Utilities Department – Highlights for 2016

Production Division

Platte Generating Station

- Phelps Control contracted to have the oil in the reserve supply transformer cleaned. The transformer was out of service for four days.
- The Powder Activated Carbon System was repaired and adjustments were made. Staff continues to fine tune the system.
- Lime slurry atomizers were sent out for rebuild. As lime passes through the atomizers, they wear the components. Once a year they are sent in for refurbishment to maintain continuous reliable operation.
- Condensate pump 1B motor was rebuilt.
- The coal crusher motor was rebuilt.
- A nitrogen leak was found and repaired on the setup transformer.
- The sanitary sewer line from Platte Generating Station to the Waste Water Treatment Plant was completed and tested. This will enable Platte to no longer have to maintain an onsite waste treatment plant.
- MATS compliance testing was done. This certifies the Particulate Monitor and Mercury Monitor.
- Soot blower work was completed.
- The Continuous Emission Monitoring Systems (CEMS) Quality Assurance/Quality Control Manual was updated for the new monitors.
- The 480VAC breaker testing was completed.
- During the spring (April) outage, the following was completed:
    - Precipitator, ductwork, Spray Dry Absorber, boiler and bottom ash were cleaned.
    - The boiler was inspected and 38 lower tube shields on the vertical reheat inlet tubes were replaced.
    - Several valves were repaired.
    - The bottom ash pipe was repaired.
    - The leaking reverse osmosis water supply line to the Air Quality Control System was repaired.
    - Coupon holders were installed on the Spray Dry Absorber to measure how much corrosion is occurring in the vessel.
    - The coal crusher screens were repaired.
    - The drum sight glass was repaired.
    - The bottom ash hopper door cylinders were replaced.
    - The cooling tower drain valve was replaced.
    - The fluidizing nozzles on the activated carbon silo were replaced.
- During the fall outage, the following work was completed:
    - The precipitator, ductwork, spray dry absorber, boiler and bottom ash were cleaned.
    - The end of fiscal year fuel, lime, and powder activated carbon inventories were completed.
    - A rapper was added on the baghouse ductwork.
    - The cooling tower basin and screens were cleaned.
    - The auxiliary boiler was tuned.
    - A new contract commenced for Fly Ash removal.
    - A yard light was installed for the coal pile.
- The new powder activated carbon did not work as expected. The feed rates had to be changed and the vendor had to supply a different type of powder activated carbon. Testing is ongoing to make sure it will work.

- The locomotive traction motor failed, and was replaced with the spare. The old one was sent in for repairs.

Burdick Station

- The Production Division Supervisors conducted a walk-through of the Black Start Procedure. A couple of items were found that needed to be changed. The hope is that it will never be used, but the department will be prepared if it is ever needed.
- A gas valve was repaired for the gas turbines.
- Steam Unit #3 generator inspection was completed and a test run was done in April.
- Gas Turbine #3 torque converter was replaced with a spare and the old torque converter was inspected.
- All of the #6 fuel oil was transferred from tanks #3 and #4 to tank #5 in preparation to sell the remaining fuel oil. Tanks #3 and #4 were cleaned and are ready for their next purpose.
- NERC requirement MOD -025 reactive testing on Gas Turbine's #2 and #3 was conducted.
- Leaks in the CO_2 fire system for the gas turbines were repaired.
- 480VAC Breaker testing was completed. These breakers are tested every three years to ensure proper operation.
- The inverter that converts AC to DC was changed out. This inverter is used to power DC equipment on GT #2 after original equipment failed.
- New DCS (Distributive Control System) equipment was installed on Burdick Unit #3. This is a change out of the computer that controls the generation unit. There were over 500 points that were verified to be corrected before the unit could be started. Operators, Mechanics, Instrument Technicians and System Technicians spent many hours checking each component to be sure all the logic was seeing the system correctly. There were many issues that were found and corrected to make the unit function safely and operate efficiently. The unit was ran and tuned.
- RATA testing was completed on Steam Unit #3. This testing is to certify that the continuous emissions monitoring equipment is operating within specifications and that when the unit is running, all environmental requirements are being met.
- Fire system inspections were completed.
- The CO_2 fire suppression system tank was repaired for the gas turbines.
- With the decommissioning of Burdick Units #1 and #2, the natural gas line was disconnected and re-piped to supply natural gas to the building heat system only.
- The GT #1 oil pump motor was replaced with a new motor. The old motor was sent in for repairs.
- The fire system was repaired and changes were made for steam units #1 and #2 being decommissioned.

Water System

- The ice pigging operation on lines from Wellfield Wells 6, 7 and 8 was completed. Ice pigging cleans the inside of the pipes and is normally done with bullet shaped foam inserts, but when the water main changes sizes, an ice slurry is used to scrub the inside of the pipes.
- The uranium removal media was replaced in both trains at the Wellfield. With both trains having new media, the system is able to treat 3,400 gallons per minute.
- Burdick Pumping Station Motor Control Center Switchgear was replaced, updating the 47 year old equipment with modern Arc Flash rated equipment. A new Program Logic Controller (computer) was installed to complete the pumping station improvements.
- The blacktop drive that leads to the pump house at Parkview 1 was repaved after a contractor damaged it with heavy equipment working on Stolley Park School. The contractor paid for these repairs.
- The Wellfield Pump House had repairs completed on the trim cap of the roof.

- Roger's Reservoir #1 had a complete blast and re-paint of the interior coating. This is required every 15 to 20 years to protect the steel of the water storage reservoir.
- Operations worked with Engineering to complete hydrant flow testing. This is done to insure that if a fire were to occur, the water system would meet the flow requirements for the Fire Department.

Water Department

- The Water Department was focused on the Capital Avenue widening project again this year. Multiple water mains were damaged and had to be repaired due to the size and weight of the equipment the concrete contractors were using. Seven line valves were also replaced along Capital Avenue during the on-going construction.
- Crews installed 350 foot of water main to provide service to a new subdivision on Stauss Road.
- 175 new and replacement water taps were made ranging in size from ¾" to 12" for various projects and plumbers throughout the City.
- Crews responded to 60 after hours calls.
- The summer seasonal employees repainted 1,345 fire hydrants throughout the City.
- 23 broken water mains were repaired; 12 line valves and six fire hydrants were replaced by the Water Department in addition to the normal system maintenance including operating line valves and fire hydrants, flushing dead end lines, repairing or replacing water meters and setting out and picking up temporary fire hydrant meters for contractors.
- 194 Turn on/off services were done at the request of Customer Service.
- Crews also performed 3,650 utility locates that had been requested through Digger's Hotline of Nebraska.

Backflow Program

2016 Backflow Prevention Device Testing Statistics:

- ✓ 4,263 First Notice reminders were mailed
- ✓ 770 Certified Letters Delivered
- ✓ 178 48 Hour Notices left at the door
- ✓ 25 Water Services shut off for failure to test

2016 Backflow Prevention Device Installation Statistics:

- ✓ 36 First Notices to require installation were mailed
- ✓ 30 Certified letters were delivered
- ✓ 10 48 Hour Notices were delivered at the door
- ✓ 3 Customers were shut off due to non-compliance of backflow device installation

Transmission – Phelps Control Center

- A bid package was finalized and a contractor was hired to rebuild the 115 kV transmission line 1064B between Substation C and Substation E north and east of the City. This line had been flagged by the Southwest Power Pool (SPP) and the recently completed Electric System Master Plan as a potentially overloaded line in the near future. All wood poles were replaced with steel and the conductor upgraded for additional load. In addition, the fiber optic communications link was increased from 12 to 48 fibers. The project was completed in June.
- The protective relay panel for the 115 kV transmission line 1145B was replaced. This line connects Grand Island's Substation D with the Nebraska Public Power District's (NPPD) Grand Island 115 kV substation east of the City. This line previously utilized outdated equipment and was in need of upgrades. Coordinating with NPPD, both ends of the line were upgraded and returned to service. A second tie line with NPPD is scheduled for a similar upgrade in 2017.

- Breaker H-1-1 was removed from Substation H. This breaker had failed late in 2015 during a thunderstorm. Since this breaker was associated with the recently retired Burdick Steam Unit #2 and no longer needed, it was decided to remove the breaker and make the necessary changes to eliminate it from all protective relaying schemes.
- A bid package was finalized and a contractor hired to rebuild the 115 kV transmission line 1093 between Grand Island's Substation E and NPPD's 115 kV Grand Island substation east of the City. This is the original tie line that was built in the 1960's. This line had been flagged by SPP and the recently completed Electric System Master Plan as a potential overloaded line in the future. Construction began in September with completion expected by May 2017.
- A bid package was finalized and a contractor hired to construct a new vehicle storage building for the Electric Service Facility. Due to the newer service trucks being larger, a larger building was needed to house them. Construction began in August with completion expected mid-2017.
- Prairie Breeze III Wind Farm came on-line in March. This wind farm is located near Elgin, Nebraska and owned and operated by Invenergy. Grand Island signed a contract for the entire 35.8 MW output of the farm in 2015 with subsequent contracts with Nebraska City and Neligh for 7 MW and 2 MW respectively. The addition of this wind energy boosted Grand Island's renewable percentage in 2016 to 13.6%.
- Chapter 15 of the Grand Island City Code was reviewed and updated to eliminate unnecessary wording that is already contained in the National Electric Code. In addition, wording was added to allow for net metering to customers who choose to add distributed generation.
- A contract was signed with NPPD for outage call answering services. Due to limitations with telephone infrastructure as well as personnel, the decision was made to contract with NPPD and have all trouble and outage related calls forwarded to their call center in Norfolk. This transition occurred in September. Adjustments continue to be made to accommodate the new system.
- A process was started to replace feeder protection relays throughout the system. The existing relays were installed in the early 2000's. Some relay failures have been experienced during the past couple years and the decision was made to begin replacing them as time permits. Several substations were completed with several more to be done in 2017.
- Federal standards require Grand Island to test 115 kV circuit breakers at certain intervals. A large majority of those breakers were scheduled to be tested in 2016. A total of 43 breakers were tested in 2016.
- The telephone system was upgraded at the Electric Service Facility. This provides extension dialing and voicemail to personnel at that location.
- The new server room at Phelps Control Center began to be utilized. Most servers have been relocated to the server room and modifications to the networking architecture continue in order to provide more reliable connectivity in the event of equipment failure.

Underground Division

- Planned rebuilds were often integrated with service upgrades being done by customers. Combining the two met the need of new customers and maintenance of the system. Under this combination, 15 transformers and two medium voltage terminals made up of 20 cable runs and 84 cable terminations were installed. Projects in this classification included:
    - Barr Middle School – 602 W. Stolley Park Road
    - Immigration Customs Enforcement (ICE) – 703 S. Webb Road
    - Charter Communications – 2533 W. Old Potash Hwy.
    - Viaero Tower – 1801 Santa Anita Drive
    - Utilities Service Building – 1116 W. North Front Street
    - All electric duplexes – 1900 block of Santa Anita Drive
    - Residence in the 900 block of McMartin Avenue

    - Apartments at 803 S. Vine Street
    - West Park Plaza – West Highway 30
- New customer services required the installation of 40 transformers and four high voltage terminals that were made up of 46 cable runs and 174 cable terminations. Notable installations included:
    - Candlewood Suites – 859 Allen Drive
    - Super Saver – 620 West State Street
    - Chief Construction – 3935 Westgate Road
    - Ryder Park Trailer Park – 2809 W. North Front Street
    - Victory Place – 2400 N. Broadwell
    - Garrett Toy Barn – 128 Piper Street
    - Hendrix Hatchery – 2325 W. Shimmer Drive
    - First National Bank – 2023 S. Locust Street
    - Gosda Car Wash – 905 S. Locust Street
    - DirtWorx – Central Nebraska Regional Airport Area
    - Heritage Assisted Living Center – 1920 Sagewood Avenue
    - Stuhr Museum – 3133 W. Hwy. 34
    - Nebraska Transload – 1215 Talc Drive
    - Talon Apartments – 200 E. Highway 34
    - Sterling Subdivision – Norseman and Ebony
    - Gerdes Residence – 163 A Road
    - Verizon – Roberts Street Cell Tower
    - Nova Tech – 4593 Gold Core Drive
- The transfer of existing overhead areas to underground was done where customer owned services were already underground. This was done in place of rebuilding the overhead line to meet the needs of increased size of existing customer services and reduce the maintenance needs due to trees and to deal with limited access. During these projects 15 transformers, eight medium voltage terminals, 30 runs of cable and 94 terminations were installed. Projects under this classification included:
    - Burdick Station GT-1 and Pump Room
    - Hidden Lakes
    - Middleton Electric – 429 Industrial Lane
    - Park Gardens – Stolley Park Circle
- Areas scheduled for rebuild due to cable failure and degradation of the transformer cabinets and electrical components prompted the replacement of 55 transformers, ten medium voltage terminals, 94 runs of cable and 188 terminations. Projects under this classification included:
    - Hidden Lakes Subdivision
    - Eagles Lake Subdivision
    - Old Mill Subdivision
    - Riverside
    - 4304 Calvin Drive
    - 1700 block of Rainbow Road
    - Hall County Courthouse area
    - 1030 McMartin
    - 4019 Norseman
    - 2nd and Walnut Streets signal light transformer
    - Chrysalis Apartments
- Feeder capacity infrastructure was extended in the Sterling Apartment Complex and Copper Creek Subdivision with the installation of:
    - One switch cabinet
    - Four medium voltage terminals
    - 2,746 circuit feet of cable
    - 36 terminations

- Proposed excavations sites were inspected, and marking of the location of underground electric lines and related documentation for 7,839 locates requested through Digger's Hotline of Nebraska was completed. Of those requests, 3,819 required marking of underground facilities of either utility owned lines and/or customer owned secondary lines up to the main distribution device.

Overhead Division

- In 2016 the Overhead Division maintained and upgraded the overhead distribution lines which entailed 9,990 linear feet of single phase line and 3,300 linear feet of 3-phase line being rebuilt. These upgrades eliminated old primary lines and secondary service wires to provide safety and more reliable service to utility customers and to keep the interruption indices (SAIDI) and (SAIFI) well below national averages.
- Crews replaced 1,700 linear feet of ADSS fiber that was damaged in an April building fire that also destroyed one primary pole.
- Four new poles were installed in various locations for Hall County Emergency Management to upgrade sirens.
- The Capital Avenue primary line relocation and streetlight improvement was completed.
- There were many inquiries about renewable energy sources. Two utility customers installed solar panels and set up co-generation accounts.
- Eleven 3-phase banks were installed to aid in dewatering for the installation of the North Interceptor Sewer Project.
- Crews removed, painted and re-installed 113 pedestrian lights fixtures on South Locust Street with 27 watt LED bulbs to improve efficiencies and aesthetics.
- Eleven deteriorated poles were replaced on Walnut Street for Charter Communications.
- Osmose Utilities inspected 821 poles this summer and found 22 poles that needed to be replaced.
- In an ongoing effort to maintain reliability with primary feeders, 25 switches/fused disconnects were installed or upgraded.
- Twenty-five secondary tap boxes were installed for service upgrades or new services.
- In 2016 seven primary poles and 12 streetlight poles were replaced that had been damaged by motorists.
- The Overhead Division continued in its efforts to keep vegetation clear of power lines. There were only 24 reported outages that were attributed to trees (including the Christmas wind storm). This was accomplished with the divisions own Tree Trimming Crew and the use of a contractor clearing 12 sections of lines and removing approximately 450 trees.
- The wind storm on Christmas Day resulted in the loss of 30 poles, primarily on Airport Road.
- Line Crews installed or replaced 270 transformers and three capacitor banks. This has improved system reliability and power quality for utility customers as load continues to increase.
- The automated meter infrastructure project continues to be a success. There are currently 169 water meters installed and 830 electric meters. The daily read percentage has been 99.9%. The system has been useful for meter readings, performing disconnects and troubleshooting for both water and electric.
- Five new LED lights were installed at the new Broadwell Avenue and Waugh Street intersection and 17 additional HPS lights were installed in residential subdivisions.

Utility Warehouse Division

- The Utility Store Room quoted, purchased, received and stocked $1,356,517.40 worth of materials for the Utilities Department.

- In 2016, the Store Room issued $2,018,440.39 worth of materials while salvaging, cleaning and re-stocking $508,684.23 worth of materials.
- Personnel pre-tested, sorted, documented and sold the obsolete and burned-up transformers in September of 2016 for $18,000.00.
- The division also processed, weighed, stored and sold 103,791 pounds of scrap aluminum, copper, electrical brass and ACSR wire for $110,888.52.
- The Utility Storeroom went through the 2016 audit with no issues.

Utilities Engineering Division

- The Utilities Engineering Division provides professional and technical civil engineering services for public and private developments, outside agencies and other City Departments.
- One of the division's major projects was the work associated with the Utilities building at 1306 W. 3rd Street. With acquisition of the building, Council voted to relocate the Customer Service/Cashier area from City Hall to this location. The project commenced with remodeling of the area on the west side of the building for the Meter Reader Division. Work then began on the Engineering Division's offices into the old warehouse area located on the north side of the building. The front interior of the building was then modified for the new Customer Service Center. This new location provides easy access for the public for utility account set-up, bill payment and processing. The project also included paving Jefferson Street between 3rd and S. Front Streets, adding a payment drive-up window, and on-site storm drainage. All design and construction management was performed by the Utilities Engineering Division. The finished work delivers convenience for the public and an efficient location for three Utility Divisions.
- Additional work completed by the Engineering Division included:
    - Drafting, editing or revising 377 DADD files and related database files
    - Forty easements and permit applications were prepared
    - Twelve contracts and requests for proposals
    - All related construction surveys
    - Implementation of mobile technology
    - System record management for department projects.
- Construction inspection and testing of 17 public and 19 commercial projects totaling over 19,200 linear feet of new water lines and 29,800 linear feet of new overhead and underground electric lines throughout the service area. Major projects included:
    - The 115 kV transmission line
    - Central Nebraska Regional Airport area
    - Pine Street and Union Pacific Railroad
    - Capital Avenue widening
    - Super-Saver North at Five Points
    - Sterling Apartments
    - Talon Apartments
    - Starr Elementary School
    - Victory Village Subdivision
    - Copper Creek Subdivisions