City of Grand Island

Tuesday, September 12, 2006
Council Session

Item G8

#2006-246 - Approving Electric Distribution System Engineering Services - Utilities Department

Staff Contact: Gary R. Mader;DaleShotkoski

Council Agenda Memo

From: Gary R. Mader, Utilities Director

Meeting: September 12, 2006

Subject: Electric Distribution System Engineering Services

Item #'s: G-8

Presenter(s): Gary R. Mader, Utilities Director

Background

Over the past century electricity has evolved from a convenience to a necessity. Yet, electric distribution systems remain very similar to the original systems; ones not designed to provide the uninterrupted source of high quality electricity now required. Although the Electric Department considers the electric distribution extremely sound, there remains potential for improvement. With the advent of large computer modeling capability, the constantly changing dynamics of an electric system can be optimized for performance and reliability.

For example, customer outage times may be reduced by: constructing short line sections to interconnect feeders; installing faulted circuit indicators to identify failed underground conductors; or automatic sectionalizers to isolate downed rural circuits.

Electrical appurtenances must be properly applied and coordinated to create the desired effect. Fuses and sectionalizers must be coordinated to minimize outage area. Capacitors are widely used to eliminate low voltage problems. However, with changes in feeder circuit loading, they can cause excessive high voltage and deterioration in power quality with resulting customer problems.

Distribution system losses are also a concern. A computerized model of the distribution system would enable better placement of capacitors and sizing of transformers. It is realistic to expect a 1% loss reduction; and most of the reduction would be realized during the peak load periods when energy is the most expensive.

Discussion

A master Plan to guide expansion of the Electric Distribution System does not exist. The electric distribution system has been expanded as driven by the need to serve additional

customers as the City has grown over the decades. Preparation of such a plan requires detailed examination of the distribution feeders. Electric Department staff time is devoted to the normal operation, maintenance and expansion rather than more comprehensive improvements. Additionally, review by qualified outside firms, with a broad knowledge of the utility industry may reveal improvements which otherwise could be overlooked.

Loading on the distribution feeder circuits is time variant. Feeder circuits optimized for a given load condition can create power quality problems as those conditions change. Electric utilities routinely utilize computerized models to study and analyze distribution feeder circuit performance. Implementing and testing such a model is time consuming and requires outside assistance. After completion and testing, the Electric Department would assume responsibility for the continued model updates and expansions.

The Electric Department engineering staff prepared a request for ELECTRIC DISTRIBUTION SYSTEM ENGINEERING SERVICES proposals, publishing the Notification in the *Grand Island Independent* on July 22, 2006. Seven engineering firms were also solicited directly. Proposals were due on August 22; a single proposal from Advantage Engineering was received.

The RFP asked for billing on hourly rates with a "not to exceed" amount. The proposal contained hourly rates with estimated time allotments for each phase of the project with estimated costs. The estimated cost total is $191,400. The Electric Department staff has reviewed cost estimates and feels the cost estimate for Master Plan and Modeling is realistic.

When system improvements are identified, the intent is to evaluate each potential improvement for cost effectiveness. If deemed cost effective, design and installation would be treated as a separate function. For design and construction management of distribution line improvements, Advantage Engineering proposed a not to exceed a charge of 15% of the construction contract amount. Because of the more complex nature of designing switched capacitor controls and line sectionalizers, and the relatively low cost of these devices, the engineering costs would be 50% of the total project costs.

The Electric Department considers an Electric Distribution System Master Plan, Modeling, and initial implementation very important to continuing improvement of performance of electric service. Advantage Engineering has performed engineering services for the Department in the past including upgrades to the 115 kV transmission system and design of Substations "E" and "F". The Electric Department staff is well satisfied with their capabilities.

Alternatives

It appears that the Council has the following alternatives concerning the issue at hand. The Council may:

1. Move to approve

2. Refer the issue to a Committee
3. Postpone the issue to future date
4. Take no action on the issue

Recommendation

City Administration recommends that the Council enter into an agreement with Advantage Engineering, Inc. for Electric Distribution System Engineering Services, in accordance with the August 2006 proposal.

Sample Motion

Motion to approve the August 2006 Proposal **for Electric Distribution System Engineering Services** to Advantage Engineering, Inc. of Chesterfield, Missouri.

Purchasing Division of Legal Department
INTEROFFICE MEMORANDUM

CITY OF GRAND ISLAND

Dale M. Shotkoski, Assistant City Attorney

Working Together for a Better Tomorrow, Today

REQUEST FOR PROPOSAL
FOR
ELECTRIC DISTRIBUTION SYSTEM ENGINEERING SERVICES

RFP DUE DATE: **August 22, 2006 at 4:00 p.m.**

DEPARTMENT: **Utilities**

PUBLICATION DATE: **July 22, 2006**

NO. POTENTIAL BIDDERS: **7**

SUMMARY OF PROPOSALS RECEIVED

Advantage Engineering, Inc.
Chesterfield, MO

cc: Gary Mader, Utilities Director
Burhl Gilpin, Assit. Utilities Director
Gary Greer, City Administrator
Dale Shotkoski, Purchasing Agent
Bob Smith, Assist. Utilities Director
Pat Gericke, Admin. Assist. Utilities
David Springer, Finance Director
Laura Berthelsen, Legal Assistant

P1099

R E S O L U T I O N 2006-246

WHEREAS, an overall evaluation of the Electric Distribution System has not been conducted in over 30 years; and

WHEREAS, such evaluation can result in improved reliability, power quality, efficiency and customer service; and

WHEREAS, a computerized model of the distribution system would enable detailed evaluation of the electric distribution system under changing dynamic conditions facilitating the most efficient placement of system devices such as capacitors and sizing of transformers; and

WHEREAS, review by qualified outside firms with a broad knowledge of the utility industry may reveal improvements which otherwise could be overlooked; and

WHEREAS, the City of Grand Island invited proposals for Electric Distribution System Engineering Services in accordance with a Request for Proposal on file with the Utilities Department; and

WHEREAS, Advantage Engineering, Inc., of Chesterfield, Missouri, submitted a proposal in accordance with the terms of the request for proposals and all statutory requirements contained therein and the City Procurement Code, such proposal being for an amount estimated at $191,400.00.; and

WHEREAS, the Electric Department staff has reviewed cost estimates and feels the cost estimate of Advantage Engineering, Inc., is realistic.

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND COUNCIL OF THE CITY OF GRAND ISLAND, NEBRASKA, that the proposal of Advantage Engineering, Inc., of Chesterfield, Missouri, for Electric Distribution System Engineering Services for an amount estimated to be $191,400.00 is hereby approved.

BE IT FURTHER RESOLVED, that the Mayor is hereby authorized and directed to execute an agreement for such services on behalf of the City of Grand Island.

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Adopted by the City Council of the City of Grand Island, Nebraska, September 12, 2006.

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Jay Vavricek, Mayor

Attest:

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RaNae Edwards, City Clerk

Approved as to Form ¤ _____
September 8, 2006 ¤ City Attorney