

Work Order Details

SP99587: 4B FEED PUMP VOLUTE REPLACEMENT

4B FEED PUMP VOLUTE REPLACEMENT

Asset: SP2024 PUMP, BOILER FEED 4B, UNIT 4 **Model:** 6HDX15A
Location: SP04.WA.FW.S Unit 04 Boiler Feedwater Pump Boiler Feed Pump 4B 004B **Product Version:**

Sched Start:	5/12/2019	Business Unit:	SPUR-Spurlock Station	Job Plan:	
Sched Finish:	5/18/2019	Priority:	3 (Low - Routine)	Supervisor:	
Target Start:	10/5/2018	Work Type:	CD-Condition Directed	Lead:	
Target Finish:	10/5/2018	Status:	WCMP	Vendor:	
Actual Start:		Parent:		Reported by:	02289
Actual Finish:		Failure Class:		Reported by:	Jody McCord
Report Date:	10/5/2018	Problem Code:		Defect Tag:	NO
Craft:	M3M4	PM Number:		Commodity:	
Unit:	4	GL Account:	512000~SP04~400~3000~03200~BASE~00~00000~00000	Comdty Grp:	
Outage:	Outage	UNID:		Classification:	

Tasks										
WO Task	Task ID	Craft	Description	Status	Sched Start	Sched Finish	Est Hours	Actual Start	Actual Finish	
SP99587-1	10	M3M4	Remove insulation blankets on 4B feed pump barrel heads & connection piping for volute replacement Remove insulation blankets on 4B feed pump barrel heads & connection piping for volute replacement	WCMP	10/5/18	10/5/18	1			
Instructions:										
SP99587-2	20	M3M4	Remove instrumentation equipment from 4B feed pump bearings & barrel heads for volute replacement Remove instrumentation equipment from 4B feed pump bearings & barrel heads for volute replacement	WCMP	4/14/19	4/29/19	1			
Instructions:										
SP99587-3	30	M3M4	Disassemble 4B feed pump & inspect Disassemble 4B feed pump & inspect	WCMP	10/5/18	10/5/18	1			
Instructions:										
SP99587-4	40	M3M4	Perform offsite modifications to 4B feed pump suction head	WCMP	10/5/18	10/5/18	1			

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Tasks										
WO Task	Task ID	Craft	Description	Status	Sched Start	Sched Finish	Est Hours	Actual Start	Actual Finish	
			Perform offsite modifications to 4B feed pump suction head							
<i>Instructions:</i>										
SP99587-5	50	M3M4	Re-assemble 4B feed pump using rebuilt volute from 4A in 2018	WCMP	12/16/18	5/17/19	1			
			Re-assemble 4B feed pump using rebuilt volute from 4A in 2018							
<i>Instructions:</i>										
SP99587-6	60	M3M4	Re-install instrumentation equipment from 4B feed pump bearings & barrel heads for volute replacement	WCMP	4/21/19	5/17/19	1			
			Re-install instrumentation equipment from 4B feed pump bearings & barrel heads for volute replacement							
<i>Instructions:</i>										
SP99587-7	70	M3M4	Re-install insulation blankets on 4B feed pump barrel heads & connection piping for volute replacement	WCMP	10/5/18	5/4/19	1			
			Re-install insulation blankets on 4B feed pump barrel heads & connection piping for volute replacement							
<i>Instructions:</i>										
SP99587-8	80	M3M4	(Carryover Work) Re-install instrumentation equipment from 4B feed pump bearings & barrel heads for volute replacement	WCMP	4/21/19	5/11/19	10			
			(Carryover Work) Re-install instrumentation equipment from 4B feed pump bearings & barrel heads for volute replacement							
<i>Instructions:</i>										
SP99587-9	90	M3M4	(Carryover Work) Re-install instrumentation equipment from 4B feed pump bearings & barrel heads for volute replacement	WCMP	5/5/19	5/18/19	10			
			(Carryover Work) Re-install instrumentation equipment from 4B feed pump bearings & barrel heads for volute replacement							
<i>Instructions:</i>										
SP99587-10	100	M3M4	(Carryover Work) Re-install instrumentation equipment from 4B feed pump bearings & barrel heads for volute replacement	WCMP	5/12/19	5/18/19	10			
			(Carryover Work) Re-install instrumentation equipment from 4B feed pump bearings & barrel heads for volute replacement							
<i>Instructions:</i>										

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Planned Labor									
Task ID	Craft	Skill Level	Labor	Vendor	Contract	Qty	Hours	Rate	Line Cost
10	M3M4		02271			1	10:00		
10	INSUL					1	03:00		
10	INSUL					1	03:00		
10	OPERATIONS		03407			1	10:00		
10	M3M4		02290			1	10:00		
20	INS					1	02:00		
20	INS					1	02:00		
20	INS					1	02:00		
20	INS					1	02:00		
20	INS					1	02:00		
20	M3M4		02271			1	10:00		
20	M3M4		02290			1	10:00		
20	INS		02734			1	02:00		
20	INS		03255			1	02:00		
20	INS		03255			1	02:00		
20	INS		03143			1	02:00		
20	INS		03255			1	02:00		
20	INS		03143			1	02:00		
30	M3M4		02290			1	30:00		
30	M3M4					1	30:00		
30	M3M4		02271			1	30:00		
30	OPERATIONS		02234			1	07:00		
30	OPERATIONS		02591			1	10:00		
30	OPERATIONS		03494			1	10:00		
30	OPERATIONS		02894			1	10:00		
30	OPERATIONS		03077			1	16:00		
30	M1M2					1	10:00		
30	M1M2					1	20:00		
40	M-CONTRACTOR					1	20:00		
40	M-CONTRACTOR					1	20:00		
50	OPERATIONS					1	20:00		
50	M3M4					1	40:00		
50	M3M4					1	40:00		
50	M1M2					1	40:00		
50	M1M2					1	10:00		

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Planned Labor										
Task ID	Craft	Skill Level	Labor	Vendor	Contract	Qty	Hours	Rate	Line Cost	
50	M3M4					1	40:00			
60	INS					1	06:00			
60	M1M2					1	08:00			
60	INS					1	20:00			
60	INS					1	20:00			
60	INS					1	02:00			
60	INS					1	04:00			
60	INS					1	04:00			
60	INS					1	02:00			
70	INSUL					1	04:00			
70	INSUL					1	04:00			
70	INS					1	20:00			
70	INS					1	20:00			
80	INS		02074			1	02:00			
80	INS		03143			1	02:00			
90	INS					1	20:00			
90	INS					1	20:00			
100	INS					1	10:00			
100	INS					1	10:00			
Total Planned Labor:										

Planned Materials						
Task ID	Item	Description	Storeroom	Qty	Unit Cost	Line Cost
30	000000000000030904	Bearing, Thrust Shoe	SWHSA	0	0.00	0.00
30	000000000000035775	O-Ring, Volute to Barrel, 1/4"Thk	SWHSA	0	0.00	0.00
30	000000000000037463	Gasket, Suction Cover to Barrel, 24.062 X 25.438 X 175, 604-	SWHSA	0	0.00	0.00
30	000000000000037453	Ring, Back-Up, Teflon	SWHSA	0	0.00	0.00
30	000000000000037452	Gasket, Volute To Barrel	SWHSA	0	0.00	0.00
30	000000000000037451	Gasket, Discharge Cover to Barrel, 24.688 X 26.062 X .175, 3	SWHSA	0	0.00	0.00
30	000000000000035795	Bushing, Stuffing Box, Coupling End	SWHSA	0	0.00	0.00
30	000000000000035794	Bushing, Stuffing Box, Thrust End	SWHSA	0	0.00	0.00
30	000000000000035786	O-Ring, Stuffing Box, 1/4"Thk	SWHSA	0	0.00	0.00
30	000000000000035785	O-Ring, Deflector, 1/8"Thk	SWHSA	0	0.00	0.00
30	000000000000035784	O-Ring, Shaft, 1/8"Thk	SWHSA	0	0.00	0.00
30	000000000000035783	O-Ring, Stuffing Box, Inside, 1/4"Thk	SWHSA	0	0.00	0.00

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Planned Materials						
Task ID	Item	Description	Storeroom	Qty	Unit Cost	Line Cost
30	000000000000035777	O-Ring, Take Off Tube, 1/8"Thk	SWHSA	0	0.00	0.00
30	000000000000035779	O-Ring, Bushing Flange, Stuffing Box, 1/4"Thk	SWHSA	0	0.00	0.00
30	000000000000035781	O-Ring, Cover to Volute, 1/4"Thk	SWHSA	0	0.00	0.00
50	000000000191301504	Gasket, Spiralwound, 316SS, Flexicarb, 1", 150#	SWHSA	0	0.00	0.00
50	000000000000050690	Volute	SWHS4	0	0.00	0.00
50	000000000000035821	Tensioner, Superbolt (W/Washer)	SWHSA	0	0.00	0.00
50	000000000000035787	Gasket, Sight Flow to Housing, 3-1/4"W x 8-1/2"Lg x 7/64"Thk	SWHSA	0	0.00	0.00
50	000000000000035786	O-Ring, Stuffing Box, 1/4"Thk	SWHSA	0	0.00	0.00
50	000000000191303504	Gasket, Spiralwound, 316SS, Flexicarb, 2-1/2", 150# (W/Flang	SWHSA	0	0.00	0.00
50	000000000000034847	Lubricant, Jack Bolt	SWHSA	0	0.00	0.00
50	000000000191303006	Gasket, Spiralwound, 316SS, Flexicarb, 900-1500#, 2" (W/Flan	SWHSA	0	0.00	0.00
50	000000000191301505	Gasket, Spiralwound, 316SS, Flexicarb, 1", 300-600#	SWHSA	0	0.00	0.00
50	000000000191301504	Gasket, Spiralwound, 316SS, Flexicarb, 1", 150#	SWHSA	0	0.00	0.00
50	000000000000035780	O-Ring, Inlet Thrust & Radial Flange, 1/8"Thk	SWHSA	0	0.00	0.00
Total Planned Materials:						0.00

Planned Services						
Task ID	Service Item	Description	Vendor	Qty	Unit Cost	Line Cost
10		LABOR FOR REP/TECH DARRYL GIES	0000014125	25675	1.00	0.00
10		LABOR FOR PUMP SUCTION HEAD MO	0000014125	2500	1.00	0.00
10		PARTS FOR PUMP SUCTION HEAD MO	0000014125	2605	1.00	0.00
10		U4/2019 LABOR FOR DISMANTLE, C	0000014125	3625	1.00	0.00
10		U4/2019 LABOR FOR REP DARRYL G	0000014125	25675	1.00	0.00
10		U4/2019 LABOR FOR PUMP SUCTION	0000014125	2500	1.00	0.00
10		U4/2019 PARTS FOR PUMP SUCTION	0000014125	2605	1.00	0.00
10		LABOR TO DISMANTLE, CLEAN, INS	0000014125	3625	1.00	0.00
Total Planned Services:						0.00

Actual Labor							
Task ID	Craft	Skill Level	Labor	Vendor	Contract Num	Regular Hours	Premium Hours
10	M3M4		02290			10:00	00:00
10	M1M2		02271			10:00	00:00
10	OPERATIONS		03407			10:00	00:00
20	M3M4		02290			10:00	00:00
20	M1M2		02271			10:00	00:00
20	INS		03255			06:00	00:00

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Actual Labor									
Task ID	Craft	Skill Level	Labor	Vendor	Contract Num	Regular Hours	Premium Hours		
20	INS		03143			04:00	00:00		
20	INS		02734			02:00	00:00		
30	OPERATIONS		03077			16:00	00:00		
30	M1M2		02271			20:00	00:00		
30	OPERATIONS		02894			10:00	00:00		
30	OPERATIONS		03494			38:00	00:00		
30	OPERATIONS		02591			10:00	00:00		
30	OPERATIONS		02234			07:00	00:00		
30	M3M4		02290			20:00	00:00		
80	INS		03143			02:00	00:00		
80	INS		02074			02:00	00:00		

Actual Materials									
Task ID	Item Description	Binum	Qty	Unit Cost	Line Cost				
30	0000000000000: Gasket, Suction Cover to Barrel, 24.062 X 25.438 X 175, 604-	GW-00-03	1	0.00	0.00				
30	0000000000000: Ring, Back-Up, Teflon	GW-00-02	1	0.00	0.00				
30	0000000000000: Bearing, Thrust Shoe	00D-D47-007	1	0.00	0.00				
30	0000000000000: O-Ring, Volute to Barrel, 1/4"Thk	00D-D04-003	1	0.00	0.00				
30	0000000000000: O-Ring, Take Off Tube, 1/8"Thk	00D-D04-003	1	0.00	0.00				
30	0000000000000: O-Ring, Bushing Flange, Stuffing Box, 1/4"Thk	00D-D03-004	2	0.00	0.00				
30	0000000000000: O-Ring, Cover to Volute, 1/4"Thk	00D-D03-004	1	0.00	0.00				
30	0000000000000: O-Ring, Stuffing Box, Inside, 1/4"Thk	00D-D04-001	2	0.00	0.00				
30	0000000000000: O-Ring, Shaft, 1/8"Thk	00D-D03-008	1	0.00	0.00				
30	0000000000000: O-Ring, Deflector, 1/8"Thk	00D-D03-007	3	0.00	0.00				
30	0000000000000: Gasket, Volute To Barrel	GW-00-04	1	0.00	0.00				
30	0000000000000: Gasket, Discharge Cover to Barrel, 24.688 X 26.062 X .175, 3	GW-00-03	1	0.00	0.00				
30	0000000000000: Bushing, Stuffing Box, Coupling End	00D-D02-004	1	0.00	0.00				
30	0000000000000: Bushing, Stuffing Box, Thrust End	00D-D02-004	1	0.00	0.00				
30	0000000000000: O-Ring, Stuffing Box, 1/4"Thk	00D-D04-001	2	0.00	0.00				
50	0000000000000: O-Ring, Inlet Thrust & Radial Flange, 1/8"Thk	00D-D03-007	3	0.00	0.00				
50	0000000000000: Gasket, Sight Flow to Housing, 3-1/4"W x 8-1/2"Lg x 7/64"Thk	00D-D02-006	1	0.00	0.00				
50	0000000001913: Gasket, Spiralwound, 316SS, Flexicarb, 1", 150#	FGC-00A-001	1	0.00	0.00				
50	0000000001913: Gasket, Spiralwound, 316SS, Flexicarb, 2-1/2", 150# (W/Flang	FGC-00A-001	4	0.00	0.00				
50	0000000000000: O-Ring, Stuffing Box, 1/4"Thk	00D-D04-001	5	0.00	0.00				
50	0000000001913: Gasket, Spiralwound, 316SS, Flexicarb, 1", 300-600#	FGC-00A-002	4	0.00	0.00				

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Actual Materials					
Task ID	Item Description	Binum	Qty	Unit Cost	Line Cost
50 000000001913	Gasket, Spiralwound, 316SS, Flexicarb, 1", 150#	FGC-00A-001	1	0.00	0.00
50 000000001913	Gasket, Spiralwound, 316SS, Flexicarb, 900-1500#, 2" (W/Flan	FGC-00B-002	1	0.00	0.00
50 000000000000	Lubricant, Jack Bolt	00E-E01-004	1	0.00	0.00
Total Actual Materials:					0.00

Log			
Date	Class	Created By	Description
06/19/2019 10:47:33 AM	WORKORDER	02661 Jansen Germann	4B Volute

EPS had a rep onsite and the Volute pump was replaced with a rebuilt one. Any information on the old pump can be found through Wes Trusdale. Completed by Sizemore, Reese

Report EK_woprint.rptdesign



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CLOSING REPORT

CUSTOMER : East Kentucky Power Cooperative **REPORT DATE** : 12/19/19
PLANT NAME : Spurlock Generating Station **REPORT NO.** : 56132-CR1
CITY/STATE : Maysville, Kentucky **CUST. ORDER** : EKPC-0000128549

EQUIPMENT : 8 X 10 X 14 HDB-11 Stage **COPY** : Jody McCord
SERVICE : Boiler Feed
MANF. : Byron-Jackson **FILE** : 56132
SERIAL NO. : Spare Element from Unit 4B **PAGE** : 1 of 2

I. SUMMARY OF REPAIRS AND ASSEMBLY

The subject pump arrived at EPS on 06/06/19 and was completely disassembled, cleaned, and inspected; a detailed inspection report, recommended repair specification, and price quotation were submitted on 06/24/19. Approval to proceed with the recommended repairs was received with an official purchase order on 06/28/19

The pump was completely repaired and rebuilt in accordance with EPS specification 56132-RS1; the total indicated runout of the rotating element was under .0025", and all floats and lifts measured to acceptable values. Overall, there were no issues with the pump repair or assembly. The completed pump element was ready for shipment on 10/04/19 and was returned to Spurlock the following day.

Please see the following page of this report for a dimensional summary of all critical fits and clearances. It should be noted that the stationary fits (volute casing and wear rings) as received were either .002" (1st stage) or .003" (series) over the nominal design diameter. Since the volute was otherwise in excellent condition, the corresponding rings were all appropriately sized to restore the design fit clearance. The groove widths were also marginally over the expected design width, and the widths on the stationary rings were all dimensioned to restore design axial clearance.

BY: *Aaron Stull*
Aaron Stull

CLOSING REPORT

CUSTOMER : EKPC - Spurlock
REPORT NO. : 56132-CR1

REPORT DATE : 12/19/19
PAGE : 2 of 2

II. SUMMARY OF FITS AND CLEARANCES							
IMPELLER / SHAFT FITS AND ASSEMBLY				STATIONARY FITS AND RUNNING CLEARANCES			
Impeller, 1 st Stage	Fit Bore	4.7570	4.7575	Casing	Fit Bore	8.378	8.378
Shaft	Fit Turn	4.7595	4.7600	Series Case Ring	Fit Turn	8.376	8.377
Resulting Fit		-0.0030	-0.0020	Resulting Fit		0.001	0.002
Design Fit		-0.0030	-0.0020	Design Fit		0.001	0.003
1-2 and Balance Sleeve	Fit Bore	4.9910	4.9920	Casing	Fit Bore	8.378	8.378
Shaft	Fit Turn	4.9935	4.9940	Stage Piece - All	Fit Turn	8.376	8.377
Resulting Fit		-0.0030	-0.0015	Resulting Fit		0.001	0.002
Design Fit		-0.0030	-0.0020	Design Fit		0.001	0.003
Impeller, 2 nd & 7 th Stg.	Fit Bore	4.9960	4.9965	Casing	Fit Bore	9.002	9.002
Shaft	Fit Turn	4.9985	4.9990	Case Rings, 1 st Stg.	Fit Turn	9.000	9.001
Resulting Fit		-0.0030	-0.0020	Resulting Fit		0.001	0.002
Design Fit		-0.0030	-0.0020	Design Fit		0.001	0.003
Impeller, 3 rd & 8 th Stg.	Fit Bore	5.0010	5.0015	1 st Stage Case Ring, TE	Clr. Bore	8.478	8.479
Shaft	Fit Turn	5.0035	5.0040	1 st Stage Impeller, TE	Clr. Turn	8.463	8.464
Resulting Clr.		-0.0030	-0.0020	Resulting Clr.		0.014	0.016
Design Clearance		-0.0030	-0.0020	Design Clr.		0.014	0.016
Impeller, 4 th & 9 th Stg.	Fit Bore	5.0060	5.0065	1 st Stage Case Ring, CE	Clr. Bore	8.224	8.225
Shaft	Fit Turn	5.0085	5.0090	1 st Stage Impeller, CE	Clr. Turn	8.209	8.210
Resulting Clr.		-0.0030	-0.0020	Resulting Clr.		0.014	0.016
Design Clearance		-0.0030	-0.0020	Design Clr.		0.014	0.016
Impeller, 5 th & 10 th Stg.	Fit Bore	5.0110	5.0115	Series Case Ring	Clr. Bore	7.859	7.860
Shaft	Fit Turn	5.0135	5.0140	Series Impeller	Clr. Turn	7.844	7.845
Resulting Clr.		-0.0030	-0.0020	Resulting Clr.		0.014	0.016
Design Clearance		-0.0030	-0.0020	Design Clr.		0.014	0.016
Impeller, 6 th & 11 th Stg.	Fit Bore	5.0170	5.0175	Series Stage Piece	Clr. Bore	6.234	6.235
Shaft	Fit Turn	5.0195	5.0200	Series Impeller	Clr. Turn	6.219	6.220
Resulting Clr.		-0.0030	-0.0020	Resulting Clr.		0.014	0.016
Design Clearance		-0.0030	-0.0020	Design Clr.		0.014	0.016
TOTAL FLOAT			.315	Center Stage Piece	Clr. Bore	6.047	6.048
CE LIFT (0°, 90°)		.012	.015	Impeller, 6 th & 11 th Stg.	Clr. Turn	6.032	6.033
TE LIFT (0°, 90°)		.014	.017	Resulting Clr.		0.014	0.016
PARALLEL LIFTS		0.009	0.010	Design Clr.		0.014	0.016