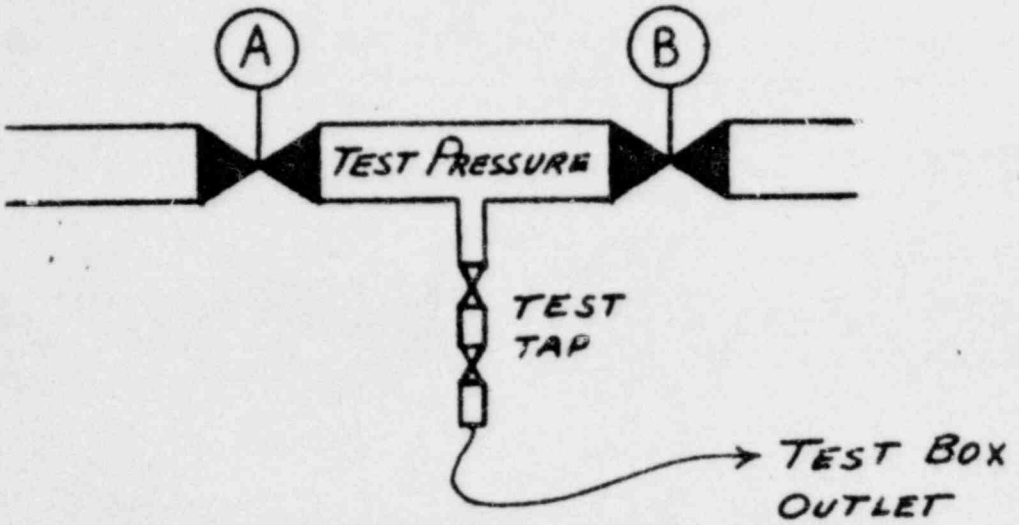
4) Begin recording test volume pressure (P1-2) every half hour for four hours.

5) Calculate test volume using 6280-M-100 series prints for center line length dimensions, pipe class and nominal size. Use spec 6280-M-300 for inside diameter of piping. Consider boundary valve volume as equivalent to cylinder of equal diameter, one half of the valve length long.

Calculated Volume (Cu. Ft.) = _____
Record Volume Calculations and Reference Prints Below

6) Calculate leakage (including error) below:

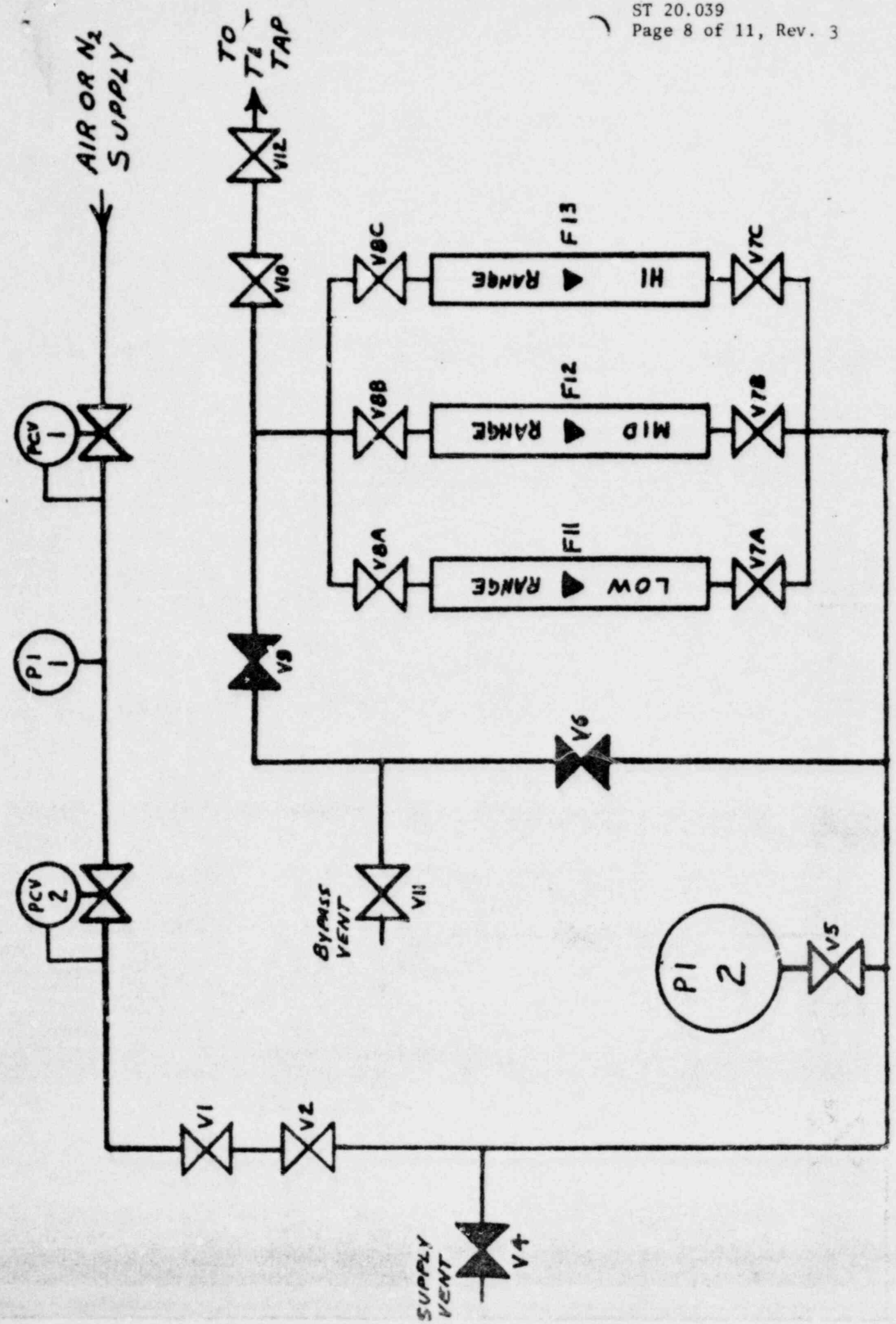
$$\text{leakage} = \frac{\text{Volume (step 5)}}{14.7 \text{ psi}} \times \frac{28{,}320 \text{ cc}}{\text{ft}^3} \times \frac{\text{pressure decay } +0.1 \text{ psi}}{\text{elapsed time (min)}}$$



Typical "Pressure Decay Test" set up. Due to pressure gage potential error (0.1 psi), calculated leakage can be reduced by increasing the duration of the test.

TEST WRAP UP :

6. When test is completed, consult Results Engineer or alternate concerning venting the test volume.
7. Leave 15 psig of N_2 in electrical penetrations upon test completion.
8. Restore system to normal using LLRT Tag Accountability Log.
9. Using the pressure correction curve (available in T.E. office) for the particular rotameter used in the test, correct indicated flow to "AS FOUND LEAKAGE" using (P1-2) as metering pressure (PSIG). Enter on test data sheet.


AIR OR N_2 SUPPLY
TO T1 TAP
V12
V10
V8C
F13
HI RANGE
V7C
V8B
F12
MID RANGE
V7B
V8A
F11
LOW RANGE
V7A
V9
V6
PCV 1
PI 1
PCV 2
BYPASS VENT
V11
PI 2
V5
V1
V2
SUPPLY VENT
V4

SPECIFIC PROCEDURE

I. Backup System Availability and Requirements;

The reactor must be depressurized before beginning this test.

Verify that there are no HPCI surveillance tests in progress.

II. System Draining:

1. Close M023-15.

2. Close AO-4807.

3. Open M023-16 to permit the HPCI steam line to drain between MO-23-15 and M023-16, to HPCI steam line drain pot.

4. Verify that the HPCI drain pot high level alarm in the main control room has not annunciated, then open the drain pot vent. If alarm annunciates, run hose to drain from drain pot vent.

5. Close MO-23-16.

III. Procedure:

1. Verify 23-15, 23-16, and AO-4807 are closed.

2. Ask the shift if the main steam lines are flooded or drained.

3. If the lines are drained, connect the test equipment to test valve 23-28A and perform the LLRT.

4. If the lines are flooded, check water level and add the correction to the test pressure then perform the LLRT. (2.309 ft. of H20/PSI.)

IV. Blocks Required:

Reactor depressurized.

V. Test Wrap-Up:

* 1. Verify that valve leakage is no greater than the maximum on scale flow on the high scale rotometer (leakage is on scale).

2. Inform shift supervision of results of test and fill out the test results section on the first page (note abov e asterisked step). Have operator review accountability log.

LLRT TAG ACCOUNTABILITY LOG

P&ID M-365

PENT No.	PENT. NAME	VALVE No./ DESCRIPTION	TAG No.	TAGGED VALVE COND.	HUNG BY	RESTORED VALVE CONDITION	VALVE RESTORED/ TAG RMVD. BY	TIME/ DATE
N-11	HPCI Steam Supply	MO23-15/HPCI Steam Supply Inner ISOL Valve.		Closed		Open		
		MO23-16/HPCI Steam Supply Outer ISOL Valve.		Closed		Open		
		AO-4807		Closed				
		Test VLV 23-27A		As Req.		Closed		
		Test VLV 23-28A		As Req.		Closed & Capped		
		Drain Pot Vent		Open & Uncapped		Closed & Capped		

Local Leak Rate Test Sheet for Penetration N-10 HPCI STEAM SUPPLY

Restrictions: OUTAGE

Test Boundaries MO 23-15, MO 23-16, and AO-4807

Tested by _____ Date _____

TIME	PRESS	FLOW

AVERAGE FLOW = _____ cc/min

AS FOUND LEAKAGE = _____ cc/min
(see Step 9 General Proc)

COMMENTS:

LLRT Box No. ___
Calibration Date _____
TEST TAP VALVES
TESTED PER PROCEDURE ST 20.116
LEAKAGE = _____ cc/min