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ACCESSION NBR: 8604080114 DOC. DATE: 86/04/01 NOTARIZED: NO DOCKET #
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AUTH. NAME AUTHOR AFFILIATION
CUTTER, A. B. Carolina Power & Light Co.
RECIP. NAME RECIPIENT AFFILIATION
DENTON, H. R. Office of Nuclear Reactor Regulation, Director (post 851125

SUBJECT: Forwards response to 851030 request for addl info re operability of containment purge & vent valves, including graph of value of dynamic torque & butterfly valve test repts.

DISTRIBUTION CODE: A034D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 13
TITLE: OR Submittal: Containment Purging

NOTES: Application for permit renewal filed. 05000400

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
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	PWR-A PSB	1	1	PWR-A RSB	1	1
INTERNAL:	ADM/LFMB	1	0	NRR BWR ADTS	1	1
	NRR PWR-A ADTS	1	1	NRR PWR-B ADTS	1	1
	NRR REEVES, E 14	1	1	NRR/DSRO/EIB	1	1
	REG FILE 04	1	1	RGN2	1	1
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ACCESSION NBR:8604040114 DOC.DATE: 86/04/01 NOTARIZED: NO DOCKET #
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SUBJECT: Forwards response to 851030 request for addl info re operability of containment purge & vent valves, including graph of value of dynamic torque & butterfly valve test reqts.

DISTRIBUTION CODE: A034D COPIES RECEIVED:LTR _ ENCL _ SIZE: ______
TITLE: OR Submittal: Containment Purging

NOTES:Application for permit renewal filed. 05000400

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PWR-A PD2 PD 01	[illegible]	[illegible]	BUCKLEY,B	[illegible]	[illegible]
	PWR-A PSB	[illegible]	[illegible]	PWR-A EB	1	[illegible]
INTERNAL:	ADM/LFMB	1	0	NRR BWR ADTS	1	[illegible]
	NRR PWR-A ADTS	1	1	NRR PWR-B ADTS	1	1
	NRR REEVES,E 29	1	1	NRR/DSRO/EIB	1	1
	REG FILE 04	1	1	RGN2	1	1
EXTERNAL:	24X	1	1	LPDR 03	1	1
	NRC PDR 02	1	1	NSIC 05	1	1

TOTAL NUMBER OF COPIES REQUIRED: LTTR 20 ENCL [illegible]

CP&L

Carolina Power & Light Company

SERIAL: NLS-86-070

APR 0 1 1986

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT
UNIT NO. 1 - DOCKET NO. 50-400
CONTAINMENT PURGE AND VENT VALVE OPERABILITY REVIEW

REFERENCE: NRC Letter Dated October 30, 1985, G. W. Knighton to Mr. E. E. Utley, *Request for Additional Information*

Dear Mr. Denton:

Carolina Power & Light Company hereby provides responses to the follow up questions regarding the operability of the containment purge and vent valves (Reference 1).

The attachments to this letter contain the following:

Attachment A Carolina Power & Light Company's responses to questions in Reference 1; organized in question and answer form.

Attachment B Graph of the value of the dynamic torque and the operator closing (spring) torque at different yoke arm angles.

Attachment C BIP Butterfly Valve Test Reports; show actual valve closing time.

If you have any questions, please contact Mr. Pedro Salas at (919) 836-8015.

Yours very truly,

A. B. Cutter - Vice President
Nuclear Engineering & Licensing

ABC/PS/ccc (3462PSA)

Attachment

cc: Mr. B. C. Buckley (NRC)
Mr. Goutam Bagchi (NRC)
Mr. G. F. Maxwell (NRC-SHNPP)
Dr. J. Nelson Grace (NRC-RII)
Mr. Travis Payne (KUDZU)
Mr. Daniel F. Read (CHANGE/ELP)
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Dr. J. H. Carpenter (ASLB)
Mr. J. L. Kelley (ASLB)
Mr. H. A. Cole

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A PDR

A034 1/1

ATTACHMENT A

SHEARON HARRIS NUCLEAR POWER PLANT
PURGE AND VENT VALVE OPERABILITY (TMI II.E.4.2(6))
NRC REQUEST FOR ADDITIONAL INFORMATION

General Comment

As indicated in the BIF Operability Report #DT-67926 Rev. A and a BIF response letter of October 30, 1985, the dynamic torque from the effluent flow is a closing torque. It actually helps, rather than resist the operator's spring return action to close the valve.

Question 1

The torque capacity of the Bettis actuator model N721C-SR60-12 is given as 2570 in-lb without reference to valve disc angle, minimum and maximum torque available, and torque available for reduced power source. (Page 41 of BIF Dynamic Torque Calculation.)

The applicant should provide the actuator torque curves versus valve opening angle in tabular or graphic form. The applicant should compare the available torque of the operator with the maximum torque required to operate the valves during the accident scenario.

Response

Referring to the fact that valve dynamic torque generated by the effluent flow (Accident Scenario) is acting unidirectionally with the operator closing torque generated by the operator spring action, a relative torque will be imposed on the actuator by the valve and not vice versa. The maximum valve dynamic torque indicated in BIF report is 1731 in-lb while the operator minimum closing (spring) torque is 2319 in-lb. The attached graph (Attachment B) shows the value of the dynamic torque and the operator closing (spring) torque at different yoke arm angles. The graph indicates that the operator torque capability is always higher than the valve dynamic torque thus preventing the valve from sudden closure. In reality, the speed at which the valve will close depends mainly on how fast the operator piston will travel during the closing cycle which in turn depends on the solenoid valve size and its air pressure drop characteristics through its exhaust port. The valve dynamic torque may increase slightly the valve closing speed but not to an appreciable value.

Question 2

Item 3 of the Ebasco letter dated August 3, 1982 requests BIF to demonstrate operability of the purge valve at "30° and 50° open with closure times less than 3.5 seconds." However, the BIF report DT-67926 Revision A addresses valve operability from the fully open (90°) to the fully closed position.

The applicant should indicate if he intends to operate the valves from an initial position that is less than fully open. The applicant should clarify that his submittal specifies and demonstrates full closure of the valves from the fully open position (90°) in less than 3.5 seconds.

Response

The valve operation during the purge will be in full open position (90°) throughout the purge period. The 30° and 50° open requirements were for other specific reasons which are no longer applicable.

Referring to BIF Butterfly Valve Test Reports, the closing time of the valves at no flow condition is 1.5 seconds or less from its full open (90°) position. Refer to item one above for the effect of the dynamic torque on the valve closing speed.

Question 3

The BIF analysis considered the valve to be completely closed at 4.75 seconds elapsed time and containment pressure of 34.35 psia. However, at 5 seconds the pressure can rise to 35.06 psia. The Shearon Harris Technical Specifications (FSAR Section 16.2, Table 3.6.1) specify a maximum isolation time of 5 seconds. The applicant should re-evaluate the BIF analyses and technical specifications to confirm that (1) the valve closure time and containment isolation time are consistent and (2) the subsequent adjustment for containment pressure will not adversely affect the ability of the valve to perform its function.

Response

The 4.75 seconds was estimated by BIF prior to the shop testing of valves. The 4.75 seconds elapsed time included 1.25 seconds signal process time plus 3.5 seconds estimated time for valve closure. The 5 seconds closing time indicated in the Shearon Harris Technical Specification, Section 16.2, Table 3.6.1, was used as an input parameter for the containment effluent release in the analysis of the DBA.

Although the actual valve closing time as demonstrated by BIF shop testing (Attachment C) is 1.5 seconds maximum, and considering instrument process signal of 1.25 to 1.5 seconds, the total containment isolation should result in a 3 seconds maximum. However, to be consistent with the containment pressure/time profile used in the BIF analyses, CP&L will propose to NRC that the SHNPP Technical Specification be revised to indicate a maximum isolation time of 4.75 seconds.

Question 4

The flow dynamic torque was calculated as the valve closed uniformly from fully open to fully closed against the ascending containment pressure. The 3.5 second closure period was divided into nine equal increments of 0.389 second duration and 10° disc rotation. At each increment, the dynamic torque was calculated using the containment pressure response curve. The maximum torque of 1731 in-lb was calculated for an 80° opening angle at 1.639 seconds elapsed time from LOCA initiation. Valve closure was initiated at 1.25 seconds to allow time to process the isolation signal. (Page 7 and 41 of BIF Dynamic Torque Calculation.)

The applicant should provide evidence that the valve closure rate is uniform from fully open to fully closed.

Response

Referring to the fact that the dynamic torque is assisting and not opposing the closing of the valve, the closure rate of the valve whether it is uniform or not will not increase the closure time above the 1.5 seconds indicated in the BIF Test Reports. Because of this short closing time the maximum value of the flow dynamic torque imposed by the valve on the operator will be much lower than the 1731 in-lb used by BIF for the operator sizing and the valve stress analysis.

Question 5

BIF committed to test the valves for speed of closure and reject any above 3.5 seconds. However, BIF does not have any test data for the closure speed of the spring loaded cylinder "when it is bled into higher than atmosphere pressure." BIF's recommendation (to Ebasco) is "to pipe the exhaust port of the solenoid valve to atmosphere to insure the 3.5 closure period." (BIF response to Ebasco comment #5, Page 43 of BIF Dynamic Torque Calculation.) The applicant should clearly demonstrate that the valve closure time of 3.5 seconds will not be exceeded during the accident scenario. The applicant should provide a response to the BIF recommendation and justify operability of the valve for any new configuration, if applicable, that is not covered by the present submittal.

Response

The torques acting on the valve during any moment of closing cycle include:

a. Flow dynamic torque. Acts in the direction of valve closure (Td).
b. Torque generated by the Operator spring force. Acts in the direction of the valve closure (Ts).
c. Torque generated by the Air Pressure differential across the operator cylinder piston ($T\Delta p$).

The equilibrium torque equation at any moment of the closing cycle will be
$Td + Ts - T\Delta p = 0$.

Td and Ts will not be affected whether operator cylinder is bled into atmospheric or higher than atmospheric pressure.

$T\Delta p$ depends on the pressure source and sink and the pressure drop through the operator solenoid valve and connected pipe and fittings.

As the ratio of Containment Pressure (P_2) (pressure sink) to the operator cylinder pressure (P_1) (pressure source) decreases, to about $P_2/P_1 = 0.53$, the air velocity through the solenoid valve will reach local acoustic value and as a result, the air discharge from the operator cylinder through the solenoid valve will depend only on the pressure source (P_1). When P_2/P_1 is above the critical ratio of 0.53, closure of the valve will depend also on the pressure sink (P_2). The pressure (P_2), which is the containment pressure during the accident scenario, will also act upon the back of the operator cylinder piston through the operator breather port thus balancing off the pressure difference and assisting the spring force and flow dynamic torque to close the valve.

From the above analogy the containment back pressure (Pressure Sink) will not affect the valve closure time. Therefore, there are no justifiable reasons for piping the operator exhaust port to the outside of containment or conducting closing speed test as suggested by BIF in their response letter.

Question 6

The analytical procedure to perform the seismic analysis indicates that stresses will be considered due to a combination of seismic load, dead weight, design pressure, and maximum operator torque. (Item 2 of BIF Seismic Analysis.) The torque capacity of the Bettis actuator is given as 2570 in-lb compared to the maximum calculated dynamic torque of 1731 in-lb for an 80° opening angle. (Page 41 of BIF Dynamic Torque Calculation.) Review of the seismic analysis revealed that the stresses are based on a torque value of 1731 in-lb. (Page 4 of BIF seismic analysis).

The applicant should justify the torque value used to demonstrate valve operability. The applicant should amend the stress analysis; if appropriate, and clearly show that the calculated stresses do not exceed the allowable stress limits.

Response

The dynamic torque of 1731 in-lb used in the stress analysis by BIF in their report can be justified by referring to the fact that this torque is imposed by the valve on the operator. It is a closing torque that, without the operator installed, will close the valve in a very short time. In reality the operator is imposing a breaking torque equal but opposite in direction in order to slow the valve closing speed.

Question 7

The flow coefficient (Kv) and dynamic torque coefficient (Ct) were obtained from hydrodynamic tests using different valve disc orientation and flow conditions. The tests were performed using water and measured with hand held torque wrenches; no tests with air were performed. (Page 3 of BIF Hydrodynamic Tests, Reference 7, and Page 2 of BIF Head Loss Tests, Reference 6.) The applicant should justify that the purge valves will experience only incompressible flow during the LOCA accident scenario. The applicant should compare the disc shapes used in the 12 inch valve flow tests versus the specified 8 inch BIF valve. The applicant acknowledges that the torque wrench readings from the flow tests have an error band of ± 10%. (Pages 3 and 6 of BIF Hydrodynamic Tests, Reference 7). The applicant should clearly show that the ± 10% deviation in torque does not adversely affect the ability of the BIF purge valve to perform its function.

Response

BIF has addressed this point as quoted in the response letter of October 30, 1985 "The flow coefficient (Kv) and the dynamic torque coefficient (Ct) are normally obtained based on water test and used on water, steam and gas applications. Testing with air, the 10% error would be more because close to a sonic air pipe line, velocity is required to create significant dynamic torque for torque wrench readings. The 10% error (if it exists) would create 10% more stress. However, in the stress analysis, the stress limits still would be within the acceptable local stress limits (see stress reports).

Comparing the disc shape in the 12" valve flow tests vs. the specified 8" valve disc, we found that both discs (designs) are the same configuration."

Elaborating further on the vendor reply quoted above, it is more practical to obtain the dynamic torque coefficients using water as the test medium with better accuracy than gases (including air). As reiterated in the proceeding items, the dynamic torque has no appreciable effect on the valve closure time and therefore the test medium whether compressible or incompressible will not change the results. The flow coefficient extracted is the valve constant which can be used for flow estimate of any medium when it is integrated in the appropriate flow formula for the valve.

Question 8

FSAR Figures 6.2.1-2 and -3 show a comparison of containment pressure transients (hot leg and cold leg breaks, respectively). The FSAR and PSAR pressure response curves are shown on both figures. The "old" PSAR analysis used the currently approved mass and energy release model, whereas the "new" FSAR analysis used a model currently being reviewed by the NRC. (FSAR Section 6.2.1.3, Page 6.2.1-21, Amendment 11 - effective through Amendment 18, November 30, 1984).

Figure 6.2.1-2 shows that the old pressure response curve envelopes the new curve up to an approximate pressure of 50 psia (15 seconds elapsed time from LOCA initiation). Beyond that point the new pressure curve envelopes the old curve and reaches a peak value of 51.4 psia (18.5 seconds elapsed time).

The BIF dynamic torque calculations were obtained by following the new pressure response curve up to an elapsed time of 4.75 seconds. (Ebasco letter dated August 3, 1982 and page 7 of BIF Dynamic Torque Calculation.)

The applicant should verify that the containment pressure response data used to calculate the dynamic torque valves are based on the appropriate LOCA pressure transient and valve closure time. As appropriate the applicant should (1) amend the purge valve report to state that its results are based on new pressure response data, which still await NRC approval or (2) update the FSAR to state that the new pressure response curves for Figures 6.2.1-2 and -3 have been approved by the NRC.

Response

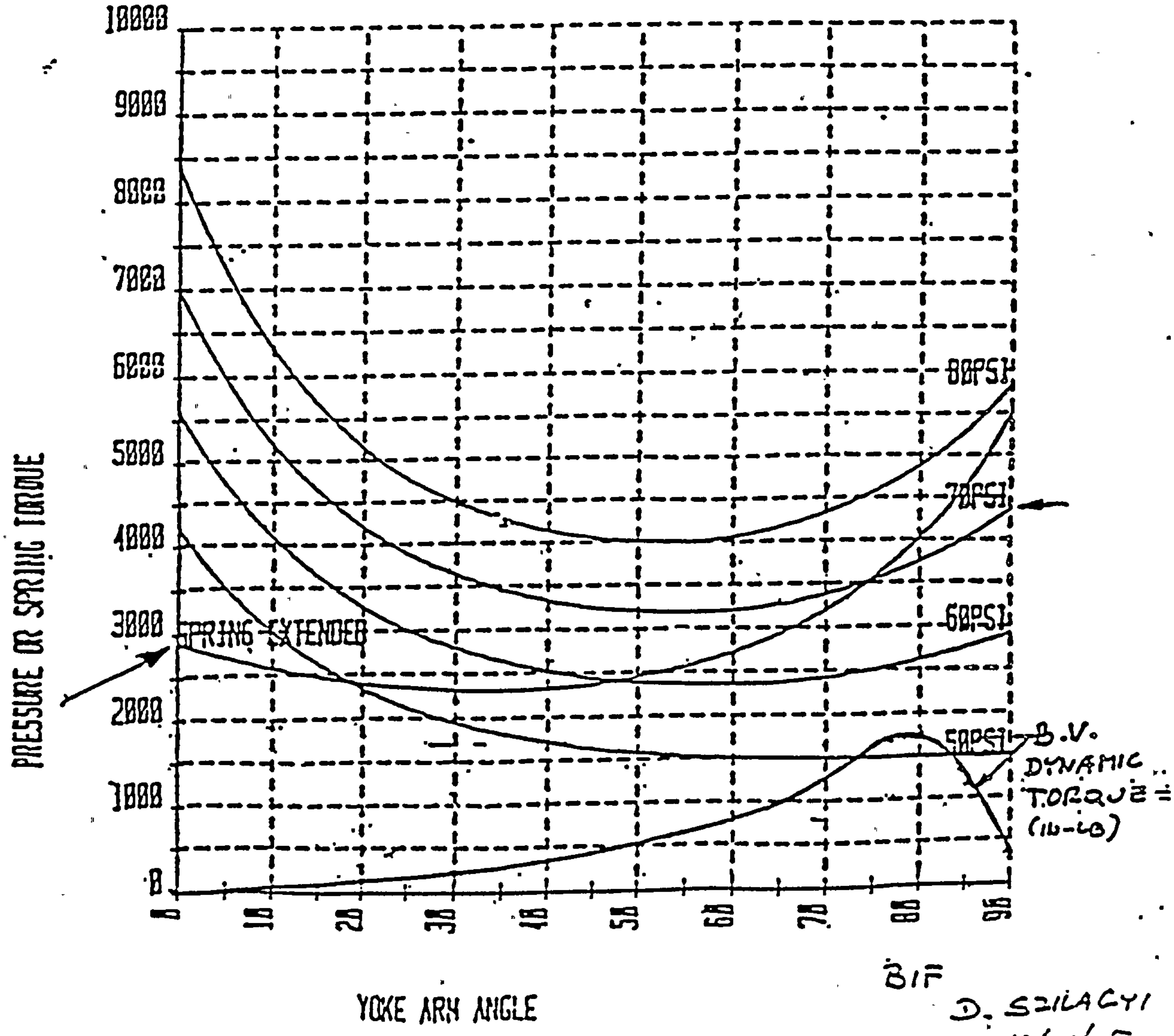
As outlined above, the dynamic torque is in the direction of the valve closure. Without this dynamic torque the valve closure was 1.5 seconds max as demonstrated by BIF test. Containment pressure response data whether the NRC approved old data or the new one which is yet to be approved by NRC has no effect on the valve closure time.

ATTACHMENT B

Graph of the Value of the
Dynamic Torque and the Operator
Closing (Spring) Torque at
Different Yoke Arm Angles

(3462PSA/ccc)

YOKE ARM ANGLE (degrees)	SPRING TORQUE (in lb)	PRESSURE TORQUE (50)psi	PRESSURE TORQUE (60)psi	PRESSURE TORQUE (70)psi	PRESSURE TORQUE (80)psi
0	2863	4194	5583	6973	6362
15	2472	2618	3625	4632	5639
30	2319	1944	2792	3640	4487
45	2395	1632	2438	3243	4049
60	2746	1509	2365	3222	4079
75	3571	1498	2528	3558	4587
90	5509	1495	2940	4385	5830



BIF
D. SZILAGYI
10/30/85

S.R. NC7-323 / NS7327

ATTACHMENT C

BIF Butterfly Valve Test Reports

BIF BUTTERFLY VALVE TEST REPORT

CUSTOMER Carolina Power & Light ORDER NO. N 67926-U SERIAL NO. N 67926-1

BIF MODEL NO. 0657 SIZE 8" PRESSURE RATING 45# CUST. TAG NO. 2CP-B1SA-1

VALVE TEST

Valve with operator	Valve plain stem
Leak test Proc. ______ Rev. ______	Leak test Proc. QCI 151 Rev. A
*Side 1 ___ PSIG ___ Min. ______ OK/Q.C.	*Side 1 150 PSIG 5 Min. E. Cotilli OK/Q.C. 1-8-85
Side 2 ___ PSIG ___ Min. ______ OK/Q.C.	Side 2 150 PSIG ___ Min. E. Cotilli OK/Q.C. 1-8-85
Body hydro test Proc. ______ Rev. ______	Body hydro test Proc. QCI 149 Rev. A
___ PSIG ___ Min. ______ OK/Q.C.	450 PSIG 10 Min. E. Cotilli OK/Q.C. 1-8-85 Also DISC HYDRO PER QCI 151 REV. A 150 PSIG FOR 5 MIN. AND 1-8-85
*Flat side up	Valve torque test ___ in-lb ___ Q.C.

OPERATOR TEST

GAUGE No 50747 0-1000 #
50938 0-300 #

Cylinder S/N 84-9026-1	Manual	Electric
Operator Pos. A 3	Operator Pos. ______	Operator Pos. ______
*Hydro Test 90 PSIG ___ OK/Q.C.	S/N ______	S/N Red. ______ S/N Elec. ______
Valve Shutoff Pressure 45 PSIG	Valve Shutoff Pressure ______	Valve Shutoff Pressure ______
Spec. Min. Cyl. Pressure 70 PSI	Torque to:	Open vs. shutoff pressure by handwheel ☐
80% Min. Cyl. Pressure ______	Actual/open ___ ft/lb ___ Q.C.	Limit switch set ☐
Actual/open 70 PSIG E.B. Q.C.	Actual/close ___ ft/lb ___ Q.C.	Torque switch set ☐
Actual/close 70 PSIG E.B. Q.C.	Input shaft turns CW to open ☐ close ☐	Elect. Cal. ☐
Dewater cylinder ☐ N/A		Open ___ sec; close ___ sec.
Cylinder size N/A		Current draw ___ A
*Unless customer spec. differs if so, enter actual OPEN 2 SEC, CLOSE 1 SEC.		If floor stand mtd., shipped w/o setting ☐

PERFORMANCE TEST

1. STANDARD VALVE – Each valve shall be opened and closed three times under no flow conditions. For valves 54" and larger, the test shall be conducted with the valve in the same position as it will be installed in the field. See Eng. Order Data Sheets. Passed test N/A Tester

2. VALVES WITH SPECIAL PERFORMANCE TEST PROCEDURES
Procedure No. QCI 152 Rev. NO Open and close 3 times. Passed test 460 Tester E. Blount 3-8-85

Final Inspection

Visual O.K. RRC Q.C.
Dimensional O.K. RRC Q.C.
If required by customer:
Paint thickness is 10 mils. EB Q.C.
Holiday check at N/A volts ______ O.K./Q.C.

Certified test report required ☒
AWWA Proof of Design report ☐ N/A

E. Cotilli 3-15-85
Product Inspector Date

RECEIVED ... 3-7?-85

3-14-85

5

Form Q.C. 2248
7-22-77

BIF BUTTERFLY VALVE TEST REPORT

CUSTOMER Carolina Power & Light ORDER NO. N67926-U SERIAL NO. N67926-2

B I F MODEL NO. 0657 SIZE 8" PRESSURE RATING 45# CUST. TAG NO. 2CP-B5SA-1

VALVE TEST

Valve with operator	Valve plain stem
Leak test Proc. ______ Rev. ______	Leak test Proc. QCI 151 Rev. A
*Side 1 ___ PSIG ___ Min. ______ OK/Q.C.	*Side 1 150 PSIG 5 Min. [illegible] OK/Q.C. 1-8-85
Side 2 ___ PSIG ___ Min. ______ OK/Q.C.	Side 2 150 PSIG 5 Min. [illegible] OK/Q.C. 1-8-85
Body hydro test Proc. ______ Rev. ______	Body hydro test Proc. QCI 149 Rev. A
___ PSIG ___ Min. ______ OK/Q.C.	450 PSIG 10 Min. R. [illegible] OK/Q.C.
	Valve torque test ___ in-lb ___ Q.C.
*Flat side up	DISC HYDRO PER [illegible] QCI 151 REV. A 150 PSIG FOR 5 MIN. 1-8-85

OPERATOR TEST

GAUGE # 50741 0-1000# 50935 0-300#

Cylinder S/N 84-9026-2	Manual	Electric
Operator Pos. A3	Operator Pos. ______	Operator Pos. ______
*Hydro Test 90 PSIG ___ OK/Q.C.	S/N ______	S/N Red. ______ S/N Elec. ______
Valve Shutoff Pressure 45 PSIG	Valve Shutoff Pressure ______	Valve Shutoff Pressure ______
Spec. Min. Cyl. Pressure 70 PSI	Torque to:	Open vs. shutoff pressure by handwheel ☐
80% Min. Cyl. Pressure ______	Actual/open ___ ft/lb ___ Q.C.	Limit switch set ☐
Actual/open 70 PSIG E.B. Q.C.	Actual/close ___ ft/lb ___ Q.C.	Torque switch set ☐
Actual/close 70 PSIG E.B. Q.C.	Input shaft turns CW to	Elect. Cal. ☐
Dewater cylinder ☐ N/A	open ☐ close ☐	Open ___ sec; close ___ sec.
Cylinder size N/A		Current draw ___ A
*Unless customer spec. differs if so, enter actual		If floor stand mtd., shipped w/o setting ☐
* OPEN 2 SEC. CLOSE 1.5 SEC. S. [illegible] 2/21/85		

PERFORMANCE TEST

1. STANDARD VALVE – Each valve shall be opened and closed three times under no flow conditions. For valves 54" and larger, the test shall be conducted with the valve in the same position as it will be installed in the field. See Eng. Order Data Sheets. Passed test N/A Tester
2. VALVES WITH SPECIAL PERFORMANCE TEST PROCEDURES
   Procedure No. QCI 152 Rev. NO Open and close 3 times. Passed test YES Tester E. Bissett 3-8-85

Final Inspection

Visual O.K. RKC Q.C.
Dimensional O.K. RKC Q.C.
If required by customer:
Paint thickness is 10 mils. EB Q.C.
Holiday check at N/A volts ______ O.K./Q.C.

Certified test report required ☒
AWWA Proof of Design report ☐ N/A

R. [illegible] 3-15-85
Product Inspector Date

* INFORMATION IS FROM BIF SHOP INSPECTOR
E. Bissett
10-29-85

REVIEWED BY [illegible]
EBASCO ENGINEERING
[illegible] 3-19-85
EBASCO VOA REP.

3/4/85

5

Form Q.C. 2240
7-22-77

B I F BUTTERFLY VALVE TEST REPORT

CUSTOMER Carolina Power & Light ORDER NO. N 67927-U SERIAL NO. N67927-1

B I F MODEL NO. CE57 SIZE 8" PRESSURE RATING 45# CUST. TAG NO. 2CP-B2SB-1

VALVE TEST

Valve with operator	Valve plain stem
Leak test Proc. ______ Rev. ______	Leak test Proc. QCI-151 Rev. A 1-10-85
*Side 1 ___ PSIG ___ Min. ______ OK/Q.C.	*Side 1 150 PSIG 5 Min. R. Castelli OK/Q.C.
Side 2 ___ PSIG ___ Min. ______ OK/Q.C.	Side 2 150 PISG 5 Min. R. Castelli OK/Q.C. 1-10-85
Body hydro test Proc. ______ Rev. ______	Body hydro test Proc. QCI-149 Rev. A 7a.
___ PSIG ___ Min. ______ OK/Q.C.	450 PSIG 10 Min. R. Castelli OK/Q.C 1-10-85
	Valve torque test DISC HYDRO PER QCI 154 REV. A 450PSI FOR 5 MIN.
*Flat side up	___ in-lb ___ Q.C.

OPERATOR TEST GAUGE # 50747 0-100 PSI 50938 0-30 PSI

Cylinder S/N 84-9028-2	Manual	Electric
Operator Pos. B3	Operator Pos. ______	Operator Pos. ______
*Hydro Test 90 PSIG ___ OK/Q.C.	S/N ______	S/N Red. ______ S/N Elec. ______
Valve Shutoff Pressure 45 PSIG	Valve Shutoff Pressure ______	Valve Shutoff Pressure ______
Spec. Min. Cyl. Pressure 70 PSI	Torque to:	Open vs. shutoff pressure by handwheel ☐
80% Min. Cyl. Pressure ______	Actual/open ___ ft/lb ___ Q.C.	Limit switch set ☐
Actual/open 70 PSIG EB Q.C.	Actual/close ___ ft/lb ___ Q.C.	Torque switch set ☐
Actual/close 70 PSIG EB Q.C.	Input shaft turns CW to open ☐ close ☐	Elect. Cal. ☐
Dewater cylinder ☐ N/A		Open ___ sec; close ___ sec.
Cylinder size N/A		Current draw ______ A
*Unless customer spec. differs if so, enter actual OPEN 2 SEC. CLOSE 1 SEC.		If floor stand mtd., shipped w/o setting ☐

PERFORMANCE TEST

1. STANDARD VALVE – Each valve shall be opened and closed three times under no flow conditions. For valves 54" and larger, the test shall be conducted with the valve in the same position as it will be installed in the field. See Eng. Order Data Sheets. Passed test N/A Tester
2. VALVES WITH SPECIAL PERFORMANCE TEST PROCEDURES
Procedure No. QCI 152 Rev. NO Open and close 3 times. Passed test YES Tester E Bennett 3-7-85

Final Inspection

Visual O.K. RKC Q.C.
Dimensional O.K. RKC Q.C.
If required by customer:
Paint thickness is 6.2 mils. EB Q.C.
Holiday check at N/A volts ______ O.K./Q.C.

Certified test report required ☒
AWWA Proof of Design report ☐ N/A

R. Castelli 3-15-85
Product Inspector Date

REVIEWED BY
EBASCO ENGINEERING
REVIEWED BY
EBASCO VQA REP.

3-14-85

5

Form Q.C. 2248
7-22-77

CUSTOMER Carolina Power & Light ORDER NO. N67927-U SERIAL NO. N67927-2

B I F MODEL NO. 0657 SIZE 8" PRESSURE RATING ______ CUST. TAG NO. 2CP-B6SB-1

VALVE TEST

Valve with operator	Valve plain stem
Leak test Proc. ______ Rev. ______	Leak test Proc. QCI 151 Rev. A
*Side 1 ___ PSIG ___ Min. ______ OK/Q.C.	*Side 1 150 PSIG 5 Min. [signature] OK/Q.C. 1-10-85
Side 2 ___ PSIG ___ Min. ______ OK/Q.C.	Side 2 150 PSIG 5 Min. [signature] OK/Q.C. 1-10-85
Body hydro test Proc. ______ Rev. ______	Body hydro test Proc. QCI-151 Rev. A
___ PSIG ___ Min. ______ OK/Q.C.	450 PSIG 10 Min. [signature] OK Q.C.
	DISC HYDRO PER QCI 151 REV. A 150 PSI FOR 5 MIN.
*Flat side up	Valve torque test ___ in-lb ___ Q.C.

OPERATOR TEST

GAUGE # 50797 0-1000# 50938 0-500#

Cylinder S/N	Manual	Electric
Operator Pos. A3	Operator Pos. ______	Operator Pos. ______
*Hydro Test 90 PSIG ___ OK/Q.C.	S/N ______	S/N Red. ______ S/N Elec. ______
Valve Shutoff Pressure 45 PSIG	Valve Shutoff Pressure ______	Valve Shutoff Pressure ______
Spec. Min. Cyl. Pressure 70 PSI	Torque to:	Open vs. shutoff pressure by handwheel ☐
80% Min. Cyl. Pressure ______	Actual/open ___ ft/lb ___ Q.C.	Limit switch set ☐
Actual/open 70 PSIG EB Q.C.	Actual/close ___ ft/lb ___ Q.C.	Torque switch set ☐
Actual/close 70 PSIG EB Q.C.	Input shaft turns CW to open ☐ close ☐	Elect. Cal. ☐
Dewater cylinder ☐ N/A		Open ___ sec; close ___ sec.
Cylinder size N/A		Current draw ______ A
*Unless customer spec. differs if so, enter actual OPEN 2 SEC. CLOSE 1.5 SEC.		If floor stand mtd., shipped w/o setting ☐

PERFORMANCE TEST

1. STANDARD VALVE – Each valve shall be opened and closed three times under no flow conditions. For valves 54" and larger, the test shall be conducted with the valve in the same position as it will be installed in the field. See Eng. Order Data Sheets. Passed test N/A Tester
2. VALVES WITH SPECIAL PERFORMANCE TEST PROCEDURES
Procedure No. QCI 152 Rev. NC Open and close 3 times. Passed test 460 Tester [signature] 3-6-85

Final Inspection

Visual O.K. RKC Q.C.
Dimensional O.K. RKC Q.C.
If required by customer:
Paint thickness is 4.8 mils. EB Q.C.
Holiday check at N/A volts ______ O.K./Q.C.

Certified test report required ☒
AWWA Proof of Design report ☐ N/A

[signature] 3-15-85
Product Inspector Date

ANI/AI REVIEW
INT [initials]
Date 3-14-85

REVIEWED BY [initials]
EBASCO ENGINEERING
REVIEWED BY [signature]
EBASCO VCA REP.

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Form Q.C. 2248
7-22-77