

COUNCIL ACTION FORM

**SUBJECT: PRELIMINARY PLANS AND SPECIFICATIONS FOR AMES PLANT
SUBSTATION IMPROVEMENTS**

BACKGROUND:

There are two separately-budgeted capital improvement projects (CIP) occurring at the Ames Plant substation. One is for the Ames Plant Switchyard, which includes the replacement of 69kV switchyard relay and controls, breakers and associated equipment; while the other is at the adjoining Ames Plant Distribution Substation, which includes Switchgear replacement and a feeder. **This Council Action Form is for the construction and installation portion of all equipment and new feeder at this site.** Because these two project sites are interrelated and situated on adjoining sites, it is most cost effective and efficient to bid them under a single bid to secure competitive pricing for the complete installation, rather than to bid two smaller-scope projects separately.

Ames Plant Switchyard

This project **includes the construction portion of the Ames Plant 69kV Switchyard relay and controls replacement.** The 69kV switchyard relaying and controls are currently located inside the Power Plant. This requires long runs of aged control cable between the Power Plant and switchyard, running beneath portions of the Water and Pollution Control's administration office. Some of the control cables are no longer operational and some conduits have collapsed and are not accessible for repair. By installing modern, programmable relays and updated controls in this location and using the previously-installed fiber-optic communications, long-term reliability can be improved by eliminating the obsolete and maintenance-intensive electro-mechanical relays and aged, lengthy control circuits that are no longer accessible for repair. The relaying and controls for the 69kV switchyard and other listed substations are critical components that play a significant role in overall electric system reliability. Included in this project is the replacement of aging and/or overstressed equipment on the Switchyard bus such as switches, lightning arrestors, potential transformers and the 69kV Breaker which serves the MidAmerican 69kV tie line – these materials have been approved by Council for purchase under a prior council action and will be installed under this construction project.

Additionally, some of the existing relays at the Stange Road, Dayton Avenue and Haber Road substations are also obsolete electro-mechanical devices that need to be replaced as part of this CIP to complete a coordinated 69kV looped scheme using the available fiber-optic communications previously installed. **The additional work to**

furnish and install these remote terminal relay and controls at Dayton Avenue, Stange Road and Haber Road substations will be brought before the City Council for approval at a later time.

Ames Plant Distribution Substation

This project also **includes the construction portion of the Ames Plant Distribution Substation Switchgear replacement and feeder extension**. This substation is one of the older substations having electro-mechanical distribution relays, air blast 13.8kV breakers, and no main breaker. The DC batteries are currently located inside the Power Plant and the cabling runs beneath the Water Plant Administration building in ducts that are partially collapsed.

Included in this project is the installation of two Breakers and associated switches which work in coordination with new relays and controls to provide enhanced protection to critical distribution power transformers at this substation—these transformers serve distribution feeder loads (including the hospital) as well as the 13.8kV Plant bus. These materials have been approved by Council for purchase under a prior council action and will be installed under this construction project. We will also be replacing the existing 13.8kV metal clad switchgear with an expanded, modern switchgear including vacuum breakers, a main breaker, and batteries. **Plans and Specs for the replacement switchgear will be brought to the City Council for approval in the future as a separate bid item. However, installation is included under this work.** Distribution relaying will be upgraded from electro-mechanical to modern microprocessor controlled relays.

This project also includes a feeder termination at the substation for a future feeder extension west along 6th Street to carry portions of the downtown load currently served by the 4kV network provided by the Power Plant. The new feeder will help to limit exposure of the Power Plant bus to distribution faults, thereby improving Power Plant reliability.

Council should note that a portion of the substation materials for the Ames Plant Distribution Substation Project were previously approved by Council, but the funding source for those materials was incorrectly reported to Council as being included entirely within the budget for the Ames Plant Switchyard Project, but a portion of those materials awarded at the July 23, 2013 meeting were also for the Ames Plant Distribution Substation Project. The corrected division of costs between capital improvement projects is correctly reported below between the two related CIP projects.

This portion of the project is the materials installation phase. The Engineer's estimate of this phase is \$875,000. Of this, \$570,000 is for the Ames Plant Switchyard Project and \$305,000 is for the Ames Plant Distribution Substation Project. Council should note that a separate report is also being presented to Council on this same meeting agenda for the purchase of controls panels for this project.

The approved FY2013/14 CIP for Electric Services includes \$1,700,000 for engineering,

materials and construction under the Ames Plant 69kV Switchyard Relay and Control Replacement project with Iowa State University contributing an estimated \$319,600 to the cost.

To date the project budget has the following items encumbered:

Ames Plant Switchyard

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| \$1,700,000.00 | Amount Budgeted for Project |
| \$122,700.00 | Encumbered Engineering for Ames Plant (A.P.) Switchyard (Approved by City Council on April 24, 2012.) |
| \$56,377.35 | Actual cost for SF6 circuit breakers. (Awarded by City Council on July 23, 2013) |
| \$122,868.40* | Actual cost for electrical materials. (Awarded by City Council on July 23, 2013) * This amount includes applicable sales taxes to be paid directly by the City of Ames to the State of Iowa. |
| <u>\$350,000.00</u> | Estimated cost for control panels. (see Control Panels Council Action Form on this Council meeting agenda) |
| \$651,945.75 | Total committed to Date |
| \$570,000.00 | Estimated cost for materials installation phase for the Ames Plant Switchyard Project – this item (pending Council approval of plans and specifications for this agenda item) |
| \$478,054.25 | Amount available to complete project (Relay and Controls equipment and installation at other substation.) |

The approved FY2013/14 CIP for Electric Services includes \$1,160,000 budgeted for construction under the Ames Plant Distribution Substation Switchgear and Feeder Extension project, which is not cost-shared by ISU.

Ames Plant Distribution Substation

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| \$1,160,000.00 | Amount Budgeted for Project |
| \$210,000.00 | Encumbered Engineering for Ames Plant (A.P.) Distribution Substation (Approved by City Council on April 24, 2012.) |
| \$112,754.50 | Actual cost for SF6 circuit breakers. (Awarded by City Council on July 23, 2013) |
| \$9,466.00* | Actual cost for electrical materials. (Awarded by City Council on July 23, 2013) * This amount includes applicable sales taxes to be paid directly by the City of Ames to the State of Iowa. |
| \$332,220.50 | Total committed to Date |
| \$305,000.00 | Estimated cost for materials installation phase for the Ames Plant Distribution Substation Project – this item (pending Council approval of plans and specifications for this agenda item) |
| \$522,779.50 | Amount available to complete project (Switchgear) |

ALTERNATIVES:

1. Approve the plans and specifications for the Ames Plant Switchyard and Distribution Substation Improvements and set September 11, 2013, as the bid due date and September 24, 2013, as the date of hearing and award of contract.
2. Do not approve the plans and specifications at this time.

MANAGER'S RECOMMENDED ACTION:

Even though we budgeted for two separate projects for work at the same substation, it will be more cost-effective and efficient to bid these as a single project. Therefore, it is the recommendation of the City Manager that the City Council adopt Alternative No. 1 as stated above.