Railroad Commission of Texas

Using GIS to Manage Natural Gas Critical Infrastructure for the Texas Electricity Supply Chain

Jared Ware

Texas GIS Forum
October 26th, 2023
Why map the natural gas supply chain?

Winter storm arrives – Texas freezes over – Multiple power outages
CID’s Regulatory Requirements

• Rule 3.65 – Critical Infrastructure
  – CI-D and CI-X Filings
  – Administrative Compliance
  – Technical Assessments

Information that constitutes part of the natural gas supply chain *

• Rule 3.66 – Weather Preparedness
  – Emergency Operations Plans
  – Inspections
  – Technical Reviews

Information used for inspections and requirements analysis

Achieving GIS-enabled solutions to track regulatory requirements

*note: not every critical load facility is on the electricity supply chain
Natural Gas Infrastructure on the Map

Rule 3.65 and Rule 3.66 Regulatory Requirements

Regulated by the Railroad Commission of Texas

Inspected by RRC’s Critical Infrastructure Division
RRC’s GIS-enabled Applications

- Electricity Supply Chain Map
- Critical Infrastructure Inspection System (CIIS)
- GeoTAB
- RRC MAP
- Power BI
Mapping the Natural Gas Supply Chain

- Over 6,000 natural gas critical infrastructure facilities in the supply chain subject to Rule 3.66
- Systems currently consists of:
  - Over 15,000 miles of gas transmission pipeline
  - Over 60,000 miles of power transmission lines
- Emergency contact information for facilities
- Live visualizations of weather watches and warnings
  - National Weather Service feeds
  - Localized weather across counties and regions
Natural Gas Critical Infrastructure Layers

- 8 Primary Layers & 4 Supplemental Layers
  - Pipelines (Transmission)
  - Pipeline Compressor Stations
  - Gas Processing Facilities
  - Off lease Gas Processing Compressor Stations
  - Gas Wells
  - Oil Leases
  - Saltwater Disposal Wells
  - Underground Storage
  - Liquid Storage Facilities
  - Pipeline Meter Stations
  - Pipeline Regulators
  - Pipeline Control Centers

* Required only for CID Inspections
Data Manipulation and Visualization
Maintained through Esri’s ArcPro & ArcGIS Online

This is a graphical depiction. The actual map is deemed confidential and privileged. Viewing requires being an approved user and signing a nondisclosure agreement.
Critical Infrastructure Inspection System

- Repository for the inspection universe
- Formal database of record for all CID regulatory requirements and actions
- Maintains version control as data changes
GeoTAB Application

- Ability to track inspections in real-time.
- Ability to analyze fleet usage and equipment operations
- Ability to optimize site inspections through route planning
MAP Application - Location

- File, confirm and store operator information
- Provides operators with mapped locations

Select the pipeline segment(s) from AUSTIN LATERAL, 20" that supplies gas to SAND HILL ENERGY CTR (SANDHYSYD) in appropriate segment order.

MAP will enable operators to file, retrieve and track 100% of their critical infrastructure in one application.
Geospatial Analysis – Extreme Cold
RRC Public GIS Viewer

- Baseline research for infrastructure on a lease
- Determine closest pipeline locations
- Determine electricity provider for operating assets
No loss of electricity due to the natural gas supply chain
What Else We Experienced in FY23

The Second-hottest Summer Ever Recorded in Texas

The summer of 2023 was Texas' second hottest on record. The average temperature in June, July and August this year was 85.3 degrees, which was 4 degrees warmer than the 20th-century average. Since 2000, only four summers have been cooler than the 20th-century average, while 19 were warmer.

2011 was the hottest summer on record with an average temperature of 86.8 degrees.

This was the second-hottest summer ever recorded in Central Texas – and September won't provide much relief.

Camp Mabry finished one-tenth of a degree shy of the all-time summer heat record.

No loss of electricity due to the natural gas supply chain.

Sources: National Oceanic and Atmospheric Administration (1885-2022); John Nielsen-Gammon, Texas state climatologist (2023 estimate)
Additional Information

Railroad Commission of Texas Website

www.rrc.texas.gov

For information on the critical infrastructure program, navigate to the agency homepage and select this icon: