



ENGINEERED PUMP SERVICES, INC.

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CLOSING REPORT

CUSTOMER	: East Kentucky Power Cooperative	REPORT DATE	: 12/30/24
PLANT NAME	: Spurlock Generating Station	REPORT NO.	: 57093-CR1
CITY/STATE	: Maysville, Kentucky	CUST. ORDER	: EKPC- 0000162701
EQUIPMENT	: 17" MQX1H5-6	COPY	: Eddy Meek
SERVICE	: Condensate Water	FILE	: 57093
MANF.	: Byron Jackson	PAGE	: 1 of 2
SERIAL NO.	: Unit # 1B		

I. SUMMARY OF REPAIRS AND ASSEMBLY

The subject pump arrived at EPS on 9/29/23 for disassembly, cleaning, and inspection. Updated repair specification 57093-RS2 was sent to Spurlock the following week. Approval to proceed with the recommended repairs was immediately received in order to meet the required outage timeline for unit #1.

This repair made use of the spare lower element and parts repaired under EPS order 52557 (EKPC-0000023948) during the fall of 2004. This was discovered to be the best course of action after initial inspection revealed the existing element would require a new 1st stage impeller and one new series casing. This element will be repaired under a separate order after the critical outage timeline is over. Overall, there was only one setback during the project. The repaired mechanical seal was not completed as quickly as requested by our aftermarket repair shop. This did not, however, negatively impact the installation schedule at Spurlock.

The pump was completely repaired and rebuilt in accordance with EPS specification 57093-RS2; the total indicated runouts of the new shafts were all under .0015", and each impeller turn runout was under .0015". The final float of the completed assembly was .974", and the pump spun freely when lifted. Apart from the delay previously mentioned, there were no issues with the pump repair or assembly. The completed pump assembly was returned to Spurlock on 11/08/23.

Overall, the impellers and casings on this pump seem to be in better condition than many others of this make and model that we have repaired. The base materials (leaded bronze and cast iron) are still a concern, but this pump should be able to go through at least one more duty cycle with only a standard overhaul. Some of the casings have been upgraded to 400 series stainless steel, and a new 1st stage impeller made of upgraded aluminum bronze can be procured in advance of a future pump overhaul.

BY: *Aaron Stull*
Aaron Stull

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II. SUMMARY OF FITS AND CLEARANCES							
All Impellers	Fit Bore	2.700	2.701	Impeller Retainers	Fit Bore	2.702	2.703
Shaft	Fit Turn	2.698	2.699	Shaft	Fit Turn	2.698	2.699
Resulting Fit		.001	.003	Resulting Fit		.003	.005
Design Fit		.001	.003	Design Fit		.004	.006
Suction Bell Ring	Clr. Bore	11.264	11.266	Series Case Ring	Clr. Bore	9.250	9.251
1st Stage Impeller	Clr. Turn	11.249	11.250	Series Impeller	Clr. Bore	9.235	9.236
Resulting Clr.		.014	.016	Resulting Clr.		.014	.016
Design Clr.		.014	.016	Design Clr.		.014	.016
Lower Bearings	Clr. Bore	2.707	2.708	Upper Bearings	Clr. Bore	2.444	2.445
Shaft	Clr. Turn	2.698	2.699	Shaft	Clr. Turn	2.436	2.437
Resulting Clr.		.008	.010	Resulting Clr.		.007	.009
Design Clr.		.008	.010	Design Clr.		.007	.009
Element Registers	Fit Bore	14.365	14.366	Lower Column	Fit Bore	14.391	14.392
Element Registers	Fit Turn	14.363	14.364	Upper Casing	Fit Turn	14.389	14.390
Resulting Clr.		.001	.003	Resulting Clr.		.001	.003
Design Clearance		.001	.003	Design Clr.		.001	.003
Upper Registers	Fit Bore	13.016	13.017	Discharge Head	Fit Bore	5.734	5.735
Upper Registers	Fit Turn	13.014	13.015	Stuffing Box	Fit Turn	5.732	5.733
Resulting Fit		.001	.003	Resulting Clr.		.001	.003
Design Fit		.001	.003	Design Clearance		.001	.003



Photo 1: Spare Element from Spurlock Stores



Photo 2: Completed Pump Assembly

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FINAL REPAIR SPECIFICATION

Ref. EPS order : 57093
Customer order: EKPC-0000162701
Page : 1 of 3 pages

Quotation no. : 67934-Q2
Quotation date : 10/31/23
Ref. EPS report : 57093-CR1

East Kentucky Power Cooperative
Spurlock Generating Station
Byron-Jackson 17" MQX1H5 – 6 Stage Condensate Pump

(* This repair makes use of the spare lower element and parts repaired under EPS order 52557 (EKPC-0000023948) during the fall of 2004.

A1) RECOMMENDED NEW PARTS (FROM EKPC STOREROOM)

Qty.	Part Description	Material
1	Intermediate Shaft	410 Stainless Steel (DVSR)
1	Upper Shaft	410 Stainless Steel (DVSR)
1	Intermediate Coupling	410 Stainless Steel
1	Complete Lower Pumping Element	Stainless Steel and Bronze

A2) RECOMMENDED NEW PARTS (FROM EPS)

Qty.	Part Description	Material
2	Column Bearing	C936 Bearing Bronze
1	Stuffing Box Bushing	C936 Bearing Bronze
1	Intermediate Coupling	410 Stainless Steel
Lot	O-Ring (As Required)	Ethylene Propylene Rubber (EPR)
Lot	Assembly Hardware (As Required)	18-8 Stainless Steel
1	Mechanical Seal Repair Kit	316 Stainless With EPR O-Rings

B) RECOMMENDED REPAIRS

- 1) Intermediate Columns (Quantity = 2)
 - a) Pad weld the male register fits.
 - b) Remove existing bearings and install new ones.
 - c) Machine bearing bore to new design diameter re-establishing concentricity and design running clearance to the intermediate shaft.
 - d) Polish existing lower fit bore and trial fit to top bowl on spare element.
 - e) Restore 45° o-ring chamfer.
 - f) Machine pad welded fit turn to restore design fit clearance to the mating component bores.

FINAL REPAIR SPECIFICATION

Ref. EPS order : 57093
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Quotation no. : 67934-Q2
Quotation date : 10/31/23
Ref. EPS report : 57093-CR1

B) RECOMMENDED REPAIRS, CONTINUED

- 2) Stuffing Box
 - a) Remove existing bushing and install new one.
 - b) Machine male fit turn to new cleanup diameter.
 - c) Machine bushing bore to new design diameter re-establishing concentricity and design running clearance to the upper shaft.
 - d) Minimum skim cut axial mounting faces to restore perpendicularity.

- 3) Discharge Head
 - a) Overlay weld stuffing box fit bore.
 - b) Set up on vertical mill and machine the lower register fit bore to new cleanup diameter. The pad welded upper column fit turn will be sized to restore design fit clearance.
 - c) Machine stuffing box fit bore to restore design concentricity and fit clearance with the new male fit turn of the stuffing box.
 - d) Minimum skim cut all axial mounting faces to restore perpendicularity.
 - e) Paint all external non wetted surfaces with red oxide primer followed by grey enamel.

- 4) Assembly
 - a) Assemble the rotating element and document the runout at each impeller and bearing journal turn.
 - b) Disassemble rotor to 1st stage impeller and then completely assemble pump in vertical position. Record the axial float at each stage of the pump as it is assembled.
 - c) Attach motor support and stuffing box and then document the final float of the assembly.
 - d) Touch up paint all non wetted surfaces of the pump with red oxide primer followed by blue enamel.
 - e) Block the element in the "full down" position and prep for return shipment to Spurlock Generating Station.