



Public Service of New Hampshire

New Hampshire Yankee Division

12  
Frank - I got this from Yankee -  
I know they met @ Crosby on 3/7/85 was  
I'm trying to track down what outcome was  
I'll advise Har Gregg  
3/14/85

SEABROOK STATION  
Engineering Office

February 27, 1985

SBN- 772

T.F. H1.1.28/G1.1.11

United States Nuclear Regulatory Commission  
Region I  
631 Park Avenue  
King of Prussia, PA 19406

Attention: Mr. Harold Gregg

References: (a) Construction Permits CPPR-135 and CPPR-136, Docket  
Nos. 50-443 and 50-444  
(b) PSNH Letter SBN-751, dated January 17, 1985, "Interim  
10CFR50.55(e) Report, Main Steam Safety Valve Ring Setting  
Deficiency", J. DeVincentis to R. W. Starostecki

Subject: Additional Documentation; Seabrook Main Steam Safety Valve Ring  
Setting Deficiency

Dear Sir:

Per your request, we have enclosed the following documentation regarding  
the subject 10CFR50.55(e) item [Reference (b)]:

- A. Test Procedure for Wyle High Flow Steam System Safety/Relief Valves  
Recertification/Acceptance/Evaluation Testing, Procedure No. 1021,  
September 17, 1981
- B. Test Report for Full Flow Testing of 16, 18, and 20-Inch Main Steam  
Safety Valve Vent Stacks for Yankee Atomic Electric Company, Report  
No. 47447-0

Note that the last three x-y plots, dated December 1, 1984, of the Test  
Report, graphically depict the Crosby valve ring setting deficiency. We have  
previously discussed these results in telephone conferences. If further  
discussion or data is required, please contact us.

Very truly yours,

J. DeVincentis, Director  
Engineering and Licensing

Enclosures

cc: Atomic Safety and Licensing Board Service List

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PDR

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**WYLE**

LABORATORIES SCIENTIFIC SERVICES & EQUIPMENT GROUP

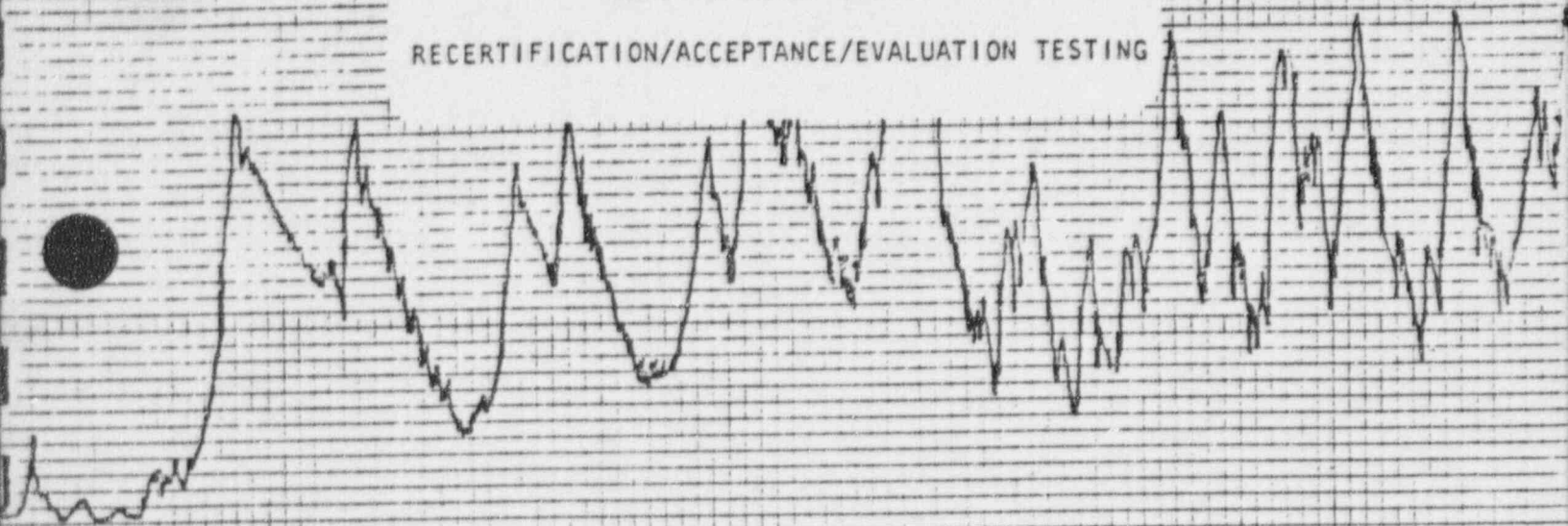
TEST PROCEDURE

FOR

WYLE HIGH FLOW STEAM SYSTEM

SAFETY/RELIEF VALVES

RECERTIFICATION/ACCEPTANCE/EVALUATION TESTING



test PROCEDURE

-8605280228 41p.

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F. H. Mosby  
M. J. Kimbrell  
M. J. Kimbrell  
J. R. Napp  
J. R. Napp



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## 1.0 PURPOSE

The purpose of this test procedure is to present the methods and procedures used in testing safety and safety relief valves on the Wyle full flow steam test system. It is very generalized in nature and can be modified to satisfy each customer's requirements.

## 2.0 REFERENCES

- 2.1 ASME Boiler and Pressure Vessel Code, as applicable.
- 2.2 American National Standard N45.2, "Quality Assurance Program Requirements for Nuclear Power Plants."
- 2.3 American National Standard ANSI/ASME PTC 25.3-1976, "Safety and Relief Valves."
- 2.4 Nuclear Regulatory Commission Regulation 10 CFR 50, Appendix B.
- 2.5 Nuclear Regulatory Commission Regulation 10 CFR 21.
- 2.6 Customer's Purchase Order and Special Instructions.

## 3.0 TEST EQUIPMENT AND INSTRUMENTATION

### 3.1 Calibration of Test Equipment and System Calibration

All test equipment and instrumentation used in the performance of this test program shall be calibrated in accordance with Wyle Laboratories' Quality Assurance Policies and Procedures Manual, which conforms to the applicable portions of ANSI-N45.2, 10 CFR 50/Appendix B, and Military Specification MIL-C-45662A. Standards used in performing all calibrations are traceable to the National Bureau of Standards.

All test equipment is calibrated on a periodic basis and the calibration interval is displayed on a decal. This decal is affixed to the equipment indicating the last calibration date, the next calibration due date, accuracy, and by whom calibrated. In addition to individual component calibration, prior to and immediately following test, an end-to-end system calibration is performed on equipment used to establish valve set pressure.

### 3.2 Measurements and Tolerances

Unless specified otherwise, the maximum allowable tolerance on test condition measurements shall be as follows:

#### Parameter

- A. Temperature  $\pm$   $\pm$  4°F
- B. Pressure:
  - Heise Gauge  $\pm$  0.1% F.S.
  - Deadweight Tester  $\pm$  0.05%
  - Pressure Transducer  $\pm$  1.0 psi

## 4.0 PERSONNEL CERTIFICATION

Wyle certifies that all personnel assigned to the steam valve facility are qualified for the tasks assigned. Personnel qualification is achieved by personnel education levels, vocational training, and practical experiences as outlined in ANSI-N45.2.

## 5.0 STORAGE

During any prolonged non-testing period, the test specimens shall be stored in a controlled storage area. The storage area shall be maintained in accordance with good laboratory practices, i.e., being properly protected from grease, oil, solvents, and any surface dirt that could influence the results of the test program. The storage area will be in compliance with ANSI-N45.2.2, Level C.

## 6.0 REQUIREMENTS AND PROCEDURES

### 6.1 System Description

- 6.1.1 The Wyle high flow system is described in more detail in Appendix I, but consists basically of two accumulators with a volume of approximately 950 cubic feet and is capable of storing a mass of steam at 1400-1550 psig. This steam is released through a servo-controlled valve system into a secondary accumulator of approximately 450 cubic feet of volume upon which the test article, a safety relief valve, has been thermally conditioned to simulate in-plant conditions.
- 6.1.2 The pressure rise in the secondary accumulator can be controlled from a low of approximately 15 psi/sec to over 200 psi/sec to simulate a reactor system experiencing an overpressure condition.
- 6.1.3 A normal test sequence is to install the test article, usually a safety relief valve, on the mounting flange of the secondary accumulator. Saturated steam shall be slowly admitted to the secondary accumulator until a pressure of 1000 +/- 10 psig of set pressure is attained. This pressure shall be maintained until thermal stabilization is achieved. Thermal stabilization is defined as no more than 4°F change in 15 minutes on any of the thermocouples attached to the valve.
- 6.1.4 In some instances, an environmental chamber shall be installed around the test article to provide an ambient temperature of 135° +/- 5°F, or as otherwise specified by the customer, to best simulate in-service conditions.
- 6.1.5 Steam tracing of the valve spring and insulation blankets may be used if elevated temperature is desired.

## 6.0 REQUIREMENTS AND PROCEDURES (CONTINUED)

### 6.2 Instrumentation

- 6.2.1 The valve lift shall be monitored with a linear voltage differential transformer (LVDT). The valve lift shall be recorded simultaneously with the valve inlet pressure on a X-Y recorder.
- 6.2.2 The inlet steam temperature, ambient temperature, body surface temperature and upper and lower bonnet surface temperatures shall be monitored using thermocouples. The temperatures shall be recorded on a digital recorder at one (1) minute intervals.
- 6.2.3 The valve inlet pressure shall be monitored with a pressure transducer and a Heise pressure gage. The valve inlet pressure, as monitored by the pressure transducer, shall be recorded simultaneously with the valve lift on the X-Y recorder. (Prior to each set pressure pop, the pressure transducer reading shall be adjusted as necessary to agree with the pressure gage reading.) The pressure transducer and the pressure gage shall be calibrated against a deadweight tester prior to and subsequent to test.
- 6.2.4 The thermocouples on the valve shall be attached by banding or spot welding as directed by the customer.

### 6.3 Leak Testing

#### 6.3.1 Mirror Leak Test

Mirror leak testing shall be conducted at the beginning and completion of testing or as otherwise directed by the customer. The leakage test shall be performed as follows.

- 6.3.1.1 A cold ( $<100^{\circ}\text{F}$ ) mirror about 2 inches square and 1/8 inch thick shall be passed around the disc to seat interface and the mirror inspected. If no moisture or a faint fogging is detected, it may be concluded that essentially zero steam leakage is present. If the mirror surface shows condensation droplets, the leakage is unacceptable and the valve must be repaired per Reference 2.6. If in doubt about whether the condensation is leakage or faint fogging, holding the mirror at the suspect area for a longer period of time will produce increased condensation droplets if steam leakage exists. The mirror shall not be allowed to heat up.



## 6.0 REQUIREMENTS AND PROCEDURES (CONTINUED)

### 6.3 Leak Testing (Continued)

#### 6.3.2 Quantitative Leak Testing

6.3.2.1 If so desired, quantitative leak testing may be conducted, but normally only when the normal west-facing tailpipe is connected. The coined blankoff plate in the Daniel Senior Orifice will be installed to isolate approximately 10 feet of tailpipe downstream of the test valve and a condenser will be used to condense steam leakage.

6.3.2.2 Leakage shall be collected in a graduated cylinder for three 5-minute periods and recorded. Acceptance/rejection criteria will be as dictated by individual customers.

### 6.4 Set Pressure Verification

6.4.1 Set pressure verification shall normally be under full flow conditions using the servo V-1 and V-2 controls. Blowdown will also be determined under these conditions, but may or may not be considered as acceptance/rejection criteria. Ramps shall be from 2 to 250 psi and may be varied to determine ramp sensitivity. A minimum of 10 minutes shall elapse between runs. To exercise the valve and obtain data in a rapid fashion, V-1 only runs may be performed (essentially full lift, short duration).

6.4.2 If the measured set pressure is not within  $\pm 1\%$  of the nameplate set pressure, or as otherwise directed by the customer, the valve shall be adjusted and actuated again.

6.4.3 The 4 valid test runs shall be within  $\pm 1\%$  of the nameplate set pressure, or as otherwise directed by the customer, and shall not exhibit a trend in either the increasing or decreasing direction. A trend is defined as a variation of more than 1.5% of nameplate set pressure from first valid run to last valid run and the intervening valid test runs are each successively higher than the preceding runs or lower than the preceding runs. For valve certification, ramp rates shall be controlled within the range specified by the customer.

### 6.5 Blowdown

It has been found that for some valves blowdown is a function of system backpressure. If desired, different sized orifices may be installed in the discharge pipe to superimpose various backpressures. These backpressures and acceptance limits must be provided by individual customers and may be added to this procedure as an approved appendix.

APPENDIX I

HIGH FLOW STEAM LOOP DESCRIPTION

## HIGH FLOW STEAM LOOP DESCRIPTION

### Introduction:

The Wyle High Flow Steam Facility has the capabilities for valve operability qualification per NRC Regulatory Guide 1.48 or ANSI 278-2.4. All test equipment and instrumentation used in conducting the test programs comply with the requirements of the Wyle Laboratories Quality Control Manual which conforms to MIL-C-45662A and the applicable portions of ANSI H45.2 and 10CFR50, Appendix E.

### System Description:

The Wyle High Flow Steam Facility (Figure 1) was designed to determine the operating characteristics of GE-BWR-NPP Safety Relief Valves under full flow and full lift conditions.

Steam for the High Flow System is provided by two Holman boilers that can be operated independently or in parallel. The boilers are usually fired by natural gas, but in times of natural gas shortages are operated on a propane standby system. Each boiler can provide saturated steam at a flow rate of 15,000 lb/hr at a maximum pressure of 1700 psig. Accumulation for High Flow is provided by two 454 cubic accumulators (denoted as A1) which are connected to a third accumulator (A2) of 450 cubic feet. These accumulators are shown in Figure 1 along with the associated valving. Principal valves in the system with their associated function are as follows:

| <u>Size</u> | <u>Designation</u> | <u>Function</u>   |
|-------------|--------------------|---|
| 3"          | V1                 | Servo actuated control valve between A1 and A2 and in parallel with V2. |
| 10"         | V2                 | Main line servo actuated control valve between A1 and A2.               |
| 2"          | V3                 | Servo actuated drain valve on bottom of A2.                             |
| 3"          | V4                 | Servo actuated bleed valve on A2.                                       |
| 10"         | V5                 | Air motor controller isolation valve between A1 and A2.                 |
| 1"          | V6                 | Manual valve.   |

The servo controlled valves V1 and V2 control the inlet pressure ramp to the test valve and can be adjusted to deliver inlet ramps from 2 to 200 psi/sec. Typical system operation, after appropriate calibrations and temperature stabilizations, is to hold A2 at a pressure (approximately 1000 psig) which is dependent upon the type and set pressure of the relief valve under test and with A1 at a higher pressure (1350-1500 psig). V1 is then actuated to a partially open position to give the desired rate of pressure increase in A2. At a predetermined pressure, less than the relief valve set pressure, V2 is programmed

to a partially open position to increase the steam flow and rate of pressure increase. At a predetermined time, V2 is opened an additional amount, usually to 100%, to provide full flow to the test valve. During this time the inlet steam pressure has reached the specimen "set" pressure and opened. As the system pressure decays, the relief valve closes at its reseal pressure. During the full flow portion of the valve cycle, discharge pipe restrictors develop the appropriate backpressure. Also, during this time the inlet pressure is decaying at a relatively constant rate depending upon the test valve size, flow rate and test objective.



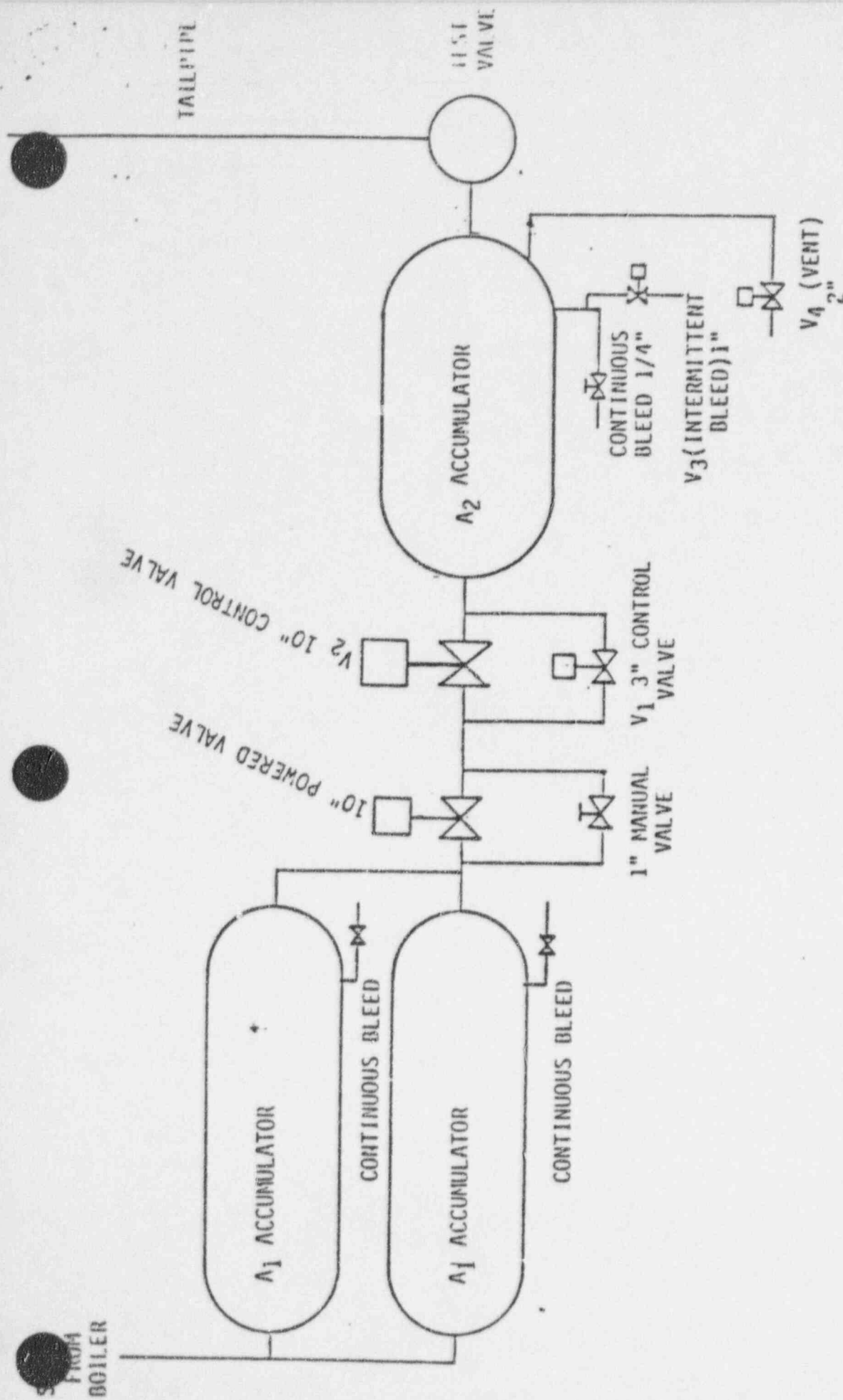


FIGURE 1

HIGH FLOW STEAM FACILITY DIAGRAM

TEST REPORT  
FOR  
FULL FLOW TESTING OF 16, 18, AND 20-INCH  
MAIN STEAM SAFETY VALVE VENT STACKS  
FOR  
YANKEE ATOMIC ELECTRIC COMPANY

1671 Worcester Road  
Framingham, Mass. 01701

8605280235 52 pp.

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# TEST REPORT



LABORATORIES SCIENTIFIC SERVICES & SYSTEMS GROUP

Yankee Atomic Electric Company  
1671 Worcester Road  
Framingham, Mass. 01701

REPORT NO. 47447-0  
OUR JOB NO. 47447  
YOUR P. O. NO. 104359  
CONTRACT N/A  
PAGE 1 of 18 PAGE REPORT  
DATE January 10, 1985

## 1.0 PURPOSE

The purpose of this report is to present the test procedure used and the test results obtained during a test program conducted to determine the design adequacy of the main steam safety valve vent stacks installed at the Seabrook Station.

## 2.0 REFERENCES

- 2.1 Wyle Laboratories' Quotation No. 544/2044-1/CP.
- 2.2 Wyle Laboratories' Test Plan No. 47447, Revision A.
- 2.3 Yankee Atomic Electric Company Purchase Order No. 104359
- 2.4 DRAVCO Corporation Sketch No. E-2936-IC-14.
- 2.5 DRAVCO Corporation Sketch No. E-2937-IC-639.
- 2.6 American National Standard ANSI/ASME N45.2-1977, "Quality Assurance Program Requirements for Nuclear Facilities."

## 3.0 TEST EQUIPMENT AND INSTRUMENTATION

All instrumentation, measuring, and test equipment used in the performance of this test program were calibrated in accordance with Wyle Laboratories' Quality Assurance Program which complies with the requirements of Military Specification MIL-STD-45662. Standards used in performing all calibrations are traceable to the National Bureau of Standards by report number and date. When no national standards exist, the standards are traceable to international standards or the basis for calibration is otherwise documented.

The Instrumentation Equipment Sheets are presented in Appendix I.

STATE OF ALABAMA }  
COUNTY OF MADISON }

W. Dysart

, being duly sworn,

deposes and says: The information contained in this report is the result of complete and carefully conducted tests and is to the best of his knowledge true and correct in all respects.

SUBSCRIBED and sworn to before me this 10th day of Jan, 1985

SEAL *W. Dysart*  
Notary Public in and for the State of Alabama at large.

My Commission expires Jan 30, 1985

Wyle shall have no liability for damages of any kind to person or property, including special or consequential damages, resulting from Wyle's providing the services covered by this report.

TEST BY NUCLEAR PLANT SERVICES

PROJ. ENGINEER *L. J. Millsaps* 1-16-85

L. J. Millsaps

WYLE Q. A. *G. W. Hight* 1/21/85

G. W. Hight

*4/1-11-8*

#### 4.0 PERSONNEL CERTIFICATION

Wyle certifies that all personnel assigned to the steam valve facility are qualified for the tasks assigned. Personnel certification is achieved through personnel education levels, vocational training, and practical experience as outlined in ANSI-N45.2.6.

#### 5.0 TEST SPECIMEN DESCRIPTION

- 5.1 The initial test specimen was fabricated in accordance with the configuration shown on References 2.4 and 2.5. The tailpipe was 10-inch Schedule 80 pipe and fittings, and the vent stack was 16-inch Schedule 30 pipe and fittings. This duplicated the vent stack presently installed in the plant.
- 5.2 A second vent stack, fabricated from 18-inch Schedule 10 pipe and fittings, was fabricated as a backup test specimen should the 16-inch vent stack prove to be inadequate.
- 5.3 A third vent stack was subsequently fabricated from 20-inch Schedule 20 pipe and fittings.
- 5.4 The fourth configuration used the 20-inch vent stack with the elbow removed. The 10-inch tailpipe was replaced with another section of 10-inch pipe and a 90° elbow which discharged into the vent stack.

#### 6.0 TESTS

##### 6.1 16-Inch Vent Stack

The 16-inch vent stack, 10-inch tailpipe, and 24-inch drip pan were fabricated and assembled in accordance with References 2.4 and 2.5, and instrumented as shown in Figure 1. A 6R10 Style HA 75FN Crosby main steam safety valve was used to supply steam to the vent stack.

The system was pressurized with saturated steam and the valve was allowed to heat for a period of time. Since the valve was not being tested, no specific stabilization requirements were used. The data from the initial actuation of the valve indicated that it only stroked 0.56 inches. Full stroke should be approximately one inch. The instrumentation and recording equipment was checked and the LVDT calibration verified. No problems were found.

The valve was actuated a second time with the same results. It was decided to remove the valve (Tag No. 1-MS-V53) and install a second valve (Tag No. 1-MS-V25). While the second valve was being installed, the valve manufacturer was contacted and apprised of the problem. It was recommended that the guide (upper) ring be lowered 150 notches, which would place it at the zero position.

## 6.0 TESTS (Continued)

### 6.1 16-Inch Vent Stack (Continued)

The second valve was allowed to heat and then actuated. The stroke was 0.52 inches. Therefore, the upper ring was lowered 150 notches and the valve actuated a second time. The stroke was 1.04 inches. Visual observation showed that there was significant blowback from the vent pipe. Some aspiration occurred when the valve disc dropped to the one-half open position. The valve was then adjusted and actuated at set pressures of 1238, 1220, 1203, and 1185 psig + 1 percent. In each case, the valve stroked fully; however, blowback from the vent pipe was observed. A video tape of the testing was furnished to the customer.

### 6.2 18-Inch Vent Stack

The second vent stack (18-inch) was then installed and the test repeated. In each case, the valve stroked fully; however, blowback from the vent stack was noted.

### 6.3 20-Inch Vent Stack

It was then decided to test the 20-inch vent stack described in Paragraph 5.3. The test results were essentially the same. Blowback appeared to be less, but was still unacceptable.

### 6.4 20-Inch Vent Stack with 90° Elbow

The 20-inch vent stack configuration was then modified as shown in Figure 2 and the tests repeated. The test results were the same. The first safety valve was installed in the system to determine if any valve problems existed. The results were the same after the upper ring was adjusted.

## 7.0 DATA

The tabulated data from 5 test series are shown in Tables I through V. The actual X-Y plots and oscillograph recordings will be stored in Wyle's contract files.

Photographs of the 16-inch vent stack test setup are shown in Photographs 1, 2 and 3.

## 8.0 DISPOSITION

The test program was placed "on hold" by the customer. The 20-inch vent stack with a 90° elbow was left in place. The safety valve was covered with polyethylene and the other valve was placed in storage.

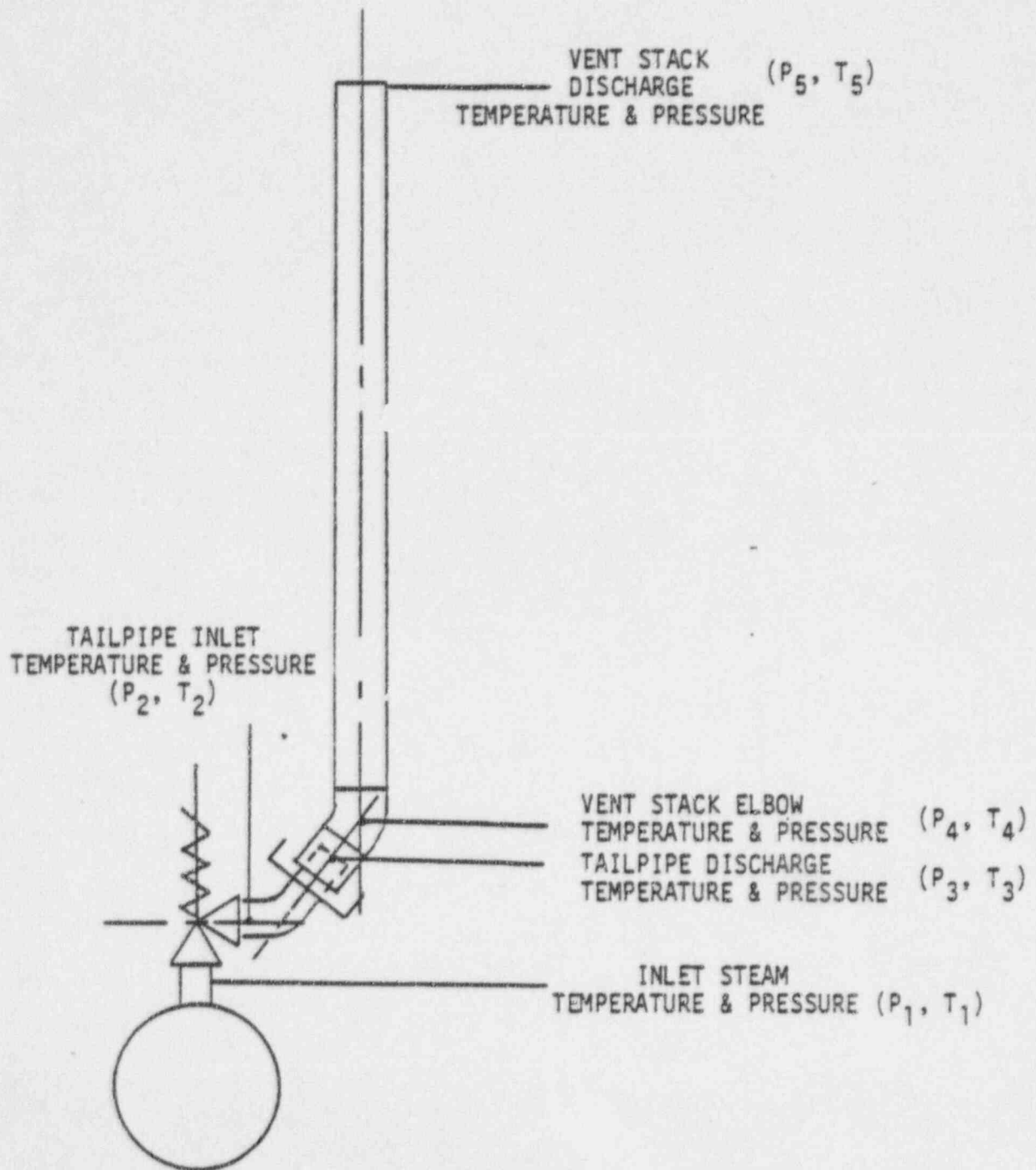


FIGURE 1. INSTRUMENTATION LOCATIONS (16, 18, AND 20-INCH VENT STACKS)



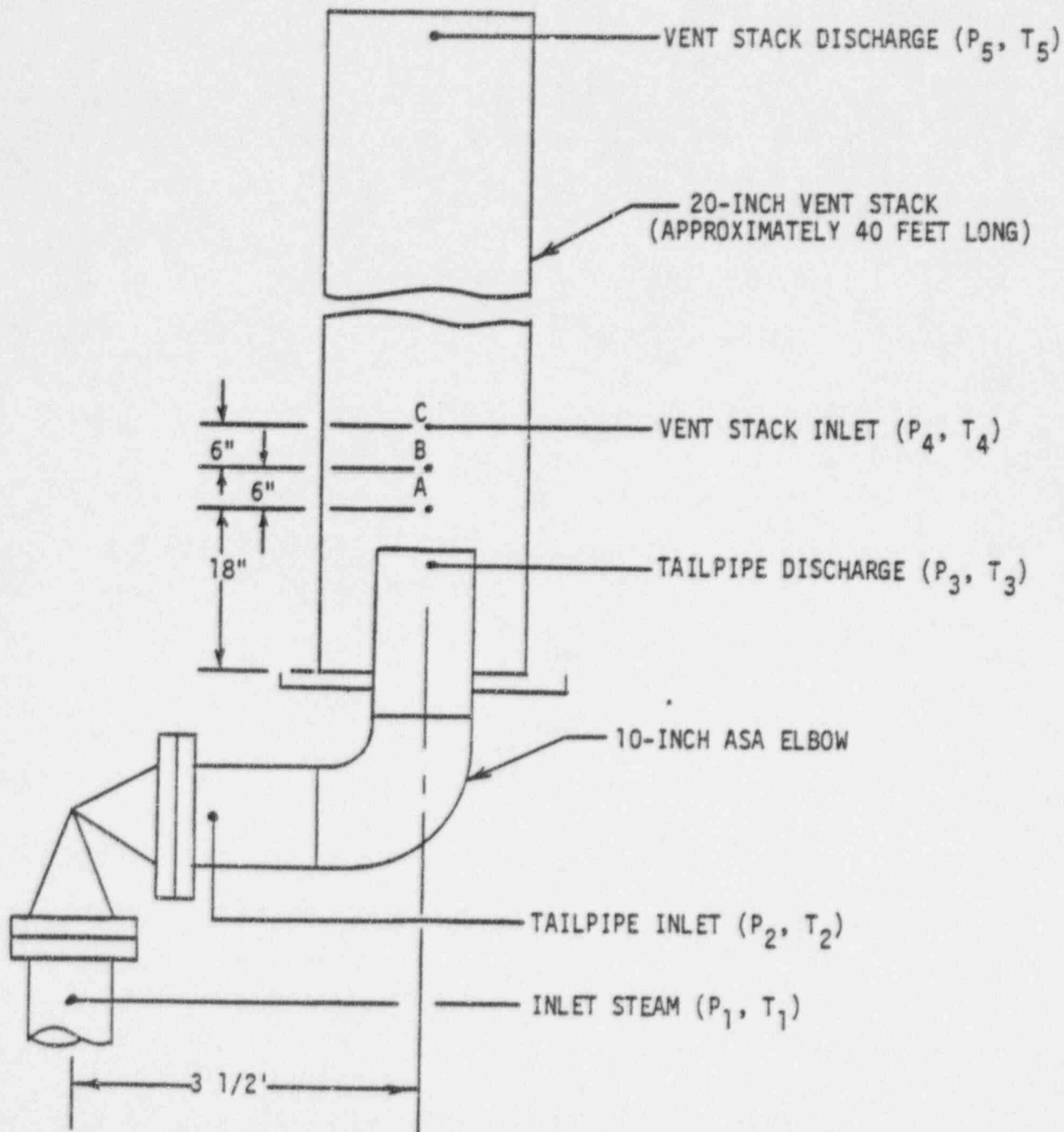


FIGURE 2. INSTRUMENTATION LOCATIONS (90° ELBOW/20-INCH VENT STACK)

TABLE I

TEST DATA SHEET, YANKEE ATOMIC J/N 47447, OCTOBER 17, 1984

VALVE TAG NUMBER 1-MS-V25

16-INCH VENT STACK

| RUN NO. | TIME | SET PRESS. | VALVE TEMP. (°F) |      |        | PRESSURE (PSIG) |                |                |                | TEMPERATURE (°F) |                |                |                | LIFT (IN) | RESEAT PRESS. | MAX. PRESS. | % BLOW-DOWN | % ACCUM. |
|---------|------|------------|------------------|------|--------|-----------------|----------------|----------------|----------------|------------------|----------------|----------------|----------------|-----------|---------------|-------------|-------------|----------|
|         |      |            | STEAM            | BODY | SPRING | P <sub>2</sub>  | P <sub>3</sub> | P <sub>4</sub> | P <sub>5</sub> | T <sub>2</sub>   | T <sub>3</sub> | T <sub>4</sub> | T <sub>5</sub> |           |               |             |             |          |
| 1       | 1328 | 1255       | 562              | 262  | 83     | <100            | <100           | 28             | 12             | 295              | 285            | 280            | 235            | 0.52      | 1181          | 1300        | 5.9         | 3.5      |
| 2       | 1404 | 1241       | 561              | 278  | 97     | 146             | 145            | 38             | 28             | 330              | 335            | 290            | 270            | 1.04      | 1161          | 1247        | 6.4         | 0.5      |
| 3       | 1441 | 1233       | 561              | 286  | 115    | 163             | 140            | 44             | 40             | 340              | 345            | 285            | 275            | 1.06      | 1156          | 1255        | 6.2         | 1.8      |
| 4       | 1523 | 1261       | 561              | 285  | 130    | 170             | 145            | 44             | 39             | 335              | 350            | 285            | 275            | 1.08      | 1176          | 1274        | 6.7         | 1.0      |
| 5       | 1558 | 1221       | 555              | 295  | 138    | 167             | 138            | 43             | 37             | 335              | 345            | 285            | 270            | 1.06      | 1140          | 1231        | 6.6         | 0.8      |
| 6       | 1619 | 1200       | 547              | 295  | 147    | 170             | 140            | 42             | 37             | 330              | 330            | 285            | 270            | 1.04      | 1125          | 1215        | 6.3         | 1.2      |
| 7       | 1635 | 1185       | 560              | 291  | 154    | 172             | 137            | 43             | 37             | 330              | 330            | 285            | 270            | 1.04      | 1112          | 1202        | 6.2         | 1.4      |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |

- NOTES: 1) Moved upper ring down 150 notches after Run No. 1.  
 2) Adjusted 1 3/4 flats clockwise after Run No. 3.  
 3) Adjusted 2 1/2 flats counterclockwise after Run No. 4.  
 4) Adjusted 1 flat counterclockwise after Run No. 5 and No. 6.

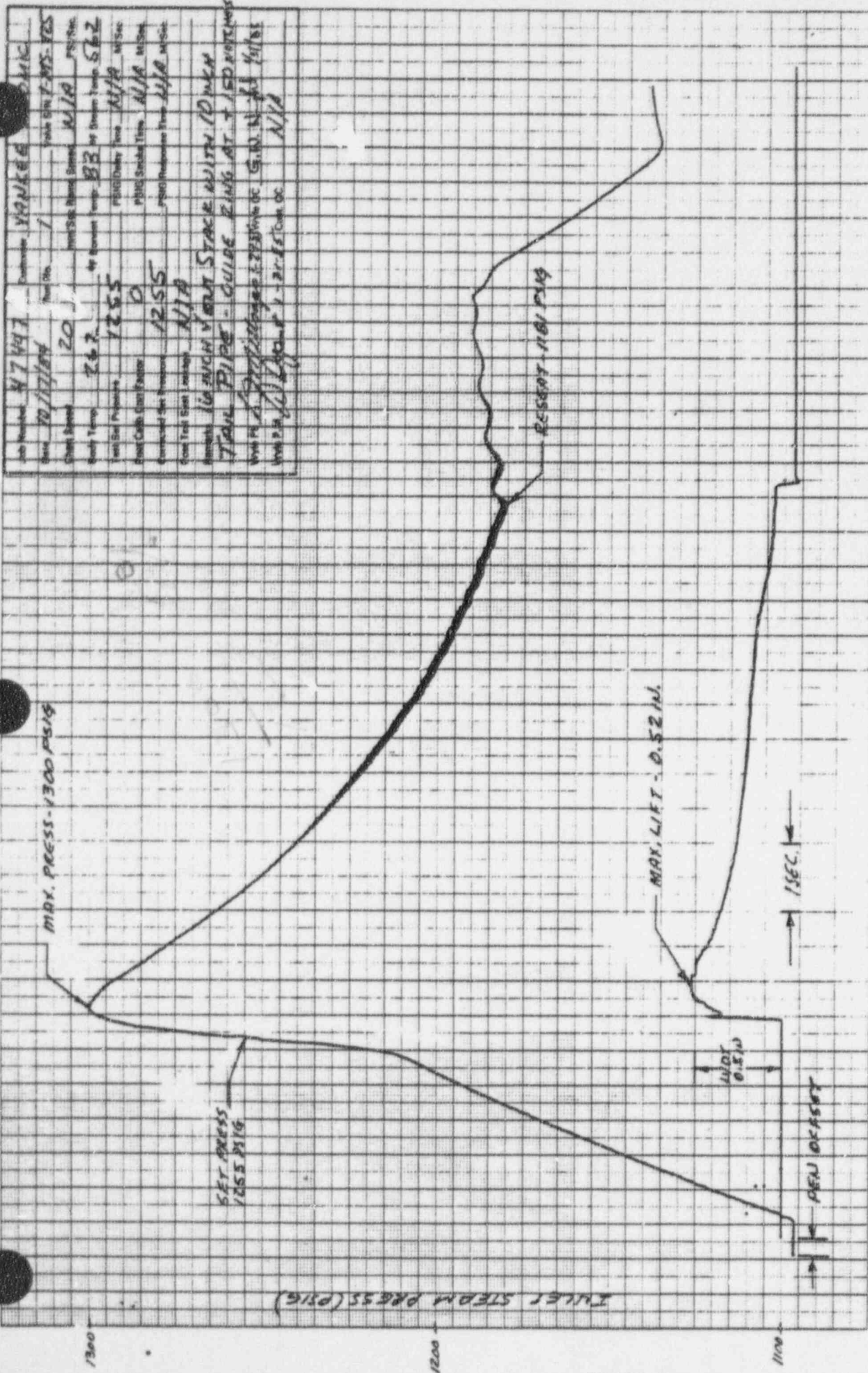
Run # 1

$$ACC = \left( \frac{1300 - 1255}{1255} \right) 100 = 3.5\%$$

$$BA = \left( \frac{1255 - 1181}{1255} \right) 100 = 5.9\%$$

|             |          |               |          |               |          |
|-------------|----------|---------------|----------|---------------|----------|
| Job Number  | 47447    | Customer      | VANDEE   | DATE          | 10/17/84 |
| Chart Dates | 20       | Test Date     | 10/18/84 | Test Time     | 12:55    |
| Chart Temp  | 26.2     | Test Temp     | 26.2     | Test Pressure | 1255     |
| Test Size   | 1255     | Test Pressure | 1255     | Test Time     | 12:55    |
| Test Date   | 10/18/84 | Test Pressure | 1255     | Test Time     | 12:55    |
| Test Size   | 1255     | Test Pressure | 1255     | Test Time     | 12:55    |
| Test Date   | 10/18/84 | Test Pressure | 1255     | Test Time     | 12:55    |
| Test Size   | 1255     | Test Pressure | 1255     | Test Time     | 12:55    |
| Test Date   | 10/18/84 | Test Pressure | 1255     | Test Time     | 12:55    |
| Test Size   | 1255     | Test Pressure | 1255     | Test Time     | 12:55    |

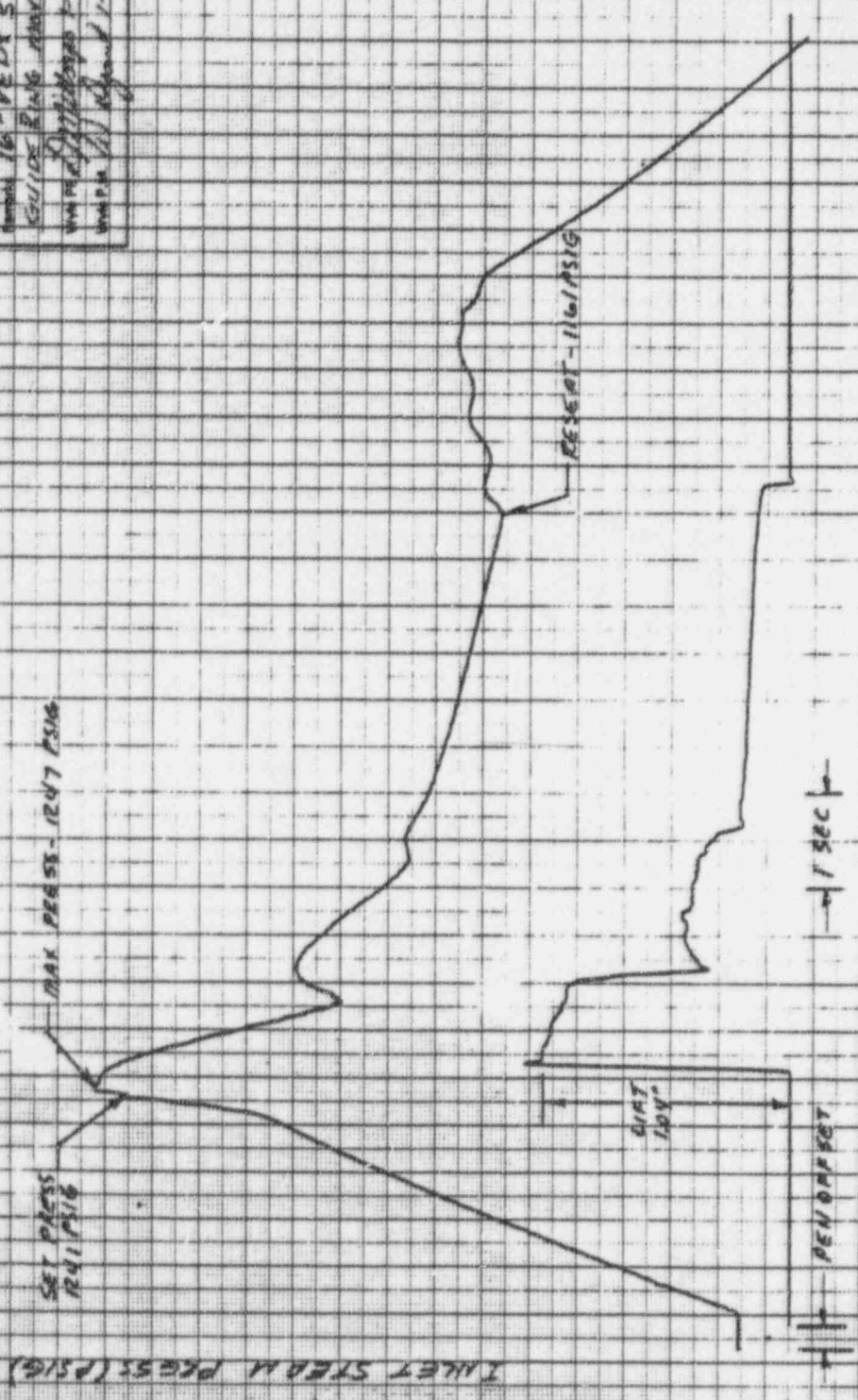
MAX. PRESS. 1300 PSIG  
 SET PRESS. 1255 PSIG  
 TAIL PIPE - GUIDE RING AT 150 INCHES  
 WITH 1/2" DIA. GUIDE RING AT 150 INCHES  
 WITH 1/2" DIA. GUIDE RING AT 150 INCHES  
 WITH 1/2" DIA. GUIDE RING AT 150 INCHES



$$A = \frac{1300 - 1255}{1255} = 3.5\%$$

$$B = \frac{1255 - 1181}{1255} = 5.9\%$$

Job Number: 47447 Customer: VANKE AIRLINE  
 Date: 10/17/94 Run No: 8 Tube Size: 1-1/2" STD  
 Chart Speed: 20 Test Part Part Speed: N/A PSI Sec:  
 Study Time: 22.8 sec Machine Temp: 97 by Machine Temp: 56.1  
 Test Part Pressure: 1241 PSIG PSIG Duty Time: 21/19 M Sec:  
 Peak Cath. Gun Fusion: 0 PSIG Shuttle Time: N/A M Sec:  
 Controlled Set Pressure: 1241 PSIG Response Time: N/A M Sec:  
 Peak Test Size: N/A  
 Remarks: 16 PVELY STACK WITH 10" TIP PIPE  
 GUIDE RING ARMED DOWN TO HORNES  
 WAS RECALIBRATED 1-29-95 W/IN OF G.D. LATER  
 USED P. IN RECALIB 1-29-95 OUT OF N/A



$$A = \frac{1247 - 1241}{1247} = 0.5\%$$

$$BD = \frac{1247 - 1161}{1247} = 6.9\%$$

6 SEC



$$A = \frac{1255 - 1233}{1255} = 1.7\%$$

$$B = \frac{1255 - 1156}{1255} = 7.9\%$$



## TABLE V

TEST DATA SHEET, YANKEE ATOMIC J/N 47447, DECEMBER 1, 1984

VALVE TAG NUMBER 1-MS-V53

20-INCH VENT STACK (90° ELBOW)

$$\left( \frac{1325}{1237} = 1 \right) \frac{1}{1.04} = 7\%$$

| RUN NO. | TIME | SET PRESS. | VALVE TEMP. (°F) |      |        | PRESSURE (PSIG) |                |                |                | TEMPERATURE (°F) |                |                |                | LIFT (IN) | RESEAT PRESS. | MAX. PRESS. | % BLOW-DOWN | % ACCUR. |
|---------|------|------------|------------------|------|--------|-----------------|----------------|----------------|----------------|------------------|----------------|----------------|----------------|-----------|---------------|-------------|-------------|----------|
|         |      |            | STEAM            | BODY | SPRING | P <sub>2</sub>  | P <sub>3</sub> | P <sub>4</sub> | P <sub>5</sub> | T <sub>2</sub>   | T <sub>3</sub> | T <sub>4</sub> | T <sub>5</sub> |           |               |             |             |          |
| 1       | 1014 | 1237       | 560              | 279  | 49     | 186             | 154            | 6              | 10             | 362              | 370            | 180            | 225            | 1.10      | 1160          | >1325       | 6.2         | >6.5     |
| 2       | 1027 | 1243       | 555              | 269  | 33     | 84              | 63             | -3             | -2             | 310              | 290            | 200            | 200            | .050      | 1158          | 1289        | 6.8         | 3.7      |
| 3       | 1105 | 1234       | 562              | 285  | 55     | 176             | 154            | N/D            | 10             | 360              | 335            | 240            | 228            | 1.10      | 1143          | 1258        | 7.4         | 1.9      |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |

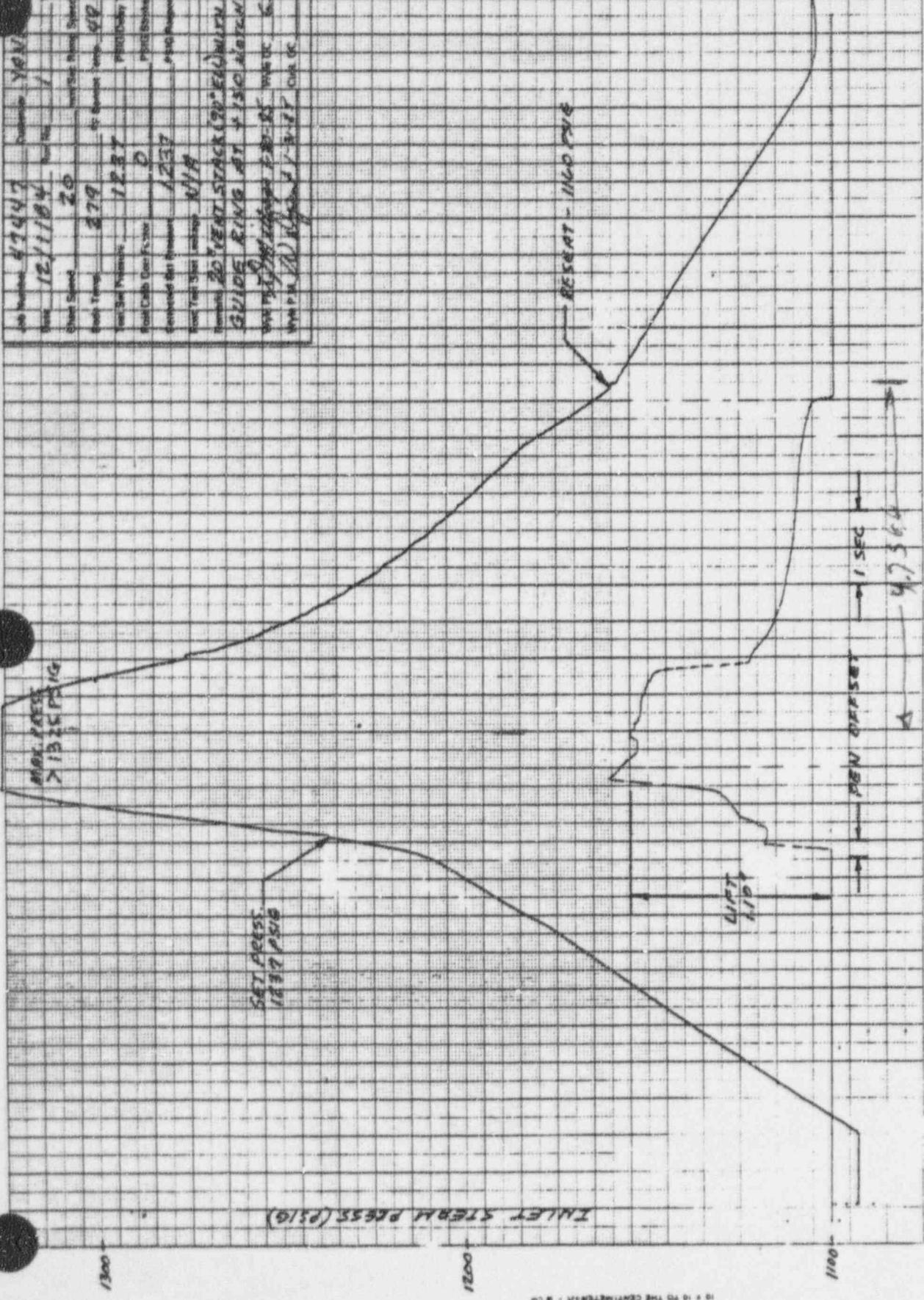
- NOTES: 1) P<sub>4</sub> at position "C" for Runs No. 1 and No. 2. Only achieved half lift on Run No. 2.  
 2) P<sub>4</sub> moved to position "A" for Run No. 3. P<sub>4</sub> malfunctioned. Upper ring moved down 150 notches to zero position.

6.6 % Acc to achieve full rated lift.

31 + 197

7  
10  
5  
6  
3  
31 Tests  
with max  
ACCUR ~ 7%

|                         |   |                     |        |                     |     |
|-------------------------|---|---------------------|--------|---------------------|-----|
| Job Number              | 47447   | Customer            | YOUNG  | MTA BIC             |     |
| Date                    | 12/1/84   | Unit No.            | 1      | YOUNG E-MS-159      |     |
| Sheet Speed             | 20  | Test Gas Name       | Subst. | N/A                 |     |
| Sheet Temp              | 279   | At Station Temp     | 48     | At Station Temp     | 580 |
| Test Gas Pressure       | 12.37   | Pressure Unit       | N/A    | Pressure Unit       | N/A |
| Field Cath. Drop Factor | 0   | Pressure Time       | N/A    | Pressure Time       | N/A |
| Calculated Gas Pressure | 12.37   | Field Response Time | N/A    | Field Response Time | N/A |
| Test Gas Unit           | N/A   |                     |        |                     |     |
| Remarks                 | 20' VENT STACK (90" EQUIV) WITH 10" DIA. PIPING<br>GUIDE RING AT 150' ALTITUDE<br>WIND 15 MPH, WINDSPEED 15-25 MPH, WIND DIR. N-NE<br>WIND P.M. 10:00 AM 1-3-87 CUBIC 11/18 |                     |        |                     |     |

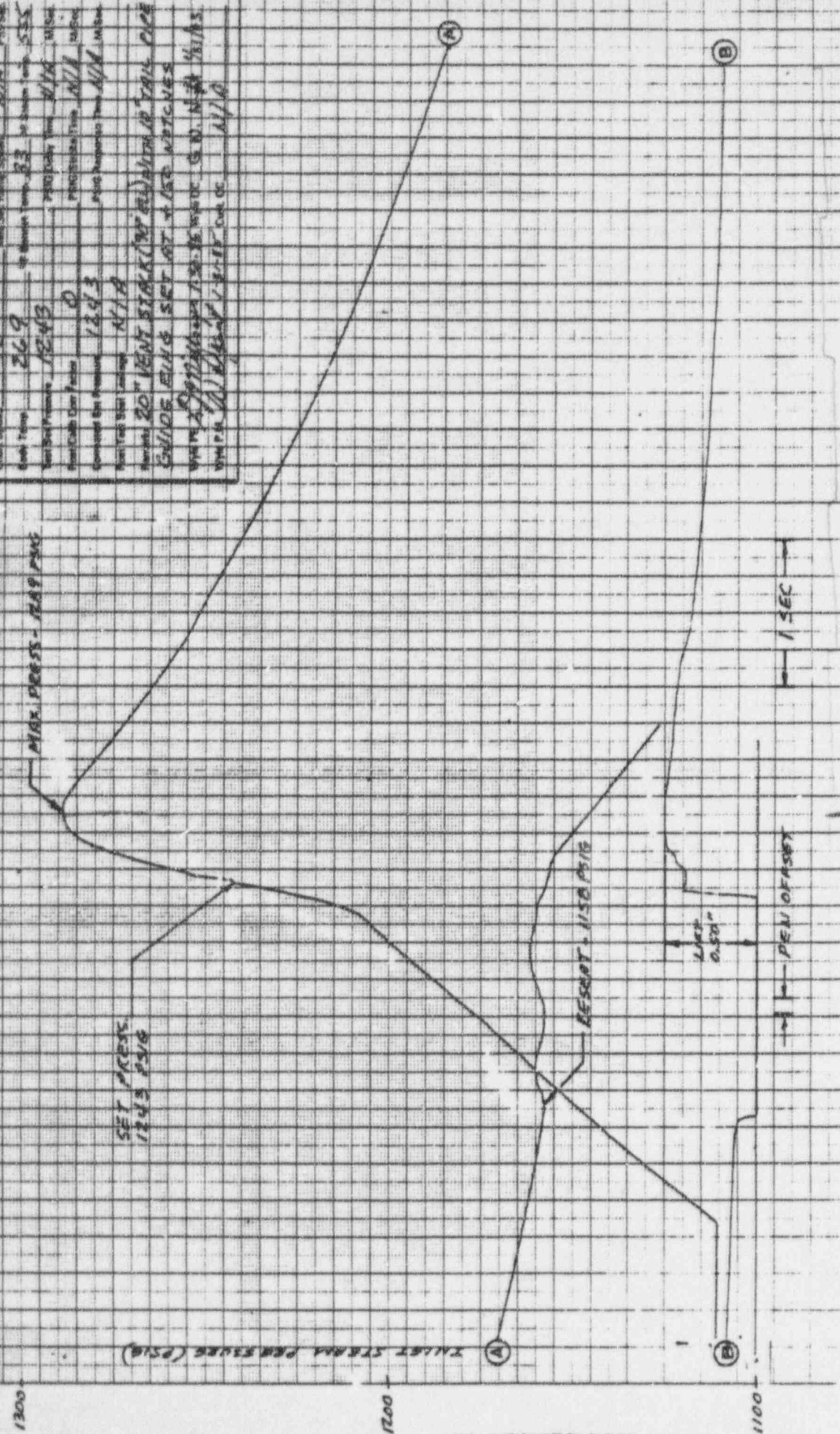


$$A = \frac{1325 - 1237}{1237} = 7.7\%$$

$$BD = \frac{1237 - 1160}{1237} = 6.2\%$$

$$t = 4.7560$$

|                           |  |                   |       |                  |
|---------------------------|--|-------------------|-------|------------------|
| Job Number                | 47447  | Customer          | YADA  | Atomic           |
| Date                      | 12/1/04  | Run No.           | 2     |                  |
| Chart Speed               | 40   | Intake Pump Speed | N/A   | Pressure         |
| Cable Temp                | 26.9   | to Electric Temp  | 33    | to Electric Temp |
| Test Set Pressure         | 1343   | Test Set Temp     | N/A   | Water            |
| Plant Cable Door Position | 0  | Pressure          | N/A   | Water            |
| Control Set Pressure      | 1243   | Plant Temperature | N/A   | Water            |
| Plant Test Set Settings   | N/A  |                   |       |                  |
| Remarks                   | 20" VENT STACK (W/FLUE) IN TAIL PIPE           |                   |       |                  |
|                           | GALLOS FLUE SET AT 450 NOTCHES                 |                   |       |                  |
|                           | W/ME 2 9972422000 150-16 NOTCH G.W. N/A 481/15 |                   |       |                  |
| W/ME P.E.                 | W/ME   | 15-16             | Notch | N/A              |



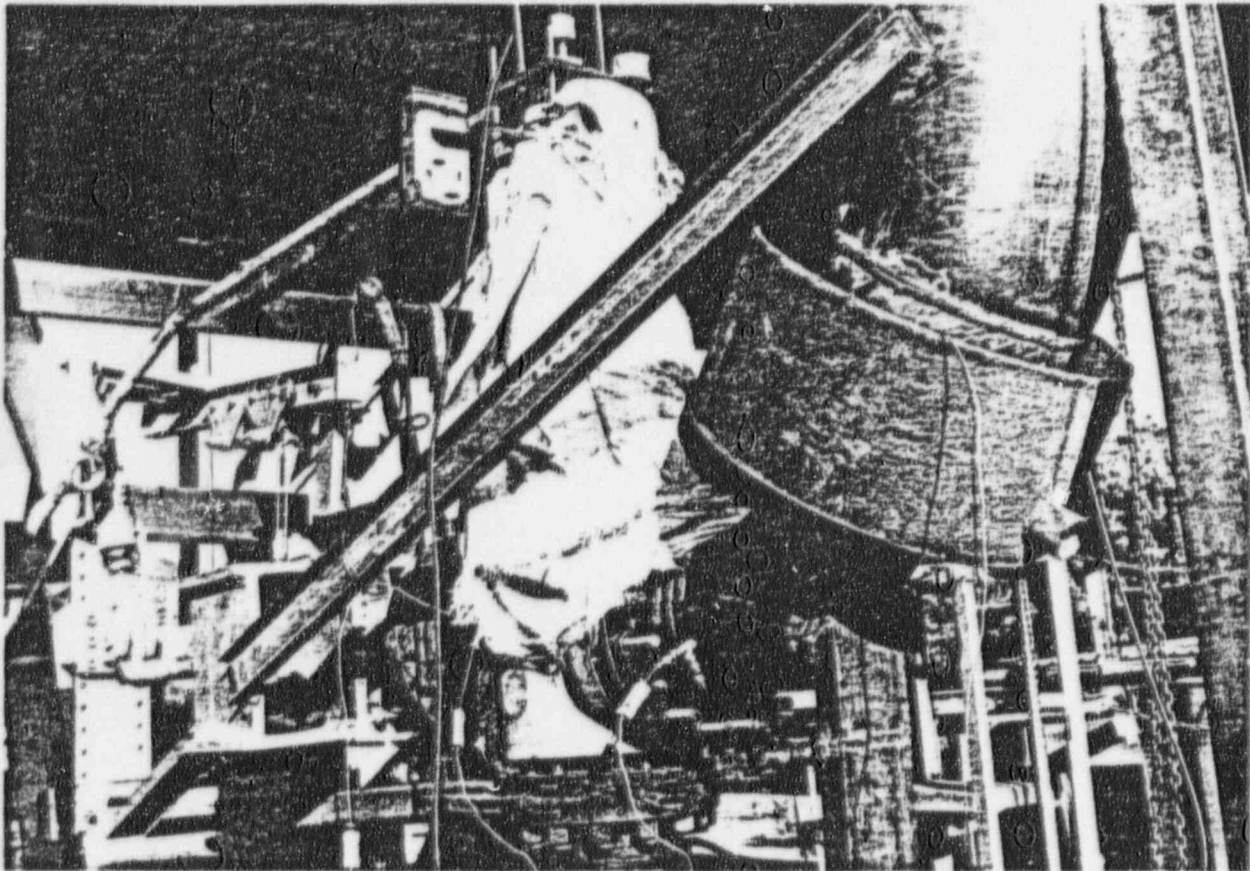
$$A = \frac{1289 - 1243}{1243} = 3.7\%$$

$$B_D = \frac{1243 - 1158}{1243} = 6.8\%$$

$$6 \sim 7.5\%$$



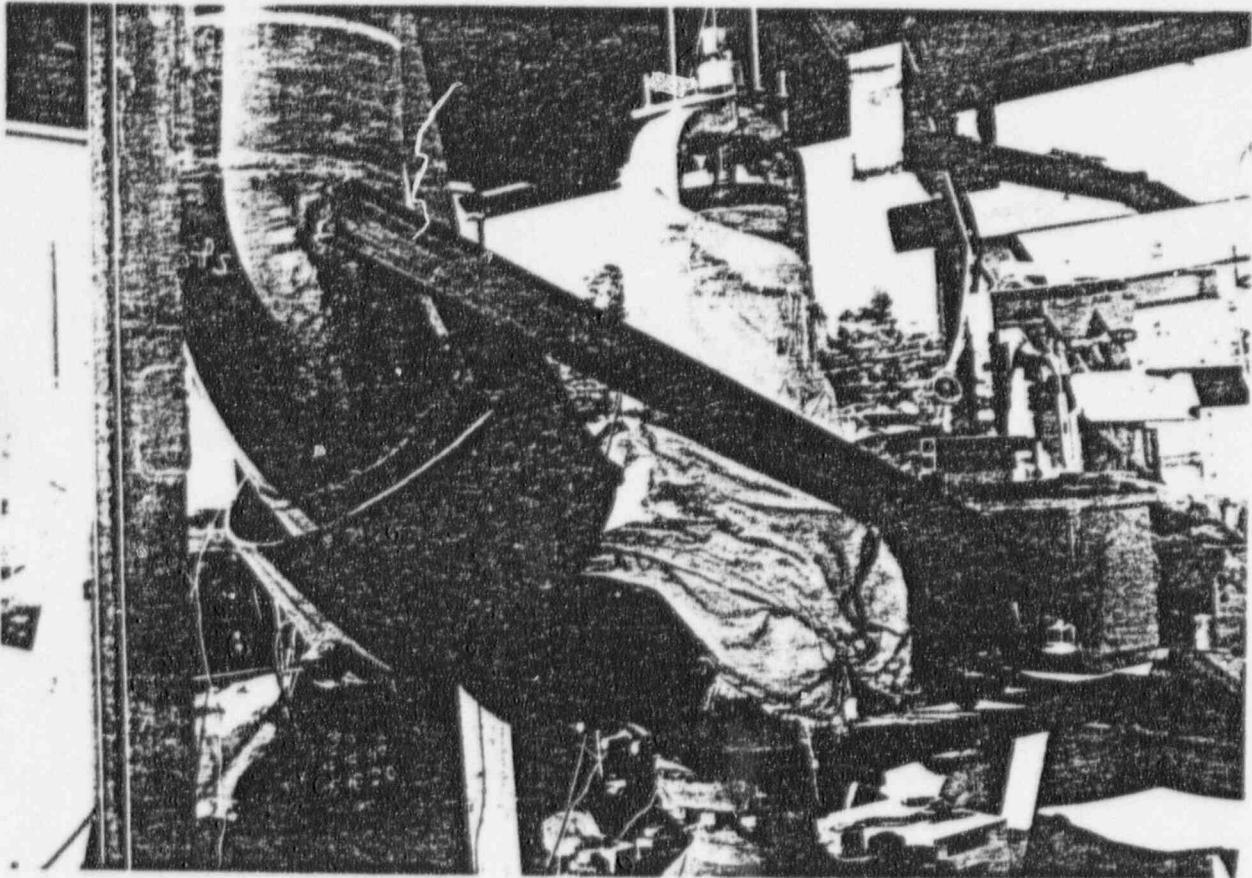




PHOTOGRAPH NO. 2

SAFETY VALVE, TAILPIPE, DRIP PAN, & ELBOWS





PHOTOGRAPH NO. 3

SAFETY VALVE, TAILPIPE, DRIP PAN, & ELBOWS

APPENDIX I  
INSTRUMENTATION EQUIPMENT SHEETS

# INSTRUMENTATION EQUIPMENT SHEET

Page 1 of 2

Date 11-27-84

Job No. 47447

Test Area HIGH FLOW

Technician D. Webb

Customer YANKEE ATOMIC

Type Test VENT STACK

Page No. 15  
Report No. 47447-0

| No. | Instrument               | Manufacturer  | Model No. | Serial No. | Wyle or Gov't No. | Range               | Accuracy | Calibration |              |
|-----|--------------------------|---------------|-----------|------------|-------------------|---------------------|----------|-------------|--------------|
|     |                          |               |           |            |                   |                     |          | On          | Due          |
| 1   | O-GRAPH                  | BELL & HOWELL | HR 212    | NA         | 100703            | DC-5 KHz            | MFG SPEC | 10-10-84    | 4-10-85      |
| 2   | GALVO-AMP                | HONEYWELL     | 117       | NA         | 0397              | GAIN 10:1           | ±2%      | 7-9-84      | 1-9-85       |
| 3   | GALVO-AMP                | HONEYWELL     | 117       | NA         | 95190             | GAIN 10:1           | ±2%      | 8-22-84     | 2-22-85      |
| 4   | MULTIMETER               | KEITHLEY      | 78        | NA         | 92680             | MULTIPLE            | MFG SPEC | 8-10-84     | 2-10-85      |
| 5   | FILTER                   | ROCKLAND      | 852       | NA         | 3148              | 0-100, 1MHz         | ±2%      | 11-27-84    | 5-27-85      |
| 6   | FILTER                   | ROCKLAND      | 852       | NA         | 100414            | 0-100, 1MHz         | ±2%      | 6-8-84      | 12-8-84      |
| 7   | X-Y PLOTTER              | H-P           | 7046A     | NA         | 96318             | 25mV to 5VDC/CM     | ±2%      | 11-12-84    | 1-12-85      |
| 8   | VOLTAGE CURRENT SOURCE   | DIGITEC       | 3110      | NA         | 100498            | 0-100VDC            | MFG SPEC | 7-12-84     | 1-12-85      |
| 9   | PRESSURE GAUGE           | Heise         | 710A      | NA         | 100272            | 0-1500 PSI          | ±.1%     | 10-8-84     | 4-8-85       |
| 10  | DATA LOGGER              | ACUREX        | A901      | NA         | 11209             | MULTIPLE            | MFG SPEC | 8-20-84     | 2-20-85      |
| 11  | Thermocouple Conditioner | DAYTRONIC     | 9110AK    | NA         | 100415            | -300 F° to +1300 F° | MFG SPEC | 4-16-84     | 4-16-85      |
| 12  | DEADWEIGHT TESTER        | AMETEK        | TQ 20     | NA         | 92564             | 0-2000 PSI          | ±.03%    | 10-11-84    | 10-11-86     |
| 13  | SIGNAL CONDITIONER       | Vishay        | 2120      | NA         | 3157              | 0-12VDC             | MFG SPEC | 9-14-84     | 12-14-84     |
| 14  | SIGNAL CONDITIONER       | Vishay        | 2120      | NA         | 3158              | 0-12VDC             | MFG SPEC | 9-14-84     | 12-14-84     |
| 15  | POWER SUPPLY             | Vishay        | 2110      | NA         | 11052             | 0-12VDC             | ±.1%     | 9-14-84     | 12-14-84     |
| 16  | SIGNAL CONDITIONER       | Vishay        | 2120      | NA         | 3155              | 0-12VDC             | MFG SPEC | 9-14-84     | 12-14-84     |
| 17  | SIGNAL CONDITIONER       | SCHAEVITZ     | CAS 100   | NA         | 92331             | 0-10VDC             | ±2%      | 7-17-84     | 1-17-85      |
| 18  | LVDT                     | SCHAEVITZ     | 3000 HR   | NA         | NA                | ±3 IN               | ±.25%    | 11-27-84    | PRIOR TO USE |

Wyle 1-3-85

Wyle 1-3-85

Instrumentation

HH 1029, Rev. A 11/82

Checked & Received By Paul A. Morgan 11-27-84

Finaly 11/27/84

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Test Area HIGH FLOW

Customer YANKEE ATOMIC ' Type Test VENT STACK

Page No. 16  
Report No. 47447-C

Paul C. Morgan 11-27-84

Wyle 1-3-85

Checked &amp; Received By \_\_\_\_\_

Thomsony 11/27/84



# INSTRUMENTATION EQUIPMENT SHEET

Page 1 of 2

Date 10-10-84

Job No. 47447

Test Area H1 FLOW - SITE B

Technician D. CHAMBERLAIN

Customer YANKEE ATOMIC

Type Test VENT STACK

| No. | Instrument               | Manufacturer  | Model No. | Serial No. | Wyle or Gov't No. | Range            | Accuracy   | Calibration |              |
|-----|--------------------------|---------------|-----------|------------|-------------------|------------------|------------|-------------|--------------|
|     |                          |               |           |            |                   |                  |            | On          | Due          |
| 1   | OSCILLOGRAPH             | BELL & HOWELL | HE 2012   | N/A        | 100703            | DC-5KHZ          | AMP. SPEC. | 10-10-84    | 4-10-85      |
| 2   | GALVO AMP                | HONEYWELL     | 117       | N/A        | 0392              | 10:16AW          | ±2%        | 7-9-84      | 1-9-85       |
| 3   | GALVO AMP                | HONEYWELL     | 117       | N/A        | 95190             | 10:16AW          | ±2%        | 8-22-84     | 2-22-85      |
| 4   | FILTER                   | ROCKLAND      | 852       | N/A        | 100414            | 0-1 AMP          | ±2%        | 6-8-84      | 12-8-84      |
| 5   | MULTIMETER VOLTAGE       | KEITHLEY      | 178       | N/A        | 922680            | MULTIPLE         | AMP. SPEC. | 8-10-84     | 2-10-85      |
| 6   | CURRENT SOURCE           | DIGITEC       | 3110      | N/A        | 100498            | 0-100W           | AMP. SPEC. | 7-12-84     | 1-12-85      |
| 7   | PRESSURE GAUGE           | HEISE         | 710A      | N/A        | 100272            | 0-1500 PSI       | ±1% FS     | 10-8-84     | 4-8-85       |
| 8   | DATA LOGGER THERMOCOUPLE | ACUREX        | AA01      | N/A        | 11209             | MULTIPLE         | AMP. SPEC. | 8-20-84     | 2-20-85      |
| 9   | CONDITIONER              | DAYTRONIC     | 9110AK    | N/A        | 100415            | -300°F TO 1250°F | AMP. SPEC. | 10-16-84    | 4-16-85      |
| 10  | SIGNAL CONDITIONER       | VISHAY        | 2120      | N/A        | 3157              | 0-12VDC          | AMP. SPEC. | 9-14-84     | 12-14-84     |
| 11  | SIGNAL CONDITIONER       | VISHAY        | 2120      | N/A        | 3158              | 0-12VDC          | AMP. SPEC. | 9-14-84     | 12-14-84     |
| 12  | POWER SUPPLY             | VISHAY        | 2110      | N/A        | 11052             | 0-12VDC          | ±1% R      | 9-14-84     | 12-14-84     |
| 13  | SIGNAL CONDITIONER       | SCHAEVITZ     | CS100     | N/A        | 92331             | 0-10VDC          | ±2%        | 7-17-84     | 1-17-85      |
| 14  | LUDET                    | SCHAEVITZ     | 3000HR    | N/A        | N/A               | ±3 IN.           | ±.25%      | 10-10-84    | PREV. TO USE |
| 15  | LUDET CALIBRATOR         | SCHAEVITZ     | CALDIM    | N/A        | 92332             | 0-2 M.           | ±.001"     | 10-4-84     | 4-4-85       |
| 16  | PRESSURE XOVER           | B & H         | CER1000   | N/A        | 11636             | 0-1500 PSI       | ±.25%      | 8-11-84     | 2-11-85      |
| 17  | PRESSURE XOVER           | B & H         | CER1000   | N/A        | 101239            | 0-500 PSI        | ±.25%      | 9-17-84     | 3-17-85      |
| 18  | PRESSURE XOVER           | B & H         | CER1000   | N/A        | 101216            | 0-500 PSI        | ±.25%      | 9-17-84     | 3-17-85      |

11/85

Instrumentation

HH 1029, Rev. A 11/82

Paul C. Chamberlain 10-10-84

Checked & Received By

11/85

D. J. Millage 10-10-84



Page 2 of 2

47447

Test Area *H, Flow - Site-B*

Type Test VENT STACK1/9/69

Paul A. Morgan 10-10-84 Checked & Received By J. M. Ellings 10-10-84

Instrumentation  
 HH 1029, Rev. A 11/82

TABLE IV

TEST DATA SHEET, YANKEE ATOMIC J/N 47447, NOVEMBER 30, 1984

VALVE TAG NUMBER 1-MS-V25

20-INCH VENT STACK (90° ELBOW)

| RUN NO. | TIME | SET PRESS. | VALVE TEMP. (°F) |      |        | PRESSURE (PSIG) |                |                |                | TEMPERATURE (°F) |                |                |                | LIFT (IN) | RESEAT PRESS. | MAX. PRESS. | % BLOW-DOWN | % ACCUM. |
|---------|------|------------|------------------|------|--------|-----------------|----------------|----------------|----------------|------------------|----------------|----------------|----------------|-----------|---------------|-------------|-------------|----------|
|         |      |            | STEAM            | BODY | SPRING | P <sub>2</sub>  | P <sub>3</sub> | P <sub>4</sub> | P <sub>5</sub> | T <sub>2</sub>   | T <sub>3</sub> | T <sub>4</sub> | T <sub>5</sub> |           |               |             |             |          |
| 1       | 1025 | 1225       | 555              | 248  | 82     | 164             | 149            | 42             | 10             | 360              | 348            | 248            | 232            | 1.14      | 1137          | 1264        | 7.2         | 3.1      |
| 2       | 1109 | 1220       | 558              | 248  | 103    | 164             | 151            | 42             | 10             | 362              | 355            | 248            | 232            | 1.10      | 1130          | 1264        | 7.4         | 3.5      |
| 3       | --   | --         | --               | --   | --     | --              | --             | --             | --             | --               | --             | --             | --             | --        | --            | --          | --          | --       |
| 4       | 1153 | 1195       | 557              | 278  | 132    | 152             | 137            | 43             | 10             | 355              | 335            | 235            | 228            | 1.06      | 1126          | 1203        | 5.8         | 0.7      |
| 5       | --   | --         | --               | --   | --     | --              | --             | --             | --             | --               | --             | --             | --             | --        | --            | --          | --          | --       |
| 6       | 1342 | 1200       | 556              | 305  | 160    | 154             | 131            | 4              | 10             | 358              | 330            | 179            | 230            | 1.1       | 1125          | 1221        | 6.2         | 1.7      |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |

Page No. 9  
Report No. 47447-0

- NOTES: 1) P<sub>4</sub> in "A" position for Runs 1-5, moved to "C" position for Run 6.  
 2) Removed drip pan for Runs 3-6.  
 3) For Runs 3 and 5, facility valve did not open. No accumulation was obtained.

TABLE III

TEST DATA SHEET, YANKEE ATOMIC J/N 47447, NOVEMBER 28, 1984

VALVE TAG NUMBER 1-MS-V25

20-INCH VENT STACK

| RUN NO. | TIME | SET PRESS. | VALVE TEMP. ( <sup>0</sup> F) |      |        | PRESSURE (PSIG) |                |                |                | TEMPERATURE ( <sup>0</sup> F) |                |                |                | LIFT (IN) | RESEAT PRESS. | MAX. PRESS. | % BLOW-DOWN | % ACCUM. |
|---------|------|------------|-------------------------------|------|--------|-----------------|----------------|----------------|----------------|-------------------------------|----------------|----------------|----------------|-----------|---------------|-------------|-------------|----------|
|         |      |            | STEAM                         | BODY | SPRING | P <sub>2</sub>  | P <sub>3</sub> | P <sub>4</sub> | P <sub>5</sub> | T <sub>2</sub>                | T <sub>3</sub> | T <sub>4</sub> | T <sub>5</sub> |           |               |             |             |          |
| 1       | 1210 | 1268       | 553                           | 306  | 57     | 166             | 145            | 40             | 12             | 355                           | 315            | 265            | 240            | 1.12      | 1176          | 1274        | 7.2         | 0.4      |
| 2       | 1236 | 1265       | 557                           | 321  | 40     | 161             | 147            | 41             | 12             | 370                           | 320            | 270            | 243            | 1.16      | 1176          | 1279        | 7.0         | 1.1      |
| 3       | 1338 | 1251       | 558                           | 313  | 51     | 159             | 137            | 41             | 12             | 370                           | N/D            | 292            | 242            | 1.16      | 1162          | 1270        | 7.1         | 1.5      |
| 4       | 1415 | 1232       | 559                           | 300  | 104    | 158             | 145            | 41             | 12             | 368                           | 330            | 268            | 242            | 1.12      | 1145          | 1257        | 7.1         | 1.9      |
| 5       | 1444 | 1214       | 557                           | 306  | 118    | 157             | 143            | 40             | 13             | 370                           | 325            | 270            | 242            | 1.14      | 1130          | 1247        | 6.9         | 2.6      |
|         |      |            |                               |      |        |                 |                |                |                |                               |                |                |                |           |               |             |             |          |
|         |      |            |                               |      |        |                 |                |                |                |                               |                |                |                |           |               |             |             |          |
|         |      |            |                               |      |        |                 |                |                |                |                               |                |                |                |           |               |             |             |          |
|         |      |            |                               |      |        |                 |                |                |                |                               |                |                |                |           |               |             |             |          |
|         |      |            |                               |      |        |                 |                |                |                |                               |                |                |                |           |               |             |             |          |
|         |      |            |                               |      |        |                 |                |                |                |                               |                |                |                |           |               |             |             |          |
|         |      |            |                               |      |        |                 |                |                |                |                               |                |                |                |           |               |             |             |          |
|         |      |            |                               |      |        |                 |                |                |                |                               |                |                |                |           |               |             |             |          |
|         |      |            |                               |      |        |                 |                |                |                |                               |                |                |                |           |               |             |             |          |

NOTES: 1) Adjusted 1/2 flat counterclockwise after Run No. 3.  
 2) Adjusted 1 flat counterclockwise after Run No. 4.

Page No. 8  
 Report No. 47447-0

TABLE 11

TEST DATA SHEET, YANKEE ATOMIC J/N 47447, OCTOBER 19, 1984

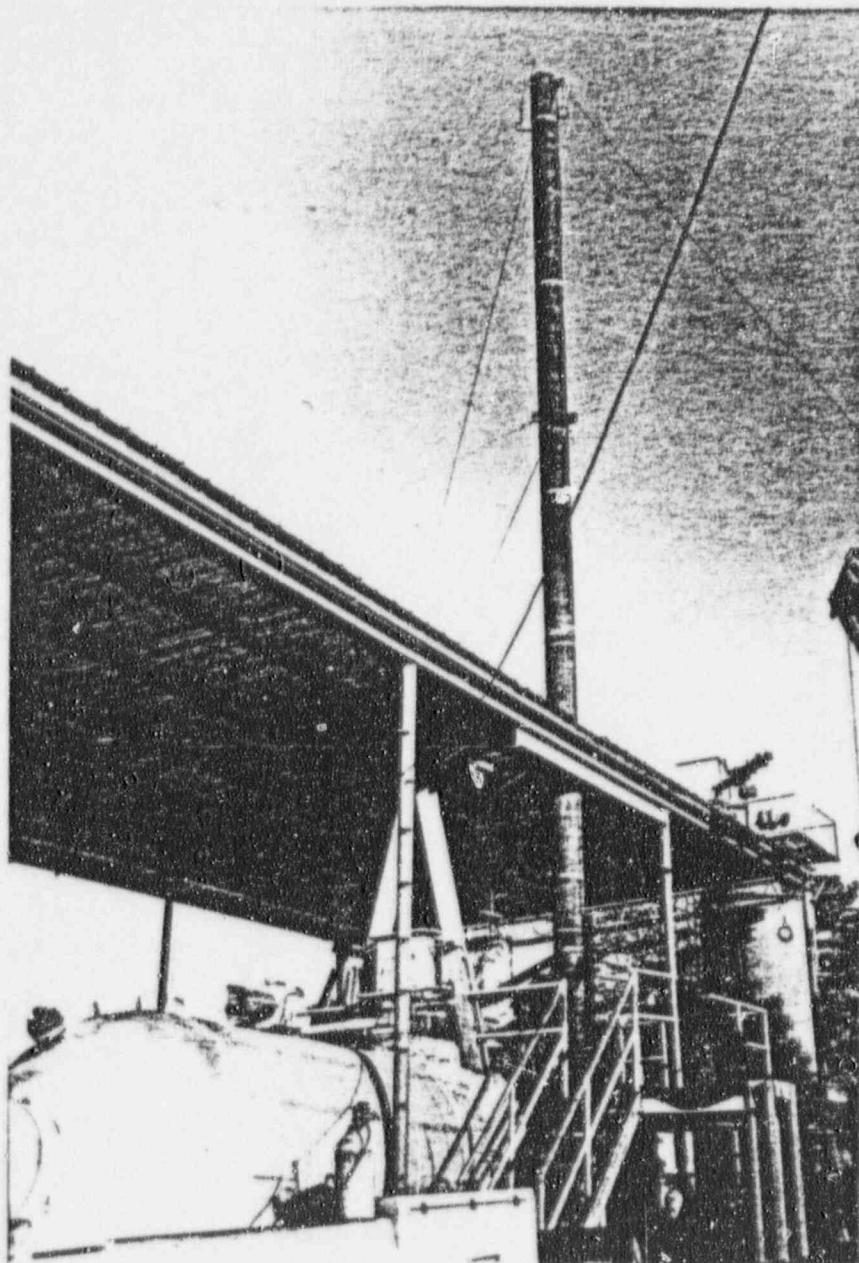
VALVE TAG NUMBER 1-MS-V25

18-INCH VENT STACK

| RUN NO. | TIME | SET PRESS. | VALVE TEMP. (°F) |      |        | PRESSURE (PSIG) |                |                |                | TEMPERATURE (°F) |                |                |                | LIFT (IN) | RESEAT PRESS. | MAX. PRESS. | % BLOW-DOWN | % ACCUM. |
|---------|------|------------|------------------|------|--------|-----------------|----------------|----------------|----------------|------------------|----------------|----------------|----------------|-----------|---------------|-------------|-------------|----------|
|         |      |            | STEAM            | BODY | SPRING | P <sub>2</sub>  | P <sub>3</sub> | P <sub>4</sub> | P <sub>5</sub> | T <sub>2</sub>   | T <sub>3</sub> | T <sub>4</sub> | T <sub>5</sub> |           |               |             |             |          |
| 1       | 0915 | 1198       | 557              | 245  | 107    | 184             | 140            | 39             | 32             | 345              | 335            | 300            | 250            | 1.16      | 1116          | 1225        | 6.8         | 2.2      |
| 2       | 0935 | 1194       | 555              | 264  | 119    | 188             | 140            | 54             | 33             | 350              | 330            | 300            | 250            | 1.12      | 1116          | 1226        | 6.5         | 2.6      |
| 3       | 0957 | 1207       | 559              | 271  | 130    | 188             | 138            | 63             | 33             | 345              | 330            | 300            | 250            | 1.18      | 1125          | 1232        | 6.8         | 2.0      |
| 4       | 1011 | 1205       | 557              | 270  | 129    | 193             | 142            | 67             | 32             | 350              | 320            | 300            | 250            | 1.12      | 1126          | 1256        | 6.5         | 4.1      |
| 5       | 1044 | 1228       | 561              | 290  | 118    | 191             | 140            | 64             | 32             | 345              | 325            | 310            | 245            | 1.18      | 1139          | 1240        | 7.2         | 0.96     |
| 6       | 1057 | 1216       | 558              | 288  | 115    | 194             | 142            | 67             | 32             | 350              | 330            | 305            | 250            | 1.12      | 1134          | 1250        | 6.7         | 2.7      |
| 7       | 1118 | 1238       | 563              | 279  | 129    | 196             | 145            | 70             | 32             | 345              | 325            | 300            | 250            | 1.16      | 1148          | 1254        | 7.3         | 1.3      |
| 8       | 1135 | 1235       | 563              | 290  | 139    | 194             | 146            | 68             | 32             | 345              | 320            | 300            | 250            | 1.12      | 1150          | 1266        | 6.9         | 2.4      |
| 9       | 1206 | 1259       | 566              | 288  | 145    | 198             | 150            | 70             | 30             | 345              | 330            | 300            | 250            | 1.22      | 1164          | 1279        | 7.5         | 1.6      |
| 10      | 1217 | 1250       | 563              | 292  | 156    | 196             | 146            | 69             | 32             | 350              | 335            | 300            | 250            | 1.14      | 1162          | 1276        | 7.0         | 2.0      |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |
|         |      |            |                  |      |        |                 |                |                |                |                  |                |                |                |           |               |             |             |          |

- NOTES: 1) Adjusted 1 flat clockwise after Run No. 2.  
 2) Adjusted 1 flat clockwise after Run No. 4. Verified calibration of P4.  
 3) Adjusted 1 flat clockwise after Run No. 6.  
 4) Adjusted 1 1/4 flats clockwise after Run No. 8.

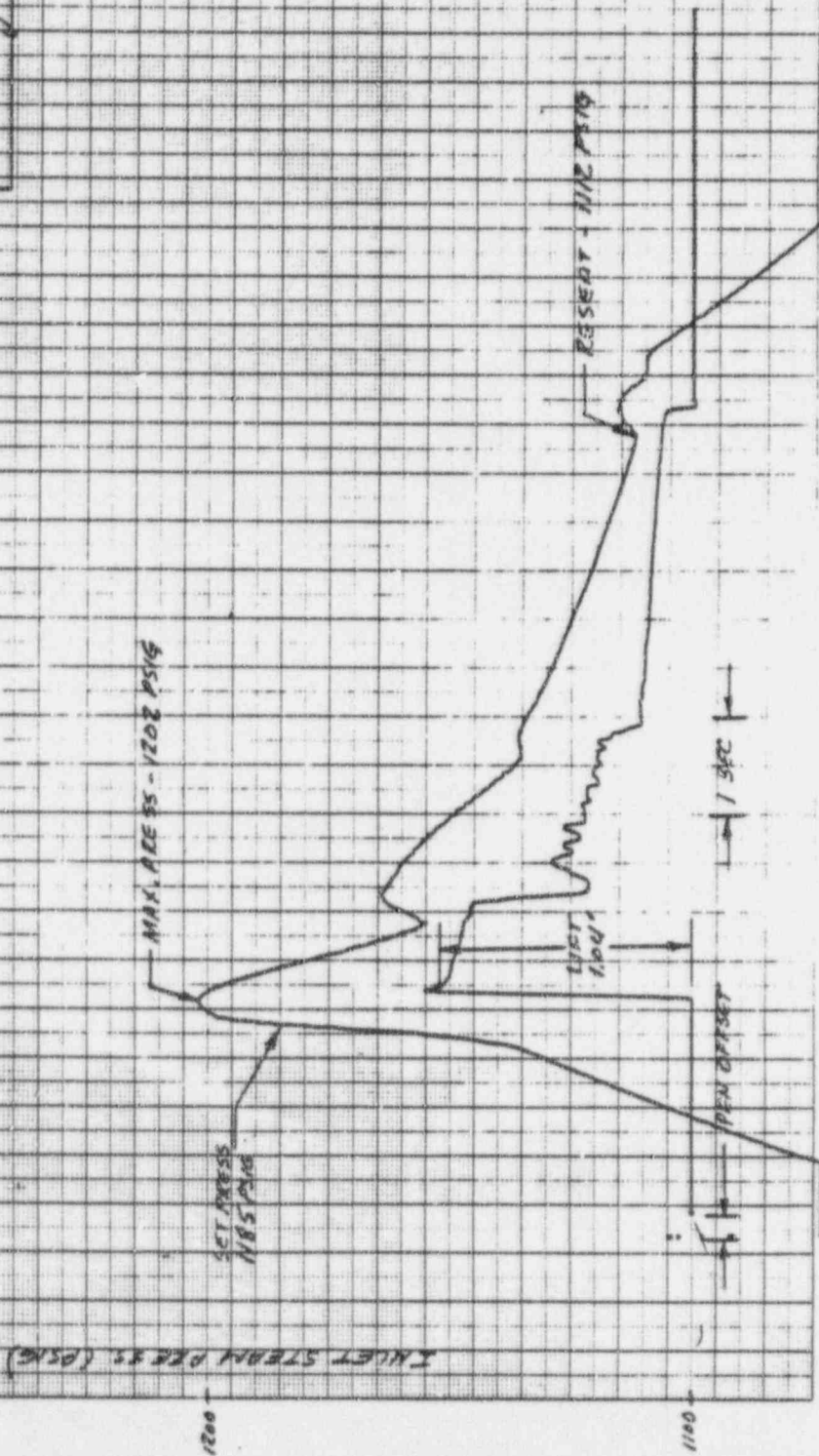




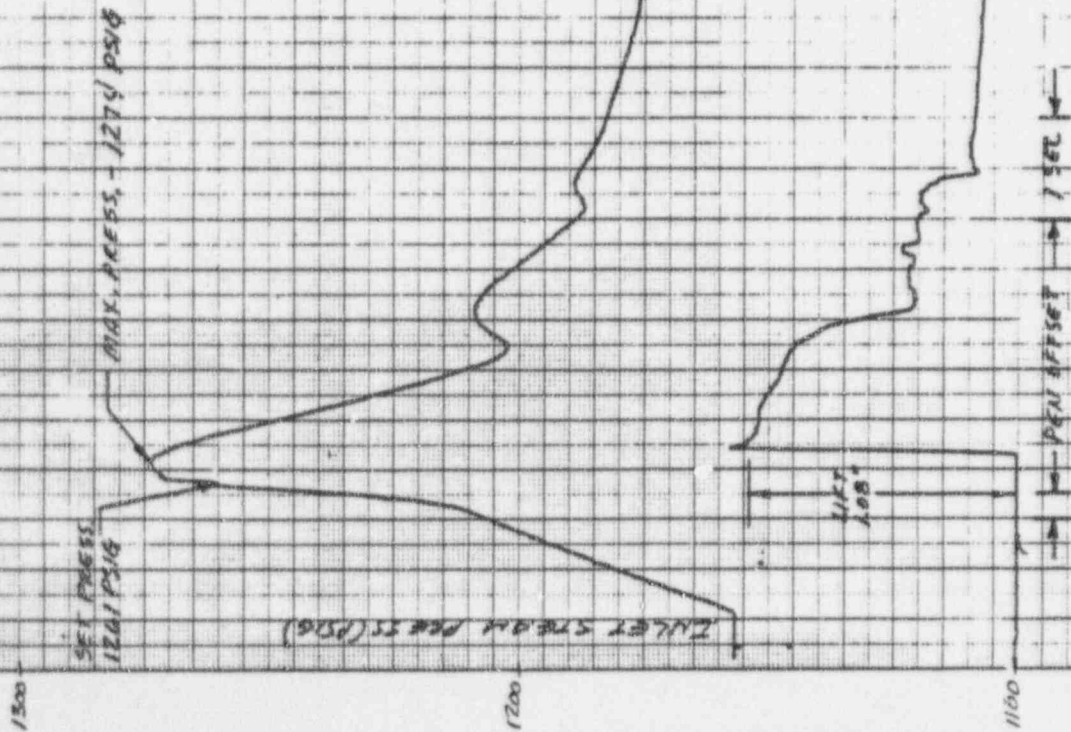
PHOTOGRAPH NO. 1  
OVERALL VIEW, 16-INCH VENT STACK



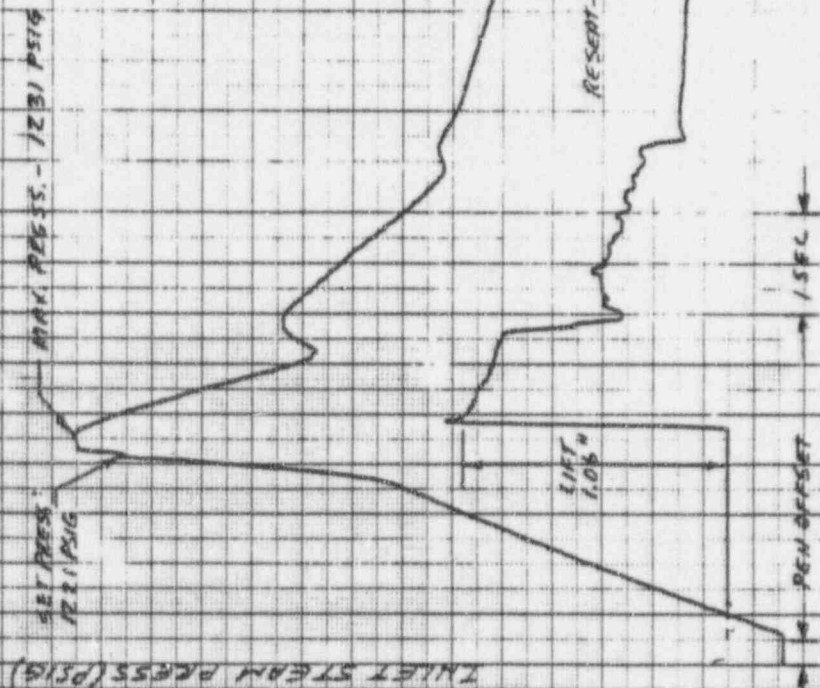
|                          |  |            |       |       |          |
|--------------------------|--|------------|-------|-------|----------|
| Job Number               | 42407  | Customer   | VANKE | DATE  | 10/17/84 |
| Date                     | 10/17/84   | Run No.    | 7     | Value | 1-MS-VBS |
| Chart Speed              | 20   | Chart Temp | N/A   | PSIG  |          |
| Scale Time               | 291  | PSIG       | 550   | PSIG  |          |
| Test Set Pressure        | 1105   | PSIG       | 550   | PSIG  |          |
| Post Settle Time         | 0  | PSIG       | 550   | PSIG  |          |
| Corrected for Pressure   | 1.85   | PSIG       | 550   | PSIG  |          |
| Post Test Time (Leakage) | N/A  | PSIG       | 550   | PSIG  |          |
| Remarks                  | 10" KENT STACK WITH 10" TAIL PIPE<br>GUIDE RING AT 2800 PSIG<br>With 10" 1-22 PSIG<br>With 10" 1-22 PSIG |            |       |       |          |
| With 10" 1-22 PSIG       | N/A  |            |       |       |          |



|  |          |                    |       |                   |
|--|----------|--------------------|-------|-------------------|
| Job No.  | 4744     | Customer           | VAHES | Atomic            |
| Date   | 10/17/84 | Run No.            | 4     | Test No. 1005-125 |
| Chart Speed  | 20       | Test Bed Name      | Suppl | PS/Sec            |
| Block Temp   | 235      | of Block Temp      | 130   | of Steam Temp     |
| Test Bed Pressure  | 1201     | PSIG Duty Time     | N/A   | Min/Sec           |
| Port Cells Out Factor  | 0        | PSIG Supply Time   | N/A   | Min/Sec           |
| Controlled Set Pressure  | 1201     | PSIG Response Time | N/A   | Min/Sec           |
| Port Cell Set Range  | N/A      |                    |       |                   |
| <p>REMARKS: 16" KEWT STAKE WITH 20" TAN PIPE<br/>GUIDE RING AT ZERO POSITION<br/>WIRE TIED TO TOP OF T-5.55 W/ 0.5" DIA. WIRE<br/>W/ 0.5" DIA. WIRE TIED TO T-5.55</p> |          |                    |       |                   |



0611



|                          |                                  |                     |       |                |          |
|--------------------------|----------------------------------|---------------------|-------|----------------|----------|
| Job Number               | 47447                            | Customer            | YOUNG | GC#            | GC#      |
| Date                     | 10/19/84                         | Branch              | 5     | Job Site       | 7-245-V8 |
| Client Name              | ZO                               | Job Site Address    | N/A   | Project        |          |
| Grade Temp               | 29.5                             | 40 Degree Temp      | 13.8  | 40 Degree Temp | 5.30     |
| Bar Steel Problems       | 1221                             | PS05 Drying Time    | N/A   | 40 Sec         |          |
| Non-Cable Over Factor    | 0                                | PS05 Sample Time    | N/A   | 40 Sec         |          |
| Unconnected Bar Problems | 1221                             | PS05 Rejection Time | N/A   | 40 Sec         |          |
| Non-Tied Cast Lengths    | N/A                              |                     |       |                |          |
| Repaired                 | 16" VEIN STACK WITH 10 TYP. FIRE |                     |       |                |          |
| Colloids                 | FWB AT ZERO PASSTAL              |                     |       |                |          |
| Wet                      | Wet                              |                     |       |                |          |
| Wet                      | Wet                              |                     |       |                |          |
| Wet                      | Wet                              |                     |       |                |          |









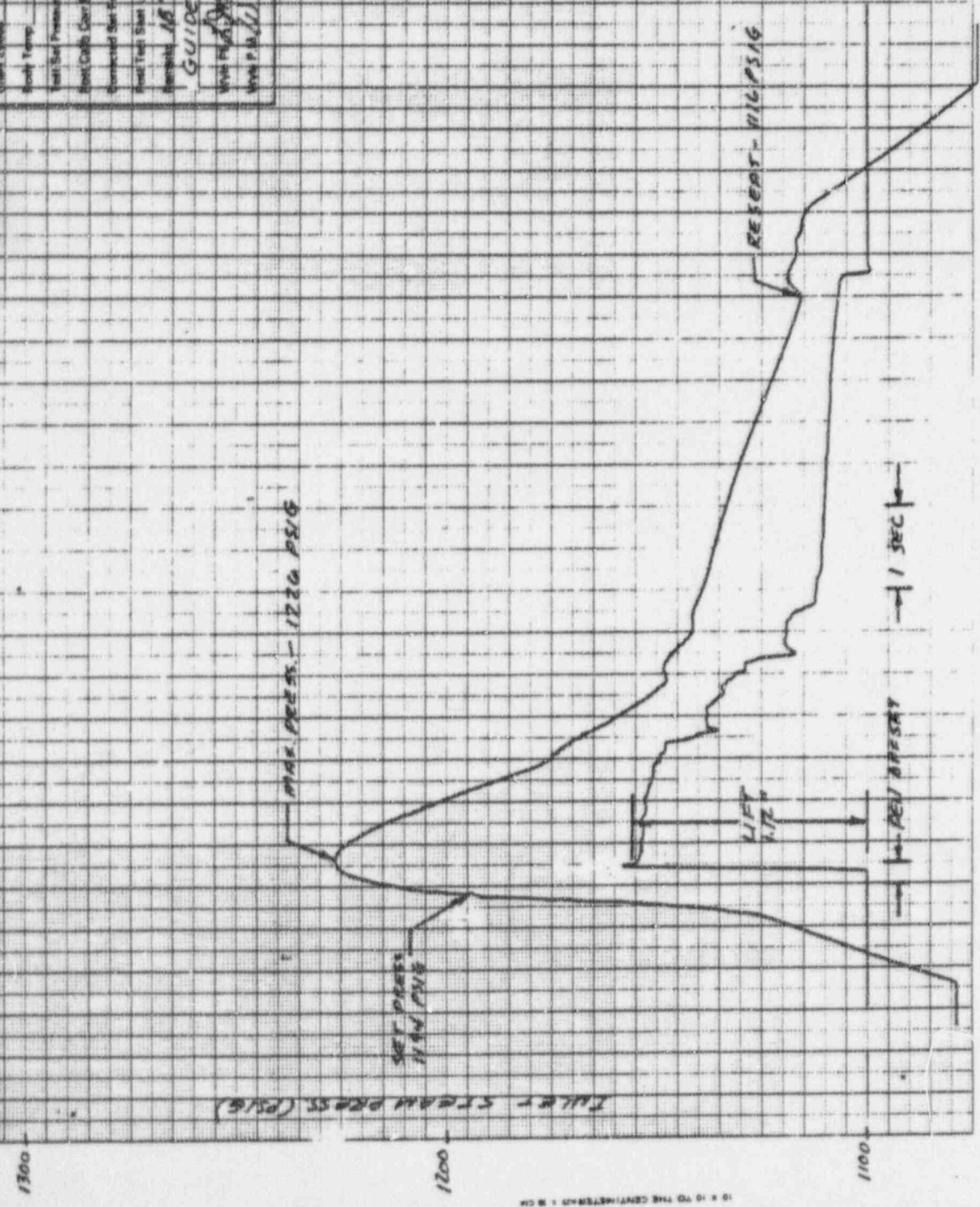






Job Number: 47447  
 Date: 10/19/84  
 Sheet: 2  
 Title: VANE PROLOG  
 Unit: 20  
 Test: 264  
 Test Name: 118  
 Test Date: 11/84  
 Test Time: 11:00  
 Test Location: 118  
 Test Operator: 118  
 Test Supervisor: 118  
 Test Engineer: 118  
 Test Technician: 118  
 Test Assistant: 118  
 Test Observer: 118  
 Test Recorder: 118  
 Test Transcriber: 118  
 Test Reviewer: 118  
 Test Approver: 118  
 Test Date: 11/84  
 Test Time: 11:00  
 Test Location: 118  
 Test Operator: 118  
 Test Supervisor: 118  
 Test Engineer: 118  
 Test Technician: 118  
 Test Assistant: 118  
 Test Observer: 118  
 Test Recorder: 118  
 Test Transcriber: 118  
 Test Reviewer: 118  
 Test Approver: 118

18" KENT STAKE WITH 10" TAIL PIPE  
 GUIDE RING AT ZERO POSITION  
 WIND DIRECTION 1-2-3-4-5-6-7-8-9-10-11-12  
 WIND SPEED 1-2-3-4-5-6-7-8-9-10-11-12

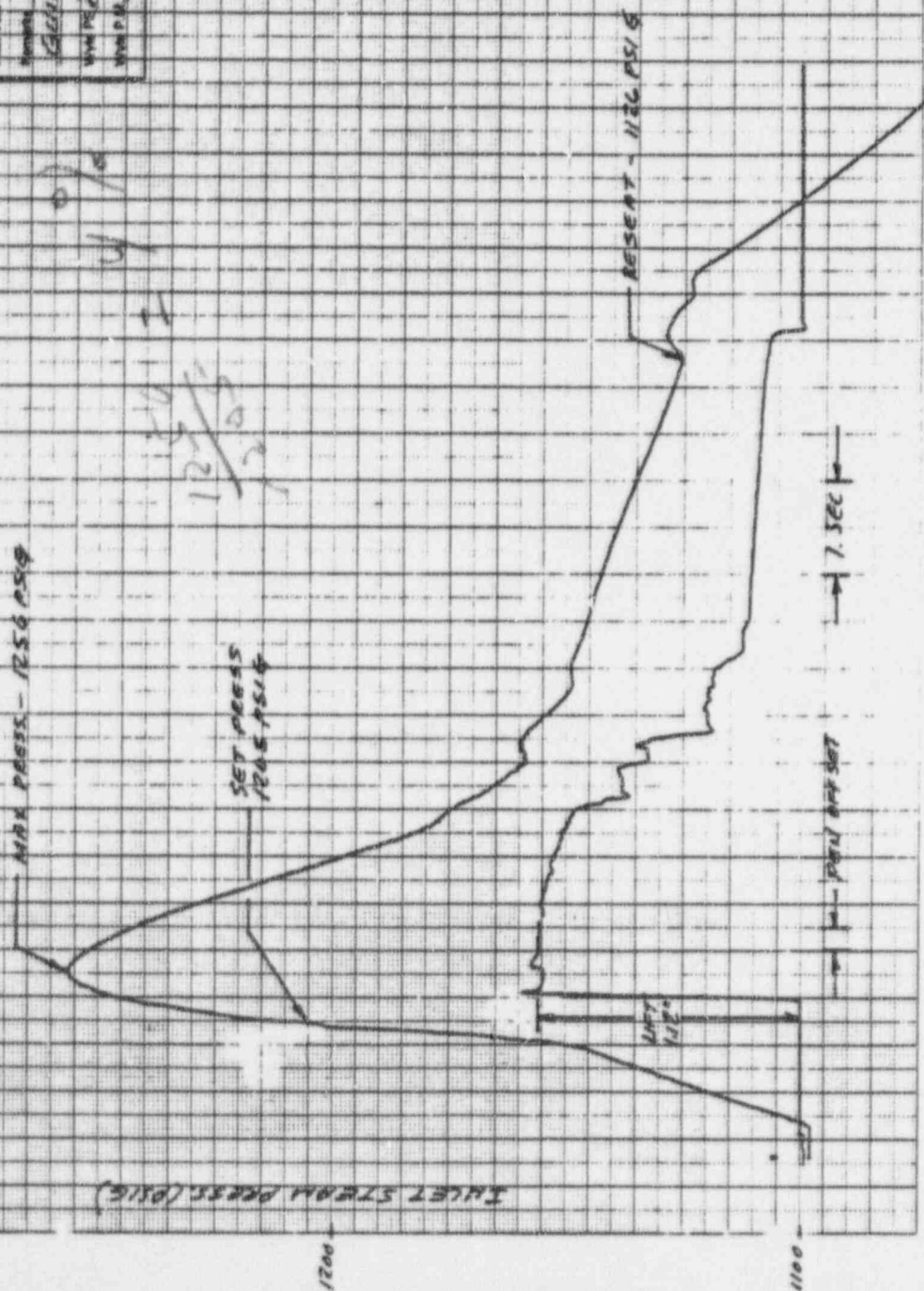


10 x 10 TO THE CENTIMETER = 1 IN





Job Number: 47447 Customer: VAN E ATOMIC  
 Date: 10/19/84 Duration: 4 Test Site: 1-10-105  
 Chart Dates: 20 Test Site Report: A119  
 Start Time: 2:00 to Report Time: 2:29 to Report Time: 5:57  
 Test Site Pressure: 1205 PSC Entry Time: 301A  
 Point Cloud Chart Focus: 0 PSC Status: A119  
 Connected Site Pressure: 1205 PSC Response Time: A119  
 Point Cloud Chart: A119  
 Remarks: 18" VENT STACK WITH 10" TALL PLAG  
 GUIDE RING AT 2500 POSITION  
 VENT PSC 1205 WIND 10-15 KTS  
 WIND PSC 1205 1-21-85 ON 10-15 KTS



1205 = 4/10

Job Number 47447 Customer YANKEE DINK

Date 10/19/84 Run No. 5 Valve Size 1-1/2" NPS

Chart Range 20 PSI Setpoint N/A PSI Set

Chart Type 290 PSI Setpoint N/A PSI Setpoint 501

Valve Size 1-1/2" N/A PSI Setpoint N/A

Plant Cells Chart Factor 0 PSI Setpoint N/A

Controlled Setpoint 1228 PSI Setpoint N/A

Plant Test Setpoint N/A

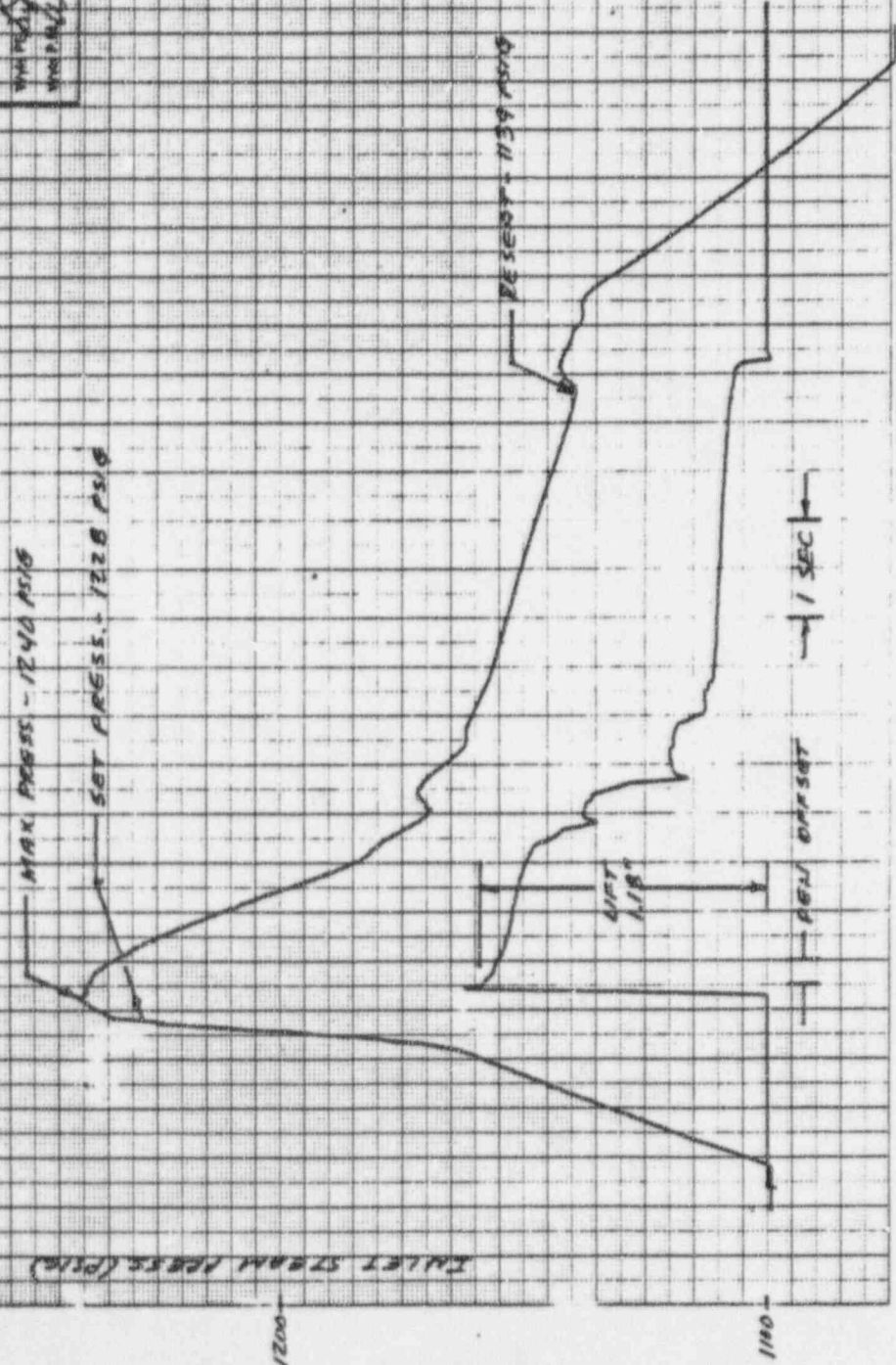
Remarks 15" VENT STACK WITH 10" TAN PIPE

GUIDE RING AT ZERO POSITION

VALVE SETPOINT 1228 PSI

VALVE SIZE 1-1/2" N/A

VALVE TYPE 1-1/2" N/A



10 X 1/2 TO THE CENTERLINE X IN CM



Lab Number 47447 Customer YANKEE DOWIC

Date 10/19/04 Run No. 6 Valve BENT-HS-75

Chart Range 20 Test Set Point Set N/A PSI/Sec

Start Temp 280 No. Events Temp 15 at Start Temp 558

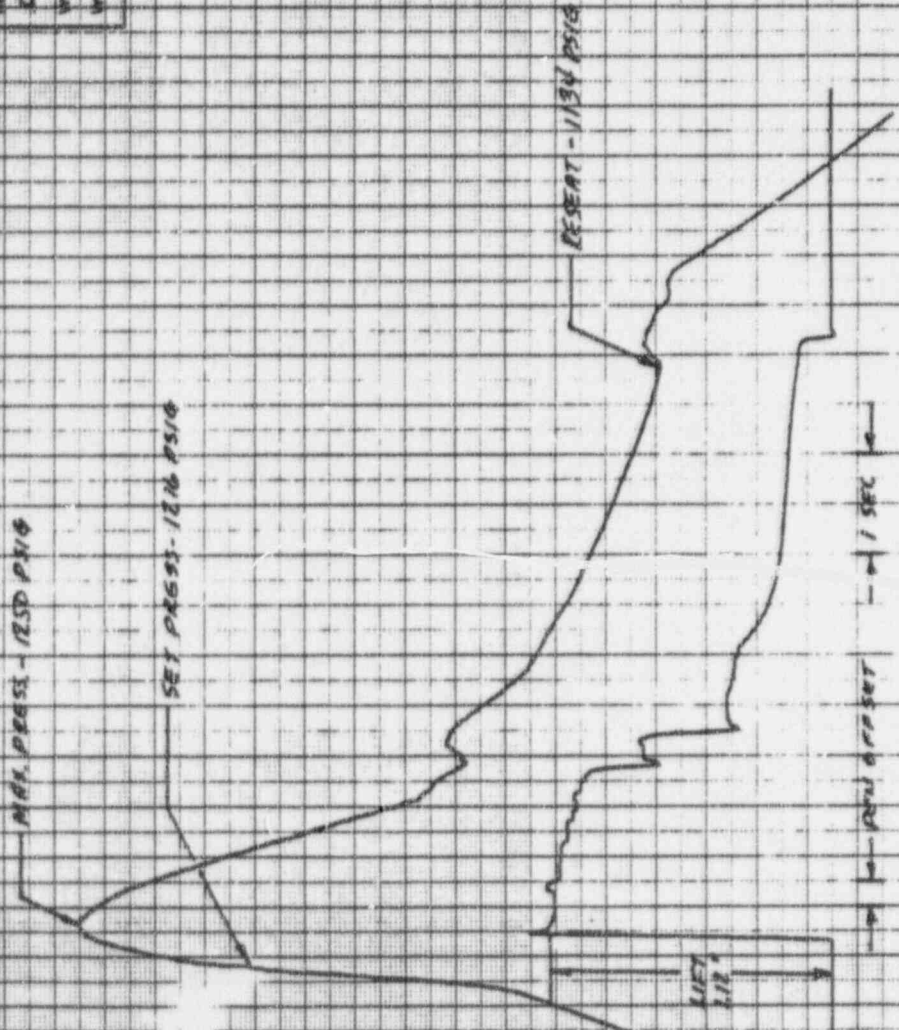
Test Set Pressure 120 Pilot Duty Test 2/2 M/Sec

End Graph Unit Factor 0 Pilot Stroke Time N/A M/Sec

Controlled Set Pressure 12/6 Pilot Response Time N/A M/Sec

Test Time Test Length N/A

Remarks 15" VENT STACK WITH 10" TAIL PIPE  
GUIDE RING AT ZERO POSITION  
VALVE BENT-HS-75 WAS ON GR. W. 10" TAIL  
PIPE. 15" VENT 1-70.15 CLOS. DC N/A



THAT STAY PRESS (PSI)

0021

0021

0021



























Job Number 47447 Customer VAN BROSSE  
 Date 11/28/80 Page 5  
 Unit Speed 40  
 Unit Type 306  
 Vent/Sec Pressure 1214  
 Fuel Cuts Off Pressure 1214  
 Combined Gas Pressure 1214  
 Fuel Test Start Voltage N/A  
 Remarks 20" VENT STACK WITH 10" TAIL PIPE  
 GASES RING AT ZERO POSITION  
 UNIT PRESSURE 1214 PSIG  
 UNIT PRESSURE 1214 PSIG  
 UNIT PRESSURE 1214 PSIG

MAX PRESS - 1214 PSIG

SET PRESS  
1214 PSIG

LIFT  
1.14

RESET - 1130 PSIG

1 SEC

INLET STEAM PRESS (PSIG)

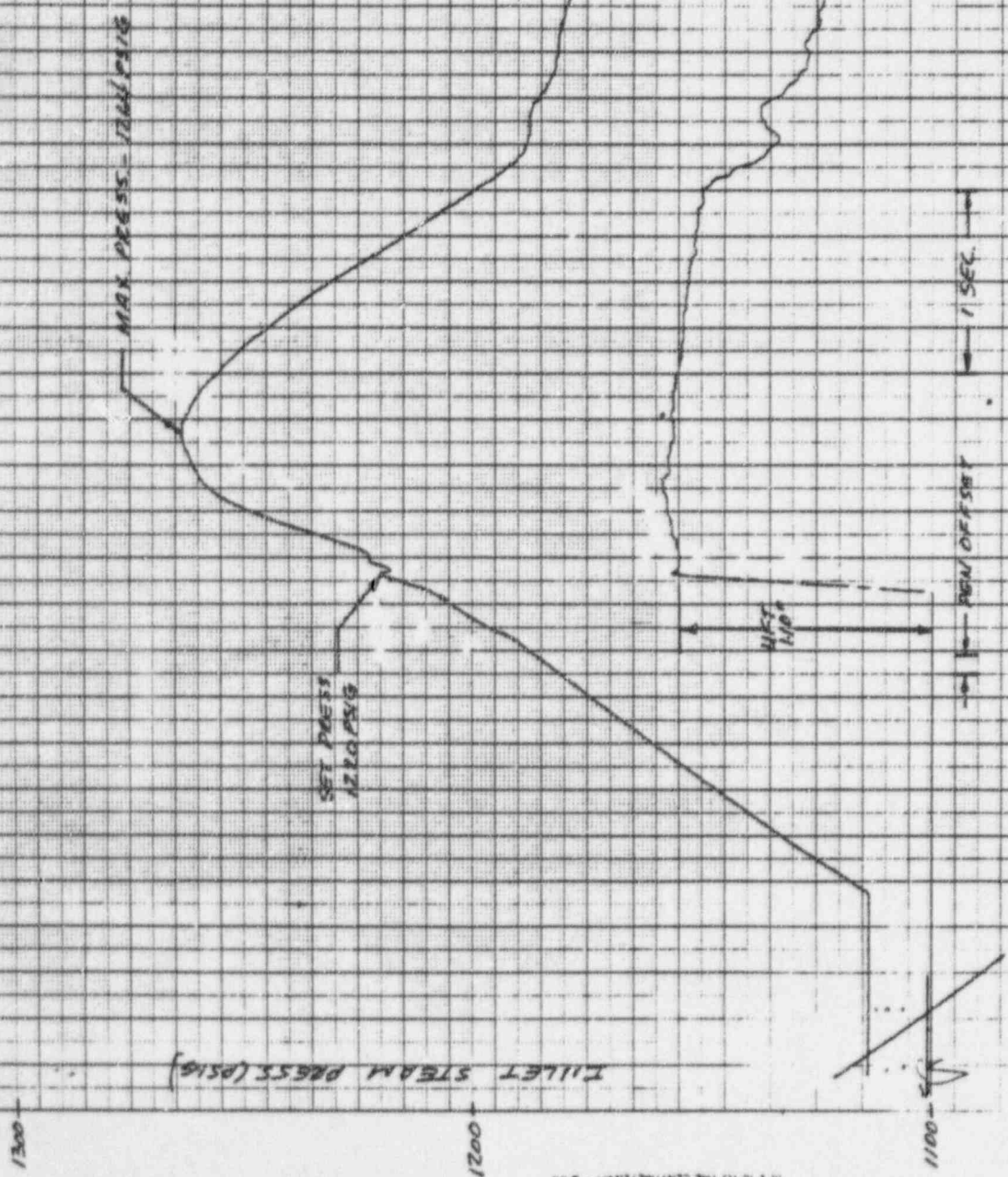
1300

1200

1100



Job Number 47447 Customer YAN ATOMIC  
 Date 11/30/84 Run No. 2 Valve BN 1-MS-VTS  
 Chart Speed 40 Test Set Range Scale N/A PSI/Sec  
 Entry Time 2:48 No. of Test Temp 102 to Steam Temp FSB  
 Test Set Pressure 1220 PSIG Safety Trip N/A M/Sec  
 Test Cell Chk Factor 0 PSIG Static Temp N/A M/Sec  
 Computed Gas Pressure 1220 PSIG Response Time N/A M/Sec  
 Test Test Start and Stop N/A  
 Remarks: 30' HENT STAINLESS (30' EL) WITH 10" TAIL PIPE  
 GUIDE RING AT ZERO POSITION  
 WARMED UP TO 130-135 WATC TO 100-105 WATC  
 WATC (1) began 11:21:55 CUR OC N/A



10 X 10 PER THE CENTIMETER - 1 IN







Job Number: 87447      Customer: YBN      Address: 1130 18th St      Date: 11/20/84      Part No: 0      Total Qty: 1200      Price: \$225

Chart Speed: 4.0820      Total Run Time: 11/18      Price: \$225

Run Time: 305      To Run Time: 1200      Price: \$225

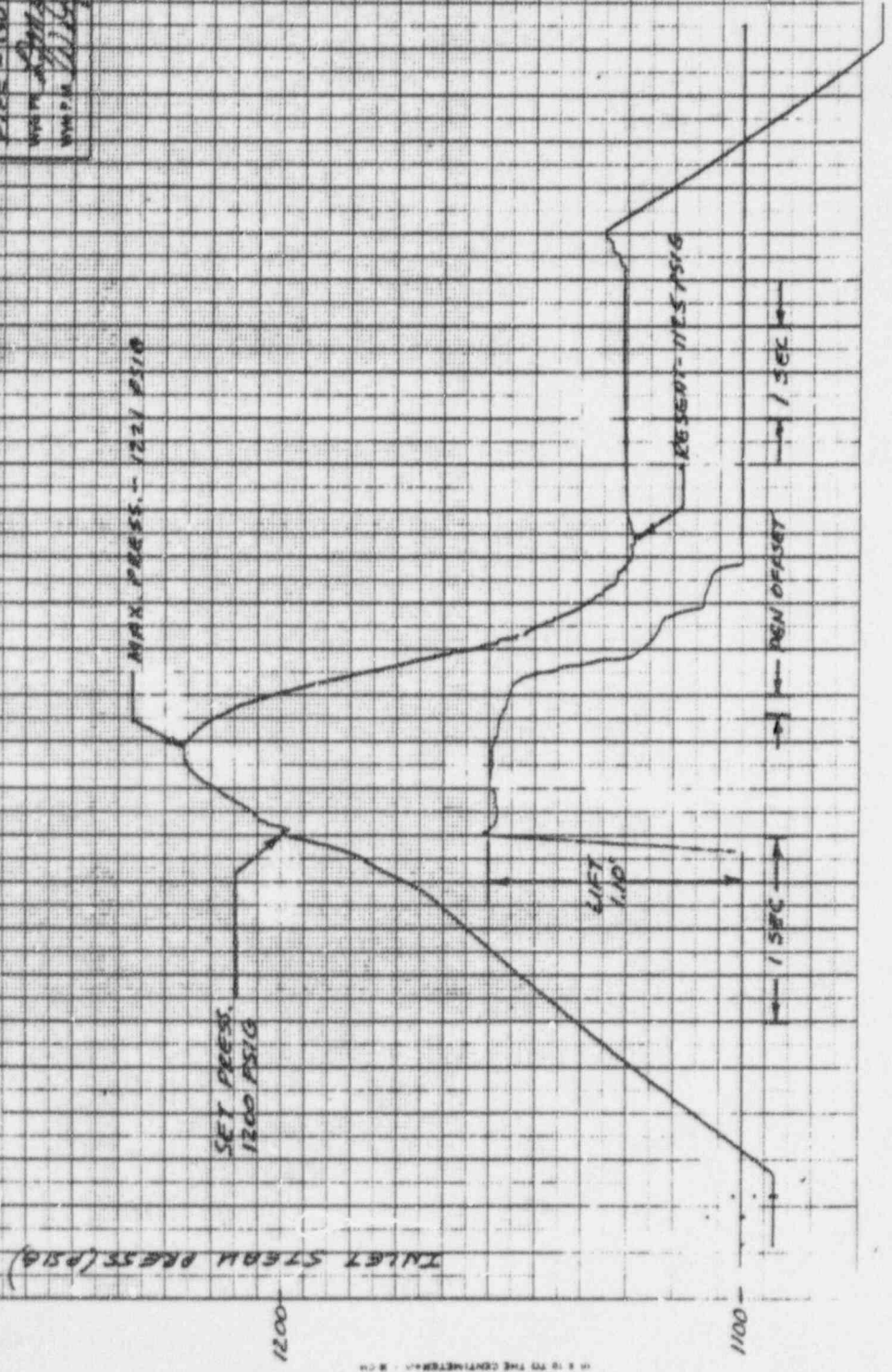
Actual Pressure: 1200      Price: \$225

Pressure Control Valve: 0      Price: \$225

Estimated Run Time: 1200      Price: \$225

Total Run Time (Loading): 11/18      Price: \$225

Remarks: 20" VENT STACK (90" DIA) WITH 10" TOP PLATE - GUIDE RING AT 7' TO 8' POSITION. WAS IN 10' STALL 1-20-85. WERE 50' ST. SIGHT MARKS. WERE 10' ST. SIGHT MARKS. 1-20-85. DATE OF: 11/18



INLET STERN PRESS (PSIG)

1300

1200

1100

1 SEC

1 SEC

1 SEC