



ARMS

Arcflash Reduction Maintenance System

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A, Version 1





Overview

- History
- Geographical Area
- Network Grids
- Network Personnel
- Network Assets
- ARMS Installation
- Incident at 701 Colorado



History



History of the Network

- Austin's first utility company, the Austin Water, Light and Power Company, was a private company formed in 1887.
- City of Austin purchased this company in 1902.
- Austin's original power plant was housed on the site of the current electric substation next to Seaholm Power Plant.
- First Network system installed in 1930's
 - Installed in alleys along Congress
 - Replaced DC generators that were fed by fuel oils.
 - Network circuits were powered from the original power plant on the Seaholm site.

Seaholm Power Plant



PICA 14339 Austin History Center, Austin Public Library

Congress 1930's



C00622 Austin History Center, Austin Public Library

Congress Present Day

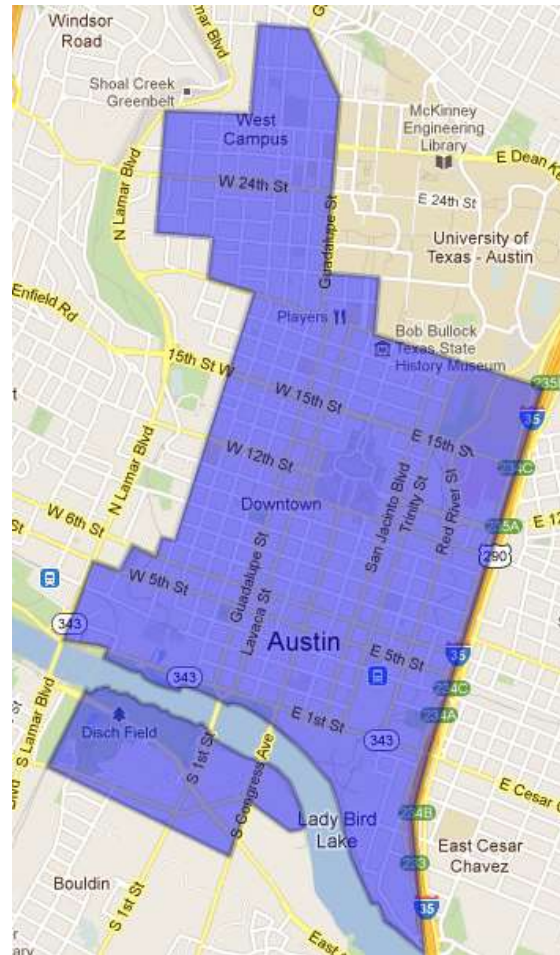




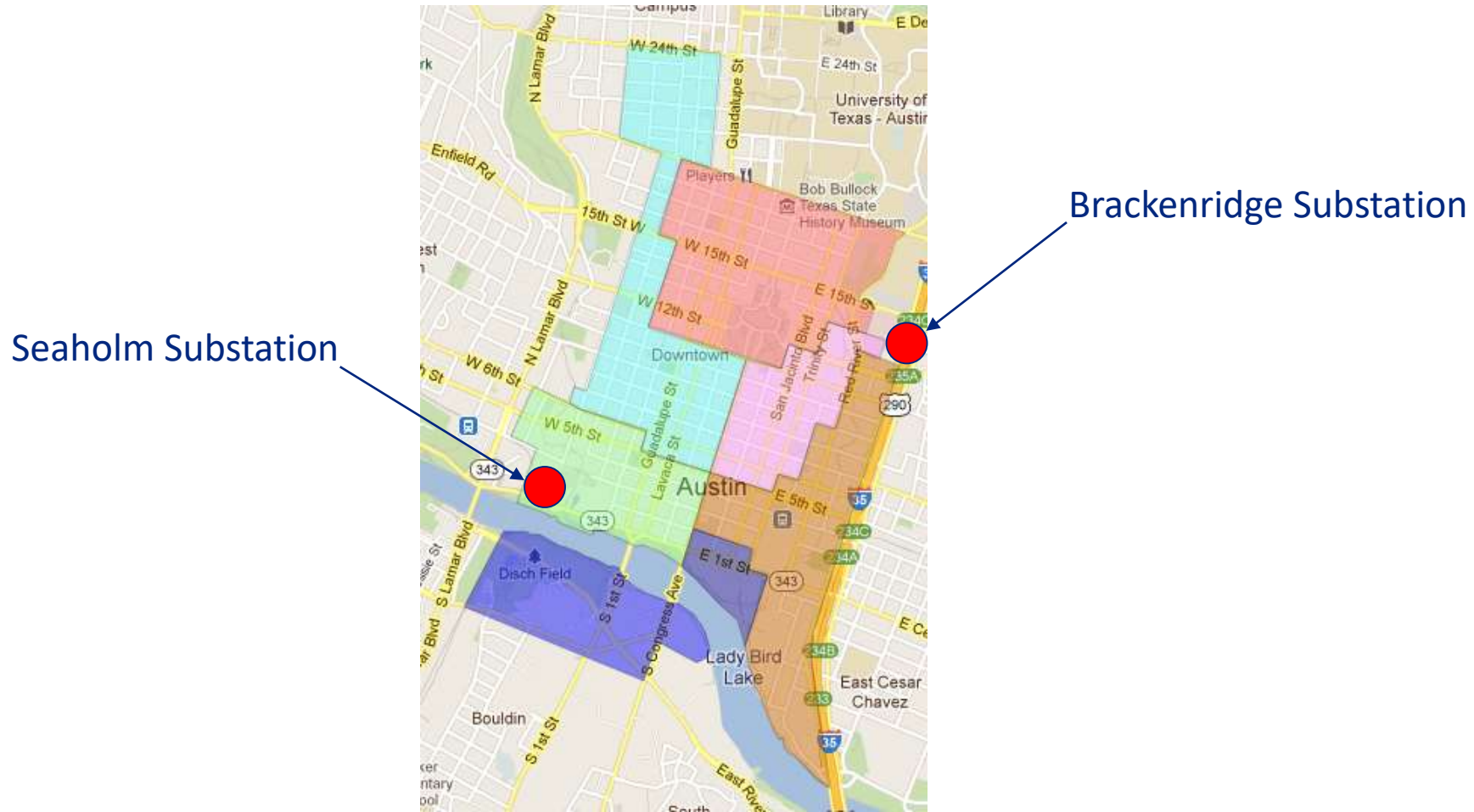
Geographical Area and Network Grids



Geographical Area



Network Grids





Network Personnel



Network Const. & Maint. Crew

- 1- Superintendent
 - 2- Supervisors
 - 1- Scheduler
- 2- Crew leaders
- 8- Journeyman
- 8- Apprentices
- 2- Locators



Network Assets



Network Assets

Downtown Network Transformer Vaults

Secondary Voltage	Number
12.47 kV Primary Feed	1
12470Y/7200 V	1
4160Y/2400 V	2
480Y/277 V	163
216Y/125 V	145
Total	312



Network Assets

Downtown Network Transformer Vaults	
Primary Voltage	Number
34.5 kV	234
12.47kV	78



Network Assets

At Grade vs. Below Grade Vaults			
At Grade		Below Grade	
Secondary Voltage	Number	Secondary Voltage	Number
12.47 kV Primary Feed	1	12.47 kV Primary Feed	0
12470Y/7200 V	1	12470Y/7200 V	0
4160Y/2400 V	2	4160Y/2400 V	0
480Y/277 V	106	480Y/277 V	54
216Y/125 V	75	216Y/125 V	70*
Total	185	Total	127
		* 34 Single Transformer Sidewalk Vaults	



Network Assets

- 721 – Total Number of Network Transformers
- 721 – Total Number of Network Protectors
- 302 – Total Number of Molded Vacuum Interrupters
- 66 – Total Number of Network Vault Protection Systems
- 36 – Total Number of Network Vaults using Eaton's VaultGard™ System
- 39 – Number of Network Vaults in Design
- 1850 – Total Number of Manholes and Pull Boxes
- 422 – Underground Substation Feeder Exits



ARMS Installation



ARMS Installation

- Austin Energy did an ARC Flash Study in 2012 and determined that all 480v Vaults exceeded 200 cal/cm²
- Began installing ARMs in all new vaults in 2013
- Created project to retrofit all 480v Network Protectors with ARMs and replace all 480v protectors that could not be retrofitted.
- Original project was projected to take 7 years and 7.5 million dollars to complete
- Network Crews completed the project in 4 years and within budget.
 - Upgraded a 128 protectors to CM-52 with ARMS
 - Added ARMS to 151 protectors
- Completed ARMs 2017



ARMs Setup

- We have it wired so that when you turn on the vault lights all protectors go into their maintenance setting.
 - This was done because we have different Austin Energy Departments entering these vaults at various times
- All vault lighting and wiring is tied back to and fed by the Network Grid



Incident at 701 Colorado (U.T. Rob)



Overview

- Crew was in the process of hooking up a temporary disconnect for a construction loop in an energized Network vault with ARMS installed and activated.
- 3 - 2000 KVA transformer spot 480v vault with 3000 amp CM-52 Protectors
- Available Fault Current –101.2 kA (3x33.7 kA for parallel contribution)
- Disconnect had been mounted to the wall and all 500 secondary had been landed within the 1200 amp main.
- Clearing time with CM52 ARMS- 1.9 cycles on average



Austin Energy ARMS Video



Questions?