



APPROVED ENGINEERING TEST LABORATORIES
A NATIONAL TECHNICAL SERVICES CO.

Report No. 548-9142

P.O. No. 46085-4481

Date: 8 May 1981

Report Number 548-9142

Flow Interruption Test

on

Gate Valve Assembly

Part Number: 79190
Serial Numbers: 25709

TESTED FOR:

BORG-WARNER CORPORATION
Nuclear Valve Division
7500 Tyrone Avenue
Van Nuys, CA 91409

TESTED BY:

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ATTACHMENT TO TRANSMITTAL

On Attachment 1 of Report 1843 it is noted that the seat leakage is OCC/5 minutes in the normal flow direction and that it is 200 CC/5 minutes in the reverse direction.

It should be noted that the valve assembly has successfully passed the flow interruption test since the specimen performed its required function in the required time and upon completion of the test demonstrated 0 leakage in the direction the valve was flow tested. The increased leakage in the reverse direction is the result of debris in the test media which caused a slight scratch on the upstream side of the gate. Examination of the gate reveals a single linear scratch which shows no evidence of being caused by valve failure to close under flow.



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APPROVALS

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Date: 8 May 1981

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Date: 5-11-81

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Date: 5-11-81



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1.0 PURPOSE

The purpose of this report is to present the test procedure used and the test results obtained during a test program. The objective of the test program was to determine the conformance of One (1) Gate Valve Assembly, Part Number 79190 (Serial Number 25709), to the Flow Interruption Test requirement specified in References 2.1 and 2.2, in accordance with Reference 2.3.

2.0 REFERENCES

- 2.1 Borg Warner Corp., Nuclear Valve Division, Report No. 1836, titled "Flow Interruption Test for Part No. 79190, Supplied to Tennessee Valley Authority Bellefonte Nuclear Plant Units 1 and 2," dated 9 February 1981.
- 2.2 Borg Warner Corp., Nuclear Valve Division, Report No. 1843, Revision A, titled "Flow Interruption Test for Part No. 77910, Supplied to Combustion Engineering, Inc. Arizona Nuclear Power Project, Palo Verde Nuclear Generating Station", dated 25 March 1981.
- 2.3 Borg Warner Corporation, Purchase Order No. 46085-4481.

3.0 SUMMARY

- 3.1 One (1) Gate Valve Assembly, described in Paragraph 1.0 and hereafter referred to as "Specimen," has been subjected to Flow Interruption Testing as described in this report. During the final test cycle, the Specimen indicator plate retaining nuts loosened causing the plate to make contact with the eyebolts. The plate was slightly bent as a result of the impact. All other results conformed to the specification requirements and no further adverse effects were noted.
- 3.2 All results are presented for evaluation.



4.0 TEST CONDITIONS AND TEST EQUIPMENT

4.1 Test Conditions

Unless otherwise specified herein, all tests were performed at room ambient conditions: defined as a temperature of $73 \pm 18^{\circ}\text{F}$ ($23 \pm 10^{\circ}\text{C}$), a relative humidity of 50 ± 30 percent, and a barometric pressure of 28.5 ± 2.0 , -3.0 inches of mercury absolute (725 ± 50 , -75 mm of mercury absolute).

4.2 Test Equipment

The test equipment presented in the Appendix was calibrated, as required, in accordance with MIL-C-45662A and is traceable to the National Bureau of Standards (NBS). The NBS traceability records are maintained on file in the AETL Quality Control Office.



5.0 TEST PROCEDURES AND TEST RESULTS

5.1 Flow Interruption Test

References 2.1 and 2.2, Paragraph 6.2

Date Commenced: 6 April 1981
Date Completed: 28 April 1981

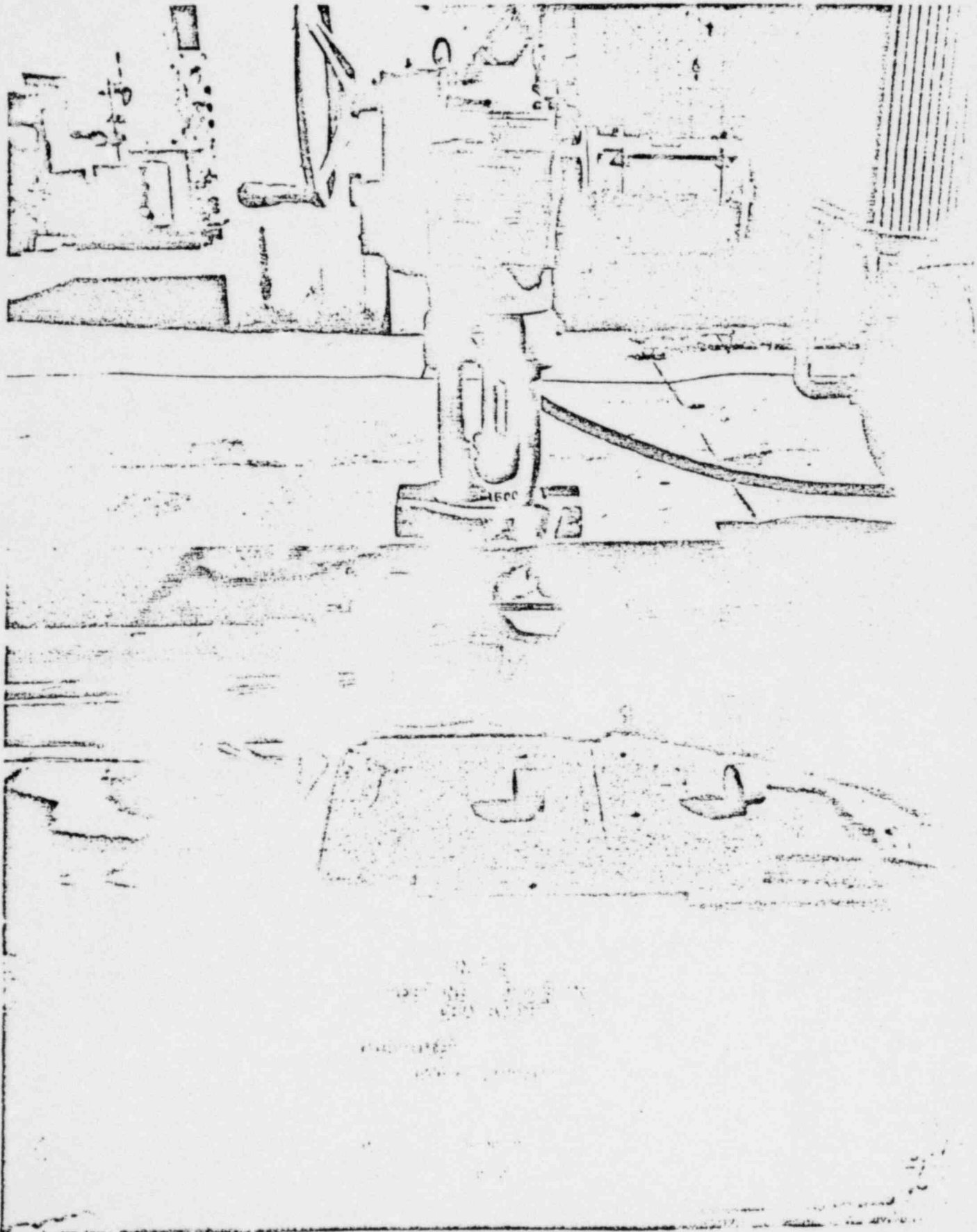
5.1.1 The Specimen was installed in the pressure flow test system as shown in Photograph 1. Instrumentation was installed to simultaneously record upstream total pressure and downstream static pressure. The downstream end of the valve was discharged to the atmosphere in a suitable receiving chamber.

5.1.2 Prior to each test cycle, the test system was hydrostatically pressurized to 2900 psi and held for a period of 15 minutes. The test system was then inspected for leakage and repairs were made as necessary.

5.1.3 The Specimen was cycled from full open to full closed to full open without pressure or flow to time the Specimen stroke. The Specimen close time was recorded at 15 seconds. The Specimen and test system were inspected for leakage or damage. No discrepancies were noted.

5.1.4 The Specimen was then cycled from full open to full closed to full open with the inlet pressure maintained at a minimum of 2500 psi. Water was flowed through the Specimen by opening an AETL valve downstream and regulation of the flow was achieved by installing an orifice between the Specimen and the AETL valve. Each full open to full closed cycle was 15 seconds in duration. During the closing cycle, the flow rate did not meet the specification requirement of 600 gpm minimum. The customer was notified and determined that the three runs partially satisfied the test requirement specified in Reference 2.1, Paragraph 6.2.4(b).

5.1.5 The test system was modified to meet the minimum flow requirement. Three full open to full closed test cycles were completed at a minimum flow rate of 600 gpm, and while maintaining the pressure above 2500 psi. Each Specimen open to close cycle lasted for a period of 15 seconds. These three runs satisfied the requirement specified in Reference 2.1, Paragraph 6.2.4 and in Reference 2.2, Paragraph 6.2.4(a).





AETL Number	E1126V
Instrument	Digital Multimeter
Manufacturer	Valhalla Scientific
Model Number	4440
Serial Number	7-3347
Calibration	6 months (cal due 9-28-81)
Range and Accuracy	0 to 500 volts AC in 5 ranges; 0 to 1000 volts DC in 5 ranges; AC volts, $\pm 0.25\%$ of range; DC volts, $\pm 0.05\%$ of range.

AETL Number	E1162V
Instrument	Oscillograph, 24 channel
Manufacturer	Heiland Div., Honeywell
Model Number	1108-206780HK
Serial Number	11-630
Calibration	Prior to test
Type	8-inch/direct writing
Chart Speed	0.05-40 in./sec. in 12 steps

AETL Number	E1353S
Instrument	Signal Conditioner
Manufacturer	Calico
Model Number	X1101
Serial Number	None
Calibration	Prior to test
Type	Bridge

AETL Number	Unknown
Instrument	Pressure Transducer
Manufacturer	Teledyne
Model Number	206-NA
Serial Number	None
Calibration	Prior to test
Range	0 to 3000 psi



AETL

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AETL Number	P1087
Instrument	Pressure Gauge
Manufacturer	Ashcroft
Model Number	Maxisafe
Serial Number	None
Calibration	For indication only
Range and Accuracy	0 to 3000 psig; $\pm 0.5\%$

AETL Number	P1157V
Instrument	Pressure Gauge
Manufacturer	Ashcroft
Model Number	1082D
Serial Number	None
Calibration	For indication only
Range and Accuracy	0 to 3000 psi, $\pm 0.5\%$

AETL Number	E1108V
Instrument	Digital Thermometer
Manufacturer	John Fluke Mfg. Co., Inc.
Model Number	2100A
Serial Number	30037
Calibration	6 months (cal due 6-8-81)
Range and Accuracy	-320°F to +1400°F; $\pm 1^\circ\text{F}$, ± 1 digit

AETL Number	P940V
Instrument	Pressure Transducer
Manufacturer	Statham Instruments, Inc.
Model Number	PM80TCF ± 100 -350
Serial Number	1091
Calibration	Prior to test
Range and Accuracy	5000 psig



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AETL Number	P1084V
Instrument	Pressure Gauge
Manufacturer	Ashcroft
Model Number	1.66
Serial Number	None
Calibration	For indication only
Range and Accuracy	0 to 3000 psi; 1.0%

AETL Number	P1129V
Instrument	Pressure Gauge
Manufacturer	Ashcroft
Model Number	1377S
Serial Number	None
Calibration	For indication only
Range and Accuracy	0 to 400 psig; $\pm 0.5\%$

AETL Number	P1045V
Instrument	Pressure Gauge
Manufacturer	U.S. Gauge Company
Model Number	1903
Serial Number	None
Calibration	For indication only
Range and Accuracy	0 to 200 psi; $\pm 0.5\%$

AETL Number	P1064V
Instrument	Pressure Gauge
Manufacturer	U.S. Gauge Company
Model Number	1818
Serial Number	None
Calibration	For indication only
Range and Accuracy	0 to 5000 psi; $\pm 0.5\%$



AETL Number
Instrument
Manufacturer
Model Number
Serial Number
Calibration
Range and Accuracy

P1158V
Flow Interrupt Test System
AETL
None
None
Hydrostatically pressurized prior to test
0 to 3000 pounds, 0 to 1500 GPM

AETL Number
Instrument
Manufacturer
Model Number
Serial Number
Calibration
Range and Accuracy

P625V
Pressure Gauge
Ashcroft
1079
None
For indication only
0 to 3000 psi, $\pm 0.25\%$

AETL Number
Instrument
Manufacturer
Model Number
Serial Number
Calibration
Range and Accuracy

P1404S
Pressure Transducer
Teledyne
206-SA-1-3000
662309
Prior to test
0 to 3000 psi

AETL Number
Instrument
Manufacturer
Model Number
Serial Number
Calibration
Range and Accuracy

P1210S
Pressure Gauge
Ashcroft
DS
None
For indication only
0 to 3000 psi; $\pm 0.5\%$