REPORT NO.: 99900053/83-01	INSPECTION DATE(S)	1/25-28/83	INSPECTION ON-SITE HOURS: 27
CORRESPONDENCE ADDRESS: ORGANIZATIONAL CONTACT:	Anchor Darling Val ATTN: Mr. A. E. C President 701 First Street Williamsport, Penn Mr. G. W. Mneiser,	ve Company arod sylvania 1770: Quality Assura	l ance Manager
TELEPHONE NUMBER:	(717) 323-6121		
NUCLEAR INDUSTRY ACTIVITY to the nuclear industry i	ear valves. Y: The Anchor Darl represents approxim	ing Valve Compa ately 55 percer	any (ADVC) contribution nt of its total workload.
ASSIGNED INSPECTOR: W.D. Sec OTHER INSPECTOR(S):	Banas Kelley, Reactive ction (R&CPS)	& Component Pro	ogram <u>7-7-83</u> Date
APPROVED BY:	1. Banas arnes, Chief, R&CPS		<u></u>
INSPECTION BASES AND SCOP	PE:		
A. BASES: 10 CFR Part	21 and 10 CFR Part	50, Appendix B	3.
B. <u>SCOPE</u> : This inspect inspector identification received at the Communits 1 ar 1 2; (2) at (Cont. on next page)	tion was made as a ation of under torq nonwealth Edison Co a 10 CFR Part 50.55	result of: (1) ued bolting of mpany (CEC), La (e) report by L	the NRC resident ASME Section III valves Salle County Station, ouisiana Power and Light
PLANT SITE APPLICABILITY: failure of valve actuator	(1) Under torqued < 65° F: 50-382;	bolting: 50-37 and (3) Valve s	73 & 50-374; (2) Potential tem failure: 50-324.
		1	DESIGNATED ORIGINAL
8305030475 8304 PDR 04999 EMVANI 99900053 F		Certified	Dy NOCC

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DPE: (Cont.) Company Dation valves that we ation, Unit 3, to clo ent Report by Carolin ilure of a core spray unswick Steam Electri	by (LP&L) concerning the poten were furnished to the Waterfor ose within the specified time; a Power and Light Company (CP v isolation valve that was fur c Station, Unit 2.	ntial failure of feedwater rd Generating ; and (3) a Licensee P&L) concerning the stem rnished to the		
DLATIONS:				
ne				
ICONFORMANCES:				
Contrary to Criter paragraph 7.4.3 in (QAM), paragraph 2 Specification No.	ion V of Appendix B to 10 CFR Section 7.0 of the Quality A in the Ebasco Services, Inco 88-70, and the Ebasco valve 1	R Part 50, Assurance Manual Prporated (Ebasco) ist:		
a. The Design Re furnished to address or de to closing of as low as 0°	port for 900-pound feedwater Waterford Generating Station, monstrate the validity of the the valve within the require F.	isolation valves Unit 3, did not design with respect d time at temperatures		
<ul> <li>b. Closing speed was not verif No. 43847-2, temperature o testing was 7</li> </ul>	design adequacy at temperatu ied as evidenced by Wyle Labo Revision C, which indicated t f the hydraulic actuator duri 0° F.	res as low as O° F ratories Report hat the lowest ng qualification		
<ol> <li>Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 7.4.4 in Section 7.0 of the QAM, modification documents pertaining to site installation of an electric heater and shroud on the 20-inch feedwater isolation valves were not reconciled with the Design Report in regard to the effect of the modification on the</li> </ol>				
	99900053/83-01 DPE: (Cont.) Compare Dation valves that we ation, Unit 3, to closent Report by Carolin ilure of a core spray unswick Steam Electric DLATIONS: ne CONFORMANCES: Contrary to Criter paragraph 7.4.3 in (QAM), paragraph 2 Specification No. a. The Design Refurnished to address or de to closing of as low as 0° b. Closing speed was not verif No. 43847-2, temperature o testing was 7 Contrary to Criter paragraph 7.4.4 in pertaining to site the 20-inch feedwa Design Report in r validity of the co	<ul> <li>INSPECTION RESULTS:</li> <li>PPE: (Cont.) Company (LP&amp;L) concerning the poter Dation valves that were furnished to the Waterfor ation, Unit 3, to close within the specified time; ent Report by Carolina Power and Light Company (Cf ilure of a core spray isolation valve that was fur unswick Steam Electric Station, Unit 2.</li> <li>DLATIONS:</li> <li>DE</li> <li>Contrary to Criterion V of Appendix B to 10 CFF paragraph 7.4.3 in Section 7.0 of the Quality A (QAM), paragraph 2 in the Ebasco Services, Inco Specification No. 88-70, and the Ebasco valve 1</li> <li>The Design Report for 900-pound feedwater furnished to Waterford Generating Station, address or demonstrate the validity of the to closing of the valve within the require as low as 0° F.</li> <li>Closing speed design adequacy at temperatu was not verified as evidenced by Wyle Labo No. 43847-2, Revision C, which indicated t temperature of the hydraulic actuator duri testing was 70° F.</li> <li>Contrary to Criterion V of Appendix B to 10 CFR paragraph 7.4.4 in Section 7.0 of the QAM, modi pertaining to site installation of an electric the 20-inch feedwater isolation valves were not Design Report in regard to the effect of the mo validity of the calculations</li> </ul>		

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## D. OTHER FINDINGS OR COMMENTS:

- Under Torqued Valve Bolting at the CEC La Salle County Station, Units 1 and 2:
  - a. The NRC inspector reviewed the ADVC Instruction Manual for the valves supplied to the CEC La Salle County Station, Units 1 and 2, and ascertained that the manual: (1) contained the following receiving inspection instruction, ". . . all bonnet, yoke and Limitorque bolting should be checked to ensure that the joints are secure. Bolting, on occasion, may become loosened during shipment and handling."; (2) instructed maintenance personnel, as follows, "When replacing the bonnet studs and nuts . . . on bolted bonnet valves, consult a torque table for correct torque to assure tightness of seal. . . ."; and (3) included a sketch providing torquing sequence instructions for different bonnet bolting configurations.
  - b. The NRC inspector noted by observation in the shop assembly area that all torque wrenches had been calibrated and were current in calibration status. It was additionally observed that a torque value chart had been posted which had an effective date of June 20, 1980.
  - c. Paragraph 12.4.4 of the QAM states, in part, "The Quality Engineer shall advise the Project Engineer of required in-process inspection operations to be performed during manufacture. This information is transmitted on the SOI. . . ." The Quality Engineer had not designated the torquing of bolting as an operation requiring in-process inspection.
- Potential Failure of Feedwater Isolation Valves at the LP&L Waterford Generating Station, Unit 3, to Close Within the Specified Time at Temperatures Below 65° F:
  - a. The NRC inspector ascertained by review of the design specification, correspondence, and interoffice memoranda that:
     (1) the design specification required the main feedwater isolation valves to be 20-inch 900-pound flex wedge gate valves with an electric motor actuator suitable for outdoor installation in an ambient temperature range from 0° F to 104° F;
     (2) ADVC was requested by their customer to change the main feedwater isolation valve actuator to permit emergency closure

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		within 5 seconds; February 22, 1977 gate valve was not a double disc para hydraulic operator ADVC proposal, the was transferred for Williamsport plant however, through t	(3) ADVC indicated in their letter or , that a flex wedge electric motor act t suitable for the intended service an allel seated gate valve with a self-co r; and (4) after customer acceptance of e responsibility for design and manufa rom the ADVC Hayward, California, plan t. All customer contacts were to be r the Hayward, California, plant.	f tuated nd offered ontained of the acturing nt to the made,
	b.	Review by the NRC for the feedwater the valves at temp design specification hydraulic actuator above. This was in paragraph B.1).	inspector determined that the design isolation valves did not address clos peratures as low as the 0° F required ion, and, that qualification testing o r was performed at temperatures of 70° identified as a nonconformance (see	report sing of by the of the °F and
	c.	The NRC inspector corrective action installation of a and controls) over the ambient temper	verified by review of correspondence agreed between Ebasco and ADVC was th metal shroud (containing an electric r the hydraulic actuator in order to m rature above 65° F.	that the ne heater naintain
	d.	The NRC inspector for the valve and calculations by us Review of the desi ment which would s document revision. ified in regard to practice had been taken to prevent r in regard to the f modification on th paragraph B.2).	reviewed the original seismic calcula noted that corrections had been made se of paste-ons, paste-overs, and whit ign specification did not reveal any r specifically preclude use of such prace A nonconformance was, therefore, no o this subject. However, ADVC stated discontinued and corrective action we recurrence. One nonconformance was id failure to reconcile the effects of th he validity of the seismic calculation	tions to the e outs. require- tices for tident- the culd be dentified he shroud hs (see
3.	Core Elec	Spray Isolation Va tric Station, Unit	live Stem Failure at the CP&L Brunswic 2:	<u>k Steam</u>
	a.	The NRC inspector	determined by review of two ADVC Noti	fication

a. The NRC inspector determined by review of two ADVC Notification and Resolution of Abnormal Occurrence Reports, one letter, two drawings, and a telephone log that: (1) a CP&L maintenance

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REPORT NO.:	99900053/83-01	INSPECTION RESULTS:	PAGE 5 of 5
	engineer had possible stem operated gate inspector at failure had of 600-pound mar location appr that there we for a period CP&L personne informed that from approxim failure area; notified ADVO intergranular operated valv and that the similar to th stem; (5) the valve) and 82	notified ADVC on June 24, 1982 for disc failure in a 10-inch of valve; (2) CP&L had notified to the Brunswick Steam Electric St occurred during a functional tes ually operated core spray isola oximately 10 inches below the re indications that the cracks of time; (3) in telephone conver- l and the ADVC technical direct the Brinell hardness of the fa- tately 300 at each end to approx (4) a CP&L failure evaluation on December 13, 1982, in regan fracture of a stem in a 20-ind e at approximately 10 inches at failure was probably due to str previously reported failure ( broken stems were from Heat No 3749 (20-inch valve).	, in regard to a 600-pound gear the NRC resident tation that a stem st of a ADVC 10-inch ation valve at a threaded section and may have existed ersations between tor, ADVC was ailed stem varied ximately 400 in the engineer had rd to the failure by ch 300-pound motor bove the "T" head ress corrosion and of the 10-inch valve os. 825737 (10-inch
	<ul> <li>b. The NRC inspective treatment recovalves were of Hayward, Calistems were spto be ASTM A2 Brinell hardn designed in a (4) the 10-in 2 hours, oil Brinell hardn to be within</li> </ul>	ctor determined by review of AL ords, and memoranda that: (1) esigned and manufactured at the fornia, plant; (2) the 10-inch ecified on the assembly drawing 76, Type 410 material and heat ess range of 282 to 320; (3) th ccordance with the requirements ch valve stems were heat treate quenched, and drawn at 1050° F ess readings after heat treatme the range specified on the asse	DVC drawings, heat the 10-inch gate e now closed ADVC and 20-inch valve g bill of materials treated to a he valves were s of ANSI B16.5; and ed at 1825° F for for 4 hours. The ent were identified embly drawings.
	c. As of this in from the fail mechanism and area. This s inspection af the reasons f	spection, ADVC had not received ed stems or a report from CP&L the reasons for high hardness ubject will be further reviewed ter receipt of pertinent techni or the failures.	d either samples addressing failure in the failure d during a subsequent ical information on

Inspector WID D. Kelley

ORGANIZATION: Anchor Darling Valve Co Inspector M Williamsport, PennsylvaniaScope/Module\_

REPORT NO.: 99900053/83	-01 PERSONS CONTACTED	APPENDIX PAGE _ of
NAME(Please Print)	TITLE(Please Print)	ORGANIZATION
A. E. Cared	President	ADVC - Radnor, PA
J. Chappell	Manager of Engineering	ADVC-Williamsport
G.W. Kneiser	Quality Assurance Mar.	
W.G. Knecht	Technical Director	
T. Garces	Project Engineer	
	2	

ORGANIZATION: Anchor Darling Valvelo INSPECTOR: WMD. Kelley Williamsport, Pennsylvania SCOPE: Undertorqued Besting

REPORT NO.:	9990	0053/83-01	DOCUMENTS EXAMINED	AP	PENDI	×
ITEN NO.	TYPE	TITLE	/SUBJECT		DOC	DOC. REV
01	4	ADVC Quality	Assurance Manual Issue 2		12/4/8	·
02	8	ADVC Instruc E-58%5: Com	tion Manual For AlDOrder N monwealth Edison Co. LaSal	la. Ie	-	-
03	6	County Station ADVC Transin ADVC Bolt	ittal of Table Listing Bolt Torque Torque Value Table	. Kiluc	6/20/20	<u> </u>
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Docum 1. D 2. S 3. P 4. Q	ent Typ rawing pecific rocedur A Manua	es: ation 6. Inter e 7. Lette 1 8. 1 Lette	has Order 9. <u>Table</u> rnal Memo 10 er 11 ruction Manuel2		l	-

ORGANIZATION: Anchor/Darling Valve Co. INSPECTOR: WMD. Kelley Williamsport, Pennsylvania SCOPE: Nonconformances & Corrective

	-	Action		
REPORT NO.:	9990	DOCUMENTS EXAMINED PA	PENDI GE et	×
ITEN NO.	TYPE	TITLE / SUBJECT	DOC	DOC. REV
01	4	ADVG Quality Assurance Manual Issue No2.		•
02	в	ADVC Standard MQCS-2 Noncenterming		F
03	8	ADVC Standard ES-11 Design Control		F
04	8	ADVC Standard ES-10 Preparation and Use of Shop Order Instructions		F
05	9	ADVC Material Rejection Notices		
06		Form MQCS-2-1 (12 MRNS on 3 Orders)		H
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Docum 1. D 2. S 3. P 4. Q	ent Typ rawing pecific rocedur A Manua	tes: 5. Purchas Order 9. <u>Material Rejection Nation</u> 5. Purchas Order 9. <u>Material Rejection Nation</u> 6. Internal Memo 10. 10. <u>Procedure</u> 12.	ės	

			Stem Failure		-
REPORT NO.: 9	199000	053/8301	DOCUMENTS EXAMINED	PPEND PAGE	F -
ITEN NO.	DOC	TIT	LE/SUBJECT	DOC	DOC. REV
01	8	ADVC Notific	ation and Resolution of Abnormal		
		Occurrence	ABW-8217	chak	2
02	8	APVC Notif	ication and Resolution of Abnorma	4	
	-7	Courrence	ABW = 82-30	13/3/	82
03	-1	ADVC Lett	er to CPAL Subject. Anchor		
		Gat VI	Ive Stem Failures - 20" 3001	1/1/10	
04	9	ADVC Terl	mical Director Telachana Loa	41983	
05	1	ADVC Dwg	1222-3-10"-600" Gate Valie	Viliot	D
		Bevel Gear O	berated Pressure Seal, BWE	- chistr	
OG	1	ADVC Dag	1646-3-20"-300" Gate Valve		
		Motor Op., E	Bolted Bennet, BWE	6/15/12	D.
07	10	ADVC Dock	et Package UEAC P.0.9527-01-		-
		248-9, CPIC	B for 4-10" 600# Gate Valves		-
_08	10	ADVC Deci	ket Package UESC PO.9527-01-		
		248-9, CP1	08 for 8 -20" 300 " Gate Values	~	
				1	
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ORGANIZATION: Anchor Darling Valve Co. INSPECTOR: WMD. Kelley Williamsport, Pennsylvania SCOPE: Core Spray Isolation Valve

ORGANIZATION:	Anchor Darling Valve Co.	INSPECTOR: WMD. Kelley
	Williamsport, Pennsylvania.	SCOPE: Failure of Feedwater Isolation Valve
		to close within Specified Time

REPORT NO.:	9990	DOCUMENTS EXAMINED	AGE A	1X -
ITEN NO.	DOC	TITLE / SUBJECT	DOC	DOC. REV
01	4	ARVE Quality Assurance Manual-Issue No2	2/1/8	1.1
02	3	ADVC Standard ES-2 Preparation of Master	_	
		Drawing Lists & Material Drowing List		1
03	3	ADVC Standard ES-10 Preparation and Use		
1. S.		of Shop Order Instructions		F
04	3	ADVC Standard ES-11 Design Control		
		and Interface Procedure		F
05	3	ADVE Standard ES-12 Project Engineer	-	B
		Qualification Requirements		
06	Z	Ebasco Services Inc. Spec. 88-70 station High		
		Pressure Steel Valves Nuclear Safety Class 2 42.		R
07	6	ADVC - Suleject: Reply to Ebasco Services		
		Telex of 2/18/01	2/20/8	-
08		Ebasco Telex Subjecti Fvd Isolation Valves		
		PO: INY. 403461 I tem 52453-NRC Question 10.3	2/18/2	
09	_//	ARVE Telex Subject. UR Telex 2/18/81		
		NRC Question 10.36	2/24/81	
10	12	Ebasco Valve List Contract NY-403461		1
-11	7	ADVC letter to Ebasco Subjecti LPALC	1 1	
10		High Pressure Valves PO, No 403461	2/22/11	
12	6	ADVC Debject. Ebasco 100 No 403461	1.1.	
12	1	ADVC D DA-WORD 2011/09 Valves	6/2977	
12		AUVE Dag 94-13030 20 KIE XZO FWIV		N
		A DU IL La Li Actuation V 21VE WITH		~
14		ADVC Bill of Ladi Panada 2	lake k	-
		and purer being Ny 110-1, 2, 3	10/23/8/	
Docum 1. Di 2. Si 3. Pi 4. Qi	ent Typ rawing pecific rocedur A Manus	pes: 5. Purchas Order 9. <u>Log</u> cation 6. Internal Memo 10. <u>Docket Package</u> re 7. Letter 11. <u>Telex</u> al 8. <u>Repart</u> 12 <u>List</u>	-	