



# ENGINEERED PUMP SERVICES, INC.

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## CLOSING REPORT

**CUSTOMER :** East Kentucky Power Cooperative      **REPORT DATE :** 1/9/2017  
**PLANT NAME :** Cooper Power Plant                      **REPORT NO. :** 55294-CR1  
**CITY/STATE :** Somerset, Kentucky                      **CUST. ORDER :** EKPC-0000085969

**EQUIPMENT :** 6" HL-11 stage                              **COPY :** Eddie Hudson  
**SERVICE :** Boiler Feed Pump Inner Element  
**MANF. :** Pacific Pump Co.                              **FILE :** 55661  
**SERIAL NO. :** Unit #2                                      **Page :** 1 of 2

The pump element referenced above was repaired per EPS repair specification 55661-RS1; approval of this specification was received on 12/14/16. The as-achieved fits and clearances, and general assembly data are included in the following report.

The rotor was completely assembled and dynamic balanced to ISO G1.0; total indicated runout for the sleeves and impellers was under .0025" at every location. The rotor was then disassembled to the 11th stage, and the pump was completely assembled in the vertical orientation. The final axial rotor float was .295". The best operating rotor location is .100" from the coupling end limiter ± .020". The element was moved to the horizontal position and the lifts were checked at both 0° and 90°. The results are in the table below:

End	Lift at 0°	Lift at 90°
Suction	.019"	.019"
Discharge	.016"	.016"

The critical as-achieved fits and clearances are in the tables below:

### FITS AND CLEARANCES (Inches)

ROTATING COMPONENTS							
Impellers	Fit Bore	3.6305	3.6310	Spacer Sleeves	Fit Bore	3.6305	3.6315
Shaft	Fit Turn	3.6295	3.6300	Shaft	Fit Turn	3.6295	3.6300
<b>Resulting Fit</b>		<b>0.0005</b>	<b>0.0015</b>	<b>Resulting Fit</b>		<b>0.0005</b>	<b>0.0020</b>
<b>Design Fit</b>		<b>0.001</b>	<b>0.003</b>	<b>Design Fit</b>		<b>0.001</b>	<b>0.003</b>
Pressure Reducing Slv	Fit Bore	3.6240	3.6245	Sleeve Nut	Fit Bore	3.6315	3.6325
Shaft	Fit Turn	3.6245	3.6250	Shaft	Fit Turn	3.6295	3.6300
<b>Resulting Fit</b>		<b>-0.0010</b>	<b>-0.0000</b>	<b>Resulting Fit</b>		<b>0.0015</b>	<b>0.003</b>
<b>Design Fit</b>		<b>-0.001</b>	<b>-0.001</b>	<b>Design Fit</b>		<b>0.001</b>	<b>0.003</b>

BY: *Aaron Stull*

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**REPORT NO. : 55661-CR1**

**REPORT DATE : 1/9/2017**  
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Please note that the main shaft and impeller diameters are .005" above the standard value. If the impeller to shaft fit clearance needs attention at the next repair interval, consideration should be given to restoring the design fit turn through minimum grinding of the shaft body.

ROTATING COMPONENTS W.R.T. STATIONARY							
1st Stage Case Ring	Clr. Bore	8.449	8.450	Series Case Rings	Clr. Bore	7.318	7.319
1st Stage Impeller Ring	Clr. Turn	8.434	8.435	Series Impeller Ring	Clr. Turn	7.303	7.304
<b>Resulting Clr.</b>		<b>0.014</b>	<b>0.016</b>	<b>Resulting Clr.</b>		<b>0.014</b>	<b>0.016</b>
<b>Design Clearance</b>		<b>0.014</b>	<b>0.016</b>	<b>Design Clearance</b>		<b>0.014</b>	<b>0.016</b>
Interstage Bushings	Clr. Bore	4.250	4.251	Pressure Reducing Bsh	Clr. Bore	6.897	6.898
Shaft Sleeve	Clr. Turn	4.235	4.236	Pressure Reducing Slv	Clr. Turn	6.882	6.883
<b>Resulting Clr.</b>		<b>0.014</b>	<b>0.016</b>	<b>Resulting Clr.</b>		<b>0.014</b>	<b>0.016</b>
<b>Design Clearance</b>		<b>0.014</b>	<b>0.016</b>	<b>Design Clearance</b>		<b>0.014</b>	<b>0.016</b>

STATIONARY COMPONENTS							
Suction Cover	Fit Bore	17.369	17.370	Intermediate Cover	Fit Bore	17.369	17.370
Intermediate Cover	Fit Turn	17.370	17.371	Intermediate Cover	Fit Turn	17.370	17.371
<b>Resulting Fit</b>		<b>-0.002</b>	<b>0.000</b>	<b>Resulting Fit</b>		<b>-0.002</b>	<b>0.000</b>
<b>Design Fit</b>		<b>-0.003</b>	<b>0.000</b>	<b>Design Fit</b>		<b>-0.003</b>	<b>0.000</b>
Discharge Cover	Fit Bore	17.369	17.370	Discharge Spacer	Fit Bore	17.258	17.257
Discharge Spacer	Fit Turn	17.370	17.371	Discharge Diffuser	Fit Turn	17.255	17.256
<b>Resulting Fit</b>		<b>-0.002</b>	<b>0.000</b>	<b>Resulting Fit</b>		<b>0.001</b>	<b>0.003</b>
<b>Design Fit</b>		<b>-0.003</b>	<b>0.000</b>	<b>Design Fit</b>		<b>0.001</b>	<b>0.003</b>

The element was shipped back on 01/06/17 and was delivered to Cooper on 01/09/17.

(\*) One item of note: The cover and spacer seal face to seal face stage lengths are still very close to the original design specifications. At the next repair interval of this pump, it should not be necessary to restore any seal lengths by adding material through overlay welding.