Nebraska Public Power District

"Always there when you need us"

AMI TWACS System City of Lexington

January 2012

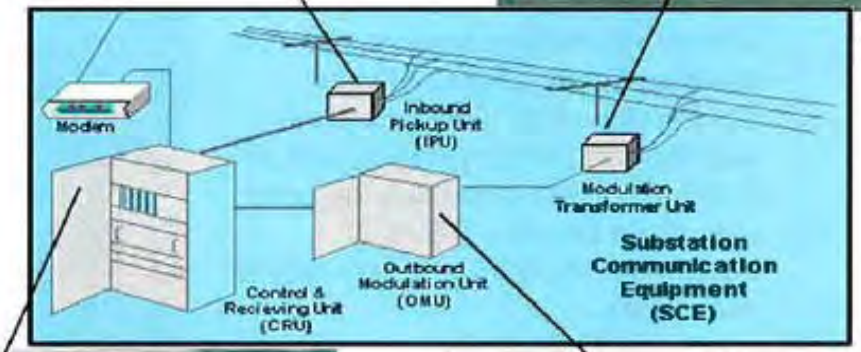
AMI Connectivity

- City software license / operating agreement
- Substation injection equipment at three (3) distribution substations, bus or feeder connection
- Data circuit from each substation to City TWACS server
- Software interface to City billing system
- Meter procurement and exchange
- Water meter upgrade (module adaptation)
- Daily system operation / monitoring

Substation Communciations Equipment (SCE)

IPU – Inbound Pickup Unit

MTU – Modulation Transformer Unit



CRU – Control & Receiving Unit

OMU – Outbound Modulation Unit

Substation Communication Equipment (SCE)

1) **Substation Collectors** –One per distribution substation. Includes all equipment, materials, labor and other associated costs of installing CRUs (Control &Receiving Units). These units are responsible for handling communications between the server and other substation components.

2) **Injection Points** –One per bus/feeder per substation transformer. Includes all equipment, materials, labor and other associated costs of installing the OMUs (Outbound Modulation Units) and MTUs (Modulation Transformer Units). The OMUs are responsible for outbound communications to the meter and the MTUs assist by stepping down voltage for the OMU.

3) **Feeder Data Retrieval** –Typically one per bus/substation transformer. Includes all equipment, material, labor and associated costs of installing the bus level IPUs (Inbound Pickup Units). These are responsible for picking up signals sent from the meters and passing those signals to the CRU components for interpretation.

4) **Other General Costs** – Data retrieval infrastructure from the collector @ each substation to the City's server. Multiple types of connection used could be Ethernet, phone line, cell phone, ect. These costs would be site specific.

Distribution Substations

Substation	
Tyson IBP – T1 – Single Injection	13.8kv
Walnut T1 & T2 – Dual Injection	13.8kv
Adams T1 – Single Injection	13.8kv
Note: NPPD does not carry transformer spares for this distribution level.	
Metering	
Electric	4166
Water	3025

Substation Injection Estimates

Single Injection		**$37,300**
Material (Includes MTU / excludes TWACS SCE Equipment)	$17,600	
Contractor Labor & Expense	$ 4,000	
Subsistence	$ 400	
Labor	$13,300	
Vehicles	$ 2,000	
Dual Injection		**$57,500**
Material (Includes MTU / excludes TWACS SCE Equipment)	$30,500	
Contractor Labor & Expense	$ 4,000	
Subsistence	$ 800	
Labor	$18,800	
Vehicles	$ 3,400	

Note: Based on actual costs from NPPD AMI injections in Scottsbluff.

Substation	Quantity	Total
Injections	3	$132,000
Substation Communications Equipment (SCE)		
CRU, OMU, & IPU per sub	3	City Procures
Metering		
Electric	4166	City Procures
Water	3025	City Procures
Software		
License , Hardware, Interface		City Procures
TOTAL ESTIMATE		**$132,000**
Estimate “only” based on NPPD installations		


150
150

Summary

- City Owned
  - Software license with Aclara
  - Pricing & procurement of substation injection equipment, meter modules, and disconnect collars
  - TWACS server and CIS interface
  - Telecommunications infrastructure for data transfer from each substation to server
  - Training – internal processes