

**COUNCIL ACTION FORM**

**SUBJECT:** PURCHASE AND INSTALLATION OF VARIABLE FREQUENCY DRIVES FOR POWER PLANT UNIT 7 COOLING TOWER

**BACKGROUND:**

The primary purpose of the Power Plant cooling tower is to remove the heat absorbed in the circulating cooling water. The circulating cooling water must leave the cooling tower and enter the turbine condenser below a certain temperature to allow the condenser to properly function. If the water is too warm, the conditions will force the entire unit to either lower electric output or shut down altogether.

Depending on the weather conditions outside, the Operator will regularly change the speeds of the cooling tower fans to create the desired water temperature. If the weather is warm, the assistance of the fans at high speeds becomes very crucial, using air movement to encourage evaporation, causing the water to cool. If the weather is below freezing temperatures, the fans must be cycled in reverse. The fans push air down into the tower, picking up heat from the hot water dropping from the top and then melting any ice on the outside louvers as the air exits. The Plant Operator must be able to manipulate the cooling tower fan speeds to effectively operate the generation unit.

The current power feeding equipment on both Unit 7 and Unit 8 cooling tower fan motors are very old and outdated. Plant staff has struggled with the reliability of the equipment. There is a current CIP project set for FY 2024/25 to replace all of the power feeding equipment with Variable Frequency Drives (VFDs). VFDs provide control over a range of speeds, improving reliability and efficiency.

This past winter, the starter assembly feeding one of the cooling tower fans on Unit 7 failed. The mechanical switch that allows the fan to go into high speed broke, limiting the cooling capacity on one fan while the other is de-icing (reversing). Plant staff was unable to find replacement parts and the safety and equipment risk of fabricating a new part was too high. Later in the winter, the power cubicle feeding the 2<sup>nd</sup> cooling tower fan failed preventing the fan from going into reverse. Plant staff had to reduce load on the unit and perform manual de-icing until outside conditions improved.

**Due to the issues outlined above, the project to replace the drives needs to be performed on Unit 7 as soon as possible to avoid operational issues during the 2021 summer weather.** It is worth noting that the installation of these VFDs can be done one at a time while the unit remains operational.

State purchasing rules allow for equipment purchases based on quotes rather than a formal bid process if the total amount of the project is under \$138,000. The City's policy

is to go out for bid if the amount of the project is greater than \$50,000. **Staff would like to install these drivers before the chance of warmer weather, and therefore requests a waiver from the Council of the purchasing policy and use quotes rather than formal bids.**

Three quotes were obtained from reputable companies to provide and install VFDs on both Unit 7 cooling tower fans. The quotes are summarized below:

	<b>Hardware</b>	<b>Installation</b>	<b>Cable Install</b>	<b>Lead Time</b>	<b>Total</b>
Baker Group	\$72,565	Included	Included	5-6 weeks	<b>\$72,565</b>
Hupp Electric	\$35,642	\$48,355	Included	3-4 weeks	<b>\$83,997</b>
Tri City	\$89,900	Included	\$11,823	6-8 weeks	<b>\$101,723</b>

**Funding for these repairs is available from the approved FY 2020/21 operating budget under the Unit 7 Steam Turbine and Generator Maintenance account. This currently contains \$85,000 for replacing piping and equipment associated with the cooling tower circulating water. The piping and equipment replacement can be deferred to future years in order to cover this project.**

**ALTERNATIVES:**

1. Approve a waiver of the City’s Purchasing Policy requiring formal bids, and award a contract to Baker Group, Ankeny, Iowa for the purchase and installation of the VFD’s for Unit 7 Cooling Tower in the amount of \$72,565 (inclusive of sales tax).
2. Award a contract to one of the other contractors.
3. Reject the quotes and delay this project.

**CITY MANAGER’S RECOMMENDED ACTION:**

The replacement of the VFD’s needs to be performed on Unit 7 as soon as possible in order to avoid operational issues during hotter weather. Therefore, it is the recommendation of the City Manager that the City Council adopt Alternative No. 1 as stated above.