

Work Order Details

SP193805: U3 BFP 3A volute replacement (EPS rep onsite 3/22/23)

Asset: SP5371 Unit 03 Boiler Feedwater Pump Boiler Feed Pump 3A
Location: SP03.WA.FW.S Unit 03 Boiler Feedwater Pump Boiler Feed Pump 3A

Model:
Product Version:

Sched Start:	3/22/2023	Business Unit:	SPUR-Spurlock Station	Job Plan:	
Sched Finish:	3/22/2023	Priority:	3 (Low - Routine)	Supervisor:	
Target Start:	3/18/2023	Work Type:	CD-Condition Directed	Lead:	03715
Target Finish:		Status:	WCMP	Vendor:	
Actual Start:	2/21/2023	Parent:		Reported by:	02289
Actual Finish:	4/19/2023	Failure Class:		Reported by:	Jody McCord
Report Date:	1/9/2023	Problem Code:		Defect Tag:	NO
Craft:	M3M4	PM Number:		Commodity:	
Unit:	3	GL Account:	512000~SP03~400~3000~03200~OVRHL~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	
SP193812	5	M3M4	*PRE - stage tool/work table, parts containers, coupling removal tooling, volute cradle & spare/rebuilt volute	WCMP	3/22/23	3/22/23	0			
<i>Instructions:</i>										
SP193806	10	INSUL	Remove insulation blankets from 3A BFP for volute replacement	WCMP	3/22/23	3/22/23	0			
<i>Instructions:</i>										
SP193807	20	INS	Remove instrumentation equipment from 3A BFP barrel heads & piping for volute replacement	WCMP			0			
<i>Instructions:</i>										
SP193808	30	M3M4	Replace 3A BFP for volute	WCMP	3/22/23	3/24/23	0			

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Tasks										
WO Task	Task ID	Craft	Description	Status	Sched Start	Sched Finish	Est Hours	Actual Start	Actual Finish	

Instructions:

SP193809	40	INS	Re-install instrumentation equipment removed from 3A BFP barrel heads & piping for volute replacement	WCMP			0			
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Instructions:

SP193810	50	INSUL	Re-install insulation blankets removed from 3A BFP for volute replacement	WCMP	3/22/23	3/22/23	0			
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Instructions:

SP193814	60	M3M4	*POST - prepare volute removed for shipment to EPS shop for rebuild	WCMP	3/22/23	3/22/23	0			
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Instructions:

Planned Labor										
Task ID	Craft	Skill Level	Labor	Vendor	Contract	Qty	Hours	Rate	Line Cost	
5	M3M4					2	08:00			
10	INSUL					2	03:00			
20	INS					2	04:00			
30	M3M4					3	50:00			
40	INS					2	06:00			
50	INSUL					2	05:00			
60	M3M4					2	05:00			
Total Planned Labor:										

Actual Labor										
Task ID	Craft	Skill Level	Labor	Vendor	Contract Num	Regular Hours	Premium Hours			
	ALL		SP_TL_OT			00:00	00:00			
	ALL		SP_TL_RG			00:00	00:00			
	M3M4		03715			08:00	02:00			

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Actual Labor								
Task ID	Craft	Skill Level	Labor	Vendor	Contract Num	Regular Hours	Premium Hours	
	M3M4		03715			08:00	02:00	
	M3M4		03715			08:00	02:00	
	M3M4		03715			08:00	02:00	
	ALL		SP_TL_RG			00:00	00:00	
	ALL		SP_TL_OT			00:00	00:00	
	M3M4		03715			08:00	02:00	
	M3M4		03715			08:00	02:00	
	M3M4		03715			08:00	02:00	
	M3M4		03715			00:00	10:00	
	M3M4		03715			08:00	02:00	
	M3M4		03715			08:00	02:00	
	ALL		SP_TL_RG			00:00	00:00	
	M3M4		03715			08:00	02:00	
	M3M4		03715			08:00	02:00	
	M3M4		03715			08:00	00:00	
	ALL		SP_TL_OT			00:00	00:00	
	M3M4		03715			08:00	02:00	

Actual Services						
Task ID	Service Item	Description	Vendor	Qty	Unit Cost	Line Cost
		Contract labor to help assist EKPC on feed pump rebuild & cooling tower WOs on T&M under contract #1262	0000022751	28,872.63	1.00	28872.63
Total Actual Services:						28872.63

Log			
Date	Class	Created By	Description
04/19/2023 08:12:23 AM	WORKORDER	02661 Jansen Germann	

The volute was replaced with a rebuilt one. The rebuilt one had a slight drag during installation and the EPS rep recommended sending it back to their shop for inspection. It was found that anti seize inside of the pump had hardened and caused this drag. The pump was cleaned and sent back then installed. Tucker

Report EK_woprint.rptdesign



ENGINEERED PUMP SERVICES, INC.

624 Perkins Drive · Mukwonago, WI 53149-1454
(262) 363-9002 · (800) 657-0845 · fax (262) 363-9013
www.epspumps.com · email: eps@epspumps.com

CLOSING REPORT

CUSTOMER : East Kentucky Power Cooperative **REPORT DATE** : 12/22/23
PLANT NAME : Spurlock Generating Station **REPORT NO.** : 57180-CR1
CITY/STATE : Maysville, Kentucky **CUST. ORDER** : EKPC-
0000162081

EQUIPMENT : 8 X 10 X 14 HDB-11 Stage **COPY** : Jody McCord
SERVICE : Boiler Feed
MANF. : Byron-Jackson **FILE** : 57180
SERIAL NO. : Spare Element from Unit 3A **PAGE** : 1 of 2

I. SUMMARY OF REPAIRS AND ASSEMBLY

The subject pump arrived at EPS on 04/25/23 and was completely disassembled, cleaned, and inspected; a detailed inspection report, recommended repair specification, and price quotation were submitted on 08/18/23. Approval to proceed with the recommended repairs was received with an updated purchase order on 08/21/23.

The pump was completely repaired and rebuilt in accordance with EPS specification 57180-RS1; the total indicated runout of the rotating element was under .002", 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 11/20/23 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.

Included with the repaired inner element were installation parts (bushings, gaskets, o-rings, etc.) required for a complete pump changeout in the field. During the spring 2024 outage, I will plan to inventory everything to make sure the additional parts included are fully accurate and completely account for everything that is needed.

BY: Aaron Stull
Aaron Stull

CLOSING REPORT

CUSTOMER : EKPC - Spurlock
REPORT NO. : 57180-CR1

REPORT DATE : 12/22/23
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	4.7550	4.7555	Casing	Fit Bore	8.378	8.378
Shaft	Fit Turn	4.7575	4.7580	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			.264	Center Stage Piece	Clr. Bore	6.047	6.048
CE LIFT (0°, 90°)		.011	.017	Impeller, 6 th & 11 th Stg.	Clr. Turn	6.032	6.033
TE LIFT (0°, 90°)		.012	.018	Resulting Clr.		0.014	0.016
PARALLEL LIFTS		0.017	0.017	Design Clr.		0.014	0.016

CLOSING REPORT

CUSTOMER : EKPC - Spurlock
REPORT NO. : 57180-CR1

REPORT DATE : 12/22/23
PAGE : 3 of 2

Digital Photographs:

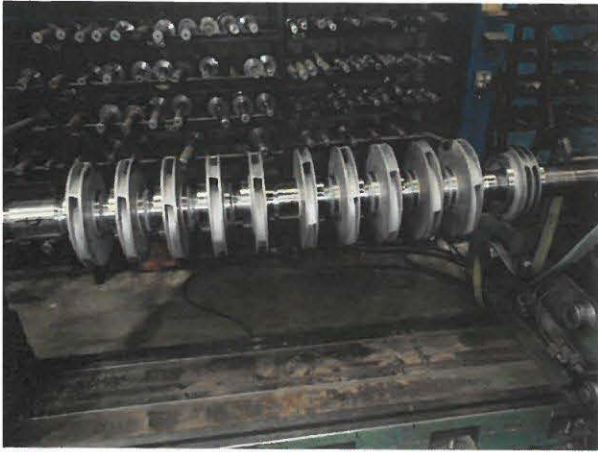


Photo 1: Rotor Dynamic Balance



Photo 2: Trial Fit Of Stationary Rings



Photo 3: Rotor Cradle Check In Casing



Photo 4: Completed Element In Shipping Crate



CEMB



Costruzioni Elettro Meccaniche ing. Buzzi & C. S.p.a.

Balancing Certificate

Customer : XYZ S.p.A		Date : 11/08/2023 07:10:10
Prog. N° 1	57180 rotor balance	
ISO G: 1.00	Total Weight: 990.00 lb	Service Speed: 3600 rpm

	Tol (g)	r (inch)	Dim (inch)	
P1	3.026	7.75	a	20.00
ST	6.051	7.75	b	52.25
P2	3.026	7.75	c	23.00

Initial Unbalances:

P1 (g)	ST (g)	P2 (g)
8.55	19.99	11.52
288.7°	282.6°	278.1°

Residual Unbalances:

P1 (g)	ST (g)	P2 (g)
1.74	3.09	1.64
260.2°	283.2°	307.7°

Measuring speed = 733 rpm

Operator: Rossi Mario

Sign : _____

NOTES:

P= 1 57180 rotor balance

F1 P2
a b c

P1 P2

ST
3.09 g
283.0°
0.5° tol

0.0 6.1

1.74 g 1.64 g

260° 308°
0.6° tol 0.5° tol

0°

ST+ P1+P2 TR

L3

QUIT

DIM

↺ ↻ ↻ ↻

Detailed description: The image shows a digital control panel for a rotor balance machine. At the top, it displays 'P= 1 57180 rotor balance'. Below this is a diagram of a rotor with three correction points labeled 'a', 'b', and 'c', with 'F1' and 'P2' labels. The main display area is divided into several sections. A central green box shows 'ST' (Static Top) measurement: 3.09 g, 283.0°, and 0.5° tol. Below this are two large green boxes for 'P1' and 'P2' (Plane 1 and Plane 2) measurements. P1 shows 1.74 g, 260°, and 0.6° tol. P2 shows 1.64 g, 308°, and 0.5° tol. At the bottom, there is a section for '0°' with a checkmark icon, and a 'TR' (Tilt) indicator with a checkmark. On the right side, there is a vertical column of buttons: a refresh button, a button with a double arrow, a button with a circular arrow, a 'DIM' (dimming) button, and a 'QUIT' button. The left side has a 'L3' label and a red arrow pointing right.