U-600339 L30-85(12-04)-L 1A.120

ILLINDIS POWER COMPANY



CLINTON POWER STATION, P.O. BOX 678, CLINTON, ILLINOIS 61727

December 4, 1985

Docket No. 50-461

Director of Nuclear Reactor Regulation Attention: Mr. W. R. Butler, Chief Licensing Branch No. 2 Division of Licensing U. S. Nuclear Regulatory Commission Washington, DC 20555

Subject: Clinton Power Station Unit 1 Long Forms for the 21 PVORT Components

Dear Mr. Butler:

Enclosed please find the long forms for the twenty-one (21) PVORT components. Long forms are included for the following components:

1.	1E12-F073A	11.	1E51-C001,	2
2.	1E12-F103A	12.	1E51-C002E	
3.	1B21-F037A	13.	1FC004A	
4 .	1E31-F014	14.	1E22-F005	
5.	1SX01PC	15.	1HG010C	
6.	1E21-C002	16.	1SX025B	
7.	1E51-F015	17.	10050	
8.	1RF019	18.	1E22-F001	
9.	1B21-F041A	19.	1E12-F021	
	1B21-F067A	20.	1SX01PA	
		21.	1CC076B	

Long forms will be available with the PVORT packages at the time of the re-audit.

Please contact us if you have any questions on this matter.

Sincerely yours, F. A. Spangenberg Manager - Licensing

and Safety

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PSB (BWR) EB (BWR) J. Lombardo B. Siegel A.Lee Docket File NSIC LPOR NAC POR 24 X

8512060266 851204 PDR ADOCK 05000461 PDR Δ

SAB:1jb

Enclosures

B. L. Siegel, NRC Clinton Licensing Project Manager cc: NRC Resident Office Regional Administrator, Region III, USNRC Illinois Department of Nuclear Safety

PVOP NO.	200C
REVISION	A
Page Cl	

Pump & Valve Operability Assurance Review Checklist

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SIGNATURE PAGE

System Engineer Review Would	Date	11/7/85
Equipment Qual. Review Muito	Date	11/7/85
Electrical Engineer Review Robert Reaven	Date	11-7-85
C&I Engineer Review Com Cantal	Date	11-7-85
Reconcilation of IPC Walkdown Results		
	Date	

Tag #1E21-C002 Page C2

REFERENCE

Sec. 1.

1. P&ID Drawings: M05-1073, Sht. 1, Rev. T and M05-1075, Sht. 1, Rev. U 2. Vendor Drawings: a. A-25513 (K-2826) b. N768857 #1 (K-2826) c. N768857 #2 (K-2826) d. 602531-682 (K-2882) 3. S&L Electrical Schematic Drawings: E02-1LP99, Sht. 8 and E02-11P99, Sht. 504 S&L Specification K-2826 4. Equipment Foundation Drawing: M04-1102 5. Foundation Load Calculations: COD-001919 and EMD-013242 6. Seismic Qual Reports: A. SQ-CL009 and B. SQ-CL042 7. Environmental Qual Report: EQ-CL061A 8. Mechanical EQ Report: MEQ-CL079 9.

10. Code Data Report - Serial Number N768B857

Illinois Power Company Clinton Power Station

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PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

Ι.	PLANT INFORMATION				
	1. Name: Clinton Unit	No. 1 2. Docket No.:50-461			
	3. Utility: Illinois Powe	The second			
		CO. [] PWR [x] BWR			
	5. A/E: Sargent & Lundy				
II.	GENERAL COMPONENT* INFORMATI	ION			
ж. 1.	1. Supplier: [] NSSS	BOP Specification K-2826			
		ilding/Room Aux/Env. Zone=H-11			
	b. E1	evation 707'-6"			
	c. Sy	stem LPCS Water Leg			
	3. Component number on in-	house drawings: 1E21-C002			
	4. If component is a 😡 P	ump complete II.5.			
	If component is a [] Valve complete II.6.				
	5. General Pump Data				
	a. Pump	b. Prime-mover			
	Name LPCS Water Leg Pump	Name Motor			
	MfgGould_Pumps, Inc.	Mfg. Reliance Electric			
	Model_3196ST	Model 215T-Frame			
	S/N N768B857	S/N 3YF883403A2 PL			
	Type Centrifugal	Type Horizontal, single speed, TEFC			

* The component, whether pump or valve, is considered to be an assembly composed by the body, internals, prime-mover (or actuator) and functional accessories.

b. Prime-mover (continued)
Size 215T, 5 H.P. Weight 140 lb.
Mounting Method Bolted to Base Plate
H.P. 5
Power requirements: (include normal, maximum and minimum).
Electrical
3 Phase; 60 Hz; 460 volts
(±10%, -25% for 1 min.)
Other None
If Motor i t: Duty cycle Continuous
Stall current 58 amps
Class of insulation H Tab D
None
mote manual hand switch

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

6. General Valve Data	
a. Valve	b. Actuator (if not an integral unit)
Name	Name
Mfg.	Mfg.
Model	Model
s/N	S/N
Туре	Туре
Size	Size
Weight	Weight
Mounting Method	Mounting Method
Required Torque	Torque
Parameter Design Operat	ing Power requirements: (include normal, maximum and minimum). Electrical
Temp	
Flow	
Max dP across valve	Ref.
Closing time @ max 'P /Ref. Opening time @ max OP	Other: [] neumatic[]Hydraulic
/Ref. Power requirements for funct	Elonal
accessories, (if any)	
List control signal inputs:	
List functional accessories:	

1.	Briefly describe components normal and safety
	functions: This pump's normal and safety function
i	s to keep the LPCS piping and RHR loop A piping filled
W	ith water in order to avoid the time delays in filling
t	he line and to avoid hydraulic hammer.
2.	The components normal state is: [X] Operating [] Sta
з.	Safety function:
	a. [] Emergency reactor b. 🕅 Containment hea shutdown removal
	c. [] Containment isolation d. 🐱 Reactor heat re
	e. [] Reactor core cooling f. [] Prevent signific release of radio active material environment
	g. Does the component function to mitigate the consequences of one or more of the following events? [K] Yes [] No If "Yes", identify.
	W LOCA [] HELB [] MSLB
	[] Other
4.	Safety requirements:
	[] Intermittent Operation [X] During postulated eve
	[] Continuous Operation [] Following postulated
	If component operation is required following an event, give approximate length of time component must remain operational.
	100 days (e.g., hours, days, e

• . • • •

*

manufacturer that are required to make the valve assembly operational, (e.g., limit switches).

5. For VALVES:

Does the component [] Fail open [] Fail closed [] Fail as Is this the fail safe position? [] Yes [] No Is the valve used for throttling purposes? [] Yes [] No Is the valve part of the reactor coolant pressure boundary [] Yes [] No

Does the valve have a specific limit for leakage? []Yes []No

If "Yes" give limit:

IV. QUALIFICATION

 Reference by specific number those applicable sections of the design codes and standards applicable to the component: ASME B&PV Code, Sec. III, Class-2 .1974 Edition thru Winter 1975. addenda, code case.

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2. Reference those qualification standards, used as a guide to qualify the component:

IEEE 323-1974, 344-1975, 334-1974

 Identify those parts of the above qualification standards deleted or modified in the qualification program.

Deleted:

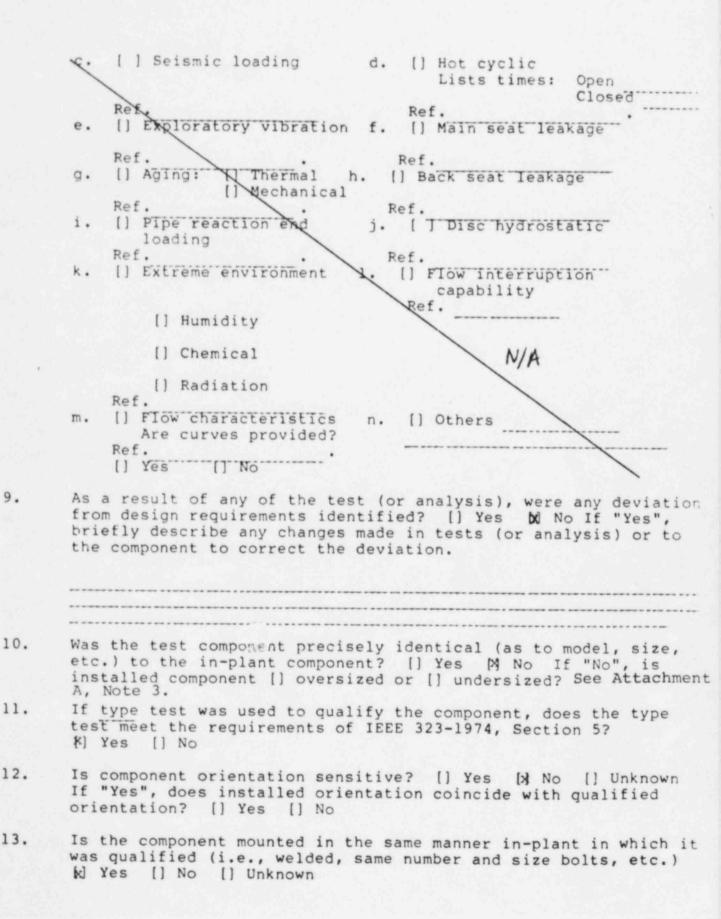
Modified:

None None

- 4. Have acceptance criteria been established and documented in the test plan(s) for the component? Yes [2] No [] Ref. Document: 8 Tab F (Motor)
- 5. What is the expected failure mode that would keep the pump or valve assembly from performing its safety function?

None

	 Are the margins* identidocumentation? Yes Ref. Documents: 7A & 7 		in the qualification No D D; 8 & 9 Tabs C & F .
If	component is a PUMP, complete IV	.7.	
If	component is a VALVE, complete I	v.8.	
7.	Pump operability has been der [] Test 🛛 🕅 Coml	monst binat	rated by: [] Analysis
	Identify PUMP tests performed	d:	
	a. [] Shell hydrostatic (ASME Section III) Ref.	b.	[x] Bearing temperature evaluations
	c. [] Seismic loading Ref.	d.	N Vibration levels
	e. [] Exploratory vibration	f.	[] Seal leakage @ hydro press
	(Fundamental freq.) Rev. g. & Aging: W Thermal	h.	M Flow performance
	🕅 Mechanical		Are curves provided kl Yes
	Ref. Doc. 8 Tab F i. [] Pipe reaction end	j.	Ref. 2A [] Others
	loads (nozzle loads) Ref. Doc. k. 🕅 Extreme environment:		
	A Humidity		
	[] Chemical		
8.	W Radiation Ref. Doc. 8 Tab F Valve operability has been der H Test [] Com	monst binat	trated by: [] Analysis
	Identify VALVE tests performed	d:	
	b. [] Shell hydrostatic MA (ASME Section III)	Þ.	List times: Open
*. the	Ref. Doc. Margin is the difference between test parameters used for equipmen	desi	Ref. gn basis parameters and alification.



14.	Were the qualification tests performed in sequence and on only one component? [] Yes [] No
	If "Yes" identify sequence, (e.g., radiation, seismic, cyclic, thermal, etc.):
15.	If "aging"* was performed, identify the significant aging mechanisms: Thermal, Mechanical, Radiation
16.	Identify loads imposed (assumed) on the component for the qualification tests (analysis) performed:
	c. [] Plants (shutdown loads) b. & Extreme environment
	c. & Seismic load d. & Others Pool dynamic, operational
17.	Have component design specifications been reviewed in-house to assure they envelope all expected operating, transient, and accident conditions? & Yes [] No
18.	Does the component utilize any unique or special materials? (Examples are special gaskets or packing, limitations on nonferrous materials, or special coatings or surfaces.) [X] Yes [] No
	If "Yes", identify: See Attachment A, Note 2
19.	Does component require any special maintenance procedures or practices, (including shorter periods between maintenance)?
	If "Yes", identify: See Attachment A, Notes 1 & 2
20.	Is the qualified life for the component less than 40 years? [] Yes [] No If "Yes", what is the qualified life?

21. Information Concerning Qualification Documents for the Component

Report Number	Report Title	Date	Company/Organizaton Preparing Report	Company/Organization Reviewing Report
N768856	Static Seismic Analysis for RHR Water Leg Pump	11-14-78	Gould Pumps	S&L-CQD (CQD-021184, SQ-CL009)
-	Letter of Response	03-21-79	Gould Pumps	S&L-CQD (CQD-021184, SQ-CL009)
ME-1168	Seismic Stress Analysis of Hori- zontal Motor, 5HP, 215T Frame	04-01-85	McDonald Engineering Analysis Co.	S&L CQD (CQD-021573, SQ-CL042)
NUC-28A	Environmental Quali- fication Report for Water Leg Pump Motor	02-08-85	Reliance Electric Co.	S&L-CQD, (CQD-013857, EQ-CL061A
N/A	Environmental Quali- fication of Gould Pump Model 31965T	08-09-85	S&L-CQD	S&L-CQD (CQD-012440, MEQ-CL079

1E21-C002 Page Cl2 (Final)

ATTACHMENT A

Note 1: - Bearings in the motor are required to be replaced every three years (Ref. 8 Tab E)

Note 2: - For the water leg pump, the following components made from Buna-N must be replaced with Viton before the start-up operation:

oil seal - outboard ----- 332A oil seal - inboard ----- 333A o-ring-bearing housing ----- 496

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Also, for the pump the following maintenance and surveillance requirements are to be followed:

- i) Whenever a metal part adjacent to each non-metallic part is removed, i.e., for maintenance, the non-metallic should be replaced.
- ii) Thrust bearings (MRC 5306) must be replaced every 4.5 years.
- iii) During the bearings replacement schedule, the teflon impeller o-ring (412A) must also be replaced.
- iv) Use Mobil DTE 26 for pump bearing lubrication. (Ref. 9 Tabs C & E)

Note 3: - The subject motor is 5HP, 3550RPM, Frame 215T with Insulation Class H, Type RN; located in Auxiliary Building. The motors tested in Environmental Qualification are:-

- 3 HP, 1730RPM, Frame 182TC with Insulation Class H, Type RH for Normal Service (Non-Containment). (Ref: 8 Tab F, Sec. 5, Report No. NUC-22)
- 150/75 HP, 1200/600 RPM, Frame D5005 with Insulation Class H, Type RN for In-containment Service. (Ref: 8 Tab F, Sec. 6, Report No. X-604)

Class H Type RN insulation has the same basic materials as Class H Type RH; but has mulitple layers of insulating materials which enables it to have additional margin.

PVOP NO.	200B
REVISION	A
Page Cl	

Pump & Valve Operability Assurance Review Checklist

SIGNATURE PAGE

Revision No. A

1.

System Engineer Review Rodlinger	Date_11-7-85
Equipment Qual. Review 11 111000	Date 11-7-85
Electrical Engineer Review Polettheorem	Date 11-7-8+
C&I Engineer Review Cham Kartal	Date //-7-85
Reconcilation of IPC Walkdown Results	

Date

REFERENCES

1. PVOP CHECKLIST

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- 2. P&ID DRAWING: M05-1052, Sheet 3, Rev. T
- 3. VENDOR DRAWINGS:
 - a) FD1A278, Rev. 6,
 - b) B-35705X, Rev. 2
- 4. S&L ELECTRICAL SCHEMATIC DRAWINGS: E02-1SX99-003, Rev. M
- 5. S&L SPECIFICATIONS: K-2828B, Amend. 2
- 6. EQUIPMENT FOUNDATION DRAWING:

S22-1018,	Rev.	AB	S22-1017,	Rev.	V
S22-1011,	Rev.	R	S21-1610,	Rev.	AB

8. SEISMIC QUALIFICATION REPORT:

- Report No. SES/TR-79-01, Dynamic Qualification of Model 8x14A VCM 2-stage Shutdown Service Water Pump, dated 01-19-79 (CQD-019842, SQ-CL017)
- b) Report No. EL-8-5134-90323-01, Seismic Withstand Capability of Siemens-Allis A.C. Induction Motor, dated 01-19-79 (CQD-019843, SQ-CL18)
- 9. CODE DATA REPORTS/HYDROSTATIC TEST REPORT/PUMP PERFOR-MANCE TEST FOR PUMP 1SX01PC, Serial #1A278 & 8-5134-90323-01

10. MISCELLANEOUS

- a) Bingham-Willamette Co. Contract Proposal Page 5 (PD)
- b) Bingham-Willamette Co.'s Code Data Report/Hydrostatic Test Report
- c) Bingham-Willamette Co. Pump Performance Test (Serial #1A278)

Illinois Power Company Clinton Pc/er Station

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PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

Ι.	PLA	NT INFORMATION	
	1.	Name: Clinton Unit No.	1 2. Docket No.:50-461
	3.	Utility: Illinois Power C	
	4.		
	5.	A/E: Sargent & Lundy	
II.	GENE	CRAL COMPONENT* INFORMATION	
	1.	Supplier: [] NSSS [K] BO	P Specification K-2828B
		Location: a. Build	A
			tion 699'-0"
		c. System	n Shutdown Service Water
	3.	Component number on in-hous	se drawings: 1SX01PC
	4.	If component is a [4] Pump	complete II.5.
		If component is a [] Valve	e complete II.6.
	5.	General Pump Data	
		a. Pump	b. Prime-mover
	Name	Shutdown Service Water Pump Div.	3 Name Motor
	Mfg.	Bingham-Willamette Co.	Mfg. Siemens-Allis
	Mode	1_8x14 A VCM - 2-Stage	Model Frame 404VP
	S/N	1A278	S/N 8-5134-90323-01
	Type	VCM 2-Stage	Vertical, single speed, Type <u>squirrel cage induction</u> , ODP
*	all and an and a later		

* The component, whether pump or valve, is considered to be an assembly composed by the body, internals, prime-mover (or actuator) and functional accessories.

Size 8x Weight 37	14A 50 lbs. (dr	у)	Size <u>Frame 404VP, 75HP, 1755</u> Weight <u>1025 lbs</u> .	RPM
Mounting An Method mo	chored to f unting plat	loor through e with bolss	Mounting Bolted to pump support Method ing disc.	rt-
Required B	.H.P. 68		H.P. 75	
Parameter	Design	Operating	Power requirements: (include normal, maximum and minimum).	
Press	107	75	Electrical	
Temp	32-95°F.	32-95°F.	460 ± 10% Volts	
Flow	1100 GPM	1100 GPM	-25% for 1 minute	
Head	175 ft.H ₂ (175 ft. H ₂ 0	Other	
Operating S Critical Sp	Submergence NPSH 2'-1-1 Speed 1760 Deed 2370 R	/2" Submergence (Min) RPM PM /Ref. C		
List functi	onal acce	ssories:*	None	
List contro	l signal	inputs:	See Attachment B	

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

6. General Valve Data at Valve b. Actuator (if not an integral unit) Name Name Mfg. Mfg. Model Model والمشارعة والمستحدثات S/N S/N Type Type Size Size Weight Weight Mounting Mounting Method Method -----N/A Required Torque Torque Ref .: Valve Data Sheet No. Parameter Design Operating Power requirements: (include normal, maximum and minimum). Press Electrical Temp Flow Max oP across valve Ref. Closing time @ max "P Other: []Preumatic[]Hydraulic /Ref. Opening time @ max op /Ref. Power requirements for functional accessories, (if any) List control signal inputs: List functional accessories:

III. FUNCTION

1.	Briefly describe components normal and safety functions: Normal: Function is to be on standby.
ren	y: Function is to operate to provide cooling water to equip- served by Div. 3 Shutdown Service Water System as a result of te-manual initiation or automatic initiation start signals. will stop with operator's remote-manual initiation.
2.	The components normal state is: [] Operating [x] Standby
3.	Safety function:
	a. [x] Emergency reactor b. [] Containment heat shutdown removal
	c. [] Containment isolation d. M Reactor heat removal
	e. [] Reactor core cooling f. [] Prevent significant release of radio- active material to environment
	g. Does the component function to mitigate the consequences of one or more of the following events? [A] Yes [] No If "Yes", identify.
	[] LOCA [] HELB [] MSLB
	A Other Loss of Offsite Power (LOOP)
4.	Safety requirements:
	[] Intermittent Operation [] During postulated event
	A Continuous Operation A Following postulated even
	If component operation is required following an event, give approximate length of time component must remain operational.
	100 days (e.g., hours, days, etc.)

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the valve assembly operational, (e.g., limit switches).

5. For VALVES:

Does the component [] Fail open [] Fail closed [] Fail as Is this the fail safe position? [] Yes [] No

Is the valve used for throttling purposes? [] Yes [] No

Is the valve part of the reactor coolant pressure boundary [] Yes [] No N/A

Does the valve have a specific limit for leakage?

If "Yes" give limit:

IV. QUALIFICATION

- Reference by specific number those applicable sections of the design codes and standards applicable to the component: ASME B&PV Code, Sec. III, Class -3, 1974 Edition including 1976 Summer Addenda
- Reference those qualification standards, used as a guide to qualify the component:

IEEE: -344 - 1975

 Identify those parts of the above qualification standards deleted or modified in the qualification program.

Deleted:

Modified:

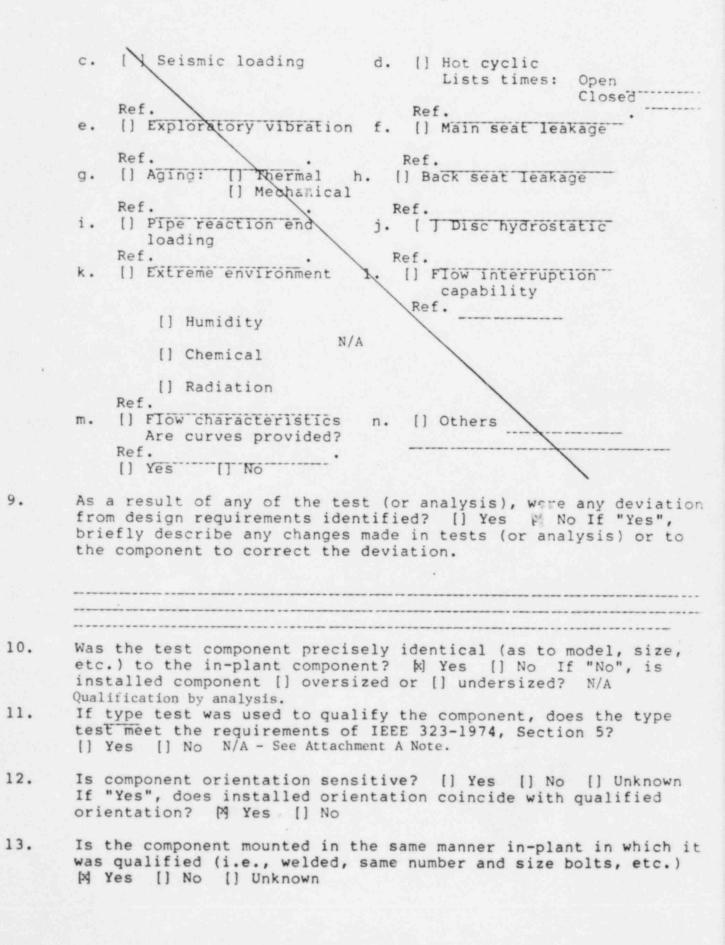
None

None

- 4. Have acceptance criteria been established and documented in the test plan(s) for the component? Yes [] No [] Ref. Document: N/A - Qualification by Analysis
- 5. What is the expected failure mode that would keep the pump or valve assembly from performing its safety function? None

	6.	Are the margins* identified documentation? [A] Yes Ref. Documents: 8a and 8b		NO	
If co	omponen	t is a PUMP, complete IV.	. 7 .		
		t is a VALVE, complete IV			
7.					
	- ump	operability has been dem [] Test [] Comb	oinat	tion	ed by: [] Analysis
	Ident	ify PUMP tests performed	:		
		A) Shell hydrostatic (ASME Section III) Ref. D	b.	[]	Bearing temperature evaluations
	c. [R	Ref. D) Seismic loading Ref.	d.	[]	Vibration levels
] Exploratory vibration	f.	[]	Seal leakage @ hydro press
	R	Fundamental freq.) ev.			
	g. [] Aging: [] Thermal	h.	[x]	Flow performance
				Are	e curves provided [X] Yes [] No
		ef. Doc.] Pipe reaction end	j.	Ref	Others
		loads (nozzle loads) ef. Doc.] Extreme environment:			
		[] Humidity	•		
		[] Chemical			
	Re	[] Radiation ef. Doc.			
•	Valve [] Tes	st [x] Comb	nonst	rat	ed by: [] Analysis
	Identi	fy VALVE tests performed	:		
] Shell hydrostatic (ASME Section III)	/	÷] Cold cyclic List times: Open Closed
. Ma	Re rgin is	f. Doc. the difference between	dani	Ref	
he te	st para	meters used for equipmen	t gu	ali	fication.

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	one component? [] Yes [] No N/A - See Attachment A Note. If "Yes" identify sequence, (e.g., radiation, seismic, cycl thermal, etc.):
	If "aging"* was performed, identify the significant aging mechanisms: N/A - See Attachment A Note.
	Identify loads imposed (assumed) on the component for the gualification tests (analysis) performed:
	c. [] Plants (shutdown loads) b. [] Extreme environmen
	c. [x] Seismic load d. [x] Others Operational
- 2	Have component design specifications been reviewed in-house assure they envelope all expected operating, transient, and accident conditions? [4] Yes [] No
ŗ	Does the component utilize any unique or special materials? (Examples are special gaskets or packing, limitations on nonferrous materials, or special coatings or surfaces.) [] Yes [A] No
1	f "Yes", identify:
- 11	Does component require any special maintenance procedures or practices, (including shorter periods between maintenance)?] Yes [X] No
	f "Yes", identify:
I	

* As outlined in Section 4.4.1 of IEEE-627 1980.

21. Information Concerning Qualification Documents for the Component

Item No.	Report Number	Report Title	Date	Company/Organizaton Preparing Report	Company/Organization Reviewing Report
A	SES/TR- 79-01	Dynamic Qualification of Model 8x14A VCM 2-stage Shutdown Service Water Pump	01-19-79	Structural Engineering Services (Control Data Corp.)	S&L - CQD (CQD-019842, SQ-CL017)
В	EL-8- 5134- 90323-01	Seismic Withstand Capability of Siemens- Allis A.C. Induction Motor	01-19-79	Siemens-Allis	S&L - CQD (CQD-019843, SQ-CL018)

REFERENCES

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Item No.	Description
С	Bingham-Willamette Company, Contract Proposal page 5 (PD)
D	Bingham-Willamette Company, Code Data Report/Hydrostatic Test Report
E	Bingham-Willamette Company, Pump Performance Test (Serial No. 1A278)

ATTACHMENT A

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Note: The pump is located in a mild zone; Environmental Qualification is not required.

PVOP 200B Page C13 (Final)

ATTACHMENT B

Shutdown Service Water Pump 1C will start with the following signal inputs:

- Pump start initiation by pump remote-manual control switch 1HS-SX009, or
- 2. Strainer 1SX01FC outlet pressure below set point, or
- 3. No pump stop action has been initiated by pump remote-manual control switch 1HS-SX009 and there is either "high drywell pressure" or "RPV level low (level 2)" signal present.

The pump will stop with the following signal inputs:

1.

 Pump stop has been initiated by remote-manual control switch 1HS-SX009.

PAGE: C1 PVOP NO. 900E REVISION: A

CHECKLIST(S)

PAGE: C2 PVOP NO. 900E REVISION: A

Pump & Valve Operability Assurance Review Checklist

SIGNATURE PAGE

Revision No. A

System Engineer Review Date 11/4/83 Alter Equipment Qual. Review Muchay Date 11/4/85 Electrical Engineer Review Jobeth Beaven Date //- 4-85 C&I Engineer Review Date /1-4-85 Reconcilation of IPC Walkdown Results

Date

PAGE: 23 PVOP NO. 900E REVISION: A

References

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- 1. 10" Double In-Line Vacuum Relief Valve Spring Loaded, GPE Controls, Drawing LD240-420, Revision AC.
- S&L Specification K-2873, "Vacuum Relief Valves" Amendment 6, July 9, 1985.
- 3. S&L Drawing M05-1063, Sheet 1, Revision G, December 14, 1984.
- Clinton FSAR Subsection 6.2, Figures 6.2-4 and 6.2-13, Amendment 34, July 1985.
- 5. S&L Drawing M06-1063, Sheet 2, Revision Y, August 27, 1984.
- SQ-CL189, Dynamic Qualification of GPE Controls/Licon Limit Switch Assembly.
- EQ-CL092, Environmental Qualification of GPE Controls/Licon Limit Switch Model #65-430189.
- MEQ-CL097, Environmental Qualification of Vacuum Relief Valves 2" and 10".
- 9. SQ-CL196, Seismic Qualification of 2" and 10" Vacuum Relief Valves.
- IPC Record Package for Document Record Number: Baldwin P.O. Cl4133, RIR Number Not Indicated, Valve Serial Number 7712-0526-63.
- NSLD Calculation 3C10-0976-002, "Maximum External Drywell Pressure on the Drywell Structure," Revision O, November 29, 1976.

PAGE: C4 PVOP NO. 900E REVISION: A

Illinois Power Company Clinton Power Station

PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

	NT INFORMATION	
1.	Name: Clinton Unit No. 1	2. Docket No.: 50-46
3.	Utility: Illinois Power Company	,
4.	NSSS: General Electric Co.	[] PWR [x] BWR
5.	A/E: Sargent & Lundy	
GENE	ERAL COMPONENT* INFORMATION	
1.	Supplier: [] NSSS [x] BOP Spe	cification K-2873
2.	Location: a. Building/Ro	om Containment/Containme
	b. Elevation	764'-0" (Ref. 5)
	c. System Gas	tainment Combustible Control
3.	Component number on in-house dra	
4.	If component is a [] Pump compl	
	If component is a [x] Valve comp	lete II.6.
5	General Pump Data	
	Pump b.	Prime-mover
Name	Name	
Mfg.	Mfg.	
Mode	1 Mode	1
S/N_	\$/N	
Type	Type	

actuator) and functional accessories.

PAGE: C5 PVOP NO. 900E REVISION: A

a. Pump (continued)	b. Prime-mover (continued
Size	Size
Weight	Weight
Mounting Method	Mounting Method
Required B H.P.	Н.Р.
Parameter Design Operating	
Press	Electrical
Temp	
Flow	
Head	Other
Required NPSH at maximum	If Motor list:
Available NPSH	Duty cycle stall current
Operating Speed	Class of insulation
Critical Speed /Ref.	
List functional accessories:* -	
List control signal inputs:	
List control signal inputs:	

1.1

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

PAGE: C6 PVOP NO. 900E REVISION: A

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a. Name	Valve Drywell/Containment Double Inline Vacuum Relief Valve	int NA: Valve	ator (if not an egral unit) e is operated by A P acros
		Name	NA
Mfg.	Vapor Corporation GPE Controls Division	Mfg.	NA
Mode	1 LD240-420	Model	NA
S/N_	(See Attachment 7712-0526-63 Note 1)	A, S/N	NA
Туре	Vacuum Relief Valve	Туре	NA
Size	10"	Size	NA
Weig	nt 680 lbs (Ref. 1)	Weight	NA
	ting Bolted to	Mounting	
Meth	Dd Flange in Pipeline	Method	NA
	ue NA - No Operator	Torque	
Paran Press (Psig Temp	neter Design Operator <u>30 (Ref. 1) 30(Attachment</u> Ref. 2) <u>330 (Ref. 1)330(Attachment</u>	ng Power ((includ and m to Electr	NA requirements: de normal, maximum inimum). ical NA
Paran Press (Psig Temp (°F) Flow	neter Design Operator <u>30 (Ref. 1) 30(Attachment</u> <u>330 (Ref. 1)330(Attachment</u> <u>Ref. 2)</u> <u>3528</u> <u>3528</u> <u>3528</u> <u>3528</u> <u>3528</u> <u>3528</u>	ng Power (includ and m to Electri to	requirements: de normal, maximum inimum). ical NA
Paran Press (Psig Temp (°F) Flow fm@ 1 p	neter Design Operator <u>30 (Ref. 1) 30(Attachment</u> <u>330 (Ref. 1) 330(Attachment</u> <u>330 (Ref. 1)330(Attachment</u> <u>8 3528 3528(See Attachment</u> <u>1 ess than</u> <u>3528 valve 20 psid</u>	ng Power i (includ and m to Electri to tachment A, N	requirements: de normal, maximum inimum). ical NA
Paran Press (Psig Temp (°F) Flow fm@ 1 p Max : Closi	neter Design Operator <u>30 (Ref. 1) 30(Attachment</u> <u>Ref. 2)</u> <u>330 (Ref. 1)330(Attachment</u> <u>Ref. 2)</u> <u>3528</u> <u>3528 3528(See Attachment</u> <u>Iess than</u> <u>1ess than <u>1ess</u> than <u>1</u></u>	ng Power (includ and m to Electri to tachment A, M Ref. Other: []	requirements: de normal, maximum inimum). ical NA Note 4) NA Pneumatic[]Hydrauli
Paran Press (Psig Temp (°F) Flow fm@ 1 p Max : Closi /Ref. Openi	neter Design Operator <u>a 30 (Ref. 1) 30(Attachment</u> <u>Ref. 2)</u> <u>330 (Ref. 1)330(Attachment</u> <u>Ref. 2)</u> <u>3528</u> <u>3528 3528(See Attachment</u> <u>Ref. 4)</u> <u>across valve 20 psid</u> (Ref. 4) <u>ang time @ max dP NA</u>	ng Power i (includ and mi to Electri to tachment A, N Ref. Other: []	requirements: de normal, maximum inimum). ical NA Note 4) NA Pneumatic[]Hydrauli
Paran Press (Psig Temp (°F) Flow fm@ 1 p Max : Closi /Ref. Openi	neter Design Operator <u>30 (Ref. 1) 30(Attachment</u> <u>Ref. 2)</u> <u>330 (Ref. 1)330(Attachment</u> <u>Ref. 2)</u> <u>3528</u> <u>3528 3528(See Attachment</u> <u>1ess than</u> <u>1ess than <u>1ess</u> than <u>1</u></u>	ng Power i (includ and mi to Electri to tachment A, N Ref. Other: []	requirements: de normal, maximum inimum). ical NA Note 4) NA Pneumatic[]Hydrauli
Paran Press (Psig Temp (°F) Flow fm@ 1 p Max : Closi /Ref. Openi /Ref. Power	neter Design Operator <u>a 30 (Ref. 1) 30(Attachment</u> <u>B 30 (Ref. 1) 30(Attachment</u> <u>Ref. 2)</u> <u>330 (Ref. 1)330(Attachment</u> <u>Ref. 2)</u> <u>3528 3528(See Attachment</u> <u>B across valve 20 psid</u> (Ref. 4) <u>Ing time @ max -P NA</u> <u>NA</u> <u>NA</u> <u>NA</u> <u>requirements for funct</u>	ng Power i (includ and mi to Electri to tachment A, N Ref. Other: []	requirements: de normal, maximum inimum). ical NA Note 4) NA]Pneumatic[]Hydrauli NA
Paran Press (Psig Temp (°F) Flow fm@ 1 p Max : Closi /Ref. Openi /Ref. Power acces	neter Design Operator <u>a 30 (Ref. 1) 30(Attachment</u> <u>B 30 (Ref. 1) 30(Attachment</u> <u>Ref. 2)</u> <u>330 (Ref. 1)330(Attachment</u> <u>Ref. 2)</u> <u>3528 3528(See Attachment</u> <u>B across valve 20 psid</u> (Ref. 4) <u>Ing time @ max -P NA</u> <u>NA</u> <u>NA</u> <u>NA</u> <u>requirements for funct</u>	ng Power i (includ and mi to Electri to tachment A, N Ref. Other: []	requirements: de normal, maximum inimum). ical NA Note 4) NA Pneumatic[]Hydrauli

PAGE: C7 PVOP NO. 900E REVISION: A

1.	Briefly describe components normal and safety functions:
	See Attachment A, Note 2
2.	The components normal state is: [] Operating 😡 St
3.	Safety function:
	a. [] Emergency reactor b. [] Containment he shutdown removal
	c. [] Containment isolation d. [] Reactor heat r
	e. [] Reactor core cooling f. [] Prevent signif release of rad active materia environment
	g. Does the component function to mitigate the consequences of one or more of the following events? [x] Yes [] No If "Yes", identify.
	[x] LOCA [] HELB [] MSLB
	[x] Other Limits Drywell to Containment Negative
4.	Differential Pressure Safety requirements:
	During Normal Operation [] During postulated e
	[Continuous Operation [X] Following postulate
	If component operation is required following an event, give approximate length of time component mus
	remain operational.
	100 days (e.g., hours, days,

manufacturer that are required to make the valve assembly operational, (e.g., limit switches).

PAGE: C8 PVOP NO. 900E REVISION: A

5. For VALVES:

Does the component [] Fail open [] Fail closed [] Fail as See Attachment A, Note 3 Is this the fail safe position? [] Yes [] No See Attachment A, Note 3 Is the valve used for throttling purposes? [] Yes [X No Is the valve part of the reactor coolant pressure boundary [] Yes [X] No

Does the valve have a specific limit for leakage? []No

If "Yes" give limit:20cc/hr (Ref. 2, p3-5)

IV. QUALIFICATION

 Reference by specific number those applicable sections of the design codes and standards applicable to the component: ASME Code, Section III, Class 2 Subarticle NC-3500, Edition 1977, Addenda

Summer 1977 and Code Case N-95.2.

 Reference those qualification standards, used as a guide to qualify the component: IEEE 344-1975 for

seismic qualification; IEEE 323-1974 for environmental

qualification

 Identify those parts of the above qualification standards deleted or modified in the qualification program.

Deleted:

Modified:

None

None

none

- Have acceptance criteria been established and documented in the test plan(s) for the component? Yes [] No [] Ref. Document: 6,7
- 5. What is the expected failure mode that would keep the pump or valve assembly from performing its safety function? None

PAGE: C9 PVOP NO. 900E REVISION: A

	 Are the margins* ide documentation? [k] Y Ref. Documents: 	entified (es [] N 6, 7	
f.com	nponent is a PUMP, complete		
r com	aponent is a romr, complete	10.7.	
f com	nponent is a VALVE, complet	e IV.8.	
• /	Pump operability has been [] Test []	demonst Combinat	rated by: [] Analysis ion
	Identify PUMP tests perfo	rmed:	
	a. [] Shell hydrostatic ASME Section III) Ref.	b.	<pre>[] Bearing temperature evaluations</pre>
	c. [] Seismic loading Ref.	- d.	[] Vibration levels
	e. [] Exploratory vibrat	ion f.	[] Seal leakage @ hydro press
	(Fundamental freq)	
	g. [] Aging: [] Thermal	h.	[] Flow performance
	[] Mechani	100	Are curves provided [] Yes [] No
	Ref. Doc.	·	Ref.
	i. [] Pipe reaction end	2	[] Others
	loads (nozzle load: Ref. Doc.	s)	7
	k. [] Extreme environment	e1 .	
	[] Humidity		
	[] Chemical		
	[] Radiation Ref. Doc.		
•	Valve operability has been demonstrated by: [] Analysis [] Test [x] Combination		
	Identify VALVE tests performed: Ref. 6,7,8,9,10		
	<pre>b. [x] Shell hydrostatic (ASME Section III)</pre>	b.	[] Cold cyclic List times: Open Closed
	Ref. Doc. 10		Ref.
Mar	rgin is the difference betw	veen desi	gn basis parameters and

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C

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the test parameters used for equipment qualification.

PAGE: C10 PVOP NO. 900E REVISION: A

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	c. [x] Seismic loading d. [] Hot cyclic Lists times: Open Closed
	Ref. 6 e. [] Exploratory vibration f. [x] Main seat leakage
	Ref. Ref. 10 g. Jaging: Jaging:
	Ref. 7 i. [] Pipe reaction end j. [] Disc hydrostatic loading
	Ref. k. b) Extreme environment 1. [] Flow interruption capability
	k] Humidity Ref.
	k] Chemical
	k] Radiation Ref. 7
	m. [x] Flow characteristics n. [x] Others Pressure Loadings Are curves provided? Ref. 10 [] Yes [x] No
9.	As a result of any if the test (or analysis), were any deviation from design requirements identified? [] Yes [] No If "Yes", briefly describe any changes made in tests (or analysis) or to the component to correct the deviation. For limit switch qualification: 1) TRS did not envelope RRS below 2.25 Hz. This is acceptable because because there are no resonances in that fre- quency Range (Ref. 6). 1 2) See Attachment A Note 6.
10.	Was the test component precisely identical (as to model, size, etc.) to the in-plant component? [2] Yes [] No If "No", is installed component [] oversized or [] undersized?
11.	If type test was used to qualify the component, does the type test meet the requirements of IEEE 323-1974, Section 5? [J] Yes [] No
12.	Is component orientation sensitive? [] Yes [] No [] Unknown If "Yes", does installed orientation coincide with qualified orientation? [] Yes [] No
13.	Is the component mounted in the same manner in-plant in which it was qualified (i.e., welded, same number and size bolts, etc.) [x] Yes [] No [] Unknown

do --

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PAGE: C11 PVOP NO. 900E REVISION: A

	Nere the qualification tests performed in sequence and on only one component? [x] Yes [] No
t	f "Yes" identify sequence, (e.g., radiation, seismic, cyclic, hermal, etc.): <u>Radiation, thermal, cyclic, seismic</u> and LOCA Environment
1 π	f "aging"* was performed, identify the significant aging mechanisms: Radiation, thermal, cyclic and seismic
I q	dentify loads imposed (assumed) on the component for the ualification tests (analysis) performed:
С	. [] Plants (shutdown loads) b. [] Extreme environment
С	. [x] Seismic load d. [x] Others Pool Dyanamics and Pressure Loads
a	ave component design specifications been reviewed in-house to ssure they envelope all expected operating, transient, and ccident conditions? [2] Yes [] No
(oes the component utilize any unique or special materials? Examples are special gaskets or packing, limitations on onferrous materials, or special coatings or surfaces.)
n (] Yes & No
(<pre>/ Yes & No f "Yes", identify:</pre>
] Yes [x] No f "Yes", identify:
l I D P l	J Yes [2] No f "Yes", identify: oes component require any special maintenance procedures or ractices, (including shorter periods between maintenance)?

14

21. Information Concerning Qualification Documents for the Component

1

Report Number	Report Title	Date	Company/Organizaton Preparing Report	Company/Organization Reviewing Report
LA241-171	Design Analysis for Seismic and Operating Conditions 10" GPE Model LD240-420 Double Vacuum Relief Valves	11/17/81	GPE Controls	S&L/CQD SQ-CL196
LA241-174	Minimum Wall Thickness Calculations for Valve Model LD240-420	3/27/79	GPE Controls	S&L/CQD SQ-CL196
N/A	Environmental Qualifica- tion of Vacuum Relief Valves 2" & 10"	10/16/85	S&L/CQD	S&L/CQD MEQ-CL097
47420-1	Nuclear Environmental Qualification Test Program on (4) GPE Controls/Licon Limit Switch Assemblies	9/13/85	Wyle	S&L/CQD SQ-CL189 EQ-CL092

PAGE: C12 PVOP NO. 900E REVISION: A

PAGE: C13 PVOP NO. 900E REVISION: A

ATTACHMENT A

Note 1

Serial number is for valve body. Duplicate serial numbers occur (i.e., for 1GH010C/11C) because there are two valves (discs) per body, thus two valve tag numbers will have the same body serial number.

Note 2

This vacuum relief valve assembly consists of two valves (1HG010C and 1HG011C) in series which penetrate the drywell wall. These valves are closed when the drywell differential pressure with respect to the containment is less than 0.2 psid. In order to minimize the drywell to containment negative differential pressure and to assist containment to drywell atmosphere mixing when the combustible gas control mixing compressors are in operation, these valves are designed to start opening at 0.2 psid and be fully opened at 0.5 psid. The valves are shown in Reference 3.

Note 3

Drywell vacuum relief is accomplished by four parallel valve assemblies into the drywell. Failure of one of the valves in an assembly to open is accounted for by the redundant parallel paths into the drywell. Failure of one of the valves in an assembly to close is accounted for by the redundant in-line valve within each valve assembly. Therefore, the fail safe position for these valves may be postulated as fail open, fail close, or fail as-is, without adverse effect on system function.

Note 4

A "K" factor of 1.68 ± .168 based on a valve port diameter of 7" has been checked using test data (Reference 10). The flow at 1 PSID differential across the valve based on this K factor is, 3528 SCFM, the rated flow of the valve. The maximum external pressure on the drywell structure at Clinton was calculated in Reference 11. This calculation conservatively modelled the drywell containment vacuum relief valves. Since the calculated external drywell design pressure is less than the external drywell design pressure, it was concluded that the drywell vacuum relief valves were properly sized.

Note 5

Solenoid: (Non-Safety-Related), 120 VAC, 60 Hz, 6W Limit Switches: (Safety-Related), 5A @ 125 VAC or 250 VAC (125 VDC @ 0.5A) 2A @ 20 VDC(Inductive)

PAGE: C14 (FINAL PAGE) PVOP NO. 900E REVISION: A

ATTACHMENT A (CON'T)

Note 6

For Limit Switch qualification:

- TRS did not envelope RRS below 2.25 Hz. This is acceptable because there are no resonances in this frequency range (SQ-CLI89).
- Accident profile did not specify a chamber pressure for testing. S&L directed Wyle to reduce the pressure to Opsig.
 - ii) The switches were to be actuated once per day during accident testing. S&L directed Wyle to actuate the switches at the 1-hour, 6-hour, and 24-hour points of the accident phase in addition to the specified once per day actuation. Also, contact resistance and insulation resistance measurements to be taken at the 1-hour, 24-hour, and near the end of post-accident aging phase.
 - iii) At option of S&L, after accident aging, additional accident aging with the conduit junction box open. S&L decided to go with this additional testing.

The above modifications to the accident aging phase do not affect the devices qualification as stated in the above items.

MEH 11/5/85

CHECKLIST(S)

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PVOP NO.	500J
REVISION	A
Page Cl	

Pump & Valve Operability Assurance Review Checklist

SIGNATURE PAGE

Revision No. A

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System Engineer Review AdmAbralam
Equipment Qual. Review in Borrens
Electrical Engineer Review Alberrers
C&I Engineer Review Com Kartal
Reconcilation of IPC Walkdown Results

Date	11-04-85
Date	11-04-85
Date	11-4-85
Date	11-4-85

Date

PVOP 500J 1FC004A Page C2

References

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1.	System Description	Tab	В
2.	Fisher Controls letter (K. E. Jeppsen to R. E. Wadlington) dated 10-18-85		
3.	Valve Data Sheet - CV-281	Tab	Н
4.	Valve Data Table - DT-011	Tab	Н
5.	Drawings	Tab	F
5.1	P&ID - M05-1037-3		
5.2	C&ID - M10-1037-5		
5.3	Logic Diagram - M15-1037-3		
5.4	S&L Electrical Schematic Drawing E02 - IF C99		
5.5	Fisher Controls Drawing No. 37A2037		
6.	Seismic Qualification Reports		
6.1	SQ-CL046		
6.2	SQ-CL048		
6.3	SQ-CL060		
6.4	SQ-CL062		
7.	Equipment Qualification Reports		
7.1	EQ-CL008		
7.2	EQ-CL024		
7.3	EQ-CL094		
8,	Mechanical Equipment Qualification Reports		
8.1	MEQ-CL082		
9.	ASME Section III Code Data Report & Test Results	Tab	D
10.	Pre-op test procedures/results	Tab	E
11.	Walkdown Results	Tab	G
	10-		

Illinois Power Company Clinton Power Station

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C.

PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

Ι.	PLA	NT INFORMATION				
	1.	Name: Clinton Unit No. 1	2. Docket No.: 50-461			
	3.	Utility: Illinois Power Com	pany			
	4.	NSSS: General Electric Co.	[] PWR [x] BWR			
	5.	A/E: Sargent & Lundy				
II.	GENERAL COMPONENT* INFORMATION					
	1.	Supplier: [] NSSS 🕅 BOP	Specification K2864			
	2.	Location: a. Buildin	g/Room F.O/Zone H-5			
		b. Elevati	on 712'-0"			
		c. System 1	Fuel Pool Cooling & Cleanup			
	з.	Component number on in-house	drawings: 1FC004A			
	4.	If component is a [] Pump c	omplete II.5.			
		If component is a [N] Valve	complete II.6.			
	5.	General Pump Data				
		a. Pump	b. Prime-mover			
	Name		Name			
	Mfg.		Mfg			
	Mode	1	lodel			
	S/N		S/N			
	Туре		Type			
14 14						

* The component, whether pump or valve, is considered to be an assembly composed by the body, internals, prime-mover (or actuator) and functional accessories.

a. Pump (continued)	b. Prime-mover (continued
Size Weight	Size Weight
Mounting Method	Mounting Method
Required B.H.P.	Н.Р
Parameter Design Operating	Power requirements: (include normal, maximum and minimum).
Press	Electrical
Temp	
Flow	
Head	Other
Required NPSH at maximum	If Motor list:
Flow	Duty cycle
Available NPSH	Stall current
Operating Speed	Class of insulation
Critical Speed /Ref.	
List functional accessories:*	
	······································
List control signal inputs:	

. . .

3

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

a. Valve	b. Actuator (if not an integral unit)
Name DEMINERALIZER FLOW REGULATOR VLV.	Name PNEUMATIC ACTUATOR
Mfg. FISHER CONTROLS	Mfg. FISHER CONTROLS
Model ED	Model N/A
S/N 7603759	S/N_N/A
Type GLOBE	Type 657NS
Size 8"-150#	Size 70
Weight 849#	Weight 256# (including appurtenances; from SQ-CL048)
Mounting Method BUTT-WELDED TO PIPE	Mounting Method BOLTED TO THE BONNET
Ref.: Ref.3 Parameter Design Operati	ng Power requirements:
Press 146 PSIG 122.8 PSIG	(include normal, maximum and minimum).
Press <u>146 PSIG 122.8 PSIG</u> Temp 140°F 140°F	(include normal, maximum
Temp <u>140°F</u> <u>140°F</u> Flow - 4150 GPM	(include normal, maximum and minimum). Electrical <u>None</u>
Temp 140°F 140°F Flow - 4150 GPM (maximum operat Max iP across valve 58.6 psig	(include normal, maximum and minimum). Electrical <u>None</u> ting) Ref.
Temp 140°F 140°F Flow - 4150 GPM (maximum operat Max dP across valve 58.6 psig See Att.) Closing time @ max dP Note 7 /Ref	<pre>(include normal, maximum and minimum). Electrical None ting) Ref. A, Other: [X]Pneumatic[]Hydraulic</pre>
Temp 140°F 140°F Flow - 4150 GPM (maximum operat Max dP across valve 58.6 psig See Att. 1 Closing time @ max dP Note 7 /Ref. Opening time @ max dP "	(include normal, maximum and minimum). Electrical <u>None</u> ting) Ref. A, Other: [M Pneumatic []Hydraulic <u>Available Air Pressure 80-120</u> psig
Temp 140°F 140°F Flow - 4150 GPM (maximum operat Max dP across valve 58.6 psig See Att.) Closing time @ max dP Note 7 /Ref	<pre>(include normal, maximum and minimum). Electrical None ting) Ref. A, Other: [M Pneumatic []Hydraulic </pre>
Temp 140°F 140°F Flow - 4150 GPM (maximum operat Max dP across valve 58.6 psig See Att. 1 Closing time @ max dP Note 7 /Ref. Opening time @ max dP "	<pre>(include normal, maximum and minimum). Electrical_<u>None</u> ting) Ref Other: MPneumatic[]Hydraulic Other: MPneumatic[]Hydraulic </pre>

*

1FSV-FC110

117.	FUNCTION						
	1.	 Briefly describe components normal and safety functions: Normal: This valve modulates to pass the 					
	pres	preset (1,000 GPM) flow through the demineralizer.					
	Safe	ety: Open the valve completely to prevent automatic closing as a result of the no-flow condition through the demineralizer, on a containment isolation signal.					
	2.	The components normal state is: [X] Operating [] Standt					
	3.	Safety function:					
		a. [] Emergency reactor b. [] Containment heat shutdown removal					
		c. [] Containment isolation d. [] Reactor heat remova					
		e. [] Reactor core cooling f. [] Prevent significan- release of radio- active material to environment					
		g. Does the component function to mitigate the consequences of one or more of the following events? [2] No If "Yes", identify.					
		N LOCA [] HELB [] MSLB					
		[] Other					
	4.	Safety requirements:					
		M Intermittent Operation M During postulated event					
		[] Continuous Operation [] Following postulated eve					
		If component operation is required following an event, give approximate length of time component must remain operational.					
		(e.g., hours, days, etc.					
		al accessories are those sub-components not supplied by the that are required to make the valve assembly operational					

manufacturer that are required (e.g., limit switches).

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5. For VALVES:

Does the component [] Fail open [] Fail closed [] Fail at

Is this the fail safe position? [] Yes [] No

Is the valve used for throttling purposes? [] Yes [] No

Is the valve part of the reactor coolant pressure boundar [] Yes \mathbb{M} No

Does the valve have a specific limit for leakage? []Yes []No

If "Yes" give limit:

IV. QUALIFICATION

4.

1.

- Reference by specific number those applicable sections of the design codes and standards applicable to the component: <u>ASME Code</u>, Section III, Class 3 <u>Subarticle ND3500</u>, Edition 1974, with Addenda Summer 1976.
- Reference those qualification standards, used as a guide to qualify the component: 1EEE-344-1975 &

_1EEE-323-1974_____

 Identify those parts of the above qualification standards deleted or modified in the qualification program.

Deleted:	Modified:
None	Valve body design calcs. were done in accordance with ANSI B16.34-1977 instead
	of ANSI B16.5 1968 (Design Requirements B16.34 satisfied or exceeded all Design
	Requirements of B16.5).
Have acceptance criteria	been established and
documented in the test pl	an(s) for the component?
Yes [X] No [] Ref. Docume	nt: Attachment A, Note 1

5. What is the expected failure mode that would keep the pump or valve assembly from performing its safety function? None

Are curves provided [] Yes

 Are the margins* identified in the qualification documentation? * Yes [] No Ref. Documents: SQ-CL048, SQ-CL046, SQ-CL060, EQ-CL008, EQ-CL094

If component is a PUMP, complete IV.7.

If component is a VALVE, complete IV.8.

7.

8.

Pump operability has been demonstrated by: [] Analysis [] Test [] Combination

Identify PUMP tests performed:

a.	<pre>[] Shell hydrostatic (ASNE Section III)</pre>	b.	[]	Bearing temperature evaluations	
	Ref.				
с.	[] Seismie loading Ref.	d.	()	Vibration levels	
e.	() and the second seco	f.	[]	Seal leakage @ hydro press	
	(Fundamental freq.)			nyoro press	
2	Rev.				
g.	[] Aging: [] Thermal	h.	[]	Flow performance	

[] Mechanical

Ref. Doc. [] No i. [] Pipe reaction end . [] Others _____

loads (nozzle loads) Ref. Doc. k. [] Extreme environment:

[] Humidity

[] Chemical

[] Radiation

Ref. Doc.

Valve operability has been demonstrated by: [] Analysis [] Test [x] Combination

Identify VALVE tests performed:

b. [X] Shell hydrostatic b. [] Cold cyclic (ASME Section III) List times: Open Closed

Ref. Doc. #9 . Ref. 10 *. Margin is the difference between design basis parameters and the test parameters used for equipment gualification.

с.	<pre>[x] Seismic loading</pre>	d. [] Hot cyclic
		Lists times: Open
	Def	Closed
~	Ref. See Note 2, Att. A	Ref. No. 10 f. [] Main seat leakage
e.	() exploratory vibration	
	Ref.	N/A See Note 8, Att. A Ref.
g.		h. [] Back seat leakage
g.	M Mechanical	
	Ref. EQ-CL008, 24, 94 .	Ref.
i.	[] Pipe reaction end	j. [] Disc hydrostatic
	loading	N/A See Notes 7 & 8, Att.
	Ref.	Ref.
k.	M Extreme environment	1. [] Flow interruption
		capability
		Ref.
	PA Humidity	
	[] Chemical	
	() chemical	
	A Radiation	
	Ref. EQ-CL008, 024, 094	
m.	[] Flow characteristics	n. [] Others
	Are curves provided?	***************
	Ref	
	[] Yes [] No	
1.1		
		st (or analysis), were any deviatio.
		ntified? [X Yes [] No If "Yes",
		made in tests (or analysis) or to
the	component to correct the	deviation.
255	Attachment A, Note 3	

Was	the test component preci	sely identical (as to model, size,
		anto Il Van Li Ma TE "Na" in

etc.) to the in-plant component? [] Yes [x] No If "No", is installed component [x] oversized or [] undersized? "See Note 6

9.

10.

- 11. If type test was used to qualify the component, does the type test meet the requirements of IEEE 323-1974, Section 5?
 [k] Yes [] No
- 12. Is component orientation sensitive? [] Yes [] No [] Unknown If "Yes", does installed orientation coincide with gualified orientation? [A Yes [] No
- 13. Is the component mounted in the same manner in-plant in which it was qualified (i.e., welded, same number and size bolts, etc.) [x] Yes [] No [] Unknown

20.	Is the qualified life for the component less than 40 years? [] Yes [x] No If "Yes", what is the qualified life? See Attachmer.
	If "Yes", identify: <u>See Attachment A, Note 5</u>
19.	Does component require any special maintenance procedures or practices, (including shorter periods between maintenance)?
	If "Yes", identify:
18.	Does the component utilize any unique or special materials? (Examples are special gaskets or packing, limitations on nonferrous materials, or special coatings or surfaces.) [] Yes [] No
17.	Have component design specifications been reviewed in-house to assure they envelope all expected operating, transient, and accident conditions? [X] Yes [] No
	c. [X] Seismic load d. [X] Others Pool Dynamics & Operating Loads
	c. [] Plants (shutdown loads) b. [x] Extreme environment
16.	Identify loads imposed (assumed) on the component for the qualification tests (analysis) performed:
15.	If "aging"* was performed, identify the significant aging mechanisms: Thermal. Mechanical & Badiation Aging. These apply for NAMCO Limitsvitches, ASCo Sol. Vivs. & Conax Seal
14.	Were the qualification tests performed in sequence and on only one component? [x] Yes [] No Except for pilot solenoid valve, See Attachment A, Note 4. If "Yes" identify sequence, (e.g., radiation, seismic, cyclic, thermal, etc.): <u>Thermal Aging, Mechanical Aging, Radiation Aging,</u> Seismic & Loca

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Attachment A

Note 1 (IV Subsection 4)

Seismic Qual Report SQ-CL048 Tab D (Page 12). Environmental & Seismic Report No. AQR-6738, Rev. 1 for ASCo Solenoid Vlvs. (contained in Qual Packages SQ-CL060, Tab D, Page 62 Table 5.2 and EQ-CL024 Tab F1, Att. A, P. A4-A10 & Tab C Page C6). Seismic Qual Package SQ-CL046 for the NAMCO Limitswitches (Tab D, P. 7-5), and Environmental Qual. Package EQ-CL008 Tab F-1, F. 11-27. Environmental Qual. Package EQ-CL094 Tab F-2, P. 6&7.

Note 2 (IV Subsection 8.C)

The valve was qualifed by analysis. A static load test was performed on two parent valves (See Note 6 of this attachment for further information) to demonstrate operability. The other appurtances such as NAMCO Limitswitches, Solenoid Vlvs. & Conax Seals were individually qualified by test and analysis (See SQ-CL048, Tab D. Qual Summary P.5-13 for further information).

Note 3 (IV Subsection 9)

The following items were noted for the qualification Documentation:

- SQ-CL046 Tab D, P. 5-7 identifies a test failure for maintained contact short travel type limitswitches. This is not a concern; standard travel series limitswitches are the only type used for 1FC004A.
- 2) SQ-CL060: The required OBE G level was not enveloped. However, the magnitude and duration of the SSE testing more than fulfills the OBE Excitation requirements for the subject test. See comment #4 on P. Al0 of the SQ-CL Package for further explanation.
- 3) EQ-CL008: See results in P10-10 of T.R.3613-PP for anomaly. For the disposition see page 7-1, Article 7.2 of QTR 105. This disposition is acceptable (See 7ABC Pages C25 thru C29 for further info.).
- EQ-CL024: See P. 56-60. Also see Section 15 of Tab A Checklist for disposition.
- 5) EQ-CL094: Abnormalities identified and justified in Sections 6.9.3 and 6.10 of Report IPS 1079.

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Note 4 (IV Subsection 14)

*EQ-CL024: The sequence per IEEE 323-1974 was not followed in the test of ASCo Solenoid Vlvs. (i.e., Equipment was not operated to extreme of electrical characteristics after base line test). However, testing performed after DBE shows acceptability (See TAB C).

Note 5 (IV Subsection 19)

	Environmenta: Maintenance	1 Maintenance	
Item	Frequency	Activity	Reference
VLV & Actuator NAMCO	4 yrs.	Replace Nitrile Diaphragms	MEQ-CL082
Limit- switches	19 yrs.	Replace the EPDM O-Rings (Lever Shaft Covers screws)	EQ-CL008
	19.13 yrs.	Replace Boot (Lever Shaft)	EQ-CL008
ASCO			
Solenoid VLV.	16 yrs.	Replace Solenoid Coil	EQ-CL024
1HSV-FC110 & 1FSV-FC110	35 yrs.	Replace Elasto- metors (Lower & Upper Seat)	EQ-CL024

Conax seals must be used in the electrical installation of the limitswitches and solenoid valves. In addition the solenoid must be installed vertical and upright.

Note 6

To prove operability of the valve assembly, a static Pull Test was performed on two Parent Valves (#3 and #5). Parent Valve 3A (3"-600 #ED-667NS 70) was chosen to qualify operability of the actuator is the same size as the actuator used in valve 1FC004A. To prove operability of the moving parts within the valve, Parent Valve #5 (4"-600#ED-667NS 45) was chosen because the valve is the same design and is within the generic family.

Note 7

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This is a modulating control valve which provides no isolation function. Therefore there is no requirement for opening/closing times.

Note 8

This valve is set to pass 1000 GPM at the full close position per valve data sheet CV-281 (Ref. 3). Therefore, valve closure and seat leakage tests are not applicable.

21. Information Concerning Qualification Documents for the Component

Report Number	Report Title	Date	Company/Organizaton Preparing Report	Company/Organization Reviewing Report
QP-16-10	Group Control Vlvs. Qualification Report Rev. B	3-3-83	Fisher Controls	S&L/CQD SQ-CL048
2TR-105 Rev. 4	Qualification of EA180 Limit Switches	1-9-84	NAMCO Controls	S&L/CQD SQ-CL046
ABS21678/ TR Rev. A	Qual. of solenoid vlvs. by environmental exposure to elevated	July 79	Isomedix	S&L/CQD SQ-CL060
AQR-67368 Rev. 1	Temperature, Radiation Wear Aging Seismic vibration endurance, Radiation & Loca	8-19-83	ASCo	
IPS-1079 Rev. D IPS-1080	Design Qualification Test Report For Electric Conductor	5-21-84 8-15-83	Conax	S&L/CQD SQ-CL062
Rev. A	Seal Assy. (ECSA) for Conax Corp.			
N/A	Analysis of Fisher Control Valves		S&L	S&L/CQD MEQ-CL082
QTR-105 Rev. 3	Qual. of EA180 Series Limit Switches	8-20-81	NAMCO Controls	S&L/CQD EQ-CL008
AQR-6738 Rev. 1	Qual. of ASCo CatNP-1 Solenoid Vlvs.	8-19-83	ASCo	S&L/CQD EQ-CL024
IPS-1079 Rev. D	Design Qual. Test Report for Conax Seal	5-21-84	Conax	S&L/CQD EQ-CL094

Pump & Valve Operability Assurance Review Checklist

SIGNATURE PAGE

Revision No. A

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System En	gineer Review Morcika
Equipment	Qual. Review Madan
Electrica	1 Engineer Review lob MBearing
	eer Review Comme Kantal
Reconcila	tion of IPC Walkdown Results

Date	11-5-85
Date	11-5-85
Date	11-5-85
Date	11-5-85

Date

REFERENCES

P&ID: M05-1002, Sheet 2, Rev. G

-

Vendor Drawing: Rockwell International Rockwell - Edward Hermavalve Drawing ACD 31602652 GE 105D5575, Rev. 0 GE 131C7911A, Rev. 5

S&L Electrical Schematics: E02 1NB99-203, Rev. J E02 INB99-216, Rev. F E02 INB99-225, Rev. D

Seismic Qualification Report: SA 493726, Rev. A Engineering Report 84-08 (Dated 10-5-84) 10959 (Dated 12-24-81) CQD-000731, Rev. 0 (Dated 1-11-80) B0037

Environmental Qualification Report: B-0058 (Dated 01-11-80)

Mechanical EQ Report: MEQ-CL085 (Dated 07-17-85)

Illinois Power Company Clinton Power Station

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PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

•	PLANT INFORMATION	
	1. Name: Clinton Unit No.	1 2. Docket No.:50-461
	3. Utility: Illinois Power Co	ompany
	4. NSSS: General Electric Co	• [] PWR [x] BWR
	5. A/E: Sargent & Lundy	
Ι.	GENERAL COMPONENT* INFORMATION	
	1. Supplier: [] NSSS [] BOD	P Specification K-2882
	2. Location: a. Build:	ing/Room Aux. Building /Env. Zo
	b. Elevat	tion 768'-9"
	c. System	n Nuclear Boiler
	3. Component number on in-hous	se drawings: 1B21-F067A
	4. If component is a [] Pump	complete II.5.
	If component is a [X] Valve	e complete II.6.
	5. General Pump Data	
	a. Pump	b. Prime-mover
	Name NA	Name NA
	Mfg.	Mfg.
	Mode1	Model
	S/N	S/N
	Туре	Туре

a. Pump (contin	ued) b		Prime-mover (continued)
Size Weight			ze ight	
Mounting Method N/	١		unting thod	
Required R.H.P.		н.	P	
Parameter Pesign	Operating	(i	wer requirements: nclude normal, aximum and minimum).	
Press		E1	ectrical	
Temp				*
Flow	\backslash			
Head	/	Oth	her	
Required NPSH at maxim	num		Motor list:	ал.
Flow		Dut	ty cycle	ç.
Available NPSH		sta	all current	
Operating Speed	*********		ase of insulation	
Critical Speed	/Ref.			
List functional access	sories:*			
****	*****			
List control signal ir	nputs:			
	**************	*****	······/···	6

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

6. General Valve Data	
a. Valve 1B21-F067A	b. Actuator (if not an integral unit)
Name Hermavalve	Name Limitorque Operator
Mfg. Rockwell-Edward	Mfg. Limitorque Corporation
Model 15104MLPT1	Model SMB-00-10
S/N BL024	S/N349971
Type Globe	Type Electric
Size 1-1/2" - 1500#	Size 10 ft-1bs.
53 Ibs. (without Weight actuator)	Weight 220 lbs.
Mounting	Mounting
Method Socket Weld	Method Bolted (Valve Mounted)
Required Torque 53 FtLbs.	Torque 90 FtLbs.
Ref.: Valve Data Sheet No. MO Parameter Design Operating Press 1250 psig- 992 psig	<pre>g Power requirements: (include normal, maximum and minimum).</pre>
Temp 575 F 546 F	Spec. K-2882-21, Form 1810Q
Flow 2000 #/Hr. 2000 #/Hr.	(Ref. GE Dwg. 105D5575, Rev. 0 & and 131C7911A; Rev. 5)
Max dP across valve 1250 psi H	Ref.
/Ref. GE 22A4622AV Opening time @ max dP7.5sec. /Ref. GE 22A4622AV	
Power requirements for function	onal
accessories, (if any) None	

List control signal inputs: 182 manually by control switch (HS) 1821	21-F067A can be opened and closed remote- ISO35. It is under (MSIV) logic control.
List functional accessories: M	lone
and will trip closed upon presence of isolation signals; MSL Hi radiation, MSL In Turbine Bldg. Temp. Hi, Turbin Vacuum Low, Reactor Water Level Low (any of the following containment MSL Hi flow, MSL Tunnel Temp. Hi, he Inlet Pressure Low, Condenser

1.1

1.	Briefly describe components normal and safety
	functions: Normal function is to provide control over
eli	mination of condensate in Main Steam Line A during startup and
low	load operations.
Saf	ety function is containment isolation.
2.	The components normal state is: [] Operating [] Standb
3.	Safety function:
	a. [] Emergency reactor b. [] Containment heat shutdown removal
	c. [X] Containment isolation d. [] Reactor heat remov
	e. [] Reactor core cooling f. [] Prevent significan release of radio- active material to environment
	g. Does the component function to mitigate the consequences of one or more of the following events? [3] Yes [] No If "Yes", identify.
	[X] LOCA [] HELB [X] MSLB
	[] Other
4.	Safety requirements:
	[X] Intermittent Operation [X] During postulated event
	[] Continuous Operation [] Following postulated even
	If component operation is required following an event, give approximate length of time component must remain operational.
	N/A (e.g., hours, days, etc.

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the valve assembly operational, (e.g., limit switches).

*'Fail as is' feature will not negate isolation of containment as the main steam inboard isolation valve will be intact and able to perform this function.

5. For VALVES:

Does the component [] Fail open [] Fail closed K] Fail as

Is this the fail safe position? [* Yes [] No (*)

Is the valve used for throttling purposes? [] Yes [X No

Is the valve part of the reactor coolant pressure boundary [3] Yes [] No

Does the valve have a specific limit for leakage? [N] Yes []No

If "Yes" give limit: 15 ml/hr Ref. Article 8, Form 273D per Article 202.1.d of

- IV. QUALIFICATION
 - Reference by specific number those applicable sections of the design codes and standards applicable to the component: ASME Code, Section III, Div. 1, Edition 1977 with Winter 1977 Addenda and Code Case No. N-154 (1791).

 Reference those gualification standards, used as a guide to gualify the component: IEEE-323-1974,

Specification K-2882.

IEEE-382-1972, IEEE-344-1975

 Identify those parts of the above qualification standards deleted or modified in the qualification program.

Deleted:

Modified:

None

None

- Have acceptance criteria been established and documented in the test plan(s) for the component? Yes [k] No [] Ref. Document: Documented in EQ-CL009.
- 5. What is the expected failure mode that would keep the pump or valve assembly from performing its safety function?

None

Are the margins* identified in the qualification 6. documentation? [] No Ref. Documents: Inherent margins are discussed in detail in Tab C of EQ-CL009. If component is a PUMP, complete IV.7. If component is a VALVE, complete IV.8. 72 Pump operability has been demonstrated by: [] Analysis [] Test [] Combination Mentify PUMP tests performed: NA Shell hydrostatic a. [] Bearing temperature b. WASME Section III) evaluations Ref. [] Seistic loading c. [] Vibration levels d. Ref. [] Exploratory vibration e. f. [] Seal leakage @ hydro press (Fundamental free Rev. [] Aging: [] Thermal g. h. [] Flow performance [] Mechanical Are curves provided [] Yes [] No Ref. Doc. Ref. [] Pipe reaction end i . Others loads (nozzle loads) Ref. Doc. k. [] Extreme environment: [] Humidity [] Chemical [] Radiation Ref. Doc. Valve operability has been demonstrated by: [] Analysis 8. [] Test [x] Combination Identify VALVE tests performed: [x] Shell hydrostatic b. [X] Cold cyclic b. (ASME Section III) List times: Open Closed 6.53 sec. Ref. Doc. Hydro Test Report Ref Certificate of Test -*. Margin is the difference between design basis parameters and Ref. Doc. Vendor's Final the test parameters used for equipment qualification.

	[x] Seismic loading d. [] Hot cyclic Lists times: Open
e.	Ref. SQ-CL203 [X] Exploratory vibration f. [X] Main seat leakage (Fundamental freq. 30.6 Hz) Ref. Vendor's Final Hydro
g.	W Aging: W Thermal h. (Back seat leakage
i.	Ref. EQ-CL009 [] Pipe reaction end j. [X] Disc hydrostatic loading
k.	Ref. Ref.Vendor's Final Hydro Test
	Ref
	[] Chemical
m.	<pre>K] Radiation Ref. EQ-CL009 [] Flow characteristics n. [] Others Are curves provided? Ref. [] Yes k] No</pre>
from	a result of any of the test (or analysis), were any deviation design requirements identified? [] Yes [X] No If "Yes", ofly describe any changes made in tests (or analysis) or to component to correct the deviation.
etc. inst If t test	the test component precisely identical (as to model, size,) to the in-plant component? [] Yes [M] No If "No", is alled component [] oversized or [M] undersized? (See Attachment A Note 2) ype test was used to qualify the component, does the type meet the requirements of IEEE 323-1974, Section 5? es [] No
etc. inst If t test K] Y Is c If ") to the in-plant component? [] Yes [] No If "No", is alled component [] oversized or [] undersized? (See Attachment A Note 2) ype test was used to qualify the component, does the type meet the requirements of IEEE 323-1974, Section 5?
etc. inst If t test K] Y Is c If " orie Is t was) to the in-plant component? [] Yes [] No If "No", is alled component [] oversized or [M undersized? (See Attachment A Note 2) ype test was used to qualify the component, does the type meet the requirements of IEEE 323-1974, Section 5? es [] No omponent orientation sensitive? [M Yes [] No [] Unknown Yes", does installed orientation coincide with qualified

9.

10.

11.

12.

13.

1	Were the qualification tests performed in sequence and on only one component? [] No				
	If "Yes" identify sequence, (e.g., radiation, seismic, cyclic, thermal, etc.): <u>Thermal, Mechanical, Radiation, Seismic & LOCA</u>				
If "aging"" was performed, identify the significant aging mechanisms: <u>Thermal, Mechanical, Radiation</u>					
1	dentify loads imposed (assumed) on the component for the gualification tests (analysis) performed:				
	a. [] Plants (shutdown loads) b. K] Extreme environment				
c	. 🕅 Seismic load d. 🅅 Others LOCA/HELB Pool				
a	Have component design specifications been reviewed in-house to assure they envelope all expected operating, transient, and accident conditions? [X] Yes [] No				
(Does the component utilize any unique or special materials? (Examples are special gaskets or packing, limitations on nonferrous materials, or special coatings or surfaces.) [] Yes [X] No				
I	f "Yes", identify:				
p	Does component require any special maintenance procedures or practices, (including shorter periods between maintenance)? [] Yes [X] No				
I	f "Yes", identify:				
ī	s the qualified life for the component less than 40 years?] Yes [3] No If "Yes", what is the qualified life?				

* As outlined in Section 4.4.1 of IEEE-627 1980.

Valve Tag # 1B21-F067A

21. Information Concerning Qualification Documents for the Component

	Report Number	Report Title	Date	Company/Organizaton Preparing Report	Company/Organization Reviewing Report
)	SA493726 Rev. A	Sei mic Calculation	03/09/84	Rockwell International	S&L/CQD (SQ-CL232)
)	ENG. RPT 84-08	Static Deflection Testing of Electric Motor Operated 1-1/2" Stainless Steel Valve	10/05/84	Rockwell International	S&L/CQD (SQ-CL232)
)	B-0058	Limitorque Valve Actuator Qualification for Nuclear Service Report.	01/11/80	Limitorque Corporation	S&L/CQD (EQ-CL009)
)	10959	Dynamic Qualification Report on Two Valves	12/24/81	Structural Dynamics Research Corporation	S&L/CQD (SQ-CL203)
)	CQD-000731 Rev. 0	Summary Report for Limitorque Valve Operators Testing Program.	01/15/82	S&L/CQD	S&L/CQD (SQ-CL203)
)	B0037	Seismic Qualification Envelope, Limitorque Valve Actuators	01/11/80	Limitorque Corporation	S&L/CQD (SQ-CL203)
)	MEQ-CL085	Environmental Qualifica- tion of Rockwell Globe Valves	07/17/85	S&L/CQD	S&L/CQD (MEQ-CL085)

ENGINEERS CHICAGO

Valve 1B21-F067A Page 12 (Final)

ATTACHMENT A

- NOTE 1: The valve assembly is not orientation-sensitive from a seismic point of view. However from the environmental view point the valve assembly is sensitive to orientation. To prevent possible intrusion of lubricant into the motor, the motor should not be mounted vertically downward; it should be horizontally mounted. Also in order to prevent flooding of the limit switch, the limit switch compartment should not be oriented facing vertically down.
- NOTE 2: For environmental qualification tests a model (SMB-0-25) larger and for seismic qualification tests a model (SMB-000) smaller than the subject component was used.

PVOP No. 2200D Revision A Page Cl

Pump & Valve Operability Assurance Review Checklist

5 1

SIGNATURE PAGE

System Engineer Review Alchard Hall	Data 11-8-85
System Engineer Review Accrima Ing	Date
Equipment Qual. Review M. E. Helmingh	Date 11/8/85
Electrical Engineer Review Not Applicable	Date
C&I Engineer Review Not Applicable	Date
Reconciliation of IPC Walkdown Results	
	Date

PVOP No. 2200D Rev. A Page C2

REFERENCES

- 1) Terry Corporation Drawing #96553E sheets 1 and 2
- 2) Terry Corporation Drawing #71996D

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- SQ-CL617, Dynamic Qualification of Reactor Core Isolation Cooling Turbine, 1E51-C002
- SQ-CL706, Dynamic Qualification of Reactor Core Isolation Cooling Pump, 1E51-C001
- 5) General Electric Drawing #105D5646
- 6) Sargent & Lundy Drawing #M04-1106
- 7) Bingham Pump Company Drawing FD-16210287
- 21A9443AY Purchase Specification Data Sheet dated 9/15/76 General Electric Co.
- 9) VPF 4062-89-4 Pump Vendor Instruction Manual dated 9/13/78 Bingham-Willamette General Electric
- 10) 762E421AA RCIC Process Diagram Revision 1 General Electric Co.
- 11) 22A3124 RCIC System Design Spec., Rev. 5, General Electric
- 12) S.O. 16210287 Quality Assurance Records Binder dated 6/12/79 Bingham-Willamette

PVOP No. 2200D Rev. A Page C3

Illinois Power Company Clinton Power Station

PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

Ι.	PLANT INFORMATION				
	1.	Name: Clinton Unit No.	1 2. Docket No.:50-461		
	3.				
	4.	NSSS: General Electric Co			
	5.	A/E: Sargent & Lundy			
II.	GEN	ERAL COMPONENT* INFORMATION			
	1.	Supplier: [x] NSSS [] BO	P Specification K-2801		
	2.	Location: a. Build:	ing/Room Auxiliary		
		b. Elevat	tion 707'-6"		
		c. System	n Reactor Core Isolation Cooling		
	3.		1E51-C001 (Pump) se drawings: 1E51-C002 (Turbine)		
	4.	If component is a 🕅 Pump			
		If component is a 🕅 Valve	complete II.6.		
	5.	General Pump Data			
		a. Pump (1E51-C001)	b. Prime-mover (1E51-C002)		
	Name	Reactor Core Isolation Cooling Pump			
		Bingham Willamette Corp.	Mfg. Terry Corporation		
	Mode	1_6x6x10 ¹ ₂ CP, 4-stage	Model_GS-2		
	S/N		S/N		
	Туре	Horizontal Double Case Type CP Centrifugal	Type Steam Driven Turbine		

* The component, whether pump or valve, is considered to be an assembly composed by the body, internals, prime-mover (or actuator) and functional accessories.

PVOP No. 2200D Revision A Tag #1E51-C001 Page C4

Size 28DX 21CKXL 4-stag Weight 6600 lbs. (Dry)	e VMT	Size Weight Mounting Method	
Mounting			
Method Bolted to floo	or		
Required B.H.P. 725	Required B.H.P. 725 (8)		
Parameter Design	Operating	Power requirements: (include normal, maximum and minimum).	
Press 1525 psi	(9&10) 1419 psi	Electrical N/A	
(9) Temp 40-140 F	(9) 40-140 F		
(design) (9)	(9) 625 gpm		
Head (mini-flow) 2980 ft.	(9) 2980 ft.	Other	
Required NPSH at maxi		If Motor list:	
(8) Flow 625 gpm, 18.4 f	t.	Duty cycle N/A	
Available NPSH 21	the second se	Stall current N/A	
Operating Speed 2250	(8) -4450 rpm	Class of insulation N/A	
Critical Speed N/A			
List functional acces	sories:*		
None: All a	re provided	by manufacturer	
List control signal i	nputs:		
Inputs are to	o pump ariv	er	

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

Tag #1E51-C001 Page C5 PVOP No. 2200D Rev. A

III	FUNCTIC	147
	I OUCTIC	154

	l.	runction	describe con	system wh	nich is	s manually	
	Sa le is	fety: Au vel to pro olation w	a periodic b tomatically ovide vessel ith loss of drop accide	initiated water inv	by rea entory dwater	actor low	water_
	2.	The comp	onents norma	l state is	5: [] (Operating	M Standby
	3.	Safety f	unction:				
		a. [] E s	mergency rea hutdown	ctor	b.	[] Contain removal	ment heat
		c. [] C	ontainment i	solation	d.	[] Reactor	heat removal
		e. P9 R	eactor core	cooling	f.	release	significant of radio- material to ment
		event	the compone quences of s? My Yes "Yes", iden	one or mor [] No	n to m e of t	itigate th he followi	ne ing
		[] LOC	A [] I	HELB	[]	MSLB	
		P9 Oth	er Reactor	isolation	and t	the control	l rod
	4.	Safety re	drop ac guirements:	cident (11	.)		
		🕅 Interm	ittent Opera	ation	🕅 Dur	ing postul	ated event
		[] Contin	uous Operati	on	[] Fol	lowing pos	tulated even
		event, gi	ent operatio ve approxima erational.	n is requi te length	ired for of time	ollowing a me compone	n nt must
			N/A		(e.(., hours,	days, etc.)
and the second sec		l accesso that are switches	reduited to	se sub-com make the		1.1.1	plied by the operational,

Tag #1E51-C002 Page C6 PVOP No. 2200D Rev. A

Size Weight Mounting Method Required B.H.P.	Size 6339PY36 (Frame) Weight 7600 lbs Mounting
Method	
Required B.H.P.	Method Bolted to Base Pump
	700 HP @ 4550 RPM H.P. 120 HP @ 2300 RPM
Parameter Design Operating	Power requirements: (include normal, maximum and minimum).
Temp	Electrical 120 VDC ± 10% for instrumentation, 48 VDC for turbine controls
Flow	
Head	Other
Required NPSH at maximum	If Motor list:
Flow	Duty cycle
Available NPSH	Stall current
Operating Speed	Class of insulation
Critical Speed /Ref.	
List functional accessories:* P	
provided by the turbine manufac	cturer. Refer to the Turbine
Instruction Manual, VPF 3927-7.	
List control signal inputs: Read	ctor low water level

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

Tag #1E51-C002 Page C7 PVOP No. 2200D Rev. A

III.	FUN	CTION
	on ca ver los	Briefly describe components normal and safety functions: Standby System which is manually started a periodic basis to assure its operability. Automati- lly initiated by reactor low water level to provide ssel water inventory during reactor isolation with as of normal feedwater, and during the control rol op accident.
	2.	The components normal state is: [] Operating [X Standby
	3.	Safety function:
		a. [] Emergency reactor b. [] Containment heat shutdown removal
		c. [] Containment isolation d. [] Reactor heat removal
		e. [x] Reactor core cooling f. [] Prevent significant release of radio- active material to environment
		g. Does the component function to mitigate the consequences of one or more of the following events? [x] Yes [] No If "Yes", identify.
		[] LOCA [] HELB [] MSLB
		A Other Reactor Isolation and the Control Rod
	4.	Safety requirements:
		<pre>[* Intermittent Operation [*] During postulated event</pre>
		[] Continuous Operation [] Following postulated event
		If component operation is required following an event, give approximate length of time component must remain operational.
		N/A (e.g., hours, days, etc.)
manura	ccure	al accessories are those sub-components not supplied by the r that are required to make the valve assembly operational, t switches).

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Tag #1E51- C002E Page C8 PVOP No. 2200D Rev. A

General Valve Data (1E51-C002E)

a. Valve	b. Actuator (if not an integral unit)
Name Trip and Throttle Valve	Name Not applicable, Name doesn't_perform_safety
Mfg. <u>Gimpel</u>	Mfg. function.
Model N/A	Model
S/N 74-12218	S/N
Type Mechanical Plug	Туре
Size4"	Size
Weight 600 lbs.	Weight
Mounting Bolted to flange on Method Turbine inlet.	Mounting Method
Required Torque N/A	Torque
Ref.: Valve Data Sheet No. Parameter Design Operatin Press 1250 psig 1135-135 ps	(include normal, maximum
Temp 575 F Ref. 10	
Flow Ref. 10 Ref. 10	
Max P across valve N/A Closing time @ max dP 0.3 sec /Ref. Turbine Manual Opening time @ max dP N/A /Ref. N/A	
Power requirements for function	onal
accessories, (if any) 120 VDC	
List control signal inputs:	120 NDC trip signal, either
List functional accessories: _	Trip solenoid, position indicating limit switches

PVOP No.2200D Rev. A Tag #1E51-C002E Page C9

1.	Briefly describe components normal and safety functions: Normally mechanically latched in
the_	open position. Safety function is to protect
the	turbine/system via automatic or remote manual
trip	signal.
2.	The components normal state is: [] Operating [X St
3.	Safety function:
	a. [] Emergency reactor b. [] Containment he shutdown removal
	c. [] Containment isolation d. [] Reactor heat r
	e. [x Reactor core cooling f. [] Prevent signif release of rad active materia environment
	g. Does the component function to mitigate the consequences of one or more of the following events? [X] Yes [] No If "Yes", identify.
	[] LOCA [] HELB [] MSLB
4.	M Other Reactor Isolation and the Control Rod Drop Accident Safety requirements:
	(x) Intermittent Operation (x) During postulated e
	[] Continuous Operation [] Following postulated
	If component operation is required following an event, give approximate length of time component must remain operational.

é

- Functional accessories are those sub-components not supplied by the manufacturer that are required to make the valve assembly operational, (e.g., limit switches).

Tag #1E51-C002E Page C10 PVOP No. 2200D Rev. A

5. For VALVES:

Does the component [] Fail open [] Fail closed [] Fail as

Is this the fail safe position? [] Yes [] No

Is the valve used for throttling purposes? [] Yes & No

Is the valve part of the reactor coolant pressure boundary: [] Yes [] No

Does the valve have a specific limit for leakage? []Yes []No

If "Yes" give limit:

IV. QUALIFICATION

 Reference by specific number those applicable sections of the design codes and standards applicable to the component: Notes 1, 2, &3 for the pump, turbine, and valve respectively of Attachment A.

 Reference those qualification standards, used as a guide to qualify the component: IEEE 344-1975.

- Identify those parts of the above qualification standards deleted or modified in the qualification program.

Deleted:

Modified:

None

None

- 4. Have acceptance criteria been established and documented in the test plan(s) for the component? Yes [X] No [] Ref. Document: 3 and 4
- 5. What is the expected failure mode that would keep the pump or valve assembly from performing its safety function? None

PVOP No. 2200D Rev. A Page Cll

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		ne	r. Docum	ents: 3	and 4				
If c	ompone	ent i	s a PUMP	, complet	e IV.	7.			
lf c	ompone	ent i	s a VALV	E, comple	te IV	.8.			
7.	Pun	np op	erabilit; Test	y has bee [X]	n dem Comb	onst inat	rat ion	ed by: []	Analysis
	Ide	entify	PUMP te	ests perf	ormed	:			
	a.	[] S Ref.	INDITE Dec	drostatic ction III)	b.	[]	Bearing te evaluation	mperature s
	с.	[x] 5	seismic 1 3	loading	•	d.	[]	Vibration	levels
	e.	[] E	xplorato	ory vibra		f.	[]	Seal leakad	ge @ s
	~	Rev.		freq.			15		
	g.	11 4] Therma				Flow perfor	
		Rof	Doc.	J Mechan	lcal				ovided [] Ye [] No
	i.			tion end	····· '	j.	Ref [x]	Others Pool	Dynamics,
	k.	Ref.	Doc. 3	zzle load			I	Pressure, and	Operating Load
			[] Humi	dity					
			[] Chem	ical					
	Valv [] 1	Ref. ve op Test	[] Radi Doc. erabilit	y has bee	n dem Comb	onst inat	rat	ed by: []	Analysis
	Iden	ntify	VALVE to	ests perf	ormed	:			
	b.	[] {	Shell hyd ASME Sect	drostatic tion III)		b.	t] Cold cycl List times:	Open
		Ref.	Doc.				Ref		Closed

PVOP No. 2200D Rev. A Page C12

с.	[x] Seismic loading	d.	[]	Hot cyclic Lists times:	Open Closed
	Ref. 3		Ref		CIOSEC
e.	k, Exploratory vibration (Fundamental Freq. 16 Hz)	f.			kage '
~	Ref. 3 [] Aging: [] Thermal h		Ref.		
g.	[] Mechanical				
í.	Ref. Pipe reaction end loading	j.	lef.	Disc hydrost	atic
	Ref. 3	R	lef.		
k.	[] Extreme environment	1.	[] F	Tow interrupt capability	lon
			Ref		
	[] H nidity				
	[] Chemical				
	[] Radiation				
	Ref.				
m.	[] Flow characteristics Are curves provided?	n.		Others Pool Dy	
	Ref.		P	ressure, and Ope	rating Loads
	[] Yes [] No				
from brie the	A result of any of the test design requirements ident fly describe any changes m component to correct the d Attachment A.	tifi nade	ed? in	[X] Yes [] N tests (or ana	o If "Yes",
see	Attachment A.				******

*****					*****
etc.	the test component precise) to the in-plant component alled component [] oversiz	it?	[x]	Yes [] No I	f "No", is
test	ype test was used to quali meet the requirements of es [] No Not applicable.				
If "	omponent orientation sensi Yes", does installed origon ntation? [3] Yes [] No	tiv	e? ion	k] Yes [] No coincide with	[] Unknown gualified
was	he component mounted in th qualified (i.e., welded, s es [] No [] Unknown	ame	ame num	manner in-plan ber and size b	nt in which it polts, etc.)

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PVOP No. 2200D Rev. A Page C13

	Were the qualification tests performed in sequence and on onl one component? [] Yes [] No Not applicable.
	If "Yes" identify sequence, (e.g., radiation, seismic, cyclic thermal, etc.):
1	If "aging"* was performed, identify the significant aging mechanisms: Not applicable
	Identify loads imposed (assumed) on the component for the qualification tests (analysis) performed:
	a. [] Plants (shutdown loads) b. [] Extreme environment
0	c. [x] Seismic load d. & Others Pool Dynamics, Pressure, Nozzle, and Op-
H	lave component design specifications been reviewed in-house to
-	issure they envelope all expected operating, transient, and accident conditions? [2] Yes [] No
a D (n	ener envelope dil expected oporating transiti
a [(n [Does the component utilize any unique or special materials? Examples are special gaskets or packing, limitations on conferrous materials, or special coatings or surfaces of
a C (n [I D p	Does the component utilize any unique or special materials? Examples are special gaskets or packing, limitations on onferrous materials, or special coatings or surfaces.) I Yes [4] No
a (n []]]]]	<pre>decident conditions? [w] Yes [] No Does the component utilize any unique or special materials? Examples are special gaskets or packing, limitations on onferrous materials, or special coatings or surfaces.)] Yes [w] No f "Yes", identify: </pre>

* As outlined in Section 4.4.1 of IEEE-627 1980.

Information Concerning Qualification Documents for the Component 21.

Report Number	Report Title	Date	Company/Organizaton Preparing Report	Company/Organization Reviewing Report
DRF E51- 00101	New Loads Analysis Report	12/10/81	General Electric	S&L/CQD SQ-CL706
VPF 5507- 12-1	Seismic Analysis Reactor Core Isolation Cooling Pump 6x6x10 ¹ ₂ CP - 4-Stage ASME Section III, Class 2	08/23/78	Bingham-Willamette Company	S&L/CQD SQ-CL706
20458	Environmental Qualification Report For GS-2N RCIC Turbine Electrical Accessories And Electronic Control System	04/21/80	Terry Corporation	S&L/CQD SQ-CL617
20397	Environmental Qualification Test Specification For GS- Type RCIC Turbine Electrical Accessories And Electronic Control System	01/09/79	Terry Corporation	S&L/CQD SQ-CL617
781098-2	Qualification Test Plan Of Turbine And Related Control Panel For Terry Corporation	01/25/80	Wyle	S&L/CQD SQ-CL617
58412	Qualification Test Program On GS-2N Turbine Electronic Control System And Electrical Accessories For Terry Corpo- ration	04/14/80	Wyle	S&L/CQD SQ-CL617

PVOP Rev. Page No. A Cl4 2200D

Page C15 (Final) PVOP No. 2200D Rev. A

ATTACHMENT A

The following are the Anomalies due to seismic testing:

1 . . 4

- Anomaly #3: The turbine tripped during the SSE run. Investigation after the run revealed loose flange bolting at interface of the governor valve and turbine casing. This caused excessive displacement in the turbine throttle valve.
- Resolution: The flange was secured and the SSE was repeated successfully.
- Anomaly #4: During the resonance search and the first OBE test in the Z-Y axis, it was observed that the oil header to the coupling and bearing had excessive displacement.
- Resolution: The piping was supported at Terry Corp. request. Testing continued.
- Anomaly #7: Switch (temperature) would not function at any temperature set point. Also, the switch could not be calibrated.
- Resolution: The temperature switch is not essential to the operation of the turbine. This switch serves an alarm function only. Note that the failure mode of the switch would not result in an erroneous alarm signal.
- Notes: 1. ASME Code, Section III, Class II, NC-3400, Edition 1974, Winter 1975 Addenda
 - 2. Applicable Sections of design codes and standards applicable to the component: None required, but the following codes were used (to the extent defined in the Equipment Spec.): ASME B&P Code, Section III, VIII, and IX, ASTM E-71, E-94, E-142, E-186, and E-280
 - 3. . oplicable Sections of design codes and standards applicable to the component: None required, but the following codes were used (to the extent defined in the Equipment Spec.): ASME B&P Code, Section III, VIII and IX, ASTM E-71, E-94, E-142, E-186, and E-280

PAGE: C1 PVOP NO. 1000B REVISION: A

Pump Valve Operability Assurance Review Checklist

SIGNATURE PAGE

Revision No. A

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System Engineer Review Moleika	Date 11/8/85
Equipment Qual. Review Michael & Holmuch	Date 11/8/85
Electrical Engineer Review Rob MBeans	Date 11-8-85
C&I Engineer Review Jun Kantal	Date //- 8-85
Reconcilation of IPC Walkdown Results	
	Date

PAGE: C2 PVOP NO. 1000B REVISION: A

References

- 1. S&L Specification K-2873A, Amendment 4, (01-28-82)
- 2. S&L Drawing M06-1002, Sheet 15, Revision AL (10-15-84)
- Anderson Greenwood & Co. Drawing No. 4-2508-530, Sheet 1, Revision B, (07-06-82)
- 4. G. E. Drawing 768E584, Revision 3, "Purchase Part Valve, Safety Relief, Nuclear Boiler System", (03-27-79)
- 5. S&L Drawing M05-1002, Sheet 1, Revision H (08-06-85)
- IPC Record Package For Document Record Number: Baldwin Associates P.O. C38368, RIR Number S18172, Valve Serial Number N-18870.
- GESSAR II, General Electric Document Number 22A7000, "Amendment 2 to the 238 Nuclear Island General Electric, Standard Safety Analysis Report, (06-15-81)
- SQ-CL197, Dynamic Qualification of Anderson Greendwood & Co. Vacuum Breaker Valves.
- MEQ-CL096, Environmental Qualification of Anderson Greenwood & Co. Vacuum Relief Valves.
- Anderson Greenwood & Co. Report No. 5-9025-169, "Design Report-Type CV1B Wafer Check Valve 10 inch ANSI Class 3" (10/27/84)
- Anderson Greenwood Co. Report N05-9025-173 "Resonance Search Report -10" Vacuum Breaker Valve", (1/21/83)
- Anderson Greenwood Co. Report N05-9005-128 "Test Report 10" 300# Vacuum Breaker Valve, Clinton Power Station", (9/20/83)

PAGE: C3 PVOP NO. 1000B REVISION: A

Illinois Power Company Clinton Power Station

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PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

Ι.	PLA	NT INFORMATION						
	1.	Name: Clinton Unit No.	1 2. Docket No.:50-461					
	3.	Utility: Illinois Power C						
	4.	NSSS: General Electric Co						
	5.	A/E: Sargent & Lundy						
II.	GENE	GENERAL COMPONENT* INFORMATION						
1	1.							
			ing/Room Containment/Drywell (H-27)					
		b. Elevat	tion 761'-6" (Ref 2)					
		c. System	Nuclear Boiler					
	3.	Component number on in-hous	e drawings: 1B21-F037A					
	4.	If component is a [] Pump	complete II.5.					
		If component is a 🕅 Valve						
	5.	General Pump Data						
		a. Pump	b. Prime-mover					
	Name	NA	Name NA					
	Mfg.	NA	Mfg. NA					
	Mode]		Model NA					
	S/N	NA	S/N NA					
	Type	NA	Type NA					

* The component, whether pump or valve, is considered to be an assembly composed by the body, internals, prime-mover (or actuator) and functional accessories.

PAGE: C4 PVOP NO. 1000B REVISION: A

Size NA Weight NA Mounting NA Method NA Required B.H.P. NA Parameter Design Operating Press NA NA Temp NA NA Flow NA NA Head NA NA	Size NA Weight NA Mounting Method NA H.P. NA Power requirements: (include normal, maximum and minimum). Electrical NA
Weight NA Mounting NA Method NA Required B.H.P. NA Parameter Design Operating Press NA NA Temp NA NA Flow NA NA	Weight NA Mounting Method NA H.P. NA Power requirements: (include normal, maximum and minimum).
Method NA Required B.H.P. NA Parameter Design Operating Press NA NA Temp NA NA Flow NA NA	Mounting Method <u>NA</u> H.P. <u>NA</u> Power requirements: (include normal, maximum and minimum).
Method NA Required B.H.P. NA Parameter Design Operating Press NA NA Temp NA NA Flow NA NA	Method NA H.P. NA Power requirements: (include normal, maximum and minimum).
Required B.H.P. NA Parameter Design Operating Press NA NA Temp NA NA Flow NA NA	H.P. NA Power requirements: (include normal, maximum and minimum).
Parameter Design Operating Press NA NA Temp NA NA Flow NA NA	Power requirements: (include normal, maximum and minimum).
Press <u>NA</u> <u>NA</u> Temp <u>NA</u> <u>NA</u> Flow <u>NA</u> <u>NA</u>	Power requirements: (include normal, maximum and minimum).
Press <u>NA NA</u> Temp <u>NA NA</u> Flow <u>NA NA</u>	(include normal, maximum and minimum).
Temp NA NA Flow NA NA	maximum and minimum).
Temp NA NA Flow NA NA	
Temp NA NA Flow NA NA	Electrical NA
Flow NA NA	
Head	
Head	
Head <u>NA</u> NA	
MA	Other NA
	<u>N8</u>
Required NPSH at maximum	
nequired aron at maximum	If Motor list:
Flow NA	Duty cycle NA
Available NPSH NA	Chall and a
Donating Court	
Operating Speed NA	Class of insulation NA
Critical Speed NA /Ref. NA	
List functional accessories:*	NA
ist control signal inputs:	NA

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

6.

PAGE: C5 PVOP NO. 1000B REVISION: A

6. General Valve Data	
a. Valve (Ref. 3)	b. Actuator (if not an integral unit)
Main Steam SRV Discharge Line Name Vacuum Relief Valve	NA:Valve is operated by ΔP acros Name NA valve
Mfg. Anderson, Greenwood & Co.	Mfg. NA
Model CV1B-1030 SCR-N-8	Model NA
S/N N-18870 (Ref 6)	S/N NA
Type Wafer Style Check Valve	Туре NA
Size 10 inch	Size NA
Weight 300 lbs.	Weight NA
Mounting Bolted to Flange Method in pipeline	Mounting Method NA
Required Torque NA-No Operator	Torque NA
Ref.: Valve Data Sheet No. Parameter Design Operating Press 625 (Ref. 1) 563 (Ref. 4)	(include normal, maximum and minimum).
Temp(°F) 494 (Ref. 1) 494 (Ref. 4) 4400@ 0.5 See Attachmen Flow(scfm) psid(Ref.1) Note 2	-
Max A P across valve 563 psig	Ref. NA
Closing time @ max Δ P NA (/Ref. NA Opening time @ max Δ P 0.2 sec /Ref. 1, p.3-3, Section 303.3b Power requirements for function	NA
accessories, (if any) None	
List control signal inputs:	None
List functional accessories:	None

PAGE: C6 PVOP NO. 1000B REVISION: A

III.	FUNCTION
	FUNCTION

Briefly describe components normal and safety 1. functions: The normal function is to be in the closed

position. The safety function of the valve is to provide vacuum relief in the MSRV line if necessary following SRV discharge. In addition, this value when closed is part of the pressure boundary

during the next blowdown. The valve is shown in Reference 5.

The components normal state is: [] Operating 🕅 Standby 2.

3. Safety function:

a.	[x]	Emergency reactor shutdown	b.	[]	Containment heat removal
с.	[]	Containment isolation	d.	[]	Reactor heat remova
e.	[]	Reactor core cooling	f.	[]	Prevent significant release of radio- active material to environment

Does the component function to mitigate the g. consequences of one or more of the following events? [x] Yes [] No If "Yes", identify.

X LOCA X HELB M MSLB

A Other Prevents formation of high water leg in SRV discharge line following SRV discharge. 4.

Safety requirements:

M Intermittent Operation [] During postulated event

[] Continuous Operation P Following postulated even

If component operation is required following an event, give approximate length of time component must remain operational.

100 days

0.

(e.g., hours, days, etc.)

Functional accessories are those sub-components not supplied by the manufacturer that are required to make the valve assembly operational, (e.g., limit switches).

PAGE: C7 PVOP NO. 1000B REVISION: A

5. For VALVES:

Does the component [] Fail open [] Fail closed [] Fail as See Attachment A, Note 1 Is this the fail safe position? [] Yes [] No See Attachment A, Note 1 Is the valve used for throttling purposes? [] Yes [X No Is the valve part of the reactor coolant pressure boundary [] Yes & No

Does the valve have a specific limit for leakage? XYes []No

If "Yes" give limit: 20cc/hr (Ref., P3.3-3, 303.3d)

IV. QUALIFICATION

Reference by specific number those applicable 1. sections of the design codes and standards applicable to the component: ASME Code Section III, Class 3 Subarticle ND-3500, Edition 1980, Addenda Summer 1981.

Reference those qualification standards, used as a 2. guide to qualify the component: IEEE 344-1975 for

seismic qualification, IEEE 323-1974 for environmental

qualification.

3. Identify those parts of the above qualification standards deleted or modified in the qualification program.

Deleted:

Modified:

None

4.

- None ----
- Have acceptance criteria been established and
- documented in the test plan(s) for the component? N/A Yes [] No [] Ref. Document: "N Qualification by Analysis"
- What is the expected failure mode that would keep the 5. pump or valve assembly from performing its safety function? None

PAGE: C8 PVOP NO. 1000B REVISION: A

	 Are the margins* identified in the qualification documentation? [X] Yes [] No Ref. Documents: 9
If	component is a PUMP, complete IV.7.
	component is a VALVE, complete IV.8.
NOT 7. APPLICABLE	Pump operability has been demonstrated by: [] Analysis [] Test [] Combination NA
	Identify PUMP tests performed: NA
	a. [] Shell hydrostatic b. [] Bearing temperature (ASME Section III) evaluations
	c. [] Seismic loading d. [] Vibration levels Ref.
	e. [] Exploratory vibration f. [] Seal leakage @
	(Fundamental freq.) Rev. g. [] Aging: [] Thermal h. [] Flow performance
	[] Mechanical Are curves provided [] Yes
	Ref. Doc. [] No i. [] Pipe reaction end j. [] Others
	loads (nozzle loads) Ref. Doc.
	k. [] Extreme environment:
	[] Humidity
	[] Chemical
	[] Radiation Ref. Doc.
8.	Valve operability has been demonstrated by: [] Analysis [] Test [x] Combination
	Identify VALVE tests performed:
	a. [X] Shell hydrostatic b. [] Cold cyclic (ASME Section III) List times: Open Closed
	Ref. Doc. 10 Ref.
the	Margin is the difference between design basis parameters and test parameters used for equipment gualification.

PAGE: C9 PVOP NO. 1000B REVISION: A

с.	[] Seismic loading d.	[] Hot cyclic	_
		Lists times:	Open Closed
	Ref.	Ref.	-10360
е.	A A CONTRACTOR OF		LACIP
	(Fundamental freq. 145Hz)	in num beat rea	suge
	and the second se	ef. 10	
g.		Back seat leaka	
9.	[] Mechanical	Back Seat leaka	je
	Ref Re		
i.	a second a second a local and and and a second second a second as a second se		
* *	loading	[] Disc hydrost	atic
	loading Ref. NA - mounted by flange to pipe [] Extreme environment 1. [
k.	() Fut on one side only.		
~ •	() Excreme environment 1. (Flow interrupt	lon
	Ref. 9 .	capability	
	A CONTRACTOR OF A CONTRACTOR O	Ref.	
	[] Humidity		
	[] Chemical		
	[] Radiation		
	Ref.		
m.	[] Flow characteristics n.	1 Others Impact I	oads
	Are curves provided?	Ref. 12	
	Ref.		
	[] Yes [] No		
As	a result of any of the test (or	analysis), were	any deviation
fro	om design requirements identified	1? [] Yes 🕅 No	If "Yes",
bri	iefly describe any changes made i	in tests (or anal	vsis) or to
the	e component to correct the deviat	ion.	
*****	***************************************		
Was	the test component precisely id	lentical (as to m	odel, size
etc	.) to the in-plant component? [1 Yes [] No If	"No" is
inst	stalled component [] oversized or	Il undersized?	N/A
*113		FICATION BY ANAL	
TE			
tool	type test was used to qualify th	and the component, doe	s the type
	t meet the requirements of IEEE		n 5?
11 :	Yes [] No N/A "N/A QUALIFICAT	'ION BY ANALYSIS"	
			and the second second
IS C	component orientation sensitive?	N *Yes [] No	[] Unknown
TF !	Runn dene inchailand and and a fi	n coincide with	
**	"Yes", does installed orientatio	in cornerde wren	qualified
orie	entation? [X] Yes [] No	in connerde wren	qualified
orie	entation? [] Yes [] No	in connerde wren	qualified
orie	entation? 🕅 Yes [] No		
orie Is t	entation? [] Yes [] No the component mounted in the sam	e manner in-plan	t in which it
orie Is t was	entation? 🕅 Yes [] No	e manner in-plan	t in which it

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PAGE: C10 PVOP NO. 1000B REVISION: A

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14.	Were the qualification tests performed in sequence and on only one component? [] Yes [] No N/A
	If "Yes" identify sequence, (e.g., radiation, seismic, cyclic, thermal, etc.):
15.	If "aging"* was performed, identify the significant aging mechanisms: N/A "N/A Qualification by Analysis"
16.	Identify loads imposed (assumed) on the component for the qualification tests (analysis) performed:
	c. [] Plants (shutdown loads) b. [] Extreme environment Ref. 9
	c. [X] Seismic load Ref. 8 Pressure Loads & Pool
	Have component design specifications been reviewed in-house to assure they envelope all expected operating, transient, and accident conditions? [X] Yes [] No
	Does the component utilize any unique or special materials? (Examples are special gaskets or packing, limitations on nonferrous materials, or special coatings or surfaces.) [] Yes [X] No
	If "Yes", identify:
2	Does component require any special maintenance procedures or practices, (including shorter periods between maintenance)?
	If "Yes", identify: <u>Ref. 9</u>
20.	Is the gualified life for the component less than 40 years? [] Yes [X] No If "Yes", what is the gualified life?
* As out	lined in Section 4.4.1 of IEEE-627 1980.

21. Information Concerning Qualification Documents for the Component

Report Number	Report Title	Date	Company/Organization Preparing Report	Company/Organization Reviewing Report
N05-9025-173	Resonance Search Report - 10" Vacuum Breaker Valve.	1/21/83	Anderson, Greenwood & Company.	S&L/CQD SQ-CL197
NO5-9025-169	Design Report - Type CVIB Wafer Check Valve 10" ANSI Class 3.	10/27/82	Anderson, Greenwood & Company.	S&L/CQD SQ-CL197
N05-9005-128	Test Report - 10" 300# Vacuum Breaker Clinton Power Station.	09/20/83	Anderson, Greenwood & Company.	S&L/CQD SQ-CL197
N/A	Environmental Qualifi- cation of Anderson, Greenwood & Company Vacuum Relief Valves.	10/22/85	S&L/CQD	S&L/CQD MEQ-CL096

PAGE: C11 PVOP NO. 1000B REVISION: A

PAGE: C12 PVOP NO. 1000B REVISION: A

ATTACHMENT A

Note 1

There are two parallel vacuum relief valves connected to each MSRV discharge line. Vacuum relief is ensured even if one valve should fail close due to the use of redundant parallel vacuum relief valves.

If one of the vacuum relief values fails open, some steam will be discharged into the drywell air space. Since the time the MSRV's are normally open is short, the steam discharge through the failed vacuum relief value should present no significant problems. If the MSRV's are ever left continuously open, the presence of a stuck open vacuum relief value on a MSRV discharge line could cause a sizeable steam release to the drywell. However, this release of steam to the drywell would be less severe than the design bases.

PAGE: Cl3 (Final Page) PVOP NO, 1000B REVISION: A

Note 2

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The size of the SRVDL Vacuum Breakers were specified to conform with the requirements set forth in GESSAR-II (Reference 7, Subsection 3BA.4.2.3).

PVOP NO.	1400	H
REVISION	A	
Page Cl		

Pump & Valve Operability Assurance Review Checklist

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SIGNATURE PAGE

7, 17/2	
System Engineer Review //shard Hall	Date 11-11-85
Equipment Qual. Review Mcmadan	Date 11-08-85
Electrical Engineer Review Not Applicable	Date
C&I Engineer Review Com Kanth	Date 11-8-85
Reconcilation of IPC Walkdown Results	
	Date

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PVOP NO. 1400H REVISION A Page C2

REFERENCES

- 1) Specification K-2882, Amendment 12
- 2) P&ID M05-1079 Sht 2 Rev. P
- 3) Valve Data Sheet CV-007 dated 3-08-79 Valve Data Table DT-009
- 4) Vendor Drawings:

....

Target Rock Drawing 71010-4 Sht 1 Target Rock Drawing 81DD-001 Rev. A

- Seismic Qualification Package SQ-CL212 for Target Rock Regulating Valves, Model Nos. 81DD-001, 002, 003
- Mechanical Environmental Package MEQ-CL099 for Target Rock Pressure Regulating Valves
- 7) Target Rock Production Test Data Sheet Code Data Report Form NPV-1
- 8) P&ID M05-1079-1, Rev. S
- 9) Single Line Drawing M07-1079-1, Rev. W
- 10) Isometric Drawing RI-761, Rev. 14

11) General Electric Documents: 22A3124, Rev. 5
22A3124BK, Rev. 1
762E421AA, Rev. 0

12) Target Rock Corporation Letter C3721, dated June 9, 1983

Clinton Power Company

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PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

3. 4. 5.	b. Elevation 709'-0" c. System <u>Reactor Core Isolation Cooling</u> Component number on in-house drawings: <u>1E51-F015</u> If component is a [] Pump complete II.5. If component is a M Valve complete II.6. General <u>Pump</u> Data a. Pump b. Prime-mover Name Mfg. N/A Model S/N
3. 4. 5. Mame	b. Elevation 709'-0" c. System <u>Reactor Core Isolation Cooling</u> Component number on in-house drawings: <u>1E51-F015</u> If component is a [] Pump complete II.5. If component is a M Valve complete II.6. General <u>Pump</u> Data a. Pump b. Prime-mover Name Mfg
3. 4. 5.	b. Elevation 709'-0" c. System <u>Reactor Core Isolation Cooling</u> Component number on in-house drawings: <u>1E51-F015</u> If component is a [] Pump complete II.5. If component is a M Valve complete II.6. General <u>Pump</u> Data a. Pump b. Prime-mover Name
3. 4. 5.	b. Elevation 709'-0" c. System <u>Reactor Core Isolation Cooling</u> Component number on in-house drawings: <u>1E51-F015</u> If component is a [] Pump complete II.5. If component is a M Valve complete II.6. General <u>Pump</u> Data a. Pump b. Prime-mover
3. 4. 5.	b. Elevation 709'-0" c. System <u>Reactor Core Isolation Cooling</u> Component number on in-house drawings: <u>1E51-F015</u> If component is a [] Pump complete II.5. If component is a M Valve complete II.6. General <u>Pump</u> Data
3. 4.	<pre>b. Elevation 709'-0" c. System <u>Reactor Core Isolation Cooling</u> Component number on in-house drawings: <u>1E51-F015</u> If component is a [] Pump complete II.5. If component is a [] Valve complete II.6.</pre>
3.	<pre>b. Elevation 709'-0" c. System Reactor Core Isolation Cooling Component number on in-house drawings: 1E51-F015 If component is a [] Pump complete II.5.</pre>
3.	b. Elevation 709'-0" c. System <u>Reactor Core Isolation Cooling</u> Component number on in-house drawings: <u>1E51-F015</u>
	 b. Elevation 709'-0" c. System <u>Reactor Core Isolation Cooling</u>
	b. Elevation 709'-0"
2.	Location: a. Building/Room Aux. Building
	Supplier: [] NSSS [] BOP Specification K-2882
GENE	RAL COMPONENT* INFORMATION
5.	A/E: Sargent & Lundy
4.	NSSS: General Electric Co. [] PWR [x] BWR
3.	Utility: Illinois Power Company
1.	Name: Clinton Unit No. 1 2. Docket No.: 50-461
	3. 4. 5. GENER

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Size	Size
Wayght	Weight
Mounting	
Method N/A	Mounting Method
Required B.H.P.	Method
Parameter Design Operating	
Parameter Design Operating	Power requirements: (include normal,
	maximum and minimum
Press	
	Electrical
Temp	
Flow	
Head	Other
Pequired NDCU -	
Required NPSH at maximum	If Motor list:
Flow	Duty cycle
Available NPSH	Stall current
Operating Speed	Class of insulation
Critical Speed /Ref.	\
List functional accessories:*	
	/
List control signal inputs:	
	·····/
	\

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Temp 170 [°] F 140 [°] F Flow <u>16 gpm 16</u> Max 3P across valve <u>1500 p</u> si	gpm Ref Other: []Pneumatic[]Hydrauli N/A
Temp 170°F 140°F Flow 16 qpm 16 Max 3P across valve 1500 psi Closing time @ max 3P N/A /Ref. not required Opening time @ max 3P N/A /Ref. not required Power requirements for function	gpm Ref Other: []Pneumatic[]Hydrauli N/A
Temp <u>170[°]F</u> <u>140[°]F</u> Flow <u>16 gpm 16</u> Max dP across valve <u>1500 psi</u> Closing time @ max dP <u>N/A</u> /Ref. not required Opening time @ max dP <u>N/A</u> /Ref. not required	gpm Ref Other: []Pneumatic[]Hydrauli N/A
Temp 170°F 140°F Flow 16 gpm 16 Max 3P across valve 1500 psi Closing time @ max 3P N/A /Ref. not required Opening time @ max 3P N/A	gpm Ref Other: []Pneumatic[]Hydrauli
Temp <u>170[°]F</u> <u>140[°]F</u> Flow <u>16 gpm 16</u> Max : P across valve <u>1500 psi</u> Closing time @ max -P <u>N/A</u> /Ref. pot required	gpm Ref
Temp 170 [°] F 140 [°] F Flow <u>16 gpm 16</u> Max 3P across valve <u>1500 p</u> si	gpm Ref
Temp <u>170[°]F</u> <u>140[°]F</u> Flow <u>16 gpm 16</u>	gpm
Temp 170°F 140°F	
Press 1500 psig to 1500 ps	sig Electrical N/A
181 psig	(include normal, maximum and minimum).
Ref.: Valve Data Sheet No. CV Parameter Design Operation	-007 ng Power requirements:
Torque N/A	Torque ¥
Required	
Method Socket weld to pipe	Method
Mounting	Mounting
Weight 22 lbs.	Weight
Size 2"	Size
Type Globe	Туре
S/N 01	S/N
Model 81 DD-001	Model
Target Rock Corp.	Mfg.
Mfg. Target Rock Corp.	Name N/A
Self-contained Name Pressure Regulator	
Name Pressure Regulator	b. Actuator (if not an integral unit)

III. FUNCTION

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1.	Briefly describe components normal and safety functions: Valve is normally isolated by valve	
	1E51-F046 and not operating. Safety function is	
	to control downstream pressure and limit flow of	
	cooling water to RCIC turbine oil cooler,	
2.	The components normal state is: [] Operating [] Standt	
3.	Safety function:	
	a. [] Emergency reactor b. [] Containment heat shutdown removal	
	c. [] Containment isolation d. [] Reactor heat remova	1 1
	e. [] Prevent significant release of radio- active material to environment	
	g. Does the component function to mitigate the consequences of one or more of the following events? [] Yes [] No If "Yes", identify.	
	[] LOCA [] HELB [] MSLB	
	M Other Control-rod Drop Accident & Loss of F.W. Transient.	
4.	Safety requirements:	
	X Intermittent Operation K During postulated event	
	Continuous Operation [] Following postulated ever	1
	If component operation is required following an event, give approximate length of time component must remain operational.	
	(e.g., hours, days, etc.)	1

:

5.	For	VAL	LVI	ES:
				the star of

IV.

	Does the component K) Fail open [] Fail closed [] Fail as
	Is this the fail safe position? [] Yes [] No
	Is the valve used for throttling purposes? M Yes [] No
	Is the valve part of the reactor coolant pressure bounda: [] Yes [X] No
	Does the valve have a specific limit for leakage?
	If "Yes" give limit: 6cc/min.
QUA	LIFICATION Ref. Spec. K-2882-17, Std. Form, ANSI B16.104.
1.	
	ASME Code, Section III, 1974 Edition w/1974 Summer Addenda
2.	Reference those qualification standards, used as a guide to qualify the component:
	IEEE-344-1975
3.	Identify those parts of the above qualification standards deleted or modified in the qualification program.
	Deleted: Modified:
	None None
4.	Have acceptance criteria been established and documented in the test plan(s) for the component?
	No test conducted
5.	What is the expected failure mode that would keep the pump or valve assembly from performing its safety function?
	None

Are the margins identified in the qualification documentation? [] Yes [] No N/A 6. Ref. Documents: Qualification is by analysis. If component is a PUMP, complete IV.7. If component is a VALVE, complete IV.8. Pump operability has been demonstrated by: [] Analysis 7. [] Test [] Combination Identity PUMP tests performed: N/A [] Shall hydrostatic a. b. [] Bearing temperature (ASME Section III) evaluations Ref. [] Seismic loading с. d. [] Vibration levels Ref. [] Exploratory vibration f. [] Seal leakage @ e. hydro press (Fundamental freg.) Rev. [] Aging: q. [] Thermal h. [] Flow performance [] Mechanidal Are curves provided [] Yes [] No Ref. Doc. Ref. [] Pipe reaction end i. [] Others loads (nozzle loads) Ref. Doc. k. [] Extreme environment: [] Humidity [] Chemical [] Radiation Ref. Doc. Valve operability has been demonstrated by: M Analysis 8. [] Test [x] Combination Identify VALVE tests performed: b. [x] Shell hydrostatic b. [] Cold cyclic (ASME Section III) List times: Open Closed Ref. Doc. Mfgr. Test Report . Ref. *. Margin is the difference between design basis parameters and the test parameters used for equipment gualification.

	c. [] Seismic loading d. [] Hot cyclic Lists times: Open Closed
	Ref. e. [] Exploratory vibration f. [] Main seat leakage
	Ref. Ref. Mfgr. Test Report g. [] Aging: [] Thermal h. [] Back seat leakage
	[] Mechanical Ref. i. [] Pipe reaction end j. [] Disc hydrostatic loading
	Ref. k. [] Extreme environment 1. [] Flow interruption capability Ref.
	[] Humidity
	[] Chemical
	[] Radiation
	Ref. m. [] Flow characteristics n. [3] Others 1) Diaphragm Hydro. Are curves provided? Ref. [] Yes No 2) Operational Test.
9.	As a result of any of the test (or analysis), were any deviation from design requirements identified? [] Yes [] No If "Yes", briefly describe any changes made in tests (or analysis) or to the component to correct the deviation.
10.	Was the test component precisely identical (as to model, size, etc.) to the in-plant component? [* Yes [] No If "No", is installed component [] oversized or [] undersized? (qualification by analysis)
11.**	If type test was used to qualify the component, does the type test meet the requirements of IEEE 323-1974, Section 5? [] Yes [] No
12.**	Is component orientation sensitive? [] Yes [] No [] Unknown If "Yes", does installed orientation coincide with gualified orientation? [] Yes [] No
13.**	Is the component mounted in the sa. manner in-plant in which it was qualified (i.e., welded, same number and size bolts, etc.) [] Yes [] No [] Unknown
**NOTE:	NO SEISMIC TEST WAS CONDUCTED AND NO 1E COMPONENTS ARE INVOLVED. HENCE, SECTIONS 8.c, 8.e, 8.g, 8.i, 8.k and 11 to 15 ARE NOT APPLICABLE.

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14.**	Were the qualification tests performed in sequence and on only one component? [] Yes [] No
	If "Yes" identify sequence, (e.g., radiation, seismic, cyclic, thermal, etc.):
15.**	If "aging"* was performed, identify the significant aging mechanisms:
16.	Identify loads imposed (assumed) on the component for the qualification tests (analysis) performed:
	c. [] Plants (shutdown loads) b. [] Extreme environment
	c. & Seismic load d. & Others Pool Dynamic and Operating Loads
17.	Have component design specifications been reviewed in-house to assure they envelope all expected operating, transient, and accident conditions? [3] Yes [] No
18.	Does the component utilize any unique or special materials? (Examples are special gaskets or packing, limitations on nonferrous materials, or special coatings or surfaces.) [] Yes [X] No
	If "Yes", identify:
19.	Does component require any special maintenance procedures or practices, (including shorter periods between maintenance)?
	If "Yes", identify:
20.	Is the qualified life for the component less than 40 years? [] Yes [] No If "Yes", what is the qualified life?

PVOP 1400H -Rev. A Page Cll (Final)

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21. Information Concerning Qualification Documents for the Component

Report Number	Report Title	Date	Company/Organizaton Preparing Report	Company/Organization Reviewing Report	
1. 3091 Rev. A	Design & Seismic Report of the Target Rock Corporation Pressure Regulating Valves Model Nos. 81DD-001, 002 & 003.	7-19-82	Target Rock Corp.	S&L/CQD (SQ-CL 212)	
2. COD-022270	Environmental Qualifi- cation of Target Rock Corp. Pressure Regu- lating valves.	10-25-85	S&L/CQD	S&L/CQD (MEQ-CL099)	

1E12-F073A Page Cl

Pump & Valve Operability Assurance Review Checklist

SIGNATURE PAGE

Revision No. A

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System Engineer Review Moreika	Date	11-8-85
Equipment Qual. Review Armadan	Date_	11-8-85
Electrical Engineer Review Acheth Beaven	Date	11-8-85
C&I Engineer Review Chan Kartal	Date	11-8-85
Reconciliation of IPC Walkdown Results		
	Date	

REFERENCES

- Sargent and Lundy Specification K2866B, Amendment 5, Dated July 13, 1984.
 - a. Paragraph 307.3a

b. Form 1810Q

- c. Form 271-H
- 2. Sargent and Lundy Valve Data Sheet No. MO-912.
- 3. Sargent and Lundy Valve Data Table No. OT-001.
- 4. Sargent and Lundy Drawings:

a. P&ID: MOS-1075, Sheet 1, Rev. U,

- b. Electrical Schematics: E02-1RH99-003, Rev D; -027, Rev. L; -522, Rev. F.
- 5. Yarway Corporation Form NPV-1 Manufacturer's Data Report and Test Data Package for Valve 1E12-F073, S/N A9550.
- 6. Yarway Corporation Report No. 957373-04, Dated 10-18-78, "Seismic Analysis of Yarway Corporation 1-1/2" Welbond Motorized Valve Fig. 5515B-SA10SM Forged Carbon Steel Valves for Baldwin Associates" (S&L/CQD: SQ-CL039)
- 7. Yarway Corporation Report No. 952917-04, Dated 11-10-80, "Operability Assurance Test Report Yarway Welbond Motor Actuated Globe Type Stop Valves for Active ASME, Section III, Class 1, 2 and 3 Service, 1-1/2" Nominal Size." (S&L/CQD: SQ-CL039).
- S&L/CQD Report CQD-000731, Dated 1-4-82, "Summary Report for Limitorque Valve Operators Testing Program (S&L/CQD: SQ-CL142)
- 9. Structural Dynamics Research Corporation Report No. 10959, Dated 12-24-81, "Dynamic Qualification Report on Two Valves" (S&L/CQD: SQ-CL142)
- Limitorque Corporation Report No. B0058, Dated 1-11-80, "Limitorque Valve Actuator Qualification for Nuclear Service" (S&L/CQD: EQ-CL009)
- 11. S&L/CQD Report No. CQD-014423, Dated 10-4-85, "Mechanical Environmental Qualification of Yarway Welbond Valves," (S&L/CQD: MEQ-CL083.
- 12. CPS-FSAR, Subsection 5.4.7.2.6(2), Amendment 5, July 1981.

Illinois Power Company Clinton Power Station

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PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

Ι.	PLA	NT INFORMATION	
	1.	Name: Clinton Unit No.	. 1 2. Docket No.:50-461
	3.	Utility: Illinois Power (
	4.		. [] PWR [x] BWR
	5.	A/E: Sargent & Lundy	
II.	GENE	CRAL COMPONENT* INFORMATION	
	1.	Supplier: [] NSSS & BC	P Specification K-2866B
	2.	Location: a. Build	ling/Room Drywell
		b. Eleva	tion 755'-0"
		c. Syste	m Residual Heat Removal
	3.	Component number on in-hou	
	4.	If component is a [] Pump	
		If component is a 🔯 Valv	
	5.	General Pump Data	
		a. Pump	b. Prime-mover
	Name	N/A	Name N/A
	Mfg.		Mfg.
	Mode	1	Model
	S/N		S/N
	Type		Type
* The	compo	onent, whether pump or valve	is considered to be an

assembly composed by the body, internals, prime-mover (or actuator) and functional accessories.

a. Pump (continued)	b. Prime-mover (continued
Size Weight	Size Weight
Mounding N/A Method	Mounting Method
Required B.H.P.	Н.Р.
Parameter Design Operating	Power requirements: (include normal, maximum and minimum).
Press	Electrical
Temp	
Flow	
Head	Other
Required NPSH at maximum	
Flow	
Available NPSH	Dut" cycle Stall current
Operating Speed	/
	Class of insulation
Critical Speed /Ref.	
List functional accessories:*	
List control signal inputs:	

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

o. General valve Data	
a. Valve	b. Actuator (if not an integral unit)
Name Yarway Welbond Valves	Name Actuator
Mfg. Yarway Corporation	Mfg. Limitorque Corporation
Model Fig. No. 5515B-SA105M	Model SMB-000
S/NA9550	S/N 300406
Type Globe	Type Electric
Size1-1/2"	Size 5 FtLb., 0.33 HP
Weight 207 Lbs. (Total Wt.	Weight 145 Lbs.
of Valve Assy.) Mounting Method Socket Welding	Mounting Bolted to Yoke
Required Torque 75 ft-1bs (Ref. Dwg. No. 045758 Ref.: Valve Data Sheet No. MC Parameter Design Operating Press 500 psig 200 psig	Ref. SQ-CL039)-912 g Power requirements: (include normal, maximum) and minimum)
Temp 388 °F	460V AC ± 10%
Flow (See Attachment B Not	:e <u>1)</u>
Max TP across valve 500 psig F	Ref. 1.b
Closing time @ max P22.5 sec. /Ref. 1.a Opening time @ max dP 22.5 sec /Ref. 1.a Power requirements for function	Not Applicable
accessories, (if any) Not A	
List control signal inputs: Se	
List functional accessories:	

III. FUN TION Briefly describe components normal and safety 1. functions: Normal function is to be in closed position. Safety function is to open for venting RHR heat exchanger when RHR system is in the steam condensing mode, and to close for containment isolation. 2. The components normal state is: [] Operating [&] Standby 3. Safety function: [] Emergency reactor а. b. [] Containment heat shutdown removal M Containment isolation C. d. K] Reactor heat removal е. K] Reactor core cooling f. [] Prevent significant release of radioactive material to environment Does the component function to mitigate the g. consequences of one or more of the following events? [] Yes [] No If "Yes", identify. X] LOCA [] HELB [] MSLB M Other Control Rod Drop Accident 4. Safety requirements: X Intermittent Operation X During postulated event [] Continuous Operation K] Following postulated event If component operation is required following an event, give approximate length of time component must remain operational. 100 days (e.g., hours, days, etc.)

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the valve assembly operational, (e.g., limit switches).

5. For VALVES:

Does the component [] Fail open [] Fail closed M Fail as

Is this the fail safe position? My Yes [] No

Is the valve used for throttling purposes? [] Yes [] No

Is the valve part of the reactor coolant pressure boundary [] Yes [M] No

Does the valve have a specific limit for leakage? [9]Yes []No

If "Yes" give limit: 15cc/Hr. (Ref. 1.c)

IV. QUALIFICATION

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 Reference by specific number those applicable sections of the design codes and standards applicable to the component:

ASME Code, Section III, 1974 Edition with Winter 1975 Addenda and Code Case No. 1516-2.

 Reference those qualification standards, used as a guide to qualify the component: IEE 323-1974, IEEE 382-1972, IEEE 344-1975

 Identify those parts of the above qualification standards deleted or modified in the qualification program.

Deleted:

4.

Modified:

None

	100	1945	1	- N1	
	e	11	O	N	
	200	**	~		

Have acceptance criteria been established and

- documented in the test plan(s) for the component? Yes [] No [] Ref. Document: EQ-CL009 & SQ-CL142
- 5. What is the expected failure mode that would keep the pump or valve assembly from performing its safety function?

None

	 Are the margins* identified in the qualification documentation? [x] Yes [] No Ref. Documents: EQ-CL009 (Tab C)
If co	omponent is a PUMP, complete IV.7.
If co	mponent is a VALVE, complete IV.8.
7.	Nump operability has been demonstrated by: [] Analysis [] Test [] Combination
	Identity PUMP tests performed: N/A
	a. [] Shell hydrostatic b. [] Bearing temperature (ASME Section III) evaluations Ref.
	c. [] Seismic loading d. [] Vibration levels
	e. [] Exploratory Vibration f. [] Seal leakage @ (Fundamental freq.)
	g. [] Aging: [] Thermal h. [] Flow performance
	[] Mechanical Are curves provided [] Yes
	Ref. Doc. [] No i. [] Pipe reaction end j. [] Others
	loads (nozzle loads) Ref. Doc.
	k. [] Extreme environment:
	[] Humidity
	[] Chemical
	[] Radiation Ref. Doc.
8.	Valve operability has been demonstrated by: [] Analysis [] Test [x] Combination
	Identify VALVE tests performed:
	a. [x] Shell hydrostatic b. [] Cold cyclic (ASME Section III) List times: Open
*. Ma	Ref. Doc. Ref. 5 . Ref. rgin is the difference between design basis parameters and st parameters used for equipment gualification.

с.	(_X) Seis:	nic loading	d. [] Hot cyc Lists t		Open Closed
е.	Ref. S	Q-CL142 atory vibration	f. b	ef. Main se	at lea	
g.	Ref. [J] Aging:	M Thermal	Re h. kJ	f. ⁵ Back seat	leaka	ge
i.	Ref. F [] Pipe i loadir	O-CL009 · eaction end	Ref j. (x] Disc h	ydrost	atic
k.	Ref.	e environment		Flow interest		lon
	м но	midity	R	ef		
	[] Cł	emical				
m.	Ref. EQ. [] Flow c	diation -CL009 haracteristics rves provided?	n. [] Others		******
tron brie	n design r efly descr	f any of the te equirements ide ibe any changes to correct the	made in	? [] Yes n tests (d	K NO	o If "Yes",

** * * * *						
etc. inst Atta If t test) to the alled com chment A, ype test	was used to qua requirements o	ent? [ized or lify the	Yes (x) (x) unders	No In sized?	"No", is (See
If " orie orie Is t Was	Yes", doe ntation? ntation, he compon qualified	orientation sen s installed orig [] Yes & No See Attachment) ent mounted in s (i.e., welded, [] Unknown	entation (Test wa A, Note the same	n coincide as conduct l e manner i	e with ted in In-plar	qualified the worst of in which it

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9.

10.

11.

12.

13.

If "Yes" identify seque thermal, etc.): Therma	ence, (e.g., radiation, seismic, cy al, Cyclic, Radiation, Seismic and J
If "aging"* was perform mechanisms: Thermal,	med, identify the significant aging Mechanical, Radiation
Identify loads imposed qualification tests (an	(assumed) on the component for the nalysis) performed:
c. [] Plants (shutdown	loads) b. k] Extreme environme
c. 🕅 Seismic load	d. [] Others LOCA/HELB Operating Loads & Por
Have component design s assure they envelope al accident conditions? [pecifications been reviewed in-hous
	ize any unique or special materials askets or packing, limitations on r special coatings or surfaces.)
If "Yes", identify:	
Does component require a practices, (including s) [] Yes [M] No	any special maintenance procedures horter periods between maintenance)
f "Yes", identify:	
s the qualified life for	or the component less than 40 years

* As outlined in Section 4.4.1 of IEEE-627 1980.

21. Information Concerning Qualification Documents for the Compone	21.	Information	Concerning	Qualification	Documents	for	the	Component
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Report Number	Report Title	Date	Company/Organizaton Preparing Report		Organization ng Report
957373-04	Seismic Analysis of Yarway Corporation 1-1/2" Welbond Motorized Valve Fig. 5515B-SA10SM Forged Carbon Steel Valves for Baldwin Associates	10-18-78	Yarway Corporation	S&L/CQD	(SQ-CL039)
952917-04	Operability Assurance Test Report Yarway Welbond Motor Actuated Globe Type Stop Valves for Active ASME Sec. III Class 1, 2 & 3 Service 1-1/2" Nominal Size	11-10-80	Yarway Corporation	S&L/CQD	(SQ-CL039)
CQD-000731	Summary Report for Limitorque Valve Operators Testing Program	1-4-82	S&L/CQD	S&L/CQD	(SQ-CL142)
10959	Dynamic Qualification Report on Two Valves	12-24-81	Structural Dynamics Research Corp.	S&L/CQD	(SQ-CL142)
B0058	Limitorque Valve Actuator Qualification for Nuclear Service	1-11-80	Limitorque Corp.	S&L/CQD	(EQ-CL009)
CQD-014423	Mechanical Environment Qualification of Yarway Welbond Valves	10-4-85	S&L/CQD	S&L/CQD	(MEQ-CL083)

ATTACHMENT A

- NOTE 1: The valve assembly is not orientation-sensitive from a eismic point of view. However from the environmental viewpoint the valve assembly is sensitive to orientation. To prevent possible intrusion of lubricant into the motor, the motor should not be mounted vertically downward, it should be horizontally mounted. Also in order to prevent flooding of the limit switch, the limit switch compartment should not be oriented facing vertically down.
- NOTE 2: A Limitorque Model SMB-0-25 actuator was tested (environmental qualification testing consisting of thermal, mechanical, radiation, seismic and LOCA) while Model SMB-000-5 is installed. A SMB-000 has been seismically qualified separately as documented in SQ-CL142.

1E12-F073A Page Cl3 FINAL

ATTACHMENT B

NOTE 1: Flow (II, Subsection 6)

• · :

Flow is variable. Operator controls valve opening manually to prevent a build up of non-condensible gases in the RHR heat exchanger. For detailed discussion see Reference 12.

NOTE 2: Control Signal Inputs (II, Subsection 6)

Solely controlled by remote-manual switch (HS) 1E12AS040A. No automatic operation. (Reference 4).

PVOP NO.	2100G		
REVISION	A		
Page Cl			

Date

Pump & Valve Operability Assurance Review Checklist

SIGNATURE PAGE

System Engineer Review In orcite. Date 11-8-85 Equipment Qual. Review TE. Hermush Date 1/8/85 Electrical Engineer Review Kah Mileon Date /1-8-85 C&I Engineer Review have Date 11-8-85 Reconcilation of IPC Walkdown Posults

PVOP NO. 2100G REVISION A Page C2

REFERENCES

- Dikkers SRV Outline Dwg. G-471-6/125.04.03, GE Document VPF 5529-1-7
- Eugene Seitz Control Valve Outline Dwg. 0-108-562E, GE Document VPF 5529-6-5
- 3) Dikkers Bill of Material, G-471-6/125.04.02, GE Document VPF 5529-10-8
- Eugene Seitz Solenoid Size 6 Assembly and Outlet Dwg. 3-108574E, GE Document VPF 5529-8-3
- 5) Eugene Seitz Parts List (for Ref. No. 2) Dwg. 3-4-108-563E, GE Document VPF 5529-14-5
- EQ-CL065 Environmental Qualification of Eugene Seitz Solenoid Valve Model 6A39 (Seal Welded)
- 7) SQ-CL654, Dynamic Qualification of Eugene Seitz Solenoid Valves Mounted on SRVs
- 8) SQ-CL721, Dynamic Qualification of Main Steam Safety/Relief Valves
- 9) MEQ-CL073, Environmental Qualification of Dikkers Safety/ Relief Valves
- 10) GE Purchase Specification 21A9538, R/4
- 11) GE Purchase Specification General Requirements for Valves, 21A8717 R/#
- 12) a) GE Nuclear Boiler System Design Specification 22A4622, R/7 and b) Data Sheet 22A4622AV, R/3.
- 13) GE Purchase Specification Data Sheet, 21A9538AB, R/4
- 14) GE Material Specification for Valves, 21A8760, R/4
- 15) GE Purchase Specification General Requirements for Actuators, 21A3530, R/0
- 16) GE Test Specification for SRV Seismic Qualification, 22A5222, R/O
- 17) GE Purchased Part Drawing, 768E584, R/3
- 18) GE Safety/Relief Valve Design Certification DC21A9538AB R/
- 19) S&L P&ID Instr. Diagrams, M10-1002, sheet 2, R/G
- 20) S&L P&ID, M05-1002, sheet 1, R/J and sheet 6 R/D
- 21) Dikkens Final Test Report FTR-8000056/5

Illinois Power Company Clinton Power Station

PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

I.	PLAN	NT INFORMATION	
	1.	Name: Clinton Unit No.	1 2. Docket No.: 50-461
	3.	Utility: Illinois Power Co	
	4.	NSSS: General Electric Co.	
	5.	A/E: Sargent & Lundy	
II.	GENE	RAL COMPONENT* INFORMATION	
·	1.	Supplier: [x] NSSS [] BOP	Specification K-2801
		Location: a. Buildi	
			ion 778'-0"
		c. System	Main Steam
	3.	Component number on in-house	e drawings: 1B21-F041A
	4.	If component is a [] Pump of	THE PERSON NEW YORK AND A DOLLAR AND A DOLLAR AND AND A DOLLAR
		If component is a 🕅 Valve	
	5.	General Pump Data	
		a. Pump	b. Prime-mover
	Name		Name
	Mfg.		Mfg.
	Mode 1		Model
	S/N		S/N
	Type		Type
* The			

* The component, whether pump or valve, is considered to be an assembly composed by the body, internals, prime-mover (or actuator) and functional accessories.

a. Pump (continued)	b. Prime-mover (continued)
Size	Size
Weight	Weight
N/A	
Mounting	Mounting
Method	Method
Required B.H.P.	H.P.
Parameter Design Operating	Power requirements:
	(include normal,
	maximum and minimum).
	maximum and minimum).
Preas	Electrical
Temp	
/	***************************************
Flow	
furner	
Head	Other
	ocher
\sim	
Required NPSH at maximum	If Motor list:
Flow N/A	
N/A N/A	Duty cycle
Available NPSH	
svallable NPSH	Stall current
Operating Speed	01
pordering speed	Class of insulation
Critical Speed /Ref.	
/Kel.	
List functional accessories:*	
ist control signal inputs:	

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

6. General Valve Data	
a. Valve	b. Actuator (if not an integral unit)
Main Steam Safety Name Relief Valve	Main Steam Safety Name Relief Valve Actuator
Mfg. Dikkers	Mfg. Sempress
Model <u>6471-6/125.04</u>	Model VB 300/235 EWVS
S/N 160535 (Total assy.)	S/N_N/A
Type Dual function SRV	Type Electro-Pneumatic
Size 8" inlet x 10" outlet	Size 11.81" bore x 9.25" stroke
Weight 3050 lbs (Dry)	Weight 407 lbs
Mounting Bolted to flanges Method in pipeline	Mounting Bolted to SRV Method bonnet
Required Torque N/A	Torque N/A
Ref.: 10, para. 4.1 & 4.1.3.2 Parameter Design Operatin 1375 psig @ inlet Press 625 psig @ outlet 1025 ps 585 F@ inlet (1375 max. Temp 500 F@ outlet 550 F	(include normal, maximum and minimum). sig Electrical 106 - 138 Vdc
Flow 895,000-939,000 1b/hr @ 1165 (ASME Rated Flow) Max SP across valve 1165 psi*	5 psig Ref.10, para.4.3.2,& 12b, para.4.6.2
	Other: k]Pneumatic[]Hydraulic
accessories, (if any) *The SRV function is to open at the maximum ΔP when the inlet pressure reduces within 89 to 9 Closing time is not applicable.	N/A (setpoint pressure) and to reclose 98% of the setpoint pressure.

List control signal inputs: This valve is actuated (to open) auto-matically by "High Reactor Pressure" signal, two divisional signals energized one or both of the pilot solenoids of the valve actuator. It can be activated remotemanually by either of the control switches (HS) 1B21CS016A or B.

> List functional accessories: None

III. FUNCTION

req	uired to provide its safety/relief function(s).
SAF	ETY: Provide overpressure protection for the main steam system
	n the system pressure exceeds the preset SRV setpoint safety/relief
	ssures
2.	The components normal state is: [] Operating [k] Standby
3.	Safety function:
	a. [x] Emergency reactor b. [] Containment heat shutdown removal
	c. [] Containment isolation d. [x] Reactor heat removal
	e. [] Reactor core cooling f. [] Prevent significant release of radio- active material to environment
	g. Does the component function to mitigate the consequences of one or more of the following events? [x] Yes [] No If "Yes", identify.
	[] LOCA [] HELB [] MSLB
	(x) Other Turbine trip without bypass or MSIV closure
4.	Safety requirements:
	[] Intermittent Operation [] During postulated event
	[] Continuous Operation [] Following postulated even
	If component operation is required following an event, give approximate length of time component must remain operational.
manuracture	12 hours (Ref.: GE doc. 137C6117, (e.g., hours, days, etc.) Note 4) al accessories are those sub-components not supplied by the r that are required to make the valve assembly operational, t switches).

5. For VALVES:

Does the component [] Fail open [] Fail closed [] Fail as Is this the fail safe position? [] Yes [] No Is the valve used for throttling purposes? [] Yes [] No Is the valve part of the reactor coolant pressure boundar; [] Yes [] No Does the valve have a specific limit for lockers?

Does the valve have a specific limit for leakage? [] Yes []No

If "Yes" give limit: 20 lbs/hr per (internal leakage), (Ref. 12b, para. 3.1.3.10.1) IV. QUALIFICATION

> Reference by specific number those applicable sections of the design codes and standards applicable to the component: ASME Code, Section III, Class 1, Subarticle NB-3500, Edition 1974, Addenda Summer 1976

 Reference those qualification standards, used as a guide to qualify the component: IEEE 344-1975;

IEEE 323-1974; IEEE 382-1980

 Identify those parts of the above qualification standards deleted or modified in the qualification program.

Deleted:

Modified:

None None

- 4. Have acceptance criteria been established and documented in the test plan(s) for the component? Yes [] No [] Ref. Document: EQ-CL065,SQ-CL721,SQ-CL654
- 5. What is the expected failure mode that would keep the pump or valve assembly from performing its safety function? None

	6.	Are the margins documentation? Ref. Documents:	ld Yes [No	the qualification 21,SQ-CL654
If c	omponent	t is a PUMP, com	plete IV.7.		
If c	omponent	t is a VALVE, co	mplete IV.8	3.	
2.	Pump	operability has [] Test	been demor [] Combir	nstrat nation	ed by: [] Analysis
	Ident	tify PUMP tests p	performed:		
		(] Shell hydrosta (ASME Section	atic t III)	• []	Bearing temperature evaluations
	c.	[] Selemic loadin	ng d	• []	Vibration levels
	e. (Fundamental free		• []	Seal leakage @ hydro press
	R	Aging: [] The		• []	Flow performance
			hanical		e curves provided [] Yes [] No
		ef. Doc.] Pipe reaction	end j	Ref	Others
		loads (nozzle ef. Doc.			
	k. [] Extreme enviro	nment:		
		[] Humidity			
		[] Chemical			
	Re	[] Radiation ef. Doc.			
8.		operability has	been demon [x] Combin	nstrat	ed by: [] Analysis
	Identi	ify VALVE tests	performed:		
		X] Shell hydrost (ASME Section Form NV-1	III) ASME) Cold cyclic List times: Open 0.14 sec. Closed 0.90 sec
the t	ardru TS	the difference ameters used for	Detween de	SIGD	• Dikkers FTR-8000056/5 p. 172

с.	<pre>[x] Seismic loading d. [X] Hot cyclic Lists times: Open 0.15 sec.</pre>
	Closed 0.73 sec
e.	Ref. SQ-CL654, SQ-CL721Ref. FTR-8000056/5, p. 191[4] Exploratory vibration f.[3] Main seat leakage = 0
	Fundamental Freq. 57 Hz
g.	Ref. SQ-CL721 . Ref. FTR-8000056/5, p. 191 & Aging:
i.	Ref. EQ-CL065 . Ref. [X] Pipe reaction end j. [] Disc hydrostatic
	roading
k.	Ref. SQ-CL721 . Ref. [] Extreme environment 1. [] Flow interruption capability
	Ref.
	[x] Humidity
	그는 그는 것을 만든 것을 만들었다. 그는 것은 것을 위한 것은 것을 것을 것을 수 없었다. 그는 것을 하는 것을 가지 않는 것을 하는 것을 수 있다. 것을 하는 것을 하는 것을 하는 것을 하는 것을 수 있다. 것을 것을 수 있다. 것을 것을 수 있다. 것을 수 있다. 것을 수 있다. 것을 것을 수 있다. 것을 수 있다. 것을 것을 수 있다. 것을 수 있다. 것을 수 있다. 것을 수 있다. 것을 것을 것을 수 있다. 것을 것을 것을 수 있다. 것을 것을 수 있다. 것을 것을 것을 수 있다. 것을 것을 수 있다. 것을 것을 것을 수 있다. 것을 것을 것을 수 있다. 것을 것을 것을 것을 수 있다. 것을 것을 것을 것을 것을 수 있다. 것을
	[] Chemical
	[x] Radiation
m.	Ref. EQ-CL065 X Flow characteristics n. (2) Others 2) Relief Valve Perf.Test Are curves provided?
	Ale curves provided: 3) Safety Valve Perf. Test
	Ref. FTR-8000056/5, p.180,181
	[] Yes [X No Dynamics (SQ-CL721).
Ac	
from	a result of any of the test (or analysis), were any deviation m design requirements identified? [X] Yes [] No If "Yes", efly describe any changes made in tests (or analysis) or to component to correct the deviation.
	See Attachment A
	bee Attachment A
******	***************************************
Was	the test component precisely identical (as to model, size,
etc.	.) to the in-plant component? [2] Yes [] No If "No", is
inst	talled component [] oversized or [] undersized?
test	type test was used to qualify the component, does the type meet the requirements of IEEE 323-1974, Section 5? Yes [] No
Is (component orientation sensitive? [] Yes [] No [] Unknown
If '	"Yes", does installed orientation coincide with qualified

9.

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orientation? [J Yes [] No
13. Is the component mounted in the same manner in-plant in which it
was qualified (i.e., welded, same number and size bolts, etc.)
[k] Yes [] No [] Unknown

sequence, (e.g., radiation, seismic, cyclic, Adiation, thermal, cyclic, seismic, and LOCA rformed, identify the significant aging tion, thermal, cyclic, and seismic osed (assumed) on the component for the s (analysis) performed: tdown loads) b. [] Extreme environment d d. [] Others Pool Dynamics and Pressure ign specifications been reviewed in-house to be all expected operating, transient, and s? [] Yes [] No
<pre>tion, thermal, cyclic, and seismic osed (assumed) on the component for the s (analysis) performed: tdown loads) b. [x] Extreme environment d d. [A] Others Pool Dynamics and Pressure ign specifications been reviewed in-house to be all expected operating, transient, and</pre>
s (analysis) performed: tdown loads) b. [,] Extreme environment d d. [3] Others Pool Dynamics and Pressure ign specifications been reviewed in-house to be all expected operating, transient, and
d d. [4] Others Pool Dynamics and Pressure ign specifications been reviewed in-house to be all expected operating, transient, and
ign specifications been reviewed in-house to be all expected operating, transient, and
ign specifications been reviewed in-house to be all expected operating, transient, and
utilize any unique or special materials? Tal gaskets or packing, limitations on Is, or special coatings or surfaces.)
Radiation resistant lubricant - Chestetron 10;
ire any special maintenance procedures or ng shorter periods between maintenance)?
Replace solenoid every 21 years.
1

* As outlined in Section 4.4.1 of IEEE-627 1980.

21. Information Concerning Qualification Documents for the Component

Report Number	Report Title	Date	Company/Organizaton Preparing Report	Company/Organization Reviewing Report
IPC-01-203	Final Test Report for the Qualification Testing of Seitz Solenoid/Control Valve Assemblies	8/23/85	Nutech Engineers	S&L/CQD EQ-CL065 SQ-CL654
43584-1	Seismic Simulation Test Program On An 8x10 Safety Relief Valve w/Air-Operated Actuator	11/18/77	Wyle	S&L/CQD SQ-CL721
N/A	Environmental Qualification of Dikkers Safety/ Relief Valves	7/19/85	S&L/CQD	S&L/CQD MEQ-CL073

PVOP 2100G Rev. A Page Cll

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ATTACHMENT A

Report 43584-1 by Wyle (SQ-CL721)

- Anamoly #2: Seismic test sequence was changed as follows: Originally operability tests were to be conducted after the 2nd OBE test. They now will be conducted prior to any seismic testing.
- Resolution: Change has no effect on qualification, along with the operability tests prior to seismic testing, this testing will be conducted after the 5th OBE, and after the SSE.

Anomaly #3: During the 5th OBE, the specimen would not self-actuate.

Resolution: Dikkers and General Electric decided to forego any further self-actuating. Power actuation will be used for remainder of testing. The specimen would not self-actuate for the following reason: Due to the test limitations at Wyle the steam supply was not large enough to makeup steam released by valve simmering. Thus, steam pressure could not be increased to the point at which the specimen would actuate. Valve was shown able to actuate by powering of solenoids.

Report IPC-01-203 by Nutech (EQ-CL065 & SQ-CL654)

Anomaly #1:	i) The control valves would not actuate when the solenoids were energized.
	ii) Leakage occurred in the control valves.
	i) The solenoids checked out electrically, thus the problem was with the control valves (which were not being qualified by this report). The problem ended up being the crystallization of the control valves lubrication. This lubrication has been changed at Clinton to Chestetron 10 (see Item 18 this checklist).
	Recommendations have been established for the leakage which includes a periodic inspection, and replacement program for the seals, lubricant and other critical components.
Anomaly #2:	Overaging occurred during thermal aging tests.
Resoultion:	None required.

PVOP 2100G Rev. A Page C13 FINAL

ATTACHMENT A - continued

Anomaly #4: TRS did not envelope RRS below 6.3 Hz.

Resolution: Since lowest natural frequency determined for the equipment is 60 Hz, thus no resonance occur in the frequencies in question.

Anomaly #6: Abnormal cycling of the seal welded solenoid during MSLB/LOCA testing, due to the deformation of the valve poppet.

Resolution: This valve poppet was not changed out subsequent to Phase I testing, therefore, this valve poppet had been through the equivalent of 80 years of aging. Clinton maintenance programs which require periodic inspections and replacements of critical components will prevent this anomaly. (See MEQ-CL073 for maintenance schedule for replacement of gaskets and other nonmetallics in the poppet valve.)

Pump & Valve Operability Assurance Review Checklist

•. •

SIGNATURE PAGE

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System Engineer Review Lichard Hall	Date 11-8-85
Equipment Qual. Review UCg Sorrer	Date 11/08/85
Electrical Engineer Review NOT APPLICABLE	Date
C&I Engineer Review gan Kartal	Date 11-8-85
Reconciliation of IPC Walkdown Results	
	Date

PVOP No. 300Y REVISION A Page C2

REFERENCES

1.	General Electric Process Diagram 762E454, Rev. 5
2.	Check Valve Test Data Report (see Tab D)
3.	Anchor Darling Drawing 93-14597, sht 1, Rev. C and sht 2, Rev. C
4.	Sargent & Lundy Drawing M05-1074-1, Rev. T
5.	Sargent & Lundy Valve Data Sheet A0007, Rev. 0

Illinois Power Company Clinton Power Station

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PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

Ι.	PLAN	NT INFORMATION
	1.	Name: Clinton Unit No. 1 2. Docket No.: 50-461
	3.	Utility: Illinois Power Company
	4.	NSSS: General Electric Co. [] PWR [x] BWR
	5.	A/E: Sargent & Lundy
II.	GENE	RAL COMPONENT* INFORMATION
	1.	Supplier: [] NSSS [k] BOP Specification K-2866A
	2.	Location: a. Building/Room DW/Zone H-27
		b. Elevation 769'
		c. System High Pressure Core Spray
	3.	Component number on in-house drawings: 1E22-F005
	4.	If component is a [] Pump complete II.5.
		If component is a [X] Valve complete II.6.
	5.	General Pump Data
		a. Pump b. Prime-mover
	Name	Name
	Mfg.	Mfg.
	Model	N/A
	S/N	E/N_
	Type	Type
* The	compo	ment, whether nump or value is considered to

assembly composed by the body, internals, prime-mover (or actuator) and functional accessories.

A. Pump (continued)	b. Prime-mover (continued)
Size	Size
Weight	Weight
Mounting Method	Mounting Method
Required B. P.	Н.Р
Parameter Design Operating	Power requirements: (include normal, maximum and minimum).
Press	Electrical
Temp	
Flow	
Head	Other
N N	/A
Required NPSH at maximum	If Motor list:
Flow	Duty cycle
Available NPSH	Stall current
Operating Speed	Class of insulation
Critical Speed /Ref.	
List functional accessories:* _	
List control signal inputs:	

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

6. General Valve Data a. Valve b. Actuator (if not an integral unit) HPCS Reactor Pressure Air Operator and NameVessel Isolation Valve Name Limitswitch Assy. Mfg. Anchor/Darling Mfg. Anchor/Darling Model N/A Model N/A S/N E-6214-21-1 S/N N/A Type Tilting Disc Check Type Air Operated Size 10" - 900# excluding actuator weight Air Operator Assy. 105# Weight 1,020# from vendor Weight Limitswitch Assy. 75# Dwg. From SQ-CL 092, Tab D Mounting Mounting Method Butt Welded to Pipe Method Bolted to the Yoke Required Torque N/A Torque N/A Ref .: Valve Data Sheet No. A0 007 Parameter Design Operating Power requirements: (include normal, maximum and minimum). Electrical N/A Press 1250 psig 1170 psig 575° F. 550° F. Temp Flow 6400 gpm Ref. 1 -----Max AP across valve 13 psid, Ref. Data Sheet A0007 when valve is fully open Closing time @ max ▲P≤0.5 sec.Other: []Pneumatic[]Hydraulic /Ref. Data Sht A0007 Opening time @ max dP N/A N/A /Ref. Power requirements for functional accessories, (if any) 120 VAC for the test solenoid Instrument Air 80-120 psig for the actuator List control signal inputs: No control signal input. Free swing of the disc can be tested by remote-manual control switch (HS) 1E22AS005 which opens valve 1E22-F304 to establish zero differential across 1E22-F005 for the test. List functional accessories: 1) air cylinder for remote test of the check valve, 2) Solenoid to control instrument air to the cylinder.

NOTE: Accessories listed are for test purposes only and have no direct participation in the active safety function of the component.

	fund	functions: The valve is a testable check valve. Normal
		ndary. Safety function is for the valve to freely open to per-
		HPCS flow on initiation.
	2.	The components normal state is: [] Operating [x] Standby
	3.	Safety function:
		a. [X] Emergency reactor b. [] Containment heat shutdown removal
		c. [X Containment isolation d. [] Reactor heat remova
		e. [X] Reactor core cooling f. [] Prevent significant release of radio- active material to environment
		g. Does the component function to mitigate the consequences of one or more of the following events? [x] Yes [] No If "Yes", identify.
		[x] LOCA [k] HELB [k] MSLB
		[X] Other Loss of feedwater transient
	4.	Safety requirements:
		[k] Intermittent Operation [k] During postulated event
		[] Continuous Operation [*] Following postulated ever
		If component operation is required following an event, give approximate length of time component must remain operational.
		100 days (e.g., hours, days, etc.)

5. For VALVES:

Does the component [] Fail open [] Fail closed [] Fail as N/A - See Attachment A, Note 2.

Is this the fail safe position? [] Yes [] No N/A - See Attachment A, Note 2.

Is the valve used for throttling purposes? [] Yes M No

Is the valve part of the reactor coolant pressure boundary [x] Yes [] No

Does the valve have a specific limit for leakage? [x]Yes []No

If "Yes" give limit: 10 cc/hr/in of nominal valve size Ref. 3 form 271

IV. QUALIFICATION

 Reference by specific number those applicable sections of the design codes and standards applicable to the component: <u>ASME Code, Section III. Class 1,</u> <u>Subarticle NB-3500, Edition 1974, with addenda Summer 1975</u>

and Code Cases 1516-1, 1567, 1622, 1635-1, 1677.

 Reference those gualification standards, used as a guide to gualify the component: IEEE 344-1975 and

IEEE 323-1974

 Identify those parts of the above qualification standards deleted or modified in the qualification program.

Deleted:

4.

Modified:

N/A

_____N/A

- Have acceptance criteria been established and
- documented in the test plan(s) for the component? Yes [4] No [] Ref. Document: SQ-CL092, SQ-CL041, MEQ-CL022
- 5. What is the expected failure mode that would keep the pump or valve assembly from performing its safety function? None.

Are the margins* identified in the qualification documentation? [k] Yes [] No 6. Ref. Documents: SQ-CL092, SQ-CL041, MEO-CL022 If component is a PUMP, complete IV.7. If component is a VALVE, complete IV.8. Yump operability has been demonstrated by: [] Analysis 7. [] Test [] Combination Identify PUMP tests performed: [] Shell hydrostatic a. b. [] Bearing temperature (ASME Section III) evaluations Ref. [] Seismic loading c. d. [] Vibration levels Ref. [] Exploratoky vibration e. [] Seal leakage @ f. hydro press (Fundamental freq. Rev. [] Aging: q. Thermal T [] Flow performance h. N/A [] Mechanica Are curves provided [] Yes [] No Ref. Doc. Ref. [] Pipe reaction end i. [] Others loads (nozzle loads) Ref. Doc. k. [] Extreme environment: [] Humidity [] Chemical [] Radiation Ref. Doc. Valve operability has been demonstrated by: 8. [] Analysis [] Test *[x] Combination * See Note 1 of Attachment A. Identify VALVE tests performed: [x] Shell hydrostatic b. [x] Cold cyclic b. (ASME Section III) List times: Open N/A Closed N/A Ref. 2 Ref. 2 *. Margin is the difference between design basis parameters and the test parameters used for equipment gualification.

c.	<pre>[x] Seismic loading</pre>	d.	[] H L	ot cycli ists tim	c es:	Open
						Closed
e.	Ref. SQ-CL092, SQ-CL041 [] Exploratory vibration	f.	k) M	ain seat	lea	kage '
g.	Ref. [] Aging: [] Thermal h [] Mechanical	• t	Ref.] Bac	2 k seat I	eaka	ge
i.	Ref. N/A, see Attachment A, Note [] Pipe reaction end loading	j.	[x] -		rost	atic
k.	Ref. [] Extreme environment	1. R	[] FI C	ow inter apabilit	У	lon
	[] Humidity		Ref.			
	[] Chemical					
m.	<pre>[] Radiation Ref. N/A, see Attachment A, Not [] Flow characteristics Are curves provided? Ref. [] Yes [] No</pre>	e 1. n.	[] 0	thers		
from	m design requirements iden	tifi made	ed? in t	[] Yes ests (or	NO NO	o If "Yes",
Was	the test component precis	ely	ident	ical (as	tor	model, size,
inst	talled component [] oversi	zed o	or []	undersi	zed?	E "NO", 15
If t test [] Y	t meet the requirements of Yes [] No	nt A, Note 1. Ref. 				
Is c If "	A - qualification by analysis. component orientation sens "Yes", does installed orie entation? X Yes [] No	itive ntat:	ion c	Yes Vincide	No with	[] Unknown qualified
was	the component mounted in t qualified (i.e., welded, Yes [] No [] Unknown	he sa same	numb	anner in er and s	-plar ize k	nt in which it polts, etc.)

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If "a mecha	ging"* was performed, identify the signinisms: N/A	
Ident	ify loads imposed (assumed) on the compor fication tests (analysis) performed:	
a. [] Plants (shutdown loads) b. [x] Extre	eme environme
] Seismic load d. [x] Others	
appare	component design specifications been revi they envelope all expected operating, t ent conditions? [X] Yes [] No	ound in house
nonfer	the component utilize any unique or speci- oles are special gaskets or packing, limi- rous materials, or special coatings or s [X] No	totions on
If "Ye	s", identify:	
bracer	<pre>omponent require any special maintenance ces, (including shorter periods between M No s", identify:</pre>	

* As outlined in Section 4.4.1 of IEEE-627 1980.

21. Information Concerning Qualification Documents for the Component

Report Number	Report Company/Organizator Title Date Preparing Report		Company/Organization Reviewing Report			
BTAD-19 Rev. D	Class 1 Valve Design Cal- culations	03/01/79	BESCO Technology Inc.	S&L/COD SQCL092		
N/A	Environmental Qualification Of Anchor Darling Valves	07/01/85	S&L/CQD	S&L/CQD MEQ-CL022		
QTR-105 Rev. 4	Qualification Of EA180 Series Limitswitches For Use In Nuclear Power Plants In Compliance With IEEE	01/09/84	NAMCO	S&L/COD SQ-CL113 and EQ-CL008A		
AQS- 21678/TR Rev. A	Qualification Tests Of Solenoid Valves By Environ- mental Exposure To Elevated Temperature, Radiation And Loss Of Coolant Accident Simulation	12/05/79	ASCO	S&L/COD SQ-CL136		
AQR- 57368 Rev. 1	Report On Qualification Of ASCO Catalog NP-1 Solenoid Valves For Safety Related Application	08/19/83	ASCO	S&L/CQD SQ-CL136 and EQ-CL024		
IPS-1079 Rev. D	Design Qualification Test Report For Electric Conductor Seal Assembly For Conax Corp.		Conax	S&L/CQD SQ-CL062 and EQ-CL094		
IPS-1080 Rev. A	Design Qualification Test Plan For Electric Conductor Seal Assemblies	08/15/83	Conax	S&L/CQD SQ-CL062 and EQ-CL094		

PVOP No. 3DOY Revision A Page Cll

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21. Information Concerning Qualification Documents for the Component

Report Number	Report Title	Date	Company/Organizaton Preparing Report	Company/Organization Reviewing Report
IPS-325 Rev. D	Design Qualification Material Test Report For Materials Used In Conax Electric Penetration As- semblies And Electric Conductor Seal Assemblies	05/14/81	Conax	S&L/CQD EQ-CL094
R85.080	Supplemental Seismic Re- port No. 10" - 900# Tilt Disc Check Valve	07/25/85	Anchor Darling	S&L/COD SQ-CL041

PVOP No. 300Y Revision A Page Cl2

PVOP NO. 300Y Revision A Page Cl3

ATTACHMENT A

Note 1:

The valve and operator were qualified by analysis. The function of the air operator is not required for the safety function of the check valve; it is only required for periodic testing of the valve disc to verify its free movement.

The engagement mechanism of the actuator shaft (outer shaft) and the valve disc (inner shaft) allows for failure of the electrical and/or air supply without restricting the valve disc from performing its intended safety function, i.e., swing freely between fully open and fully closed position. The specific aspects of the environmental and seismic qualification of the solenoid valves, conax seals and Namco Limitswitches are not addressed on this checklist since these items are not essential for the safety function of the check valve. However, these items were qualified by analysis and test to ensure integrity of the LE power source. For maintenance and replacement of the non-organic materials for the solenoid valves and Namco Limitswitches see EQ-CL008A and EQ-CL024.

Note 2:

The valve is a free swinging check valve. It is not subject to actuator failure.

PVOP NO.	2100F
REVISION	A
PAGE-C1	

Pump & Valve Operability Assurance Review Checklist

SIGNATURE PAGE

Date 11-8-85 System Engineer Review Vichard Equipment Qual. Review M.S. Helmush Date 11/8/85 Electrical Engineer Review Not APPLICABLE Date 11-8-C&I Engineer Review Date 11-8-85 Reconcilation of IPC Walkdown Results Date

PVOP No. 2100F Page C2 Rev. A

REFERENCES

1.1

1.	Anchor/Darling Valve Company Drawing No. 2991-3, Rev. D
2.	SQ-CL709, Dynamic Qualification of Limitorque Valve Actuators.
3.	SQ-CL724, Dynamic Qualification of HPCS M.O. Gate Valve 16" - 150 lb.
4.	EQ-CL009, Environmental Qualification of Limitorque Operators, Model Nos. SMB-0, SMB-00, SMB-000, SMB-1, SMB-3, SMB-4 and SMB/HBC.
5.	MEQ-CL071, Environmental Qualification of General Electric Supplied Valves.
6.	Anchor/Darling Valve Company, NPV-1, Form No. 2N954 and Vendor Test Report
7.	S&L P&ID M05-1074, Sheet 1, Rev. T
8.	S&L P&ID M05-1079, Sheet 2, Rev. S
9.	General Electric Process Diagram 762E454, Rev. 5

PVOP No. 2100F Page C3 Rev. A

Illinois Power Company Clinton Power Station

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PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

Ι.	PLA	NT INFORMATION					
	1.	Name: Clinton Unit No.	1 2. Docket No.:50-461				
	3.	Utility: Illinois Power C					
	4.	NSSS: General Electric Co					
	5.	A/E: Sargent & Lundy					
II.	GENE	GENERAL COMPONENT* INFORMATION					
	1.	Supplier: [] NSSS [] BO	P Specification GE 21A8717				
		Location: a. Build:					
	b. Elevation 713' - 0"						
		c. System	High Pressure Core Spray				
	3.	Component number on in-hous					
	4.	If component is a [] Pump					
		If component is a [x] Valve	complete II.6.				
	5.	General Pump Data					
		a. Pump	b. Prime-mover				
	Name		Name				
	Mfg.		Mfg.				
	Model		Model				
	S/N		S/N				
	Type_		Туре				
* The	compo	mant of the					

* The component, whether pump or valve, is considered to be an assembly composed by the body, internals, prime-mover (or actuator) and functional accessories.

PVOP No. 2100 F Page C4 Rev. A

:

a. Pump (continued) Size Weight	b. Prime-mover (continued) Size Weight
Mounting Method	Mounting Method
Required B.H.P.	H.P
Parameter Pesign Operating	Power requirements: (include normal, maximum and minimum).
Press	Electrical
Temp	
Flow	
Head	Other
Required NPSH at maximum	If Motor list:
Flow	Puty cycle
Available NPSH	Stall current
Operating Speed	Class of insulation
Critical Speed /Ref.	
List functional accessories:*	
List control signal inputs:	/
	L

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

PVOP No. 2100F Page C5 Rev. A

6. General Valve Data Valve a. b. Actuator (if not an integral unit) HPCS Condensate Storage Name Motor Actuator Name Tank Suction Valve Mfg. Anchor/Darling Mfg. Limitorque Model 2991-3 Model SMB-00-10 S/N 2N954 S/N 221390 Type Gate Type Electric Size 10 ft.-1b. motor Size 16" - 150 lb. Weight 1300 lbs. (dry) Weight 200 lbs. Mounting Mounting Method Butt weld to pipe Method Bolt to valve yoke Required Torque 5.22 ft.-lbs. (motor) Torque 10 rt.-lbs. (motor) Ref.: Valve Data Sheet No. GE VPF No. 3238-605-4. Parameter Design Operating Power requirements: (include normal, maximum and minimum). Press 100 psig 100 psig (max) Electrical 460 Vac., 60 Hz. Temp 212 F 120 F three phase, valve has 80% Flow minimum voltage requirement -----Max :P across valve 90 psid Ref. GE 105D5007K (DCD) Closing time @ max "P 80 sec.Other: []Pneumatic[]Hydraulic /Ref. GE 105D5007 (PPD) Opening time @ max oP 80 sec. N/A /Ref. GE 105D5007 (PPD) Power requirements for functional accessories, (if any) N/A List control signal inputs: This valve receives an automatic signal to close when the E22-F015 valve reaches the fully open position. (Continued on Page C6). List functional accessories: Limit switches used for interlocking.

PVOP No. 2100F Rev. A Page C6

List of Control Signal Inputs (Continued)

This normally open valve can be closed by remote-manual control switch (HS) 1E22AS001. 'Valve 1E22-F015 is fully open' signal will automatically close 1E22-F001. It can be opened by (HS) 1E22AS001 if "Valve 1E22-F015 is fully open" signal is not present.

High pressure core spray system initiation signal (high drywell pressure and/or low RPV level [level 2]) will cause 1E22-F001 to open as soon as 1E22-F015 is proven 'closed' thru interlocks.

PVOP No. 2100F Page C7 Rev. A

III. FUNCTION

Briefly describe components normal and safety 1. functions: The E22-F001 valve is normally open. Upon receiving a closure signal within 24 hours following a DBE, it must close within 80 seconds and must then remain closed for the remainder of the 100 day DBE to provide condensate storage isolation. The components normal state is: [] Operating M Standby 2. 3. Safety function: [] Emergency reactor a. b. [] Containment heat shutdown removal C. (x Containment isolation [] Reactor heat removal d. 1 Reactor core cooling e. f. [] Prevent significant release of radioactive material to environment g. Does the component function to mitigate the consequences of one or more of the following events? & Yes [] No If "Yes", identify.

LOCA (X HELB (M MSLB

A Other Loss of feedwater transient

4. Safety requirements:

Intermittent Operation [] During postulated event

[] Continuous Operation [] Following postulated event

If component operation is required following an event, give approximate length of time component must remain operational.

24 hours (e.g., hours, days, etc.)

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the valve assembly operational, (e.g., limit switches).

PVOP No. 2100F Page C8 Rev. A

5. For VALVES:

Does the component [] Fail open [] Fail closed [] Fail as Is this the fail safe position? [] Yes [] No [x] Depends on mode of Is the valve used for throttling purposes in Yes M No Is the valve part of the reactor coolant pressure boundary [] Yes [X No Does the valve have a specific limit for leakage? XYes []No If "Yes" give limit: 10 cc/hr/inch of nominal valve size (GE 21A8717) IV. QUALIFICATION Reference by specific number those applicable 1. sections of the design codes and standards applicable to the component: ASME Code, Section III, Class 2, Subarticle NC-3500, Edition 1971, Addenda Winter 1973, and Code Case 1637. Reference those qualification standards, used as a guide to qualify the component: IEEE 344-1975; 2. IEEE 323-1974; IEEE 382-1972. -----3. Identify those parts of the above qualification standards deleted or modified in the qualification program. Deleted: Modified: None None Have acceptance criteria been established and 4. documented in the test plan(s) for the component? Yes [X No [] Ref. Document: EQ-CL009, SQ-CL709 What is the expected failure mode that would keep the 5. pump or valve assembly from performing its safety function? None

PVOP No. 2100F Page C9 Rev. A

Are the margins* identified in the qualification 6. documentation? 😡 Yes [] No Ref. Documents: EQ-CL009; SQ-CL709 If component is a PUMP, complete IV.7. If component is a VALVE, complete IV.8. Rump operability has been demonstrated by: [] Analysis 7. [] Test [] Combination Identity PUMP tests performed: [] Shell hydrostatic b. [] Bearing temperature a. (ASME Section III) evaluations Ref. [] Seismic Neading c. d. [] Vibration levels Ref. [] Exploratory Vibration f. [] Seal leakage @ e. hydro press (Fundamental freq. Rev. [] Aging: [] Thermal g. [] Flow performance h. [] Mechanical Are curves provided [] Yes [] No Ref. Doc. Ref. i. [] Pipe reaction end [] Others j. loads (nozzle loads) Ref. Doc. [] Extreme environment: k. [] Humidity [] Chemical [] Radiation Ref. Doc. Valve operability has been demonstrated by: [] Analysis 8. [] Test [x] Combination Identify VALVE tests performed: a. [x] Shell hydrostatic (ASME Section III) b. [x] Cold cyclic (Preoperational) List times: Open 73 sec. Closed 73 sec. Ref. Doc. 6 Ref. *. Margin is the difference between design basis parameters and the test parameters used for equipment qualification.

PVOP No. 2100F Page C10 Rev. A

с.	<pre>[x] Seismic load</pre>	ling	d.		ot cyclic sts times	
	Ref. SQ-CL120					
e.	[] Exploratory V	ibration	f.	[X] Ma	in seat]	leakage
	Ref.		R	ef.	6	
g.		chanical	h. [9]	Back	seat lea	ikage
	Ref. EQ-CL009		Re	f.	6	
i.	[] Pipe reaction loading	end	j.	[x] I	lisc hydro	ostatic
	Ref.		Re	f.	6	
k.	X Extreme envir	onment		ca	pability	
	13 m			Ref.		
	() Humidity					
	[] Chemical					
	bd Radiation					
	Ref. EQ-CL009					
m.	[] Flow characte		n.	*) Ot	hers Pool	Dynamics and
	Are curves pr	ovided?		oper	ating Log	ads
	Ref. [] Yes [] No	·····			ing Leaka	
	() 103 () 10					
As a	a result of any o	f the tes	st (or	anal	veiel. we	re any deviation
from	m design requirem	ents ider	ntifie	d? [] Yes k	No If "Yes",
brie	efly describe any	changes	made	in te	sts (or a	nalysis) or to
the	component to cor	rect the	devia	tion.		
Was	the test company					
etc.	the test compone .) to the in-plan	nt precis	sely 10	denti	cal (as t	o model, size,
inst	talled component	<pre>() oversi</pre>	zed of	r M	undersize	d?
II t	ype test was use	d to qual	ify th	he co	mponent,	does the type
[x]	meet the required as [] No	ements of	TEEE		IUIA Coo	
	10 10			323-	19/4, Sec	tion 5?
Is d	component orienta	tion sens	itive	2 [X]	Yes []	No [] Unknown
If '	component orienta 'Yes", does insta	lled orie	ntatio	? M on co	Yes [] incide wi	No [] Unknown th gualified
If '		lled orie	ntatio	? M on co	Yes [] incide wi	No [] Unknown th gualified
If ' orie	component orienta 'Yes", does insta entation? [X] Yes	lled orie [] No	see At	? M on co tach	Yes [] incide wi ment A, No	No [] Unknown th qualified ote l
If ' orie Is t was	component orienta 'Yes", does insta entation? [X] Yes the component moun qualified (i.e.,	<pre>lled orie [] No nted in t welded,</pre>	ntatio See At he sar	? M on co tachi ne ma	Yes [] incide wi ment A, No nner in-p	No [] Unknown th qualified ote 1 lant in which it
If ' orie Is t was	component orienta 'Yes", does insta entation? [X] Yes	<pre>lled orie [] No nted in t welded,</pre>	ntatio See At he sar	? M on co tachi ne ma	Yes [] incide wi ment A, No nner in-p	No [] Unknown th qualified ote 1 lant in which it

.

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PVOP No. 2100F Page Cll Rev. A

	If "Yes" identify sequence, (e.g., radiation, seismic, cyclic, thermal, etc.): Thermal Aging, Mechanical Aging, Radiation Aging, Seismic & LOCA				
15.	If "aging"* was performed, identify the significant aging mechanisms: <u>Thermal</u> , <u>Mechanical & Radiation</u>				
16.	Identify loads imposed (assumed) on the component for the qualification tests (analysis) performed:				
	c. [] Plants (shutdown loads) b. [] Extreme environment				
	c. [x] Seismic load d. [?] Others Pool Dynamics and Operating Loads				

Were the qualification tests performed in sequence and on only

- Have component design specifications been reviewed in-house to 17. assure they envelope all expected operating, transient, and acciden, conditions? [* Yes [] No
- 18. Does the component utilize any unique or special materials? (Examples are special gaskets or packing, limitations on nonferrous materials, or special coatings or surfaces.) [] Yes & No

If "Yes", identify:

14.

.....

19. Does component require any special maintenance procedures or practices, (including shorter periods between maintenance)? [] Yes 🕅 No

If "Yes", identify:

Is the gualified life for the component less than 40 years? 20. [] Yes [] No If "Yes", what is the gualified life?

* As outlined in Section 4.4.1 of IEEE-627 1980.

one component? MY Yes [] No

21. Information Concerning Qualification Documents for the Component

Report Number	Report Title	Date	Company/Organizaton Preparing Report	Company/Organization Reviewing Report
B0058	Limitorque Valve Actuator Qualification for Nuclear Service Report	1-11-80	Limitorque	S&L-CQD EQ-CL009
N/A	Environmental Qualifi- cation of General Electric Supplied Valves	7-23-85	S&L-CQD	S&L-CQD MEQ-CL071
10959	SDRC Report 10959 Rev. 0	12-15-81	SDRC	S&L-CQD SQ-CL709
2669	Design Calculations 16" - 150 lb. Gate Valve	3-10-74	Anchor Darling	S&L-CQD SQ-CL724

PVOP No. 2100F Page Cl2 Rev. A

PVOP No 2100F Page Cl3 (Final) Rev. A

ATTACHMENT A

NOTE 1: The valve was seismically qualified for any direction. The operator though, is sensitive to orientation in regards to environmental condition, i.e., to prevent flooding of the limit switch rotor, the limit switch compartment should not face vertically down. To prevent the flow of lubricant into the motor, the motor should not be mounted vertically down.

PVOP NO.	700H
REVISION	A
Page Cl	

Pump & Valve Operability Assurance Review Checklist

SIGNATURE PAGE

System Engineer Review Alladhugter
Equipment Qual. Review 11100
Electrical Engineer Review RABeovers
C&I Engineer Review Orgun Kartal
Reconcilation of IPC Walkdown Results

1 -

Date 11-8-85 Date 11-8-85 Date //- 8-85 Date 11-8-85

Date

PVOP 700H -Rev. A Page C2

REFERENCES

1.	PVOP Checklist
2.	Valve Data Sheet: MO-378, dated 9-27-77
3.	P&ID Drawings: M05-1032, Sheet 2, Rev. L
4.	Vendor Drawing: Posi-Seal Drawing #16204-5, Rev. B
5.	S&L Electrical Schematic Drawings: E02 1CC99-005, Rev. F 1SX99-024, Rev. F
6.	S&L Specification: K-2868, Miscellaneous Butterfly Valves
7.	Seismic Qualification Report:
	 Report #16205, Nuclear Seismic Analysis, 14" CL. 150 Valve Assembly with Limitorque Actuator, dated 2-20-79 (SQ-CL148)
	 B) Report #5-6167-5, Report of Fragility Test on SMB-1-25/H4BC Operator for Limitorque Corporation, dated 12-17-75 (SQ-CL182)
8.	Environmental Qualification Report: Report No. B-0058, Limitorque Valve Actuator Qualification for Nuclear Ser- vice Report (Environmental), dated 1-11-80 (EQ-CL009)
9.	Mechanical EQ Report: Environmental Qualification of Posi-Seal Butterfly Valves, dated 3-23-84 (MEQ-CL084)

- 10. Code Data Report: Valve 1CC076B
- 11. Miscellaneous: Posi-Seal Transmittal dated October 22, 1985 and telex dated 11-1-85 to S&L

PVOP 700H Rev. A Page C 3

Illinois Power Company Clinton Power Station

PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

Ι.	PLA	PLANT INFORMATION					
	1.	Name: Clinton Unit No.	1 2. Docket No.: 50-461				
	3.	Utility: Illinois Power C					
	4.	NSSS: General Electric Co					
	5.						
II.	GENE	RAL COMPONENT* INFORMATION					
	1.	Supplier: [] NSSS 🕅 BO	P Specification K-2868				
	2.	Location: a. Build					
		b. Eleva	tion 737'-0"				
		c. Syste	m Component Cooling Water				
	3.	Component number on in-hou					
	4.	If component is a [] Pump	complete II.5.				
		If component is a [x] Valve					
	5.	General Pump Data					
		a. Pump	b. Prime-mover				
	Name		Name				
	Mfg.		Mfg.				
	Model	N/A					
	S/N		SXA				
	Type		Type				
The	e compo	ment, whether nump or uslue	a record and a record				

assembly composed by the body, internals, prime-mover (or actuator) and functional accessories.

PVOP 700H Rev. A Page C4

Pump (continued)	b. Prime-mover (continued)
Size Weight	Size
	Weight
Mounting Method	Mounting Method
Required B.H. P.	Н.Р
Parameter Design Operating	Power requirements: (include normal, maximum and minimum).
Press	Electrical
Temp	
Flow	
Head	Other
N/	/A
Required NPSH at maximum	If Motor list:
Flow	Duty cycle
Available NPSH	stall current
Operating Speed	Class of insulation
Critical Speed /Ref.	
List functional accessories:*	
List control signal inputs:	

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

PVOP 70CH Rev. A Page C 5

6. General Valve Data	
a. Valve #1CC076B Isolation Valve for CCW Supply Line to FPC&C Heat	b. Actuator (if not an integral unit)
Name Exch. 1B	Name Motor Actuator
Mfg. Posi-Seal International	Mfg. Limitorque Corp.
Model144	Model H1BC-SMB-000
S/N 16204-5-B	S/N 277593
Type Butterfly	Type Electrical
Size 14" - 150 lbs.	Size 2 ft 1bs.
Weight 234 lbs excluding actuator weight - Ref. 4 Mounting Method Bolted to pipe flange	Weight 180 lbs. (Ref. 7a) Mounting Bolted to mounting Method bracket on value
Required Torque 5,028 in1bs. Ref. 11 Ref.: Valve Data Sheet No. MO Parameter Design Operatio	Torque 14,112 in1bs. Ref. 11
Press 200 psig 90 psig	and minimum). Electrical
Temp <u>150°F.</u> <u>105°F.</u>	460 Vac ±10%
Flow 4150 GPM 4150 GPM	
Max TP across valve 200 psi	Ref. 6 Form 1810Q
Closing time @ max \$P 260 sec. /Ref. 10 Opening time @ max \$P 260 sec. /Ref. 10 Power requirements for function	Other: []Pneumatic[]Hydraulic None
accessories, (if any) <u>None</u>	
List control signal inputs: Normally closed valve opens b switch 1HS-CC087 if valves 10 1SX062B is closed. It can be No automatic operation is inv Functional accessories - Limit switches to provide int 1CC075B & 1SX062B.	closed by 1HS-CC087.

PVOP 700H Rev. A Page C 6

III. FUNCTION

CI110	functions: <u>Normal: Function to provide cooling water to</u>
	from the Fuel Pool Heat Exchanger via the component cooling
wat	er system. Safety: Function to isolate cooling water from CC
	allow cooling water from SX which is a safety related piping
	tem.
2.	The components neveral states in the second
	K) Standby
3.	Safety function:
	a. [] Emergency reactor b. [] Containment heat shutdown removal
	c. [] Containment isolation d. [] Reactor heat remova
	e. [] Reactor core cooling f. [X] Prevent significant release of radio- active material to environment
	g. Does the component function to mitigate the consequences of one or more of the following
	events? [x] Yes [] No If "Yes", identify.
	events? [x] Yes [] No
	If "Yes", identify.
4.	Wes [] No If "Yes", identify.
4.	W LOCA [] HELB [] MSLB
4.	<pre>events? KJ Yes [] No If "Yes", identify. & LOCA [] HELB [] MSLB & Other CC Line Break or LOOP Safety requirements:</pre>
4.	<pre>events? Ø Yes [] No If "Yes", identify. Ø LOCA [] HELB [] MSLB Ø Other CC Line Break or LOOP Safety requirements: [] Intermittent Operation Ø During postulated event</pre>

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the valve assembly operational, (e.g., limit switches).

PVOP 700H Rev. A Page C7

5. For VALVES:

> Does the component [] Fail open [] Fail closed [] Fail as is

Is this the fail safe position? [] Yes [] No

Is the valve used for throttling purposes? [] Yes [X] No

Is the valve part of the reactor coolant pressure boundary [] Yes [X] No

Does the valve have a specific limit for leakage? XYes []No

If "Yes" give limit: 140 ml./Hr.

IV. QUALIFICATION

Reference by specific number those applicable 1. sections of the design codes and standards applicable to the component: ASME B&PV Code Section III, Sub.Sec. ND (c1-3), 1974 Edition including the Winter 1976 Addenda.

Reference those qualification standards, used as a 2. guide to gualify the component:

IEEE: -323-1974, 382-1972, 344-1975

Identify those parts of the above qualification 3. standards deleted or modified in the gualification program.

Deleted:

Modified:

None.

None. ****** -----

- Have acceptance criteria been established and 4. documented in the test plan(s) for the component? Yes & No [] Ref. Document: 7b Tab-G; 8 Tab-F
- What is the expected failure mode that would keep the 5. pump or valve assembly from performing its safety function? None.

				Page C 8
	6.	Are the margins* ident documentation? & Yes Ref. Documents: 7a & b'		No
If	component	is a PUMP, complete I	V.7.	
If	component	is a VALVE, complete	IV.8.	
7.	Pump	operability has been d] Test [] Co	emonst mbinat	trated by: [] Analysis
	Ident	ify PUMP tests perform	ed:	
	a. (Shell hydrostatic (ASME Section III) ef.	b.	<pre>[] Bearing temperature evaluations</pre>
	c. [] Seismic loading .	d.	[] Vibration levels
	e. (J Exploratory vibratio	n f.	[] Seal leakage @ hydro press
	R	ev.] Aging: [] Thermal	, h.	[] Flow performance
		[] Mecharnica:	1	Are curves provided [] Yes
		ef. Doc.] Pipe reaction end	N/A j.	Ref. [] No [] Others
	k. [loads (nozzle loads) ef. Doc.	/	
		[] Humidity		
		[] Chemical		
8.		[] Radiation of. Doc. operability has been d t [x] Co	lemons	trated by: [] Analysis
		fy VALVE tests perform		.101
		<pre>() Shell hydrostatic (ASME Section III)</pre>	b.	<pre>[x] Cold cyclic Not required f List times: Open safety function</pre>
he	Margin is	f. Doc. <u>10</u> the difference betwee meters used for equipm	n desi ent qu	Ref. 10 Closed 59.5 sec.

PVOP 700H

PVOP 700H Rev. A Page C 9

c. [x] Seismic loading d. [] Hot cyclic Lists times: Open Closed
Ref. 7a Tab D; 8 Tab F e. [] Exploratory vibration f. [] Main seat leakage
Ref Ref. 10
g. 🕅 Aging: 🕅 Thermal h. [] Back seat leakage [x] Mechanical
Ref. 8 Tab F . Ref. i. [] Pipe reaction end j. [x] Disc hydrostatic loading
Ref. 10 K. [x] Extreme environment 1. [] Flow interruption capability Ref. 10 Ref. 10 Ref. 10 Capability
M Humidity
[] Chemical
<pre>[x] Radiation Ref. 8 Tab F m. [] Flow characteristics n. [] Others Are curves provided? Ref. [] Yes [] No</pre>
As a result of any of the test (or analysis), were any deviation from design requirements identified? [] Yes [X] No If "Yes", briefly describe any changes made in tests (or analysis) or to the component to correct the deviation.
Was the test component precisely identical (as to model, size, etc.) to the in-plant component? [] Yes [X] No If "No", is installed component [] oversized or [X] undersized?
If type test was used to qualify the component, does the type test meet the requirements of IEEE 323-1974, Section 5? [] No
Is component orientation sensitive? [] Yes [] No [] Unknown If "Yes", does installed orientation coincide with qualified orientation? [] Yes [] No See Attachment A Note.

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13. Is the component mounted in the same manner in-plant in which it was qualified (i.e., welded, same number and size bolts, etc.) [x] Yes [] No [] Unknown

PVOP 700H Rev. A Page C 10

		*********	*********		ation, Seismic, LOCA
If 'mech	aging"* w anisms:	as perform Thermal, Mec	ed, ident hanical, Ra	ify th diation	e significant aging , Seismic
Iden qual	tify load ification	s imposed tests (an	(assumed) alysis) p	on th erform	e component for the ed:
a.	[] Plants	(shutdown	loads)	b.	x Extreme environme
с.	🕅 Seismi	c load		d. þ	Others Operational, Pool Dynamic
A 19 19 19 19	Le CIICY CI	t design sp nvelope al itions? [X	PYDPCTA	1 ODOF	een reviewed in-house ating, transient, and
nonf	infres are	special da	iskets or	Dackir	or special materials ng, limitations on ngs or surfaces.)
If "	'es", ider	tify:			
1. W. P.B. P.L. 1	component ices, (in s [X] No	require a cluding sh	ny specia orter per	l main iods b	tenance procedures o etween maintenance)?
If "Y	'es", iden	tify:			
	e qualifi	ed life fo	r the com		less than 40 years? alified life?

* As outlined in Section 4.4.1 of IEEE-627 1980.

Item No.	Report Number	Report Title	Date	Company/Organizaton Preparing Report	Company/Organization Reviewing Report
A	16204 Item #5	Nuclear Seismic Analysis, 14"CL.150 Valve Assembly with Limitorque Actuator	02-20-79	Posi-Seal International	S&L - CQD (RefCQD-015255, SQ-CL148)
В	5 -6167- 5	Report on Fragility Test on SMB-1-25/ H4BC Operator for Limitorque Corporation	12-17-75	Aero Nav Laboratories, Inc.	S&L - CQD (RefCQD-019751, SQ-CL182)
с	B-0058	Limitorque Valve Actuator Qualification for Nuclear Service Report (Environmental)	01-11-80	Limitorque Corp.	S&L - CQD (RefCQD-002366, EQ-CL009)
D	N/A	Environmental Qualifi- cation of Posi-Seal Butterfly Valves	03-23-84	S&L - CQD	S&L - CQD (RefCQD-013011, MEQ-CL084)

21. Information Concerning Qualification Documents for the Component

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PVOP 700H Rev. A Page Cl2 FINAL

ATTACHMENT A

Note: The valve assembly is not orientation-Sensitive from a seismic point of view. However, from the environmental viewpoint, the valve assembly is sensitive to orientation. To prevent possible intrusion of lubricant into the motor, the motor should not be mounted vertically downward; it should be horizontally mounted. Also in order to prevent flooding of the limit switch, the limit switch compartment should not be oriented facing vertically down.

PVOP 700H Rev. A Page C 9

с.	<pre>[x] Seismic loading d. [] Hot cyclic Lists times: Open Closed</pre>
e.	Ref. 7a Tab D; 8 Tab F [] Exploratory vibration f. & Main seat leakage
g.	Ref
i.	Ref. 8 Tab F . Ref. [] Pipe reaction end j. [x] Disc hydrostatic loading
k.	Ref. Ref. 10 [x] Extreme environment 1. [] Flow interruption capability
	M Humidity Ref.
	[] Chemical
	[X] Radiation Ref. 8 Tab F
m.	<pre>[] Flow characteristics n. [] Others Are curves provided? Ref. [] Yes [] No</pre>
from	result of any of the test (or analysis), were any deviation design requirements identified? [] Yes [A] No If "Yes", fly describe any changes made in tests (or analysis) or to component to correct the deviation.

etc.	the test component precisely identical (as to model, size,) to the in-plant component? [] Yes [X] No If "No", is alled component [] oversized or [X] undersized?
test	ype test was used to qualify the component, does the type meet the requirements of IEEE 323-1974, Section 5? es [] No
If "	omponent orientation sensitive? [] Yes [] No [] Unknown Yes", does installed orientation coincide with qualified ntation? [] Yes [] No See Attachment A Note.
was	he component mounted in the same manner in-plant in which it qualified (i.e., welded, same number and size bolts, etc.) es [] No [] Unknown

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PAGE: C1 PVOP NO. 900F REVISION: A

Pump & Valve Operability Assurance Review Checklist

SIGNATURE PAGE

Revision No. A

System Engineer Review Moriles Equipment Qual. Review 9 mull Electrical Engineer Review Albeaver C&I Engineer Review Karta gen Reconcilation of IPC Walkdown Results

Date 85 11/6 Date 16 Date 11-6-85 Date 11-6-85

Date

PAGE: C2 PVOP NO. 900F REVISION: A

REFERENCES

- G.P.E. Controls, Drawing LD246-25, Sheet 1, Revision AC, (09/11/80).
- 2. S&L Drawing M06-1075, Sheet 4, Revision V, (06/26/84).
- G.E. Document 22A3731, Revision 6, "Design Pressures for Piping Systems (04/22/85).
- IPC Record Package for Document Record Number: (Baldwin P. O. Number, Not indicated, RIR Number S-11993, Valve Serial Number 7712-0526-19.
- 5. S&L Drawing M05-1075, Sheet 4, Revision 5, (06/28/85).
- S&L Specification K-2873, Amendment 6, "Vacuum Relief Valves," (07/09/85).
- 7. S&L, NSLD Calculation No. 3C10-1082-003, Revision 0, (11/15/83).
- MEQ-CL097, Environmental Qualification of Vacuum Relief Valves 2" and 10", (10/16/85).
- SQ-CL196, Seismic Qualification of 2" and 10" Vacuum Relief Valves.
- 10. G.E. Memorandum MNK-83-03 (07/03/83).

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PAGE: C3 PVOP NO. 900F REVISION: A

Illinois Power Company Clinton Power Station

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PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

1.	PLAN	I INFORMATION
	1.	Name: Clinton Unit No. 1 2. Docket No.:50-461
	з.	Utility: Illinois Power Company
	4.	NSSS: General Electric Co. () PWR [x] BWR
	5.	A/E: Sargent & Lundy
II.	GENE	RAL COMPONENT* INFORMATION
	1.	Supplier: [] NSSS [A BOP Specification K-2873
	2.	Location: a. Building/Room Auxiliary/A.1.9 (H-12
		b. Elevation 754'-6" (Ref. 2)
		c. System Residual Heat Removal
	3.	Component number on in-house drawings: 1E12-F103A
	4.	If component is a [] Pump complete II.5.
		If component is a 🕅 Valve complete II.6.
	5.	General Pump Data NOT APPLICABLE
		a. Pump b. Prime-mover
	Name	NA Name NA -
	Mfg.	NA Mfg. NA
	Mode	NA Model NA
	S/N_	NA S/N NA
	Type	NA Type NA

* The component, whether pump or valve, is considered to be an assembly composed by the body, internals, prime-mover (or actuator) and functional accessories.

PAGE: C4 PVOP NO. 900F REVISION: A

Size NA	Size NA			
Weight NA				
	WeightNA			
Mounting	Mounting			
Method NA	Method NA			
Required B.H.P. NA	H.PNA			
Parameter Design Operating	Power requirements: (include normal, maximum and minimum).			
Press <u>NA</u> <u>NA</u>	ElectricalNA			
Temp NA NA				
Flow NA NA				
Head <u>NA NA</u>	OtherNA			
Required NPSH at maximum	If Motor list:			
Flow NA	Duty cycle NA			
Available NPSH - NA	Stall currentNA			
Operating Speed NA	Class of insulation NA			
Critical Speed NA /Ref. NA				
List functional accessories:* .	NA			
List control signal inputs:	NA			
	NA			

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

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PAGE: C5 PVOP NO. 900F REVISION: A

6. General Valve Data a. Valve b. Actuator (if not an integral unit) NA: Valve is RHR Discharge Line operated by AP across valve. Name Vacuum Relief Valve Name NA Mfg. GPE Controls Division Mfg. NA Model LD246-25 Model NA S/N 7712-0526-19 S/N NA Type Vacuum Relief Valve Type NA Size 2" Size NA Weight 160 1bs. (Ref. 1) Weight NA Mounting Mounting Method NA Method Bolted to Hange in pipe Required Torque NA - No Operator Torque NA Parameter Design Operating Power requirements: (include normal, maximum and minimum). Electrical NA Press(psig)220(Ref.6) 220 (Ref. 3) Temp (°F)395(Ref. 6) 395(Ref. 3) 700@ 2 psid See Attachment A, Flow(scfm) (Ref. 4) Note 2 Max AP across valve 220 Ref. NA Closing time @ max AP NA Other: []Pneumatic[]Hydraulic /Ref. NA Opening time @ max oP ____NA___ NA /Ref. NA Power requirements for functional accessories, (if any) NA List control signal inputs: None List functional accessories: None

PAGE: C6 PVOP NO. 900F REVISION: A

III. FUNCTION

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1.			normal function					e
is	in the cl	osed positi	on. The safe	ty funct	ion is	to reliev	e the	-
vacu	uum in th	e RHR safet	y/relief valve	e discha	rge li	ne (1RH30)	BA12)	
fol	lowing di	scharge thr	ough this line	e into t	he sup	pression p		
The	valve is	shown on R	eference 5.					_
2.	The co	mponents	normal stat	e is:	[] Op	erating	50	Stand
3.	Safety	function	1:					
	a. []	Emergeno	y reactor	Þ	• ()	Contain removal	ment	heat
	c. []	Containm	ment isolati	on d	• ()	Reactor	heat	remo
	e. []	Reactor	core coolin	g f	• ()	Prevent release active environ	of mater	adio-
	co	ents? M	Yes [] N , identify.	more				
	1	LOCA	[] HELB		[] [ISLB		
	N	Other	See Section I	II.1 abo	ove.			
4.	Safety	requirem	ents:					
	b) Int	ermittent	Operation	11	Durin	ng postu	lated	event
	[] Con	tinuous C	peration	Ø	Follo	owing po	stula	ted ev
	event,	give app operatio	eration is roximate le nal.	requirength of	ed foi f time	llowing a compone	an ent m	ust
	See	Attachment	A. Note 3.		(e.g.	, hours	, day	s, etc

 Functional accessories are those sub-components not supplied by t manufacturer that are required to make the valve assembly operationa (e.g., limit switches).

PAGE: C7 PVOP NO. 900F REVISION: A

5. For VALVES:

Does the component [] Fail open [] Fail closed [] Fail See Attachment A Note 1 Is this the fail safe position? [] Yes [] No See Attachment A Note 1 Is the valve used for throttling purposes? [] Yes [] Yes [] T Is the valve part of the reactor coolant pressure bound [] Yes [] No

Does the valve have a specific limit for leakage? [x] Yes []No

If "Yes" give limit: 2cc/hr (Ref. 6, p. 3-6, 303.4c)

IV. QUALIFICATION

 Reference by specific number those applicable sections of the design codes and standards applicable to the component: <u>ASME Code, Section III, Class 2,</u> <u>Subarticle NC-3500, Edition 1977, Addenda Summer 1977.</u>

 Reference those qualification standards, used as a guide to qualify the component: IEEE 344-1975 for

seismic qualification. IEEE 323-1974 for environmental

qualification.

 Identify those parts of the above qualification standards deleted or modified in the qualification program.

Deleted:

Modified:

None

None

 Have acceptance criteria been established and documented in the test plan(s) for the component? NA Yes [] No [] Ref. Document: NA Qualification by Analysis

5. What is the expected failure mode that would keep the (pump or valve assembly from performing its safety function? None

PAGE: C8 PVOP NO. 900F REVISION: A

	documentation? [X] Yes Ref. Documents: 8	[] N	•
com	ponent is a PUMP, complete IV	.7.	
com	ponent is a VALVE, complete I	v.8.	
~	Pump operability has been de [] Test [] Com		
	dentify PUMP tests performe	d:	
	a. N Shell hydrostatic (ASME Section III) Ref.	b.	[] Bearing temperature evaluations
	c. [] Seishic loading	d.	[] Vibration levels
	e. [] Exploratory vibration	f.	[] Seal leakage @ hydro press
	(Fundamental freq) Rev. g. [] Aging: [] Thermal	h.	[] Flow performance
	[] Mechanical	NA	Are curves provided [] Ye
	Ref. Doc.	· j.	Ref. 1) others
	loads (nozzle loads) Ref. Doc. k. [] Extreme environment:		
	[] Humidity	•	
	[] Chemical		
	[] Radiation Ref. Doc.		
	Valve operability has been d [] Test [x] Co		
	Identify VALVE tests perform	ed:	
	<pre>b. [X] Shell hydrostatic (ASME Section III)</pre>	b.	[] Cold cyclic List times: Open Closed
Ma	Ref. Doc. 4 rgin is the difference betwee	des	Ref.

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PAGE: C9 PVOP NO. 900F REVISION: A

с.	[] Seismic loading	d. [] Hot cyclic Lists times: Open
e.	Ref. [] Exploratory vibration	Ref. f. LA Main seat leakage
g.	Ref. [] Aging: [] Thermal h [] Mechanical	Ref. 4 [] Back seat leakage
i.	Ref. [] Pipe reaction end loading	Ref. j. [] Disc hydrostatic
k.	Ref. [] Extreme environment	Ref. 1. [] Flow interruption capability Ref.
	[] Humidity	
	[] Chemical	
	[] Radiation	
Ħ.,	Ref. [] Flow characteristics Are curves provided? Ref. [] Yes [] No	n. [] Others
fro bri	om design requirements ident	t (or analysis), were any deviati tified? [] Yes [] No If "Yes", made in tests (or analysis) or to deviation.
etc	.) to the in-plant component	ely identical (as to model, size, ht? [] Yes [] No If "No", is zed or [] undersized? NA
If	type test was used to qual:	red or [] undersized? NA CATION BY ANALYSIS" (YL MINKS Ify the component, does the type IEEE 323-1974, Section 5? FICATION BY ANALYSIS" (YL MINKS
Is If	component orientation sens	itive? [] Yes [] No [] Unknown ntation coincide with qualified

13. Is the component mounted in the same manner in-plant in which is was qualified (i.e., welded, same number and size bolts, etc.) N Yes [] No [] Unknown

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PAGE: C10 PVOP NO. 900F REVISION: A

Were the qualification tests performed in sequence and on on: one component? [] Yes [] No NA "NA QUALIFICATION BY
ANALYSIS" Munitify sequence, (e.g., radiation, seismic, cyclic thermal, etc.):
If "aging"* was performed, identify the significant aging mechanisms: NA "NA QUALIFICATION BY ANALYSIS" (Multiple)
Identify loads imposed (assumed) on the component for the gualification tests (analysis) performed:
a. [] Plants (shutdown loads) b. [X] Extreme environment
c. [X] Seismic load d. [X] Others Pool Dynamics and Pressure Loads.
Have component design specifications been reviewed in-house t assure they envelope all expected operating, transient, and accident conditions? [] Yes [] No
Does the component utilize any unique or special materials? (Examples are special gaskets or packing, limitations on nonferrous materials, or special coatings or surfaces.) [] Yes [] No
If "Yes", identify:
Does component require any special maintenance procedures or practices, (including shorter periods between maintenance)? [] Yes [K] No
If "Yes", identify:

* As outlined in Section 4.4.1 of IEEE-627 1980.

Report Number	Report Title	Date	Company/Organizaton Preparing Report	Company/Organization Reviewing Report
A241-158	Design Analysis for Seismic and Operating Conditions 2" GPE Models LD246-23, -24,-25, -26, -27, Vacuum Relief Valve.	05/17/79	GPE Controls	S&L/CQD SQ-CL196
IA	Environmental Qualifica- tion of Vacuum Relief Valves 2" and 10"	10/16/85 , ,	S&L/CQD	S&L/CQD MEQ-CL097

Information Concerning Qualification Documents for the Component

PAGE: C12 PVOP NO. 900F REVISION: A

ATTACHMENT A

Note 1

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Two series mounted vacuum relief valves are attached to each RHR SRV discharge line. If one of the valves fails open, the redundant valve in the pair prevents suppression pool bypass when steam is discharged in the RHR system.

If one of the valves fails close, the potential exists for water to be siphoned from the suppression pool up the RHR discharge line. Reflood of the RHR system discharge line following the plant normal first actuation of the RHR SRV was calculated to be 12.95 feet above the end of the RHR discharge line (Reference 10). Since the vacuum breakers are located more than 15.33 feet above the end of the RHR discharge lines, the RHR discharge lines will not be flooded to the height of the vacuum breakers. Bubble dynamics for subsequent actuation RHR SRV air clearing and subsequent actuation air clearing loads were calculated and addressed in response to Humphreys' Concerns (Reference 7).

During a LOCA, the initial functional modes of the RHF system are low pressure coolant injection (LPCI) and suppression pool cooling. In these modes, steam is not discharged through the RHR heat exchanger discharge lines, and therefore vacuum relief on the lines is not required. Steam may be discharged through the RHR heat exchanger discharge lines when the RHR system is in the steam condensing mode. However, the likelihood of using the RHR steam condensing mode in a post-LOCA environment coincident with failure of one of the vacuum relief valves in the closed position is judged to be remote and is not considered in the design.

PAGE: Cl3 (Final Page) PVOP NO. 900F REVISION: A

ATTACHMENT A (CONT'D)

Therefore, based on the previous discussion, the fail safe position for these valves may be postulated as fail open, fail close, or fail as-is without adverse effect on system function.

Note 2

The operating flow rate of this valve will vary with the differential pressure across the valve. The sizing of the RHR SRV Discharge Line Vacuum Relief Valves was based on General Electric Company recommendations. The sizing of this valve is judged to be not critical since this valve may fail open or closed as described in Note 1.

Note 3

This value should operate intermittently to relieve the vacuum following an RHR SRV discharge until the steam in the discharge line has condensed. A rough estimate of the cool down time of the discharge line is 8 hours, when the surrounding environment is less than $122^{\circ}F$.

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Pump & Valve Operability Assurance Review Checklist

SIGNATURE PAGE

Revision No. A

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System Engineer Review More Ka_	Date 11-7-85
Equipment Qual. Review 25 Borrer	Date 11-7-85
Electrical Engineer Review RABcaven	Date 11-7-85
C&I Engineer Review Ogum Kantal	Date 11-7-85
Reconcilation of IPC Walkdown Results	
	Date

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REFERENCES FOR VALVE 1RF019

- Fisher Controls Report No. FQP-16-6, "Group VI Control Valves Qualification Report, Rev. B, dated 3-3-83 (S&L/CQD: SQ-CL055).
- NAMCO Controls Report No. QTR-105, Rev. 4, "Qualification of EA180 Limit Switches, dated 1-9-84 (S&L/CQD: SQ-CL046).
- 3. Isomedix Report No. ABS21678/TR, Rev. A, dated July 1979 and ASCo Report No. AQR-67368, Rev. 1, dated 8-19-83, "Qualification of Solenoid Valves by Envirormental Exposure to Elevated Temperature, Radiation, Wear Aging, Seismic Vibration Endurance, Radiation and LOCA" (S&L/CQD: SQ-CL060).
- Conax Report Nos. IPS-1079, Rev. D, dated 5-21-84 and IPS-1030, Rev. A, dated 8-15-83, "Design Qualification Test Report for Electrical Conductor Seal Assy. (ECSA) for CONAX Corp." (S&L/CQD: SQ-CL062).
- 5. S&L Analysis of Fisher Control Valves (S&L/CQD: EQ-CL082).
- NAMCO Controls Report No. QTR-109, Rev. 0, "Qualification of EA180 Series Limit Switches," dated 10-3-83 (S&L/CQD: EQ-CL008).
- ASCo Report No. AQR-6738, Rev. 1, "Qualification of ASCo CatNP=1 Solenoid Valves," dated 8-19-83 (S&L/CQD: EQ-CL024).
- Conax Report No. IPS-1079, Rev. D, "Design Qualification Test Report for Conax Seal," dated 5-21-84 (S&L/CQD: EQ-CL094).
- 9. Sargent & Lundy Control Valve Data Sheet No. CV-850, Sheets 1 and 2, dated February 28, 1979.
- 10. Sargent & Lundy Valve Data Table No. DT-001.
- 11. Sargent & Lundy Drawings:
 - a. P&ID: M05-1047, Sht. 3, Rev. F
 - b. LOGIC: M15-1047, Sht. 2, Rev. B
 - c. Electrical Schematic: E02 1RF99-008, Rev. M; -010, Rev. J
- 12. Fisher Controls Drawing No. 35A6351, Rev. C, dated 9-25-84.
- Specification K-2864, Amendment 9, dated July 23, 1985, Form 273-D, Paragraph 8.2.1d.

REFERENCES FOR VALVE 1RF019 (CONT'D)

- Fisher Controls Test Certification Data , Tag No. 1RF019, S/N 7418774.
- 15. Sargent & Lundy Mechanical Department Piping Line List.

Illinois Power Company Clinton Power Station

PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

Ι.	PLAN	NT INFORMATION							
	1.	Name: Clinton Unit No.	1 2. Docket No.:50-461						
	3.	Utility: Illinois Power Co							
	4. NSSS: General Electric Co. [] PWR [x								
	5. A/E: Sargent & Lundy								
II.	GENE	RAL COMPONENT* INFORMATION							
		Supplier: [] NSSS [K] BOR							
	2.	Location: a. Buildi	ng/Room_Drywell/Zone_H-16						
	b. Elevation 738'								
	c. System Containment Building Floor Drai								
	3.								
	4.	If component is a [] Pump	complete II.5.						
		If component is a [X] Valve	complete II.6.						
	5.	General Pump Data							
	-	a. Pump	b. Prime-mover						
	Name		Name						
	Mfg.		Mfg.						
	Model	NA	Model						
	S/N		S/N						
	Type_		Туре						
* The	compo	ment, whether nump or walue							

* The component, whether pump or valve, is considered to be an assembly composed by the body, internals, prime-mover (or actuator) and functional accessories.

a. Pump (continued)	b. Prime-mover (continued)
Size	Size Weight
Mounting Method	Mounting Method
Required B.H.P.	Н.Р.
Parameter Design Operating	Power requirements: (include normal, maximum and minimum).
Press	Electrical
Temp	
Flow	
Head	Other
N	A
Required NPSH at maximum	f Motor list:
Flow	Duck cycle
Available NPSH	Stall current
Operating Speed	Class of insulation
Critical Speed /Ref.	
List functional accessories:*	
List control signal inputs:	/

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* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

6. General Valve Data a. Valve b. Actuator (if not an integral unit) Name RF Drywell Penetration Name Pneumatic Actuator Inboard Isolation Mfg. Fisher Controls Mfg. Fisher Controls Model ES Model N/A S/N 7418774 S/N N/A Type Globe Type 66. NS Size 3" - 150# Size 45 (excluding Actuator) 132.6# (including appurtenances Weight 127.4# from Vendor Dwg. Weight SQ-CL055, Tab D Mounting Mounting Method Butt Welded to Pipe Method Bolted to the Bonnet Required Thrust 15. gue 3,136# Thrust Torque 1,470# Ref.: Valve Data Sheet No. CV-850 Parameter Design Orono CV-850 Parameter Design Operating Power requirements: (include normal, maximum (Ref. 15) and minimum). 50 psig 25 psig Electrical Press Temp 150°F 150°F None Flow 50-150 GPM 50-150 GPM Max dP across valve 50 psig Ref. Closing time @ max OP Other: [X] Pneumatic[]Hydraulic /Ref.See Att. B, Note 1 Ref: Valve Data Sheet No. CV-850 Opening time @ max OP /Ref. See Att. B, Note 1 Power roduling time 1 Ref: Valve Data Sheet No. CV-850 90-120 psig Supply Air Pressure Power requirements for functional accessories, (if any) 120V ac +10%, -10% (Solenoid) Spec. K-2864, Form 1999 List control signal inputs: See Att. B, Note 2 List functional accessories: See Att. B, Note 3

III. FUNCTION

	1.	Briefly describe components normal and safety functions: <u>Normal function is for valve to be in open</u>									
	position to allow drainage through drywell penetration. Safety										
	func	tion	is t	o close for	contain	ment isol	ation.	F.	low contro	l air.	
	valv	e sol	enoi	d is de-ener	gized in	<u>safety f</u>	unctic	n m	ode.		
	2.	The	cor	nponents i	normal s	state is	s: [^X]	Ope	erating	[]	- Standby
	3.	Saf	ety	function				(Ene	ergized)		
		a.	[]	Emergency shutdown	/ reacto	or	b.	[]	Contain removal	ment	heat
		с.	[X]	Containme	ent isol	ation	d.	[]	Reactor	heat	removal
		e.	[]	Reactor o	core coo	oling	f.	[]	Prevent release active r environ	of rater	adio-
		g.	eve	s the com sequences nts? M If "Yes",	Yes []	or mor No	on to e of	mit the	igate the following	ne ing	
			M L	OCA	[] HEL	В	(] M	ISLB		
			[] 0	ther							
	4.	Safe	ety	requireme	nts:						
		[X] 1	Inte	rmittent	Operati	on	N Du	rin	g postul	ated	event
		[] (Cont	inuous Op	eration		[] Fo	110	wing pos	tulat	ed event
		even	it,	onent ope give appr operation	oximate	is requ length	ired of t	fol ime	lowing a compone	in int mu	ist
				N/A			(e	.g.	, hours,	days	, etc.)
<pre>* Func manufac (e.g.,</pre>	curet	. una	L d	sories ar re requir es).	e those ed to m	sub-co	mone	nte	not sup	nlind	but the

5. For VALVES:

Does the component [] Fail open [X] Fail closed [] Fail as

Is this the fail safe position? [] No

Is the valve used for throttling purposes? [] Yes N NO

Is the valve part of the reactor coolant pressure boundary: [] Yes [X No

Does the valve have a specific limit for leakage? MYes []No

> If "Yes" give limit: 0.01% of maximum valve capacity Reference 13

IV. QUALIFICATION

1. Reference by specific number those applicable sections of the design codes and standards applicable to the component: ASME Code, Section III, Class 2, Subarticle NC3500 Edition 1974 with Addenda Summar 1976.

2. Reference those qualification standards, used as a guide to gualify the component: IEEE-344-1975,

IEEE-323-1974

Identify those parts of the above qualification 3. standards deleted or modified in the qualification program.

Deleted:

Modified: Valve body design calcs. were done in accordance with ANSI B16.34-1977 instead of ANSI B16.5-1968 (Design Requirements of B16.34 satisfied None or exceeded all Design requirements of B16.5.In addition B16.34 is now 4. Have acceptance criteria been established and accepted documented in the test plan(s) for the component? by the Yes [X No [] Ref. Document: Attachment A, Note 1 ASME Code)

5. What is the expected failure mode that would keep the pump or valve assembly from performing its safety function? None

6. Are the margins* identified in the qualification documentation? [X] Yes [] No Ref. Documents: SQ-CL055, SQ-CL046, SQ-CL060, EQ-CL008, EO-CL094 If component is a PUMP, complete IV.7. If component is a VALVE, complete IV.8. 7. Pump operability has been demonstrated by: [] Analysis [] Test [] Combination Identify PUMP tests performed: a. Shell hydrostatic b. [] Bearing temperature ASME Section III) evaluations Ref. [] Seismic loading c. [] Vibration levels d. Ref. [] Exploratory vibration e. f. [] Seal leakage @ hydro press (Fundamental freq. Rev. [] Aging: [] Thermal g. h. [] Flow performance [] Mechanical Are curves provided [] Yes NA [] No Ref. Doc. Ref. [] Pipe reaction end i. Others j. [] loads (nozzle loads) Ref. Doc. [] Extreme environment: k. [] Humidity [] Chemical [] Radiation Ref. Doc. Valve operability has been demonstrated by: [] Analysis 8. [] Test [x] Combination Identify VALVE tests performed: b. [X] Shell hydrostatic b. [X] Cold cyclic (ASME Section III) List times: Open OK Closed OK Ref. Doc. Ref. 14 Ref. Ref. 14 *. Margin is the difference between design basis parameters and the test parameters used for equipment qualification.

c. [X] Seismic loading d. [] Hot cyclic Lists times: Open
Ref. See Note 2, Att. A. Ref. e. [] Exploratory vibration f. [X] Main seat leakage
Ref. Ref. 14 g. [X] Aging: [X] Thermal h. [] Back seat leakage [X] Mechanical
Ref. EQ-CL008, 24, 94. i. [] Pipe reaction end j. [x] Disc hydrostatic loading
<pre>Ref. k. Ø Extreme environment 1. [] Flow interruption capability</pre>
Ref.
[] Chemical
[X] Radiation
<pre>Ref. EQ-CL008, 24, 94 m. [] Flow characteristics n. M Others Diaphragm to Case Leak Are curves provided? Ref. [] Yes [] No</pre>
As a result of any of the test (or analysis), were any deviation from design requirements identified? [X] Yes [] No If "Yes", briefly describe any changes made in tests (or analysis) or to the component to correct the deviation.
See Attachment A, Note 3
Was the test component precisely identical (as to model, size,
etc.) to the in-plant component? [] Yes [X] No If "No", is installed component [X] oversized or [] undersized?See Att. A, Note 5
If type test was used to qualify the component, does the type test meet the requirements of IEEE 323-1974, Section 5? [M] Yes [] No
Is component orientation sensitive? [A Yes [] No [] Unknown If "Yes", does installed orientation coincide with qualified orientation? [K] Yes [] No

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Nere the qualification tests performed in sequence and on only 14. one component? [X] Yes [] No

If "Yes" identify sequence, (e.g., radiation, seismic, cyclic, thermal, etc.): Thermal Aging, Mechanical Aging, Radiation Aging, Seismic & LOCA

- If "aging"* was performed, identify the significant aging 15. mechanisms: Thermal, Mechanical & Radiation Aging. These apply for NAMCO Limit switches, ASCo Solenoid Valves, & Conax Seal
- Identify loads imposed (assumed) on the component for the 16. qualification tests (analysis) performed:

[] Plants (shutdown loads) b. [3] Extreme environment a.

C. [X Seismic load

d. [X] Others Pool Dynamics & Operating Loads

- 17. Have component design specifications been reviewed in-house to assure they envelope all expected operating, transient, and accident conditions? [X] Yes [] No
- Does the component utilize any unique or special materials? 18. (Examples are special gaskets or packing, limitations on nonferrous materials, or special coatings or surfaces.) [] Yes My No

If "Yes", identify:

.....

19. Does component require any special maintenance procedures or practices, (including shorter periods between maintenance)? X Yes [] No

If "Yes", identify: See Attachment A, Note 4

20. Is the qualified life for the component less than 40 years? [] Yes [X] No If "Yes", what is the gualified life? See Att. A, Note 4.

* As outlined in Section 4.4.1 of IEEE-627 1980.

21. Information Concerning Qualification Documents for the Component

Report Number	Report Title	Date	Company/Organizaton Preparing Report	Company/Organization Reviewing Report
RQP-16-6	Group VI Control Valves Qualification Report Revision B	03/03/83	Fisher Controls	S&L/CQD SQ-CL055
QTR-105 Ref. 4	Qualification of EA180 Limit Switches	01/09/84	NAMCO Controls	S&L/CQD SQ-CL046
ABS21678/ TR Rev. A	Qual. of Solenoid Valves by Environmental Exposure to Elevated temperature,	07/79	Isomedix	S&L/CQD SQ-CL060
AQR-67368 Rev. 1	Radiation Wear Aging Seismic Vibration Endurance, Radiation & LOCA	08/19/83	ASCo	
IPS-1079 Rev. D IPS-1080 Rev. A	Design Qualification Test Report for Electric Conductor Seal Assy. (ECSA) for Conax Corp.	05/21/84 08/15/83	Conax	S&L/CQD SQ-CL062
N/A	Analysis of Fisher Control Valves		S&L	S&L/CQD . EQ-CL082
QTR-109 Rev. 0	Qual. of EA180 Series Limit Switches	10/03/83	NAMCO Controls	S&L/CQD EQ-CL008
QR-6738 Rev. 1	Qual. of ASCo CatNP-1 Solenoid Valves	08/19/83	ASCo	S&L/CQD EQ-CL024
IPS-1079 Rev. D	Design Qual. Test Report for Conax Seal	05/21/84	Conax	S&L/COD EQ-CL094

ATTACHMENT A

Note 1 (IV Subsection 4)

Seismic Qualification Report SQ-CL055, Tab D (Page 12). Environmental & Seismic Report No. AQR-6738, Rev. 1 for ASCo Solenoid Valves (contained in Qualification Packages SQ-CL060, Tab D, Page 62, Table 5.2 and EQ-CL024, Tab F1, Att. A, P. A4-A10 and Tab C, Page C6). Seismic Qualification Package SQ-CL046 for the NAMCO limit switches (Tab D, P. 7-5) & Environmental Qualification Package EQ-CL008, Tab F-2, P. 9-24. Environmental Qualification Package EQ-CL094, Tab F-2, P. 6&7.

Note 2 (IV Subsection 8.C)

The valve was qualified by analysis. A static load test was performed on a representative Parent Valve (see Note 5 of this attachment for further information) to demonstrate operability. The other appurtenances such as NAMCO limit switches, Solenoid Valves, and Conax Seals were individually qualified by test and analysis (See SQ-CL055, Tab D, Qualification Summary P. 5-13 for further information.)

Note 3 (IV Subsection 9)

The following items were noted for the Qualification Documentation:

- SQ-CL046, Tab D, P. 5-7, identifies a test failure for maintained contact short travel type limit switches. This is not a concern; standard travel series limit switches are the only type used for 1RF019.
- 2) SQ-CL060: The required OBE G level was not enveloped. However, the magnitude and duration of the SSE testing more than fulfills the OBE Excitation requirements for the subject test. See comment #4 on P. Al0 of the SQ-CL Package for further explanation.
- EQ-CL008: See Tab C, Page C30.9, for identification and disposition of abnormalities.
- EQ-CL024: See P. 56-60. Also see Section 15 of Tab A, Checklist for disposition.
- 5) EQ-CL094: Abnormalities identified and justified in Sections 6.9.3 and 6.10 of Report IPS-1079.

ATTACHMENT A (CONT'D)

Note 4 (IV Subsection 19)

Item	Environmental Maintenance Frequency	Maintenance Activity	Reference
Valve & Actuator	4 Years	Replace Nitrile Diaphragms	MEQ-CL082
NAMCO Limitswitches	4.13 Years	Replace the EPDM O-Rings (Lever Shaft, Cover Screws)	EQ-CL008
NAMCO Limitswitches	27.79 Years	Replace Silicone Rubber (boot lever shaft, top & bottom cover gasket)	EQ-CL008
ASCO Solenoid Valves 1HSV-FC110 &	<pre>3.5 Years</pre>	Replace Solenoid Coil	EQ-CL024
lFSV-FC110	3.5 Years	Replace Elastometers (Gasket & Seats)	EQ-CL024

Conax seals must be used in the electrical installation of the Limitswitches and Solenoid Valves. In addition, the solenoid must be installed vertical and upright.

Note 5

To prove operability of the valve assembly a static pull test was performed on Parent Valve 3A (1-1/2" - 600#, ED-667 NS 45). Parent Valve 3A was chosen because the actuator is the same design and size and also the valve body is the same design and is within the generic family of valve 1RF019. Seismic loading on the Parent Valve was greater than specified for 1RF019 thus providing operability conservatism.

Valve 1RF019 Page C15 Final

ATTACHMENT B

Note 1: Valve Closing and Opening Times (II Subsection 6)

Air operated values by design are fast closing, therefore values were ordered with normal vendor opening and closing times. Exact tolerances were not specified.

Note 2: Control Signal Inputs (II Subsection 6)

This valve can be opened by remote-manual control switch 1HS-RF028, if there are no "RPV Level Low (Level 2)" or "Drywell Pressure High" LOCA signals present. It can be closed by 1HS-RF028 or automatically by the above mentioned LOCA isolation signals. (References 11 and 12)

Note 3: Functional Accessories (II Subsection 6)

Solenoid valve - ASCO No. 206-832-3U. (References 9, 11.a and 12)

CHECKLIST (S)

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PVOP NO. 1100C REVISION A

Pump & Valve Operability Assurance Review Checklist

SIGNATURE PAGE

Revision No. A

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System Engineer Review Oppor Kartal	Date 11-1-85
Equipment Qual. Review Monadan_	Date 11-1-85
Electrical Engineer Review M. M. Bearers	Date 11-1-85
C&I Engineer Review Ogun Kartal	Date 11-1-85
Reconcilation of I.C Walkdown Results	
	Date

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Illinois Power Company Clinton Power Station

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Project No. 4536-00 Valve Tag #1E31-F014 Page C2

REFERENCES

1.	Valve	Data	Sheet:	SO934	(Dated	1-20-83)

- 2. Valve Data Table: DT001
- 3. P&ID: M05-1041, Sheet 4, Rev. D
- Vendor drawings: Valcor Engineering Corporation, drawing 333170001, Rev. A
- 5. S&L Electrical schematics: E02 1LD99-007, E02 1VG99-014, E02 1VG99-015
- 6. S&L Specification: K-2882-16
- 7. Seismic Qualification reports: QR 52600-5940-2, Rev. C, MR-526-5960-1-1, Rev. A IPS-1079, Rev. D
- 8. Environmental Qualification Report: SKA 11129, Rev. D MR-526-5960-1-2, Rev. A S-1441, Rev. B
- 9. Mechanical EQ Report: IPS-1079, Rev. D
- 10. Code Data Reports: N19384 (Dated 6-1-84)

ii

Illinois Power Company Clinton Power Station

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PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

I.	PLAN	NT INFORMATION					
	1.	Name: Clinton Unit No.	1 2. Docket No.:50-461				
	3.	Utility: Illinois Power Company					
	4.	NSSS: General Electric Co. [] PWR [x] BWR					
	5.						
II.	GENERAL COMPONENT* INFORMATION						
	1.	Supplier: [] NSSS [4] BOR	Specification K-2882				
	2.	Location: a. Buildi	ng/Room Drywell				
		b. Elevat	ion 764'-0"				
		c. System	Leak Detection				
	3.	Component number on in-house drawings: 1E31-F014					
	4.	If component is a [] Pump	complete II.5.				
		If component is a 😡 Valve	complete II.6.				
	5.	General Pump Data					
		a. Pump	b. Prime-mover				
	Name	<u></u>	Name				
	Mfg.		Mfg.				
	Mode	1	Mode1				
	S/N		s/N				
	Type		Туре				
* The	compo	onent, whether pump or valve	is considered to be an				

assembly composed by the body, internals, prime-mover (or actuator) and functional accessories.

Size	b. Prime-mover (continue Size
Weight	Weight
Mounting Method	Mounting Method
Required B.H.P.	Н.Р.
Parameter Design Operating	Power requirements: (include normal, maximum and minimum).
Press	Electrical
Temp	
Flow	
Head	Other
Required NPSH at maximum	
	If Motor list:
Flow	Daty cycle
Available NPSH	Stall current
Operating Speed	Class of insulation
Critical Speed /Ref.	
List functional accessories:*	
	/
	/
List control signal inputs:	/

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

6. General Valve Data	
a. Valve 1E31-F014	b. Actuator (if not an integral unit)
Solenoid Valve Name (Position Indicating)	NameN/A
Mfg. Valcor Engineering Corp.	Mfg.
Model V526-5940-1	Model
S/N 2	S/N
Type Gate	Туре
Size 1"	Size
Weight 48 lbs. (max.)	Weight
Mounting Socket weld ends Method pipe mounted	Mounting Method
Required Torque N/A	Torque N/A
Ref.: Valve Data Sheet No. S09 Parameter Design Operating Press 50 psig -0.5" WC to 30 psig	Power requirements: (include normal, maximum
Temp 350°F 330°F	
Flow _13.2 SCFM _ 13.2 SCFM	
Max dP across valve 1.0"WC F	lef.
Closing time @ max dP * C /Ref. Craning time @ max dP * /Ret.	N/A
Power requirements for functio	nal
accessories, (if any) None	
List control signal inputs: 1E local control switch 1HS-LD001. It containment isolation signals of hi RPV level (Level 2) when 1HS-LD001	will also close automatically on gh drywell pressure and/or low

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and open). It can be opened by IHS-LDOOL if neither of the isolation signals referenced above is present.

*By design solenoid valves are fast closing. No special closing requirements necessary to accomplish safety function.

1.	Briefly describe components normal and safety functions: <u>1E31-F014 is a normally open (energized) solenoid</u> valve providing drywell fission products monitoring samples to iodine and particulate analysis systems. Safety function of 1E31-F014 is to close on isolation signal or at operator's discretion based on monitored values.					
2.	The components normal state is: [] Operating [] Standby					
3.						
	a. [] Emergency reactor b. [] Containment heat shutdown removal					
	c. [] Containment isolation d. [] Reactor heat remova					
	e. [] Reactor core cooling f. [X Prevent significant release of radio- active material to environment					
	g. Does the component function to mitigate the consequences of one or more of the following events? [X] Yes [] No If "Yes", identify.					
	[X] LOCA [] HELB [] MSLB					
	[] Other					
4.	Safety requirements:					
	[X] Intermittent Operation [X] During postulated event					
	[] Continuous Operation [3] Following postulated even					
	If component operation is required following an event, give approximate length of time component must remain operational.					
	100 days Post-LOCA (e.g., hours, days, etc.)					

manufacturer that are required to make the valve assembly operational, (e.g., limit switches).

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5.	For	VAI	LV	ES:

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	Does the component	[] Fail open 🕅 Fail closed [J rall as 1
	Is this the fail sa	afe position? [] Yes [] No	
	Is the valve used f	for throttling purposes? [] Ye	s [X] No
	Is the valve part o [] Yes [X] No	of the reactor coolant pressur	e boundary?
	Does the valve have [X]Yes []No	e a specific limit for leakage	?
	If "Yes" give	limit: 47.2 SCC/Min (Air)	
QUAL	IFICATION	Reference: Article 8, form 273D, pe Article 202.1.d of Specification K	r 2882.
1.	sections of the design to the component: ASN	number those applicable n codes and standards applica Æ Code Section III, Div. I, 1977 Addenda (Class 2 valve)* ANSI B16.3	
2.	Reference those quali	fication standards, used as a component: IEEE-317-1976, 4-1975	
	Reference those quali guide to qualify the IEEE-323-1974 and IEEE-34 Identify those parts	component: IEEE-317-1976.	
	Reference those quali guide to gualify the IEEE-323-1974 and IEEE-34 Identify those parts standards deleted or	of the above qualification	
	Reference those quali guide to gualify the IEEE-323-1974 and IEEE-34 Identify those parts standards deleted or program.	of the above qualification modified in the qualification	
2.	Reference those quali guide to gualify the IEEE-323-1974 and IEEE-34 Identify those parts standards deleted or program. Deleted: None	component: IEEE-317-1976, 4-1975 of the above qualification modified in the qualification Modified: None	
	Reference those quali guide to qualify the IEEE-323-1974 and IEEE-34 Identify those parts standards deleted or program. Deleted: <u>None</u> Have acceptance crite	component: IEEE-317-1976, 4-1975 of the above qualification modified in the qualification Modified: <u>None</u> ria been established and t plan(s) for the component?	

Are the margins* identified in the qualification 6. documentation? [] Yes [] No Ref. Documents: Inherent margins are discussed in detail . in TAB-C of EQ-CLO12. If component is a PUMP, complete IV.7. If component is a VALVE, complete IV.8. Pump operability has been demonstrated by: [] Analysis 7. [] Test [] Combination Mentify PUMP tests performed: a. N Shell hydrostatic b. [] Bearing temperature (ASME Section III) evaluations Ref. [] Seismic loading C . d. [] Vibration levels Ref. [] Exploratory vibration f. [] Seal leakage @ e. hydro press (Fundamental freq. Rev. g. [] Aging: [] Thermal h. [] Flow performance [] Mechanical Are curves provided [] Yes [] No Ref. Doc. Ref. i. [] Pipe reaction end i. 1 Others loads (nozzle loads) Ref. Doc. [] Extreme environment: k. [] Humidity [] Chemical [] Radiation Ref. Doc. 8. Valve operability has been demonstrated by: [] Analysis [] Test [x] Combination Identify VALVE tests performed: b. [X] Shell hydrostatic ** b. [] Cold cyclic (ASME Section III) List times: Open Valcor Engineering Corp. Closed Ref. Doc. Test Report . Ref. *. Margin is the difference between design basis parameters and the test parameters used for equipment qualification.

** Pneumatic

	c. [x] Seismic loading d. [] Hot cyclic Lists times: Open Closed
	Ref. SQ-CL218 Ref.
	e. & Exploratory vibration f. [] Main seat leakage (*) 50 Hz (by test) SQ-CL218
	Ref. SQ-CL218 . Ref.
	g. k] Aging: [] Thermal h. [] Back seat leakage [] Mechanical
	Ref. EQ-CL012 i. [] Pipe reaction end j. [X] Disc hydrostatic** loading Valcor Engineering Corp.
	Ref. Ref. Test Report k. [] Extreme environment 1. [] Flow interruption
	Ref. EQ-CL012 . Capability
	[x] Humidity Ref.
	[] Chemical
	(*) Represented in Disc Leakage Test
	Ref. m. [] Flow characteristics n. [] Others Are curves provided? Ref.
	[] Yes [] No
9.	As a result of any of the test (or analysis), were any deviation from design requirements identified? [] Yes [X] No If "Yes", briefly describe any changes made in tests (or analysis) or to the component to correct the deviation.
10.	Was the test component precisely identical (as to model, size, etc.) to the in-plant component? [] Yes [] No If "No", is installed component [] oversized or [] undersized?
10. 11.	etc.) to the in-plant component? [] Yes [] No If "No", is
	etc.) to the in-plant component? [] Yes [] No If "No", is installed component [] oversized or [] undersized? If type test was used to qualify the component, does the type test meet the requirements of IEEE 323-1974, Section 5?

**Pneumatic

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We	ere the qualification tests performed in sequence and on only ne component? [4] Yes [] No
C1	f "Yes" identify sequence, (e.g., radiation, seismic, cyclic, nermal, etc.): Thermal, cyclic, radiation, seismic, operation under LOCA condition. (Ref. EQ-CLO12)
If me	aging"* was performed, identify the significant aging echanisms: Thermal, Mechanical, Radiation
Id	dentify loads imposed (assumed) on the component for the alification tests (analysis) performed:
с.	[] Plants (shutdown loads) b. [] Extreme environment
с.	[x] Seismic load d. [x] Others Pool dynamic loads combination of LOCA/HELB
as	we component design specifications been reviewed in-house to sure they envelope all expected operating, transient, and cident conditions? [v] Yes [] No
no	es the component utilize any unique or special materials? xamples are special gaskets or packing, limitations on nferrous materials, or special coatings or surfaces.) Yes [x] No
If	"Yes", identify:
Pr	es component require any special maintenance procedures or actices, (including shorter periods between maintenance)? Yes [] No
If	"Yes", identify: See below: **
Is	the qualified life for the component less than 40 years? Yes 🛃 No If "Yes", what is the qualified life?

^{*} As outlined in Section 4.4.1 of IEEE-627 1980.

^{**} The EPR Bonnet o-ring and EPR flange o-ring of solenoid are qualified for 1.5 yearsand are required to be replaced with silicon o-rings during the first fuel outage. After that, the silicon o-rings must be replaced regularly every 5 years. Note: The valve is provided with a qualified seal 'Conax' to prevent moisture intrusion at the conduit connection. For qualification of 'Conax' seal see SQ-CL062 and EQ-CL094.

21. Information Concerning Qualification Documents for the Component

	Report Number	Report Title	Date		y/Organiza ing Report			/Organization ng Report
	QR52600- 5940-2, Rev. C	Qualification Test Report on Snupps Solenoid Valves	4-21-81	Valcor	Engineering	Corp.	S&L/CQD	(SQ-CL218)
2.	SKA 11129 Rev. D	Similarity Qualification Test Report	Transmittal Date 3-28-8		"	"	S&L/CQD	(EQ-CL012)
3.	MR526-5960- 1-2 Rev. A	Qualified Life	9-11-85	"	"	"	"	"
•	S-1441 Rev. B	Qualification Analysis	10-5-82	"	"	"	"	"
	MR526-5960- 1-1 Rev. A	Stress Analysis Report on Valves, Solenoid 1 Inch, Sch. 40, Class 150, A.C., N.C. Nuclear Service P/N 333170001 333170002 & 333170003	9-6-84	n	n	"	S&L/CQD	(SQ-CL423)
5.	IPS-1079 Rev. D	Design Qualification Test Report for Electrical Conductor Seal Assembly (ECSA) for Conax Corporation	5-21-84	Conax	Corporation		S&L/CQD	(SQ-CL062 & EQ-CL09

CHECKLIST(S)

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Pump & Valve Operability Assurance Review Checklist

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Revision No. A

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System Engineer Review Shallany	Date 10.28.85
Equipment Qual. Review MKmadom	Date 10.28.85
Electrical Engineer Review John M. Conkman	Date 10-29-85
C&I Engineer Review R.G. Wunder	Date 10-29-85
Reconcilation of IPC Walkdown Results	
	Date 10-29-85

Valve Tag #15X025B Page C2

2 3.

REFERENCES

1. PVOP Checklist

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- 2. Valve Data Sheet #CV-761
- 3. P&ID's -M05-1052-4R/M -M05-1115-1R/J
 - -M10-1115-3R/G
 - -M10-1115-7R/E
 - -M15-1115-3R/E
- 4. Vendor Drawings
 - -Ball Valve (Jamesbury) Carrier Corporation 0500H2072-V2-4 Sheets 1&2
 - -Milliampere Hydromotor Actuator (ITT General Controls) Carrier Corporation 0500H2072-V6-2 Sheets 1&2
- 5. S&L Electrical Schematics

-E02-1SX99-049R/D

-E02-1VX99-024R/H

6. S&L Specification

K-2905B

- 7. Seismic Qualification Reports
 - a. JHA-81-167 Rev. 0 & Addendum Dated 8/25/82 (SO-CL319) S&L/CQD
 - b. 5480-8230
 (SQ-CL265) S&L/CQD
- 8. Code Data Report
 - a. Carrier Certificate of Compliance
 - b. Nuclear Projects Quality Checklist Valve Serial No. ND-6584-01
 - c. Form NPV-IN Sheets 162

Valve Tag #15X025B Page C3

Illinois Power Company Clinton Power Station

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1.

PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

I.	PLAN	PLANT INFORMATION						
	1.	Name: Clinton Unit No.	1 2. Docket No.:50-461					
	3.	Utility: Illinois Power Co						
	4.	NSSS: General Electric Co.						
	5.	A/E: Sargent & Lundy						
II.	GENE	RAL COMPONENT* INFORMATION						
	1.	Supplier: [] NSSS [] BOP	Specification K-2905B					
	2.	Location: a. Buildi						
		b. Elevation 781'-0"						
		c. System	Shut Down Service Water					
	з.	Component number on in-hous	e drawings: 1SX025B					
	4.	If component is a [] Pump	complete II.5.					
		If component is a [X] Valve	complete II.6.					
	5.	General Pump Data						
		a. Pump	b. Prime-mover					
	Name	N/A	Name N/A					
	Mfg.		Mfg.					
	Mode		Model					
	S/N		S/N					
	Type		Туре					

* The component, whether pump or valve, is considered to be an assembly composed by the body, internals, prime-mover (or actuator) and functional accessories.

a. Pump (continued)	b. Prime-mover (continued)
Size N/A Weight	Size Weight
Mounting Method	Mounting Method
Required B.H	Н.Р.
Parameter Design Operating	Power requirements: (include normal, maximum and minimum).
Press	Electrical
Temp	
Flow	
Head	Other
Required NPSH at maximum	Ne Motor list:
Flow	Duty cycle
Available NPSH	Stall current
Operating Speed	Class of insulation
Critical Speed /Ref.	
List functional accessories:*	
List control signal inputs:	

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

6. General Valve Data a. Valve b. Actuator (if not an integral unit) Name Switchgear Heat Removal Name Milliampere Hydramotor SX Control Valve Acutator Mfg. ITT General Controls Mfg. Jamesbury Corp. Model BWS 2236PP Model NH 91 CD302 S/N ND-65846-01B S/N 253768-01-001 Type Ball Type Hydromotor Size 2" Size N/A Weight 14 1bs. Weight 95 lbs. Mounting Mounting Method _____Socket Weld Method Bolted to the Valve (Welded to Pipe) Required Torque 20 foot pounds Torque 65 ft-1bs (SQ-CL319) Ref.: Valve Data Sheet No. CV-761 Parameter Design Operating Power requirements: (include normal, maximum and minimum). Press 200 psig 88 psig Electrical 460V[±] 108 120°F 105°F Temp Flow 180 GPM 180 GPM Ref. 2, CV-761 Max :P across valve 200 psig Ref. 6, Form 1800Z Closing time @ max "P Other: []Pneumatic[]Hydraulic /Ref. /Ref. _____) See Note 1 Opening time @ max GP _____) Attachment "A" -----/Ref. Power requirements for functional accessories, (if any) None List control signal inputs: See Note 7 Attachment "A" List functional accessories: None

III. FUNCTION

 Briefly describe components normal and safety functions: The valve does not operate normally except during

testing or the loss of non-safety-related system. During the abnormal mode, the valve modulates the shutdown service water flow (SSW) to the condenser of the condensing unit VX06CB to maintain the head pressure at the set point.

- 2. The components normal state is: [] Operating [3] Standt
- 3. Safety function:
 - a. [] Emergency reactor b. [] Containment heat shutdown removal
 - c. [] Containment isolation d. [] Reactor heat removal
 - e. [] Reactor core cooling f. [] Prevent significant
 - release of radioactive material to environment
 - g. Does the component function to mitigate the consequences of ore or more of the following events? [X] Yes] No If "Yes", identify.
 - () LOCA [] HELB [] MSLB
 - [*] Other Auxiliary System (See Note 2 Attachment A)
- Safety requirements:
 - [] Intermittent Operation 🕅 During postulated event
 - X Continuous Operation
 X Following postulated ever

If component operation is required following an event, give approximate length of time component must remain operational.

100 days

(e.g., hours, days, etc.)

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the valve assembly operational, (e.g., limit switches).

5. For VALVES:

Does the component [] Fail open [N] Fail closed [] Fail as Is this the fail safe position? [] Yes [N] No Attachment A Is the valve used for throttling purposes? [N] Yes [] No Is the valve part of the reactor coolant pressure boundars [] Yes [N] No

Does the valve have a specific limit for leakage? [X]Yes []No

If "Yes" give limit: No visible leakage (spec. K-29055

IV. QUALIFICATION

 Reference by specific number those applicable sections of the design codes and standards applicable to the component: ASME Code, Section III, Div. 1, 1974 edition with Summer '76 Addenda (Class 3 valve)

 Reference those gualification standards, used as a guide to gualify the component: IEEE 344-1975

 Identify those parts of the above gualification standards deleted or modified in the gualification program.

Del	eted:	

Modified:

None

None

- 4. Have acceptance criteria been established and documented in the test plan(s) for the component? Yes [3] No [] Ref. Document: SQ-CL 265 (for actuator only) valve gualified by analysis
- 5. What is the expected failure mode that would keep the pump or valve assembly from performing its safety function? None

	documentation? [X] Yes [Ref. Documents: SQ-CL265] No	•
f compone	ent is a PUMP, complete IV.7		
f compone	ent is a VALVE, complete IV.	8.	
• Pun	np operability has been demo [] Test [] Combi	nstr nati	ated by: [] Analysis
Ide	entify PUMP tests performed:		N/A
a.	[] Shell hydrostatic (ASME Section III) Ref.	ь.	[] Bearing temperature evaluations
с.		d.	[] Vibration levels
e.	[] Exploratory vibration	ŧ.	<pre>[] Seal leakage @ hydro press</pre>
g.	(Fundamental freq.) Rev. [] Aging: [] Thermal	n.	[] Flow performance
	[] Mechanical	/	Are curves provided [] Yes
i.	Ref. Doc. [] Pipe reaction end	j.	Ref. [] Others
k.	loads (nozzle loads) Ref. Doc. [] Extreme environment:		
1	[] Humidity		
	[] Chemical		
Val	[] Radiation Ref. Doc. ve operability has been demo	net	at ad hus 11 hashesis
	Test [x] Combi		
Ide	ntify VALVE tests performed:		N/A (See N
b.	[X] Shell hydrostatic (ASME Section III)	b.	[; Cold cyclic Attachment List times: Open
Margin e test p	Ref. Doc. Vendor Data is the difference between d arameters used for equipment	esid	Ref.

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	c. [X] Seismic loading d. [] Hot cyclic Attachment "A" Lists times: Open Closed
	Ref. SQ-CL265 e. [] Exploratory vibration f. [% Main seat leakage
	Ref. Ref. Vendor Data g. [] Aging: [] Thermal h. [] Back seat leakage [] Mechanical
	Ref. i. [] Pipe reaction end j. [] Disc hydrostatic loading
	Ref. k. [] Extreme environment 1. [] Flow interruption capability
	[] Humidity Ref.
	[] Chemical
	[] Radiation Ref.
	<pre>m. [] Flow characteristics n. [] Other Are curves provided? Ref. [] Yes [] No</pre>
3.	As a result of any of the test (or analysis), were any deviation from design requirements identified? [] Yes [X] No If "Yes", briefly describe any changes made in tests (or analysis) or to the component to correct the deviation.
10.	Was the test component precisely identical (as to model, size, etc.) to the in-plant component? [] Yes [] No If "No", is installed component [] oversized or [] undersized?
11.	See Note 4, Attachment "A" If type test was used to qualify the component, does the type test meet the requirements of IEEE 323-1974, Section 5? [] Yes [] No N/A See Note 5, Attachment "A"
12.	Is component orientation sensitive? [X] Yes [] No [] Unknown If "Yes", does installed orientation coincide with qualified orientation? [X' Yes [] No See Note 6, Attachment "A"
13.	Is the component mounted in the same manner in-plant in which it was gualified (i.e., welded, same number and size bolts, etc.) [] Yes [X] No [] Unknown See Note 4, Attachment "A"

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Were the qualification tests performed in sequence and on only one component? [] Yes [] No N/A See Note 5, Attachment A
If "Yes" identify sequence, (e.g., radiation, seismic, cyclic, thermal, etc.):
If "aging"* was performed, identify the significant aging mechanisms: N/A See Note 5, Attachment A
Identify loads imposed (assumed) on the component for the qualification tests (analysis) performed:
c. [] Plants (shutdown loads) b. [] Extreme environment
c. [X] Seismic load d. [X] Others Pool Dynamic Loads and
Have component design specifications been reviewed in-house to assure they envelope all expected operating, transient, and accident conditions? [X] Yes [] No
Does the component utilize any unique or special materials? (Examples are special gaskets or packing, limitations on nonferrous materials, or special coatings or surfaces.) [] Yes [] No
If "Yes", identify:
Does component require any special maintenance procedures or practices, (including shorter periods between maintenance)? [] Yes 例 No
If "Yes", identify:

* As outlined in Section 4.4.1 of IEEE-627 1980.

1. 1. 1.

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21. Information Concerning Qualification Documents for the Component

-		Report Title	Date	Company/Organizaton Preparing Report	Company/Organization Reviewing Report
1.	JHA-81-167 Rev. 0 and Addendum Dated 8/25/82		12/28/81	John Henry Associates, Inc.	S&L/CQD (SQ-CL319)
2.	5480-8230	Seismic Qualification Test Report on Damper Assemblies. Part numbers, serial numbers, and peripheral equipment as listed in Table I for Clinton Nuclear Power Station Units 1 and 2, Contract K-2903, Project 4536-00	2/11/80	Approved Engineering Test Laboratories	S&L/CQD (SQ-CL265)

Valve Tag #1SX025B Page Cll

ATTACHMENT "A"

Notes

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- The valve is used for modulating duty, therefore, closing and opening times are not required.
- 2. Provide cocling for the Essential Switchgear Room to maintain acceptable environment for the electrical equipment.
- 3. Standby system is available. Also, manual by-pass is provided. Fail open position can cause condenser pressure to drop considerably making the operation of the cooling coil uncertain.
- 4. The ITT actuators (Model No. NH95) were tested along with damper assemblies (Ref. 2 of Item 21, Pg. 9). The damper assemblies are flexible while the valve assemblies are more rigid than the damper assemblies. Moreover, these valves have been provided with additional supports to make them even more rigid. Therefore, it is conservative to use these test results for valve assemblies. The testing was conducted with The operator mounted (Horizontal & Vertical) (Model No. NH95). These operators were operated before, during and after the seismic testing and no damage to the operator was noticed at any stage.

Model No. NH91 has same weight, C.G. location, and mounting configuration (same linear convertor, mounting bolts, bracket and weld) as Model No. NH95 (Ref. telecon memo in Tab G of SQ-CL 265).

Hence, Model No. NH91 is qualified on the basis of similarity.

Valve Tag #1SX025B Page Cl3 (Final)

Attachment "A"

- The valve is located in the mild zone, environmental qualification is not required.
- 6. When mounting the actuator
 - A. in a vertical position The control plate compartment must face upward.
 - B. in a horizontal or intermediary position Electric compartment must be in an upward position. (Ref. ITT Manual)
- 7. The valve is interlocked with the supply fan 1VX03CB of Switchgear Heat Removal System condensing serial 1VX06CB. Once the flow is proven, permissive is given to valve 1SX025B to modulate per output signal of controller IPC-VX114 to maintain 1VX06CB condenser pressure at a preset point. When supply fan is off 1SX025B closes. On loss of power, the valve will fail close by spring action.

PVOP NO.	300Ø
REVISION	A
Page Cl	

Pump & Valve Operability Assurance Review Checklist

SIGNATURE PAGE

Revision No.

System	Engineer	Review	I Wore ka
Equipme	nt Qual.	Review	Ula Borrens
Electri	cal Engir	neer Revi	ew Albeavens
C&I Eng	ineer Rev	view_Os	in Kartal
Reconci	lation of	IPC Wal	kdown Results

Date	11-1-85
Date	11-1-85
Date	11-4-85
Date	11- 4-85

Date

Tag No. 1E12-F021 Page C2

REFERENCES

1.	Anchor/Darling	Company	Drawing	No. 931	4658,	Revisi	on B,
	14"-300# welded	d-end car	bon stee	l globe	valve,	, with	SMB-2
	limitorque oper	rator.					

- Specification K-2866A, "ASME Section III Valves," Amendment 2, 08-22-85.
- 3. S&L drawing M06-1075, Sheet 15, Rev. AJ
- 4. S&L P&ID drawing M05-1075, Sheet 3, Rev. P
- S&L Electrical Schematics E02 1RH99-003, Rev. D; E02-1RH99-015, Rev. G and E02-1RH99-016, Rev. H.
- 6. Valve Data Sheet: MØ-008
- 7. Valve Data Table: DT009
- 8. Limitorque valve actuator qualification for Nuclear Service Report, S&L/CQD EQ-CL009.
- Analysis of environmental qualification of valves under Specification K-2866A, S&L/CQD MEQ-CL022.
- 10. SDRC Report No. 10959, Rev. o, S&L/CQD SQ-CL120.
- 11. Category I Seismic analysis of 14"-300# clobe valve with SMB-2-40 motor operator, S&L/CQD SQ-CL121.
- IPC record package, Baldwin Associates P.O. No. C-2513, RIR No. S-4681, dated 11-06-78, valve ser al No. E6214-85-1.
- 13. Residual Heat Removal System design specification, G.E. document No. 22A3139, Rev. 5.

Illinois Power Company Clinton Power Station

PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

1.	PLAN	PLANT INFORMATION					
	1.	Name: Clinton Unit No.	1 2. Docket No.:50-461				
	3.	Utility: Illinois Power C					
	4.	NSSS: General Electric Co. [] PWR [x] BWR					
	5.	A/E: Sargent & Lundy					
II.	GENE	RAL COMPONENT* INFORMATION					
	1.	Supplier: [] NSSS [] BOD	P Specification K2866A				
	2.	Location: a. Build:	ing/Room Aux. Bldg./Zone H-9				
		b. Elevat	ion 722'				
		c. System	n Residual Heat Removal				
	3.	Component number on in-hous	e drawings: 1E12-F021				
	4.	If component is a [] Pump	complete II.5.				
		If component is a 😡 Valve	complete II.6.				
	5.	General Pump Data					
		a. Pump	b. Prime-mover				
	Name		Name				
	Mfg.		Mfg.				
	Model	1	Model				
	S/N		S/N				
	Type		Type				
The	-						

* The component, whether pump or valve, is considered to be an assembly composed by the body, internals, prime-mover (or actuator) and functional accessories.

a. Pump (continued) Size Weight	<pre>b. Prime-mover (continued Size Weight</pre>
Mounting Method	Mounting Method
Required B.H.P.	Н.Р.
Parameter Design Operating	Power requirements: (include normal, maximum and minimum).
Press	Electrical
Temp	
Flow	
Head	Other

Required NPSH at maximum	If Motor list:
Flow	Duty cycle
Available NPSH	Stall current
Operating Speed	Class of insulation
Critical Speed /Ref.	
List functional accessories:*	

list control signal inputs:	
and a subact the subac	·····

. 1

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

Loop C Test Line Name Shut-off & Throttling Mfg. Anchor/Darling Model N/A Model N/A S/N_E6214-85-1 Type_Globe Size_14"-300# Weight 1,705# from Vendor dwg. (Excluding wt. of actuator) Mounting Method Butt welded to pipe Required Torque 11,120 In-# (From SQ-CL111, TAB D, P. 8) (1 Ref.: Valve Data Sheet No. MO-008	Actuator (if not an integral unit) meMotor Operator gLimitorque delSMB-2 N260712 peElectric ze40_ft# ight_535# (from SQ-CL111 TAB D, P unting thod_Bolted to the yoke
Name Shut-off & Throttling Name Mfg. Anchor/Darling Mf Model N/A Mc S/N_E6214-85-1 S/ Type_Globe Ty Size_14"-300# Si Weight 1,705# from Vendor dwg. We (Excluding wt. of actuator) Mo Mounting Mo Method Butt welded to pipe Me Required To (From SQ-CL111, TAB D, P. 8) (1) Ref.: Valve Data Sheet No. MO-008 Mo	<pre>g. Limitorque del SMB-2 N 260712 pe Electric ze 40 ft# ight 535# (from SQ-CL111 TAB D, P unting thod Bolted to the yoke</pre>
Model N/A Mc S/N_E6214-85-1 S/ Type_Globe Ty Size_14"-300# Si Weight 1,705# from Vendor dwg. We (Excluding wt. of actuator) Mo Mounting Mo Method Butt welded to pipe Me Required To Torque 11,120 In-# To (From SQ-CL111, TAB D, P. 8) (1) Ref.: Valve Data Sheet No. MO-008	del SMB-2 N 260712 pe Electric ze 40 ft# ight 535# (from SQ-CL111 TAB D, P unting thod Bolted to the yoke cque 23,328 In-#
S/N E6214-85-1 S/ Type Globe Ty Size 14"-300# Si Weight 1,705# from Vendor dwg. We (Excluding wt. of actuator) Mounting Mo Method Butt welded to pipe Me Required Torque 11,120 In-# To (From SQ-CL111, TAB D, P. 8) (1 Ref.: Valve Data Sheet No. MO-008	N 260712 pe Electric ze 40 ft# ight 535# (from SQ-CL111 TAB D, P unting thod Bolted to the yoke cque 23,328 In-#
Type <u>Globe</u> Ty Size <u>14"-300#</u> Si Weight <u>1,705#</u> from Vendor dwg. We (Excluding wt. of actuator) Mounting Mo Method Butt welded to pipe Me Required Torque <u>11,120</u> In-# To (From SQ-CL111, TAB D, P. 8) (1 Ref.: Valve Data Sheet No. MO-008	N 260712 pe Electric ze 40 ft# ight 535# (from SQ-CL111 TAB D, P unting thod Bolted to the yoke cque 23,328 In-#
Size 14"-300# Si Weight 1,705# from Vendor dwg. We (Excluding wt. of actuator) Mounting Mo Method Butt welded to pipe Me Required Torque 11,120 In-# To (From SQ-CL111, TAB D, P. 8) (1 Ref.: Valve Data Sheet No. MO-008	pe <u>Electric</u> ze <u>40 ft#</u> ight <u>535# (from SQ-CL111 TAB D, P</u> unting thod Bolted to the yoke
Weight 1,705# from Vendor dwg. We (Excluding wt. of actuator) Mounting Method Butt welded to pipe Required Torque 11,120 In-# (From SQ-CL111, TAB D, P. 8) Ref.: Valve Data Sheet No. MO-008	ight 535# (from SQ-CL111 TAB D, P unting thod Bolted to the yoke
(Excluding wt. of actuator) Mounting Mo Method Butt welded to pipe Me Required Torque 11,120 In-# To (From SQ-CL111, TAB D, P. 8) (1 Ref.: Valve Data Sheet No. MO-008	unting thod Bolted to the yoke
Method Butt welded to pipe Me Required Torque 11,120 In-# To (From SQ-CL111, TAB D, P. 8) (1 Ref.: Valve Data Sheet No. MO-008	thod Bolted to the yoke
Required Torque 11,120 In-# To (From SQ-CL111, TAB D, P. 8) (1 Ref.: Valve Data Sheet No. MO-008	rque 23,328 In-#
Torque 11,120 In-# To (From SQ-CL111, TAB D, P. 8) (1 Ref.: Valve Data Sheet No. MO-008	
Parameter Design Operating	Power requirements: (include normal, maximum and minimum).
Press 500 psig - 130 psig	Clectrical
Temp 200°F 120°F	460 VAC+10%
Flow 6060 gpm 6060 gpm	
Max 3P across valve 330 psi Ref.	K-2866A, FOrm 1810Q
Closing time @ max dP 210 sec. Othe /Ref. K-2866A max. Opening time @ max dP 210 sec. 1 /Ref. K-2866A max. Power requirements for functional	lone
accessories, (if any) None	

.

List functional accessories: * None

6. General Valve Data	
a. Valve	b. Actuator (if not an integral unit)
Name	Name
Mfg.	Mfg.
Model	Model
S/N	S/N
Туре	Туре
Size	Size
Weight	Weight
Mounting	
Method	Mounting Method
******************	Rechod
Required	
Torque	Torque
* *********************	torque
Ref.: Valve Data Sheet No. Parameter Design Operatin	g Power requirements: (include normal, maximum and minimum).
Press	Flootwigel
Temp	
Flow	
Max dP across valve	Ref
Closing time @ max dP /Ref.	Other: []Pneumatic[]Hydraulic
Opening time A may op	
Power requirements for function	onal
accessories, (if any)	
List control signal inputs:	
List functional accessories:	

*

III. FUNCTION

. .

	in LPCI injection line. Normally on standby in closed position. Fety function is to return to closed position in case it is in

ope	en position in testing mode. The closing action is signalled by
LOC	CA initiation.
2.	The components normal state is: [] Operating [4] Stands
3.	Safety function:
	a. [] Emergency reactor b. [] Containment heat shutdown removal
	c. [] Containment isolation d. [A] Reactor heat remov
	e. [] Reactor core cooling f. [] Prevent significan release of radio- active material to environment
	g. Does the component function to mitigate the consequences of one or more of the following events? .[x] Yes [] No If "Yes", identify.
	[] LOCA [] HELB [] MSLB
	[] Other
4.	Safety requirements:
	☑ Intermittent Operation ☑ During postulated event
	[] Continuous Operation [] Following postulated ev
	If component operation is required following an event, give approximate length of time component must remain operational.
	N/A (e.g., hours, days, etc.

5. For VALVES:

Does the component [] Fail open [] Fail closed [] Fail as

Is this the fail safe position? [X] Yes [] No

Is the valve used for throttling purposes? [] Yes [] No

Is the valve part of the reactor coolant pressure boundary [] Yes [] No

Does the valve have a specific limit for leakage? [x] Yes []No

If "Yes" give limit: 140 mL/hr

Ref. K-2866A (MSS-SP61)

IV. QUALIFICATION

- Reference by specific number those applicable sections of the design codes and standards applicable to the component: ASME Code, Section III, Class 2 Subarticle NC3500, Edition 1974 with Addenda Summer 1975 and Code Cases 1516-1, 1567, 1622, 1635-1, 1677
- Reference those qualification standards, used as a guide to qualify the component: IEEE344-1975,

IEEE323-1974, IEEE382-1972

 Identify those parts of the above qualification standards deleted or modified in the qualification program.

Deleted:

Modified:

None	
	and the second s

None

- Have acceptance criteria been established and documented in the test plan(s) for the component? Yes [] No [] Ref. Document: EQ-CL009, SQ-CL120
- 5. What is the expected failure mode that would keep the pump or valve assembly from performing its safety function? None

Are the margins* identified in the qualification 6. documentation? [3] Yes [] No Ref. Documents: EQ-CL009, SQ-CL120 If component is a PUMP, complete IV.7. If component is a VALVE, complete IV.8. Rump operability has been demonstrated by: [] Analysis 7. [] Test [] Combination Ident Ny PUMP tests performed: [] Shall hydrostatic b. [] Bearing temperature a. (ASM& Section III) evaluations Ref. [] Seismic loading C. d. [] Vibration levels Ref. [] Exploratory Vibration f. [] Seal leakage @ e. hydro press (Fundamental freq. Rev. [] Aging: [] Thermal g. h. [] Flow performance [] Mechanical Are curves provided [] Yes [] No Ref. Doc. Ref. i. [] Pipe reaction end Others j. loads (nozzle loads) Ref. Doc. [] Extreme environment: k. [] Humidity [] Chemical [] Radiation Ref. Doc. 8. Valve operability has been demonstrated by: [] Analysis [] Test [x] Combination Identify VALVE tests performed: a. [x] Shell hydrostatic b. [x] Cold cyclic Globe Valve Test Data Report List times: Open 82 Secs. (ASME Section III) Closed 82 Secs. Ref. Doc.for A/DV Ser.No.E6214-85-1Ref. As in 8(a) *. Margin is the difference between design basis parameters and the test parameters used for equipment gualification.

с.	[x] Seismic loading d. [] Hot cyclic Lists times: Open
	Ref. SQ-CL111 & 120 Ref. Closed
е.	
	Ref Ref. As in 8(a)
g.	<pre>(x) Aging: [x] Thermal h. [* Back seat leakage [x] Mechanical</pre>
i.	Ref. EQ-CL009 . Ref. As in 8(a) [] Pipe reaction end j. [J Disc hydrostatic loading
	Ref. As in 8(a)
k.	[3] Extreme environment 1. [] Flow interruption
	Ref FO_CLOOQ Capability
	k] Humidity Ref.
	[] Chemical
	k] Radiation
	Ref.
m.	[] Flow characteristics n. [] Others
	Are curves provided?
	Ref. [] Yes [] No
brie	a result of any of the test (or analysis), were any deviation m design requirements identified? [] Yes [x] No If "Yes", efly describe any changes made in tests (or analysis) or to component to correct the deviation.

Was	the test component precisely identical (as to model, size,
inst) to the in-plant component? [] Yes [] No If "No", is alled component [] oversized or [] undersized?
11130	arred component k) oversized or () undersized?
If t	ype test was used to qualify the component, does the type
test	meet the requirements of IEEE 323-1974, Section 5?
K K	(es [] No
Is c	component orientation sensitive? [] Yes [] No [] Unknown
If "	Yes", does installed orientation coincide with qualified
orie	intation? [x] Yes [] No See Attachment A, Note 1.
Is t	he component mounted in the same
15 6	he component mounted in the same manner in-plant in which it

was qualified (i.e., welded, same number and size bolts, etc.)

. .

9.

10.

11.

12.

13.

14. Were the qualification tests performed in sequence and on only one component? [2] Yes [] No

If "Yes" identify sequence, (e.g., radiation, seismic, cyclic, thermal, etc.): Thermal aging, mechanical aging, radiation aging seismic & LOCA

- 15. If "aging"* was performed, identify the significant aging mechanisms: thermal, mechanical and radiation
- 16. Identify loads imposed (assumed) on the component for the qualification tests (analysis) performed:

c. [] Plants (shutdown loads) b. [x] Extreme environment

c. 🕅 Seismic load

- d. [x] Others Pool dynamics plus operating loads
- 17. Have component design specifications been reviewed in-house to assure they envelope all expected operating, transient, and accident conditions? [x] Yes [] No
- 18. Does the component utilize any unique or special materials? (Examples are special gaskets or packing, limitations on nonferrous materials, or special coatings or surfaces.) [] Yes [4] No

If "Yes", identify:

It res , identity.

19. Does component require any special maintenance procedures or practices, (including shorter periods between maintenance)? [] Yes [X] No

If "Yes", identify:

20. Is the qualified life for the component less than 40 years? [] Yes [x] No If "Yes", what is the qualified life?

* As outlined in Section 4.4.1 of IEEE-627 1980.

21.	Information	Concerning	Qualification	Documents	for	the	Component
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Report Number	Report Title	Date	Company/Organizaton Preparing Report	Company/Organization Reviewing Report
B0058	Limitorque Valve Actuator Qualification for Nuclear Service Report	1-11-80	Limitorque	S&L/CQD EQ-CL009
N/A	Analysis of Environmental Qualification of Valves Under Spec. K2866A	11-18-83 ,	S&L/CQD	S&L/CQD MEQ-CL022
10959	SDRC Report No. 10959 Rev. D	12-15-81	SDRC	S&L/CQD SQ-CL120
78.004	Category I Seismic Analysis of 14"-300# Globe Valve With SMB-2-40 Motor Operator	6-1-78	Anamet Labs	S&L/CQD SQ-CL111

Valve Tag #1E12-F021 Page C13 (Final)

ATTACHMENT A

Note 1 (IV Subsection 12)

The valve was seismically qualified with the valve body in a horizontal axis and the stem vertical up. The operator is sensitive to orientation in regards to environmental condition, i.e., to prevent flooding of the limit switch rotor. The limit switch compartment should not face vertically down. To prevent the flow of lubricant into the motor, the motor should not be mounted vertically downward.

PVOP NO. <u>300B</u> REVISION <u>0</u> PAGE C1

Pump & Valve Operability Assurance Review Checklist

SIGNATURE PAGE

Revision No.

(n)
System Engineer Review Chadlington
Equipment Qual. Review 2 Berner
Electrical Engineer Review MBearen
C&I Engineer Review Commenter
Reconcilation of IPC Workdown Results

Date 11-1-85 Date //-/-85 Date 11-4-85 Date //-1-85

Date

3

Illinois Power Company Clinton Power Station

Project No. 4536-00 System: 1CC050 Page C2

REFERENCES

1. PVOP Checklist

• (),

2. Valve Data Sheet: MO-519

3. P&ID Drawings: M05-1032, Sheet 3

4. Vendor Drawing: A/DV Drawing #93-14769, Rev. B

- 5. S&L Electrical Schematic Drawings: E02-1CC99-009 & E02-1CC99-016
- 6. S&L Specification: K-2866, ASME Section III, Valves
- 7. Seismic Qualification Report:
 - a) Report No. 10959, SDRC, Rev. D, dated 12-15-81 (SQ-CL120)
 - b) Report No. 78.047, Category I Seismic Analysis of 6"-150# Flex Wedge Gate Valve with SMB-000-5 Motor Operator, dated 05-27-78 (SQ-CL104)
- Environmental Qualification Report: Report No. B0058, Limitorque Valve Actuator Qualification for Nuclear Service Report dated 01-11-80 (EQ-CL009)
- 9. Mechanical EQ Report: Analysis of Environmental Qualification of Valve under Specification K-2866A (MEQ-CL022)
- 10. Code Data Reports: Valve-1CC050; Identification No. E-6214-137-1
- 11. Miscellaneous: A/DV Information transmittal to S&L dated 10-18-85

Illinois Power Company Clinton Power Station

PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

1.	PLANT INFORMATION	
	1. Name: Clinton Unit	No. 1 2. Docket No.: 50-461
	3. Utility: Illinois Powe	
		Co. [] PWR [x] BWR
	5. A/E: Sargent & Lundy	
II.	GENERAL COMPONENT* INFORMATI	ON
î,	1. Supplier: [] NSSS 🕅	BOP Specification K-2866A
	2. Location: a. Bu	and the second
		evation 737'-0"
	c. Sy:	stem Component Cooling Water
	3. Component number on in-	nouse drawings: 100050
	4. If component is a [] Pu	Imp complete II.5.
	If component is a 😡 Va	alve complete II.6.
	5. General Pump Data	
	a. Pump	b. Prime-mover
	Name	Name
	Mfg.	Mfg.
	Mode1	Model
	s/N	S/N
	Туре	Type
Th	a component wheth	

* The component, whether pump or valve, is considered to be an assembly composed by the body, internals, prime-mover (or actuator) and functional accessories.

Siza	Size
	Weight
Mounting Method	Mounting Method
Required B.H.P.	Н.Р.
Parameter Design Operating	Power requirements: (include normal, maximum and minimum).
Press	Electrical
Temp	
Flow	
lead	Other

Required NPSH at maximum	If Motor list:
flow	Duty cycle
Available NPSH	Stall current
perating Speed	Class of insulation
critical Speed /hof.	
ist functional accessories:	
ist control signal inputs:	

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

6. General Valve Data a. Valve b. Actuator (if not an integral unit) CCW Supply Inside Name Drywell Isolation Valve Name Motor Operator Mfg. Anchor/Darling Valve Co. Mfg. Limitorque Corporation Model N/A Model SMB-000 S/N E6214-137-1 S/N 271910 Type Flex Wedge Gate Type Electric Size 6"-150# Size 5 ft.-1bs. (from SQ-CL068 Weight 350# (excluding actuator, Weight 130# Tab D, P.7) from vendor dwg) Mounting Mounting MethodButt welded to pipe Method Bolted to yoke Required Torque. 325.8 in-# Torque. 1,005 in-# . . (From SQ-CL104, Tab D) (From SQ-CLI04, Tab D) Ref.: Valve Data Sheet No. M0519 Parameter Design Operating Power requirements: (include normal, maximum and minimum). Press Electrical 140 psig 100 psig Temp 150⁰F 105°F 460 V - 10% Flow 1245 GPM ____1245 GPM Max dP across valve 140 PSID Ref. Spec. K-2866A, Form 1810Q Closing time @ max "P 32 sec. Other: []Pneumatic[]Hydraulic /Ref. M0519 Opening time @ max dP 32 sec. None /Ref. M0519 Power requirements for functional accessories, (if any) None List control signal inputs: Normally open valve closes by remotemanual control switch 1HS-CC009, or automatically on "high drywell (level 2) pressure" and/or "RPV level low (level2)" signal. It can be opened by 1HS-CC009 if neither one of these containment isolation signals is present.

List functional accessories:* None

III.	FUN	CTION					
	1.	 Briefly describe components normal and safety functions: Normal: Function is to remain in the open 					
	posi	tion to provide CC Water to equipment located inside containment.					
		ty: Function is to provide containment isolation on					
		ainment isolation signal.					
	2.	The components normal state is: [] Operating [] Standby					
	3.	Safety function:					
		a. [] Emergency reactor b. [] Containment heat shutdown removal					
		c. [X] Containment isolation d. [] Reactor heat removal					
		e. [] Reactor core cooling f. [] Prevent significant release of radio- active material to environment					
		g. Does the component function to mitigate the consequences of one or more of the following events? [K] Yes [] No If "Yes", identify.					
		[] LOCA [] HELB [] MSLB					
		[] Other					
	4.	Safety requirements:					
		[] Intermittent Operation [] During postulated event					
		[] Continuous Operation [] Following postulated event					
		If component operation is required following an event, give approximate length of time component must remain operational.					
	100 days (e.g., hours, days						
	57 50 50 A. S.C.	al accessories are those sub-components not supplied by the r that are required to make the valve assembly operational, t switches).					

5. For VALVES:

Does the component [] Fail open [] Fail closed [] Fail as

Is this the fail safe position? [] Yes [] No

Is the valve used for throttling purposes? [] Yes [X No

Is the valve part of the reactor coolant pressure boundary [] Yes [] No

Does the valve have a specific limit for leakage? [X]Yes []No

If "Yes" give limit: 60 mL/hr

IV. QUALIFICATION

Ref.: Per Specification K-2866A

 Reference by specific number those applicable sections of the design codes and standards applicable to the component: ASME Code, Section III, Class 2, Subarticle NC3500 Edition 1974 with Addenda Summer 1975 and Code Cases 1516-1, 1567, 1622, 1635-1 & 1677.

 Reference those qualification standards, used as a guide to qualify the component: IEEE 344-1975, IEEE-323-1974 and IEEE 382-1972.

- Tdentify the
- Identify those parts of the above qualification standards deleted or modified in the qualification program.

Deleted:

Modified:

None

None		
	 	 -

- 4. Have acceptance criteria been established and documented in the test plan(s) for the component? Yes [X] No [] Ref. Document: EQ-CL009, SQ-CL120
- 5. What is the expected failure mode that would keep the pump or valve assembly from performing its safety function? None

6. Are the margins* identified in the qualification documentation? [] Yes [] No Ref. Documents: E0-CL009, SQ-CL120 If component is a PUMP, complete IV.7. If component is a VALVE, complete IV.8. 7 Pump operability has been demonstrated by: [] Analysis [] Test [] Combination Identify PUMP tests performed: (ASME Section III) a. b. [] Bearing temperature evaluations Ref. [] Seismic loading C. d. [] Vibration levels Ref. [] Exploratory vibration f. [] Seal leakage @ е. hydro press (Fundamental Freq. Rev. [] Aging: g. [] The mal h. [] Flow performance [] Mechanical Are curves provided [] Yes [] No Ref. Doc. Ref. i. [] Pipe reaction end [] Others loads (nozzle loads) Ref. Doc. [] Extreme environment: k. [] Humidity [] Chemical [] Radiation Ref. Doc. 8. Valve operability has been demonstrated by: [] Analysis [] Test [x] Combination Identify VALVE tests performed: [X] Shell hydrostatic b. [X] Cold cyclic a. (ASME Section III) List times: Open 30 sec Closed 30 sec Ref. Doc. Ref. E *. Margin is the difference between design basis parameters and the test parameters used for equipment qualification.

с.	<pre>[x] Seismic loading d. [] Hot cyclic Lists times: Open Closed</pre>
e.	Ref. SO-CL104,120 [] Exploratory vibration f. k] Main seat leakage
g.	Ref. E K] Aging: K] Thermal h. [X] Back seat leakage K] Mechanical
i.	Ref. E [] Pipe reaction end j. [X] Disc hydrostatic loading
k.	Ref. E [X] Extreme environment 1. [] Flow Interruption capability
	Ref. EQ-CL009 . Ref.
	[] Chemical
	[x] Radiation Ref.
m.	[] Flow characteristics n. [] Others Are curves provided?
	Ref. [] Yes [] No
brie	a result of any of the test (or analysis), were any deviation m design requirements identified? [] Yes [K] No If "Yes", efly describe any changes made in tests (or analysis) or to component to correct the deviation.
etc	the test component precisely identical (as to model, size, .) to the in-plant component? [] Yes [K] No If "No", is talled component [] oversized or [X] undersized?
test	type test was used to qualify the component, does the type E meet the requirements of IEEE 323-1974, Section 5? Yes [] No
If '	component orientation sensitive? [2] Yes [] No [] Unknown "Yes", does installed orientation coincide with qualified entation? [3] Yes [] No (See Attachment Note 1)
Is t was	the component mounted in the same manner in-plant in which it qualified (i.e., welded, same number and size bolts, etc.) Yes [] No [] Unknown

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	Were the qualification tests performed in sequence and on only one component? [X] Yes [] No
1.11	If "Yes" identify sequence, (e.g., radiation, seismic, cyclic, thermal, etc.):
ī	If "aging"* was performed, identify the significant aging mechanisms: <u>Thermal, mechanical, and radiation</u> .
	Identify loads imposed (assumed) on the component for the qualification tests (analysis) performed:
ē	a. [] Plants (shutdown loads) b. k] Extreme environment
0	c. [X] Seismic load d. [X] Others <u>Pool dynamics plus</u> <u>operating loads</u> .
0	Have component design specifications been reviewed in-house to assure they envelope all expected operating, transient, and accident conditions? [] Yes [] No
n	Does the component utilize any unique or special materials? Examples are special gaskets or packing, limitations on conferrous materials, or special coatings or surfaces.)] Yes [X] No
I	f "Yes", identify:
P	Noes component require any special maintenance procedures or ractices, (including shorter periods between maintenance)?] Yes [9] No
I	f "Yes", identify:
I	s the qualified life for the component less than 40 years?] Yes Ŋ No If "Yes", what is the qualified life?

As outlined in Section 4.4.1 of IEEE-627 1980.

21.	Information	Concerning	Qualification	Documents	for	the	Component
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Report Number	Report Title	Date	Company/Organizaton Preparing Report	Company/Organization Reviewing Report		
B0058	Limitorque Valve Actuator Qualification for Nuclear Service Report	1-11-80	Limitorque	S&L/CQD	EQ-CL009	
N/A	Analysis of Environmental Qualification of Valves Under Spec. K-2866A	11-18-83	S&L/CQD	S&L/CQD	MEQ-CL022	
10959 •	SDRC Report No. 10959 Rev. D	12-15-81	SDRC	S&L/CQD	SQ-CL120	
78.047	Category I Seismic Analysis of 6" 150# FLEX Wedge Gate Valve with SMB-000-5 Motor Operator	05-27-78	ANAMET Labs	S&L/CQD	SQ-CL104	
	Number B0058 N/A 10959	Number Title B0058 Limitorque Valve Actuator Qualification for Nuclear Service Report N/A Analysis of Environmental Qualification of Valves Under Spec. K-2866A 10959 SDRC Report No. 10959 Rev. D 78.047 Category I Seismic Analysis of 6" 150# FLEX Wedge Gate Valve with SMB-000-5 Motor	NumberTitleDateB0058Limitorque Valve Actuator Qualification for Nuclear Service Report1-11-80N/AAnalysis of Environmental Qualification of Valves Under Spec. K-2866A11-18-8310959SDRC Report No. 10959 Rev. D12-15-8178.047Category I Seismic Analysis of 6" 150# FLEX Wedge Gate Valve with SMB-000-5 Motor05-27-78	NumberTitleDatePreparing ReportB0058Limitorque Valve Actuator Qualification for Nuclear Service Report1-11-80LimitorqueN/AAnalysis of Environmental Qualification of Valves Under Spec. K-2866A11-18-83S&L/CQD10959SDRC Report No. 10959 Rev. D12-15-81SDRC78.047Category I Seismic Analysis of 6" 150# FLEX Wedge Gate Valve with SMB-000-5 Motor05-27-78ANAMET Labs	NumberTitleDatePreparing ReportReviewingB0058Limitorque Valve Actuator Qualification for Nuclear Service Report1-11-80LimitorqueS&L/CQDN/AAnalysis of Environmental Qualification of Valves Under Spec. K-2866A11-18-83S&L/CQDS&L/CQD10959SDRC Report No. 10959 Rev. D12-15-81SDRCS&L/CQD78.047Category I Seismic Analysis of 6" 150# FLEX Wedge Gate Valve with SMB-000-5 Motor05-27-78ANAMET LabsS&L/CQD	

Valve Tag #1CC050 Page Cl2 (Final)

ATTACHMENT A

Note 1

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The valve and actuator are seismically qualified with the valve body in a horizontal axis and the stem vertical up. The operator is sensitive to orientation in regards to environmental condition, i.e., to prevent flooding, the limitswitch compartment should not face vertically down. Also to prevent the flow of lubricant into the motor, the motor should not be mounted vertically downward.

PVOP NO. 200D REVISION A PUMP 1SX01PA

Pump & Valve Operability Assurance Review Checklist

SIGNATURE PAGE

Revision No. A

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System Engineer Review Reliable	D
Equipment Qual. Review 11 Autor	D
Electrical Engineer Review Roberth Beaven	D
CaI Engineer Review Communication	D
Reconcilation of IPC Walkdown Results	

Date 11- 7-85 Date 11-7-85 late 11-7-55 ate 11-7-85

Date

REFERENCES

- 1. PVOP CHECKLIST
- 2. P&ID DRAWING: M05-1052, Sheet 1, Rev. W M10-1052, Sheet 2, Rev. C M15-1052, Sheet 6, Rev. C M15-1068, Sheet 2, Rev. B
- 3. VENDOR DRAWINGS:
 - a) T-38303-1, Certified Pump Curve, Rev. 0
 - b) T-38303-2, Pump Test Data, Rev. 0
 - c) 2E-2548, Rev. D; Pump Outline, Rev. D
- 4. S&L ELECTRICAL SCHEMATIC DRAWINGS: E02-1SX99-001, Rev. V
- 5. S&L SPECIFICATIONS: K-2828A, Amend. 3
- 6. EQUIPMENT FOUNDATION DRAWING: S22-1018, Rev. AB S22-1011, Rev. R S22-1017, REv. V S21-1610, Rev. AB
- 7. SEISMIC QUAL REPORT:
 - Report No. DC1502, Seismic Analysis for Essential Service Water Pumps, dated 08/28/78 (CQD-019841, SQ-CL015)
 - b) Report No. EL-8-5017-90307-01, Dynamic Qualification of A.C. Induction Motors, dated 05/30/79 (CQD-013414, SQ-CL016)
- 8. CODE DATA/HYDROSTATIC TEST/PUMP PERFORMANCE REPORTS
- 9. MISCELLANEOUS
 - a) Contract Specification K-2828A (PD Page Section)
 - Byron-Jackson's Code Data Report/Hydrostatic Test Report
 - c) Byron-Jackson Pump Performance Test

Illinois Power Company Clinton Power Station

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PUMP AND VALVE OPERABILITY ASSURANCE REVIEW

I.	PLAN	PLANT INFORMATION							
	1.	Name: Clinton Unit No.	1 2. Docket No.: 50-461						
	3.								
	4. NSSS: General Electric Co. [] PWR [x] BWI								
	5.	5. A/E: Sargent & Lundy							
II.	GENE	GENERAL COMPONENT* INFORMATION							
*	1.	Supplier: [] NSSS [3] BOR	Specification K-2828A						
		Location: a. Buildi							
	b. Elevation 699'-0"								
		c. System	Shutdown Service Water						
	3.	3. Component number on in-house drawings: 1SX01PA							
	4.	4. If component is a [x] Pump complete II.5.							
		If component is a [] Valve complete II.6.							
	5.	General Pump Data							
		a. Pump	b. Prime-mover						
	Name	Shutdown Service Water Pump	NameMotor						
	Mfg.	Byron Jackson	Mfg. Siemens-Allis						
	Model	37KXL 2-stage VCT	Model Frame 3754						
	S/N	761-C-0091	S/N 8-5017-90307-1						
		2-stage, VCT	Type Squirrel-cage induction						
* Th	e compo	nent, whether pump or valve,	, is considered to be an						

assembly composed by the body, internals, prime-mover (or actuator) and functional accessories.

Size 37KXL, 2-stage, VCT Weight 22,800 lbs. (dry) Mounting Anchored to floor through Method mounting plate by bolts Required B.H.P. 1317			Size Frame 3754, 1500HP, 89 Weight 11,100 lbs. Mounting Bolted to the pump Method supporting disc H.P. 1500					
					Parameter	resign	Operating	Power requirements: (include normal, maximum and minimum).
					Press	200 psig	120 psig	Electrical
Temp	32-95° F.	32-95° F.	4000 ± 10% Volts					
Flow	16,500 GPM	16,500 GPM	-25% - 1 minute					
Head	2 <u>75</u> ft. H ₂ 0	275 ft. H ₂ 0	Other					
Reguired N	PSH at maxi	mum	If Motor list:					
Flow 7 ft	. Submergence		Duty cycle <u>Continuous</u> Stall current 1170					
Available	NREH 12'-10"	Submergence						
Operating	Speed 890 R	PM	Class of insulation F					
Critical S	peed 1405	/Ref. C						
List funct	ional acces	sories:*	None.					
ist contro	ol signal i	nputs:	See Attachment B.					
		5.6. S S S						

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the pump assembly operational, (e.g., coupling, lubricating oil system, etc.)

6. General Valve Data Valve a.\ b. Actuator (if not an integral unit) Name Name Mfg. Mfg. Model Model S/N S/N Type Туре Size Size Weight Weight -----Mounting Mounting Method Method N/A Required Torque Torque Ref .: Valve Data Sheet No. Parameter Design Operation Power requirements: (include normal, maximum and minimum). Press Electrical Temp Flow Ref. Max dP across valve Closing time @ max "P Other: [] Poeumatic[] Hydraulic /Ref. Opening time @ max dP /Ref. Power requirements for functional accessories, (if any) List control signal inputs: List functional accessories:

T.	II	F	FI	JN	C	T	Τ/	2	6.7
۰	-		1. 1	634	100	*	1.1	1	1.8

 Briefly describe components normal and safety functions: Normal: Function is to be on standby. Safety:
 Function is to operate to provide cooling water to equipment served by Division 1 Shutdown Service Water System as a result of remotemanual initiation or automatic initiation start signals. Pump will stop with operator's remote-manual initiation.

2. The components normal state is: [] Operating [x] Standby

Safety function:

C.

- a. [x] Emergency reactor b. [] Containment heat shutdown removal
 - [] Containment isolation d. [] Reactor heat removal

£.

e. [] Reactor core cooling

 Prevent significant release of radioactive material to environment

- g. Does the component function to mitigate the consequences of one or more of the following events? [x] Yes [] No If "Yes", identify.
 - M LOCA [] HELB [] MSLB

M Other Loss of Offsite Power (LOOP)

- Safety requirements:
 - [] Intermittent Operation 🕅 During postulated event
 - A Continuous Operation (A) Following postulated event

If component operation is required following an event, give approximate length of time component must remain operational.

100 days (e.g., hours, days, etc.)

* Functional accessories are those sub-components not supplied by the manufacturer that are required to make the valve assembly operational, (e.g., limit switches).

5. For VALVES:

Does the component [] Fail open [] Fail closed [] Fail as Is this the fail safe position? [] Yes [] No

Is the valve used for throttling purposes? [] Yes [] No

Is the valve part of the reactor coolant pressure boundary [] Yes [] No

N/A

Does the valve have a specific limit for leakage?

If "Yes" give limit:

IV. QUALIFICATION

 Reference by specific number those applicable sections of the design codes and standards applicable to the component: <u>ASME B&PV Code</u>, Section III, Class -3, 1974 Edition with Winter 1975 Addenda.

 Reference those qualification standards, used as a guide to qualify the component:

IEEE: -344 - 1975

 Identify those parts of the above qualification standards deleted or modified in the qualification program.

Deleted:

Modified:

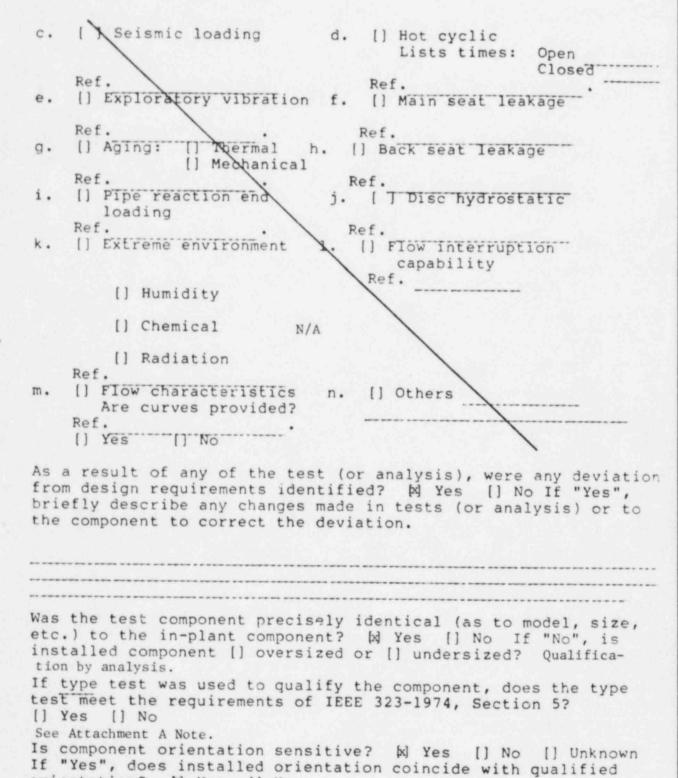
None. None.

- 4. Have acceptance criteria been established and documented in the test plan(s) for the component? Yes [] No [] Ref. Document:
- 5. N/A Qualification by analysis. What is the expected failure mode that would keep the pump or valve assembly from performing its safety function? None.

PVOP No. 200 D Page C8 6. Are the margins* identified in the qualification documentation? [] Yes [] No Ref. Documents: Ba & Bb, Tab D If component is a PUMP, complete IV.7. If component is a VALVE, complete IV.8. Pump operability has been demonstrated by: [] Analysis 7. [] Test [X] Combination Identify PUMP tests performed: a. [X] Shell hydrostatic b. [] Bearing temperature (ASME Section III) evaluations evaluations Ref. D [] Seismic loading d. [] Vibration levels C. Ref. e. [] Exploratory vibration f. [] Seal leakage @ hydro press (Fundamental freq.) Rev. g. [] Aging: [] Thermal h. [x] Flow performance [] Mechanical Are curves provided [x] Yes [] No Ref. Doc. Ref. E i. [] Pipe reaction end j. [] Others ----loads (nozzle loads) Ref. Doc. -----k. [] Extreme environment: [] Humidity [] Chemical _____ [] Radiation Ref. Doc. Valve operability has been demonstrated by: [] Analysis [] Test [x] Combination Identify VALVE tests performed: b. [] Shell hydrostatic b. [] Cold cyclic (ASME Section III) List times: Open N/A Closed Ref. Doc. Ref.

*. Margin is the difference between design basis parameters and the test parameters used for equipment gualification.

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13. Is the component mounted in the same manner in-plant in which it was qualified (i.e., welded, same number and size bolts, etc.)

X Yes [] No [] Unknown

Were the qualification tests performed in sequence and on only one component? [] Yes [] No N/A					
I t	f "Yes" identify sequence, (e.g., radiation, seismic, cyclic hermal, etc.):				
Im	f "aging"* was performed, identify the significant aging				
Ic	dentify loads imposed (assumed) on the component for the ualification tests (analysis) performed:				
c.	[] Plants (shutdown loads) b. [] Extreme environment				
	A Seismic load d. [3] Others Operational				
	we component design specifications been reviewed in-house t sure they envelope all expected operating, transient, and conditions? [2] Yes [] No				
no	es the component utilize any unique or special materials? Examples are special gaskets or packing, limitations on inferrous materials, or special coatings or surfaces.) Yes [A] No				
If	"Yes", identify:				
1	es component require any special maintenance procedures or actices, (including shorter periods between maintenance)? Yes [X] No				
If	"Yes", identify:				
Is []	the qualified life for the component less than 40 years? Yes [x] No If "Yes", what is the qualified life?				

* As outlined in Section 4.4.1 of IEEE-627 1980.

21. Information Concerning Qualification Documents for the Component

Item No.	Report Number	Report Title	Date	Company/Organizaton Preparing Report	Company/Organization Reviewing Report
A	DC-1502 Rev. A	Seismic Analysis for Essential Service Water Pumps	08/28/78	Byron Jackson	S&L - CQD (CQD-019841, SQ-CL015)
В		Dynamic Qualification of A.C. Induction Motors	05/30/79	Siemens-Allis	S&L - CQD (CQD-013414, SQ-CL016)

ATTACHMENT A

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Note: The pump is located in a mild zone; Environmental Qualification is not required.

PYOP No. 200 D Page C13 (Final)

ATTACHMENT B

Shutdown Service Water Pump 1A will start with the following signal inputs:

- 1. Pump start has been initiated by remote-manual control switch 1HS-SX007 in the presence of permissive A, or
- 2. Pump start has been initiated by remote shutdown panel control switch (HS) 1C61HS503 in the presence of permissive B, or
- 3. Strainer 1SX01FA outlet pressure below setpoint signal in the presence of permissive A, or
- 4. No pump stop action has been initiated by pump remote-manual control switch IHS-SX007 and there is either "high drywell pressure" or "RPV level low (level 2)" signal present along with permissive A.

The pump will stop with the following signal inputs:

- Pump stop has been initiated by remote shutdown panel control switch (HS) 1C61HS503 in the presence of permissive B, or
- Pump stop has been initiated by 1HS-SX007 in the presence of permissive A.

PERMISSIVES (1SX01PA)

1

- A Remote shutdown transfer switch (HS) 1C61HS501 is in "NORMAL" position.
- B Remote shutdown transfer switch (HS) 1C61HS501 is in "EMERGENCY" position,