

COUNCIL ACTION FORM

**SUBJECT: POWER PLANT FUEL CONVERSION – MECHANICAL INSTALLATION
GENERAL WORK CONTRACT - CHANGE ORDER NO. 9**

BACKGROUND:

In November of 2013, the City Council approved the conversion of the City's Steam Electric Plant from coal to natural gas. In May of 2014, the City Council approved the selection of Sargent & Lundy of Chicago, Illinois, to provide engineering and construction oversight services for the conversion project.

On September 22, 2015, City Council approved the award of a contract to TEI Construction Services, Inc. (TEI), Duncan, South Carolina for the General Work Contract for Mechanical Installation in the amount of \$1,572,019.

The action being requested now is to approve Change Order No. 9 to the Mechanical Installation Contract. This Change Order is for TEI to supply and install the refractory that is required around the nine (9) new natural gas burners for Unit 8.

Refractory materials are typically "clay-like" substances, that when cured harden and appear like masonry cement or concrete, and contain special minerals and chemical compounds that are used in boilers, furnaces, kilns, etc. to shield and protect metal surfaces from damage from exposure to fire, extreme heat, corrosive or abrasive atmospheres, etc. In our case, the refractory is used to protect the boiler tubes and the metal surfaces of the burners from the fire and heat in the boiler, and also from the possible corrosive atmosphere in the boiler from burning refuse-derived fuel (RDF). Additionally, unique and critically important to our conversion of the power plant (from coal to natural gas), the refractory around the new natural gas burners has to be shaped and profiled quite precisely in order to properly channel the air for combustion to the burner to optimize the natural gas flame.

The supplier of the burners for our natural gas conversion, Alstom (now GE Power), provided the refractory for the burners as a part of their bid. This product has apparently been Alstom's standard for many years. Once placed, it soon needs to be progressively and continuously heated to a very high temperature (at least 1750°F) to cure properly. Unfortunately, this is not possible to do given the integrated tasks and the sequence of events that must be undertaken to ready Unit 8's boiler and the rest of the power plant for firing natural gas. **After an extensive amount of investigation and discussion, a consensus was reached that there was no way to properly cure the originally supplied refractory, and that we needed to try to find a suitable alternate refractory.**

Staff researched alternate refractories and found a manufacturer and supplier of refractory materials that had a product deemed to be suitable for our application. This supplier, Stellar Materials, has a refractory that can be cured successfully given our set

of conditions. The down side is that this refractory is difficult and tricky to apply, and it takes a knowledgeable and experienced crew to properly apply this material. The product is also expensive. However, Alstom will warranty their burner equipment and installation if this refractory is used.

TEI will hire Hi-Tech Industrial Services, Inc. as a subcontractor to supply and install the refractory for the natural gas burners in Unit 8 boiler. This company has the required expertise and experience to successfully apply and cure this particular refractory.

The price of this change order is \$175,496.89 and includes the subcontractor's labor, equipment, refractory materials, scaffolding, freight, and sales tax, plus TEI's markup.

CHANGE ORDER HISTORY:

Eight change orders have previously been issued for this project.

Change Order No. 1 for \$8,750 was for TEIC to procure Nordstrom valves.

Change Order No. 2 for \$156,131 was for TEIC to supply natural gas control and on-off valves.

Change Order No. 3 for \$187,984 was for TEIC to provide and modify platforms, stairs, grating, toe plates, railings, etc. on four levels associated with the installation of natural gas burners and igniters on Unit 8 boiler and to provide Unit 7 & 8 Steam turbine front standard installation work including probe removal, worm gear removal, disconnecting linkages, and valve installation.

Change Order No. 4 for \$9,785.37 was for TEIC to provide material, equipment, and labor necessary to fabricate and install structural steel angle frames onto the outside of the burner windboxes on three burner levels of Unit 8 boiler to facilitate the mounting of nine burners.

Change Order No. 5 for \$3,032.17 was for TEIC to remove & reinstall operating cylinder pump at the direction of the GE representative.

Change Order No. 6 for \$7,725.98 was for TEIC to provide the necessary material, equipment, and labor to remove the existing burner support rings and replace them with rings at Elevation 127'-3" on Unit 8 boiler.

Change Order No. 7 for \$3,032.16 was for TEIC to provide equipment and labor to remove, inspect, adjust, and reinstall the pilot valve on Unit 8 turbine.

Change Order No. 8 for \$21,673.58 was for TEIC to cut the piping and weld flanges in each of the nine (9) natural gas igniter valve assemblies to facilitate the maintenance and removal (if necessary) of the gas control valves, plus install fittings along with shutoff valves to be able to isolate pressure gauges for maintenance and removal without having to shut down the system to perform the work.

The total cost of previous eight (8) change orders was \$398,114.26. With Change Order No. 9, the new change order total is \$573,611.15.

PROJECT COST HISTORY:

The Engineer's estimate of the cost for this phase of the project was \$5,115,000. With this change order, the total costs for the Mechanical Installation General Work Contract portion of the project will be increased to \$2,145,630.15.

Overall, the total project dollar amount committed to date (inclusive of this Change Order No. 9) is \$17,198,810.65. The approved FY 2015/16 Capital Improvements Plan includes \$26,000,000 for the Unit 7 and Unit 8 fuel conversion. However, some of the funding of the conversion project is coming from the sale of Electric Revenue bonds. Considering that the project is coming in much less than the budgeted amount, staff has chosen to reduce the size of the bonds issuance and has reflected the budgeted amount accordingly. The project budget to date is shown on page 4 and 5. It should be noted if there are future Change Orders that cause the budget to exceed the remaining balance, the bond request cannot/will not be adjusted. Staff at that time will look at cancelling or delaying lower priority projects to fund the change.

ALTERNATIVES:

1. Approve contract Change Order No. 9 with TEI Construction Services, Inc., Duncan, SC for the Power Plant Fuel Conversion - Mechanical Installation General Work Contract in the amount of \$175,496.89.
2. Reject contract Change Order No. 9. With this alternative will be a higher risk of improperly curing the original refractory.

MANAGER'S RECOMMENDED ACTION:

The original refractory included by Alstom would not work given the Electric Utility's commissioning process. Therefore, an acceptable alternative had to be identified in order to keep the project on schedule and meet Alstom's warranty.

Therefore, it is the recommendation of the City Manager that the City Council adopt Alternative No. 1 as stated above.

PROJECT BUDGET

The overall project budget and commitments to date are summarized below. To date, the project budget has the following items encumbered:

\$17,475,000	FY 2015/16 CIP amount budgeted for project \$26,000,000 less reduced bonds issuance by \$8,525,000
<u>Sargent & Lundy, LLC</u>	
\$1,995,000	Encumbered not-to-exceed amount for Engineering Services
\$2,395,000	Engineering Services Contract Change Order No. 1
\$174,000	Engineering Services Contract Change Order No. 2
<u>Alstom Power Inc.</u>	
\$3,355,300	Contract cost for Natural Gas Conversion Equipment
\$29,869	Equipment Contract Change Order No. 1
(-\$321,600)	Equipment Contract Change Order No. 2
(-\$51,000)	Equipment Contract Change Order No. 3
<u>Emerson Process Management Power & Water Solutions, Inc.</u>	
\$1,595,000	Contract cost for DCS equipment
\$39,377	DCS Contract Change Order No. 1
\$12,611	DCS Contract Change Order No. 2
<u>GE Energy Control Solutions, Inc.</u>	
\$814,920	Contract cost for TCS equipment Bid 1
\$244,731	TCS Bid 1 Contract Change Order No. 1
\$34,000	TCS Bid 1 Contract Change Order No. 2
<u>General Electric International, Inc.</u>	
\$186,320	Contract Cost for Turbine Steam Seal System - TCS Bid 2
\$24,536	TCS Bid 2 Contract Change Order No. 1
\$150,000	TCS Bid 2 Contract Change Order No. 2
<u>Henkel Construction Co.</u>	
\$898,800	Contract cost for Control Room Installation General Work Contract
\$66,782	Control Room Contract Change Order No. 1
<u>TEI Construction Services, Inc.</u>	
\$1,572,019	Contract cost for Mechanical Installation General Work Contract

\$8,750	Mechanical Contract Change Order No. 1
\$156,131	Mechanical Contract Change Order No. 2
\$187,984	Mechanical Contract Change Order No. 3
\$9,785.37	Mechanical Contract Change Order No. 4
\$3,032.17	Mechanical Contract Change Order No. 5
\$7,725.98	Mechanical Contract Change Order No. 6
\$3,032.16	Mechanical Contract Change Order No. 7
\$21,673.58	Mechanical Contract Change Order No. 8
\$175,496.89	Mechanical Contract Change Order No. 9
	<u>FPD Power Development, LLC</u>
\$3,145,149	Contract cost for Electrical Installation General Work Contract
	<u>Graybar Electric</u>
\$98,560	Contract cost for UPS System
(-\$1,010)	UPS System Contract Change Order No. 1
	<u>Hertz Equipment Rental Corporation</u>
<u>\$166,835.50</u>	Contract cost for Portable Electric Space Heaters
\$17,198,810.65	Costs committed to date for conversion
\$276,189.35	Remaining Project Balance to cover miscellaneous equipment and modifications to the power plant needed for the fuel conversion