Multi-Utility System Using NMS
### KUB Customers: 464,637

#### ELECTRIC SYSTEM STATS

- **Customers:** 208,982
- **5,545,119 megawatts total purchased power**
- **5,381 miles of service lines**
- **63 substations**
- **$418 million purchased power cost**
- **77% of sales**
- **12,000 kWh annual use by typical residential customer $108.38/month $3.56/day**

#### NATURAL GAS SYSTEM STATS

- **Customers:** 103,399
- **12,392,482 dekatherms total purchased gas**
- **2,460 miles of service mains**
- **$50 million purchased gas cost**
- **47% of sales**
- **607 dekatherms annual use by typical residential customer $57.53/month $1.89/day**

#### WATER SYSTEM STATS

- **Customers:** 80,449
- **12.6 billion gallons total treated water**
- **1,409 miles of service mains**
- **1 treatment plant, 28 storage facilities, 24 booster pump stations**
- **38.3 million gallons reserve capacity**
- **34.5 million gallons/day average flow**
- **44,980 gallons annual use by typical residential customer $26.45/month $0.87/day**

#### WASTEWATER SYSTEM STATS

- **Customers:** 71,807
- **17.1 billion gallons total treated water**
- **1,317 miles of service mains**
- **77 pump stations, 4 treatment plants, 6 storage facilities**
- **66.4 million gallons Rated Capacity**
- **44,880 gallons annual use by typical residential customer $62.50/month $2.05/day**

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* KUB bills in Ccf. One Ccf (748 gallons) of water will flush a toilet about 374 times.
* A therm will dry six loads of clothes in a gas dryer.
* Wastewater is billed in Ccf and based on your water usage.
KUB’s History for Outage Management

1993
• Paper Orders
• Paper Field Maps

1994
• Implemented computerized outage call list
• Digitized trouble tickets & tied to GIS

2003
• First Outage Management Software
• Mobile Units
• Digital Maps

2011
• Upgraded OMS Version

2017
• OMS / ADMS Roadmap Developed

2018
• Kicked off Oracle NMS Project

2020
• Goes Live with Oracle NMS v2.4
Implementation Strategy

- Unique NMS environment for each utility
  - Allows proper modeling of each utility
  - Higher operating costs

- Single NMS environment with all utilities
  - Electric is a “connected” model; Gas/Water/Wastewater was non-intelligent models – standalone devices
  - Additional configuration requirements to meet each utility needs
  - Lower operating costs

- Two NMS environments: Elect + Gas/Water/Wastewater
  - Similar to single environment but additional operating costs.
Scope of NMS Implementation

- **Phase 1**
  - NMS version 2.4.0.0.4.A
  - Storm management
  - Service alerts
  - Oracle mobile application (REST services only)
  - SCADA integration (LiveData)

- **Phase 2**
  - Power flow
  - Advanced feeder management
  - Fault location analysis
  - Outage analytics (OUA v2.7)
Connecting Enterprise Systems

IBM WebSphere Liberty

NMS

CIS
PeopleSoft

Website

GIS
ESRI

IVR
Intrado

AMI
SENSUS

Mobile
Fieldwork

SCADA
Siemens via LiveData
Managing Multiple Utilities with NMS

- Require unique network models for each utility
- Number of hide/display layers, crew types, event details, etc. multiply with each utility
Managing Multiple Utilities with NMS

- **Electric**
  - Normal outages, partial power, low voltage, etc.

- **Gas**
  - Gas leaks, dig-ins, relights, etc.

- **Water**
  - Water main breaks, fire hydrants, etc.

- **Wastewater**
  - Dig-ins, leaks, overflows, building back-ups
KUB’s original OMS was highly customized to be our only mobile solution to our crews.
Single Mobile Solution

- Let field crews do more of what they are good at
  - Restore power, repair mains, etc
- Develop a single, simple solution that allows the same user interface no matter the source
## Multiple Sources, Single Endpoint

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Today’s Status

- Scheduled Go-Live with NMS v2.4.0.0.4A
  - March 27, 2020

- Phase 2: Summer 2020
  - Power flow
  - Advanced feeder management for suggested switching
  - Fault location
  - Oracle utilities analytics v2.7
Lessons Learned

- Collaboration with Oracle on configuration ideas and options
- Configuration over customization – even if changing existing business processes
- Obtaining employee buy-in early in the process and from the top down

“Learning equals change. If we haven’t changed, we haven’t learned.”

– John G. Miller
Discussion / Q&A