



# Austin Energy

## Briefing on System Operations

## Rolling Blackouts

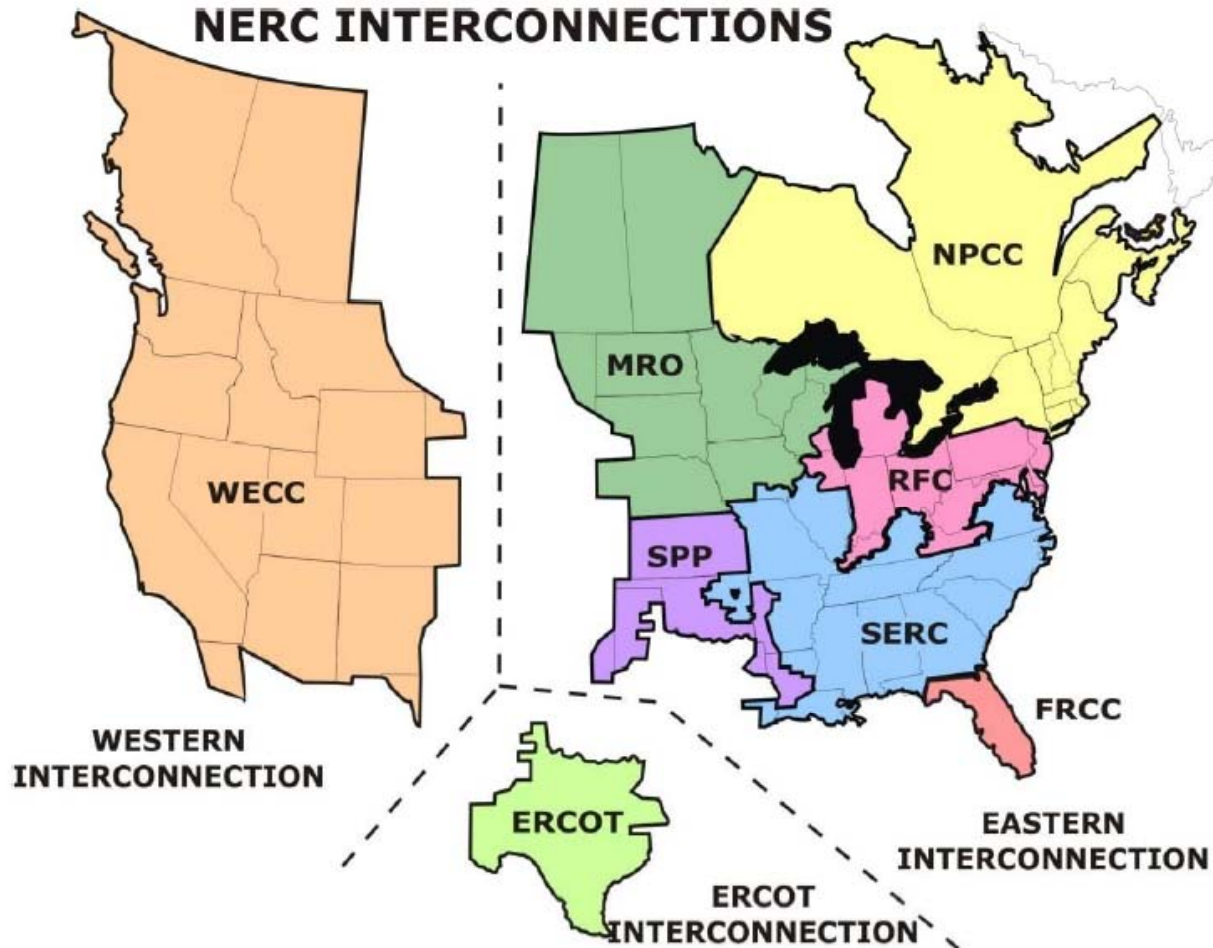
*Mission: Deliver clean, affordable, reliable energy and excellent customer service.*

*Larry Weis, General Manager*

February 10, 2011



# North American Reliability Regions





# Electric Reliability Council of Texas (ERCOT)



ERCOT  
grid serves  
85% of  
Texas

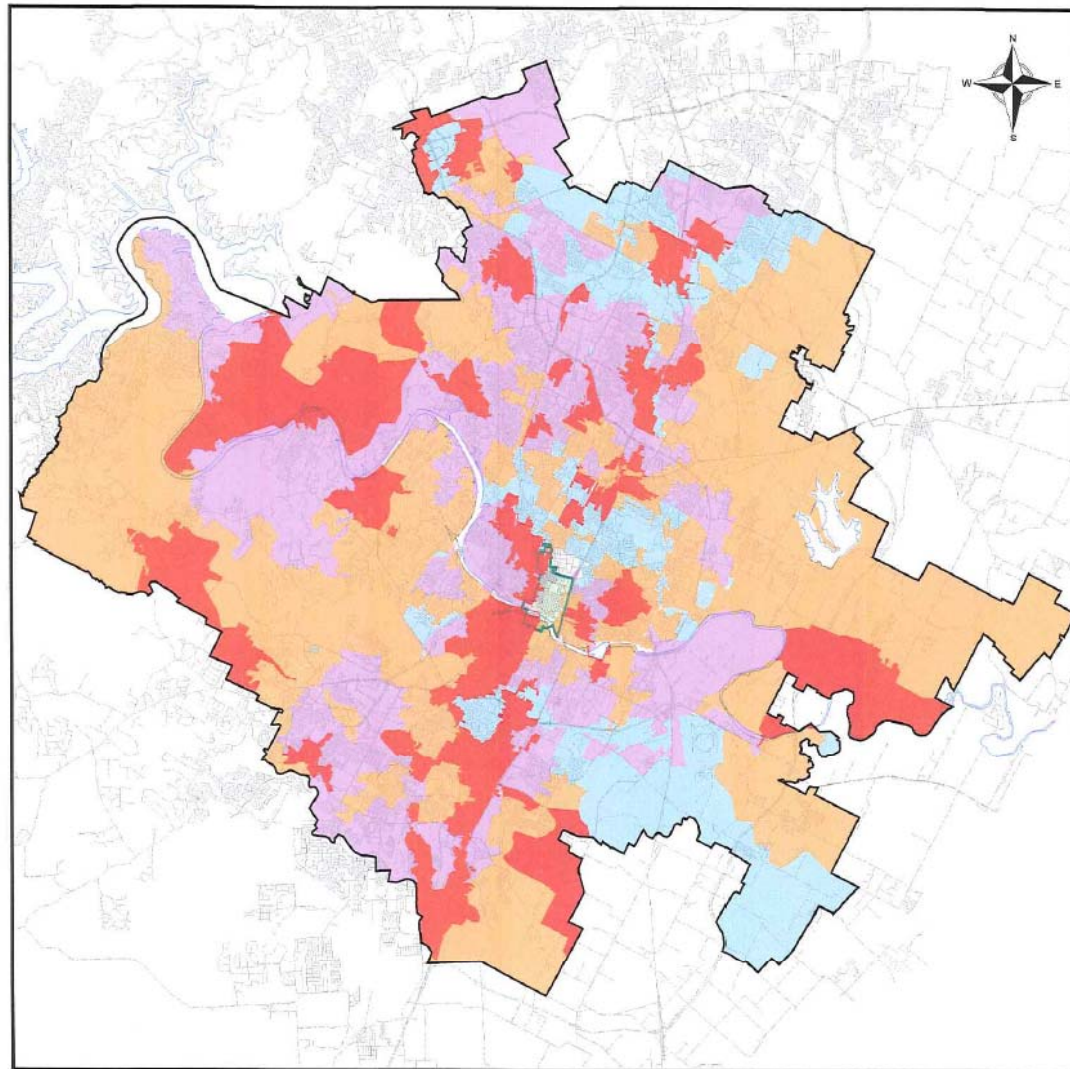











# AE Distribution Circuits

Attachment 6

AE Distribution Circuits  
Used for Load Reduction  
February 2, 2011



-  Load Shed Circuits
-  Industrial Circuits
-  Critical Load Circuits
-  Under Frequency Circuits
-  Network
-  Austin Energy Service Area
-  Street Centerline

Note: Circuit areas are approximate boundaries

0mile 2mile 4mile 6mile



02/08/2011

This map has been produced by Austin Energy for the sole purpose of geographic reference. No warranty is made by the City of Austin regarding specific accuracy or completeness.





# ERCOT Rolling Blackouts

- Weather event - insufficient generation and high consumption
- Third time in recent history for AE (12/22/1989, 4/17/2006, 2/02/2011)
- Additional generation unable to start and stay online
- ERCOT alerts when reserves below 3,000 MW
- Rolling blackouts ordered by ERCOT as last step to restore grid balance
- If grid frequency declines to 59.3 Hz, relays activate automatically to prevent system blackout





# Rolling Blackout Response

- AE's system "shares the outage" within ERCOT
- Energy Control Center staff responded to ERCOT directive to begin load shedding immediately
- AE generation had minor interruptions
- Situation progressed rapidly
  - 12:01- 6:00 a.m. – Over 80 generating units trip & reduced output
  - 2:47 a.m. - Reserves shortage by ERCOT
  - 5:08 a.m. - ERCOT issued physical response below 2,500 MW notice
  - 5:17 a.m. - Energy Emergency Alert Level 2a (EEA2a) activated Emergency Interruptible Load Service (EILS) and Loads Acting as Resources (LaaRs)
  - 5:43 a.m. - Load shed ordered





# Austin Energy Communications

- 5:42 a.m. - AE corresponded with City Of Austin Emergency Operations Center (EOC) shortly after ERCOT issued Energy Emergency Alert Level 2a (EEA2a) at 5:17 a.m.
- 6:14 a.m. - AE communicated with media and Corporate PIO initially
  - Ongoing status reports throughout the day
- AE maintained staffing at City Of Austin Emergency Operations Center (EOC) once activated





# AE Criteria for Load Shed Plan

- ERCOT requires AE to develop a load shed plan
- AE plan is to shed 4% share of 1,000 MW or 40 MW via rolling blackouts
- Plan includes 44 circuits with rotations targeting about 7-10 minute outages for 10 circuits at a time
- Internal policy considers the function and service of each of the 376 circuits in service at any given time
- 332 circuits are excluded from load shed plan
  - **211** health and safety critical loads and industrial loads
  - **31** serving downtown network
  - **90** with automatic required under frequency load shed relays
- 48 circuits utilized for rolling blackouts impacting more than 80,000 or 20% of AE customers

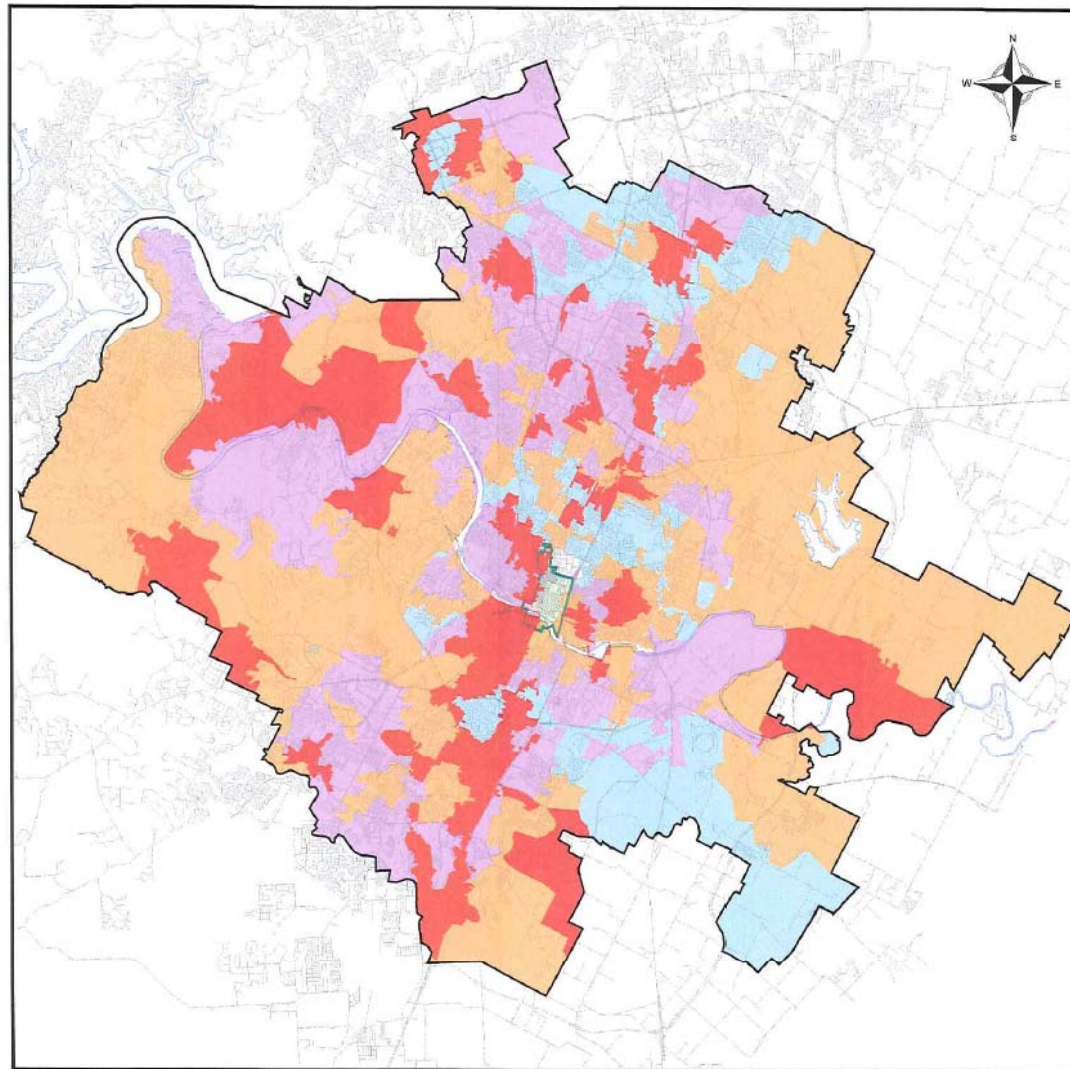











# AE Distribution Circuits

Attachment 6

AE Distribution Circuits  
Used for Load Reduction  
February 2, 2011



-  Load Shed Circuits
-  Industrial Circuits
-  Critical Load Circuits
-  Under Frequency Circuits
-  Network
-  Austin Energy Service Area
-  Street Centerline

Note: Circuit areas are approximate boundaries

0mile 2mile 4mile 6mile



02/08/2011

This map has been produced by Austin Energy for the sole purpose of geographic reference. No warranty is made by the City of Austin regarding specific accuracy or completeness.





# Downtown Network

- Serves Central Business District, State Capitol Complex and portions of West Campus
- Multiple circuits that backup each other
- Redundancy is automatic, not controlled remotely
- Dropping a circuit would not result in load reduction due to redundancy
- Dropping circuits could potentially cause overloading and damage to facilities





# Health and Safety Critical Loads

- Defined as those benefiting public safety, security and health
  - Hospitals, inpatient treatment and surgery centers with overnight facilities
  - Licensed eldercare nursing facilities, dialysis facilities, residential hospice
  - Water and sewage treatment facilities
  - Airport
  - Public safety, military, detention facilities, 911 & 311
  - Media broadcasting facilities





# Outages larger and longer than planned

- AE Plan based on 1,000 MW system wide load shed, 40 MW for AE
- ERCOT rapidly increased load shedding requirement to 4,000 MW system wide, 160 MW for AE
  - Duration of rolling blackout intervals increased to 30-45 minutes
  - Included up to 40 circuits at a time to meet ERCOT obligations
- Power outages also occurred outside load shed operation





# AE Customers Responded

- About 45 commercial & industrial customers responded to AE's appeal for conservation on behalf of ERCOT
- AE staff in constant contact with 500+ customers to encourage load conservation and provide updates including:
  - State and local agencies
  - School districts (8), local colleges and universities
  - Hospitals
  - Industrial facilities
  - Large residential retirement communities
- AE staff expanded communications to include small businesses, national retail and social service non-profits





# Overall AE Power Plants Performed Well

- AE planned for the weather
- Outage crews were ready
- Some weather impact on AE units
  - 400 MW unit producing 90 MW tripped off line at 1:04 a.m. and was back online at 2:14 a.m. prior to rolling blackouts
  - 50 MW unit tripped at 8:53 a.m. and 11:17 a.m. and was running consistently by 12:54 p.m.
  - 25 MW unit failed to start at 4 a.m. and was online at 2:33 p.m.
- AE switched from gas to oil in a 325 MW Decker unit to mitigate potential gas supply issues





# Next Steps

- Reviews of this event already initiated by
  - Public Utility Commission of Texas (PUCT)
  - Electric Reliability Council of Texas (ERCOT)
  - North American Electric Reliability Corporation (NERC) and Texas Reliability Entity (TRE)
  - Texas Senate Business and Commerce and Natural Resources Committees (Tuesday, February 15)
  - Texas Railroad Commission (Natural Gas Regulation)
- AE to evaluate process and identify improvements
  - Policies and load shed plan
  - Communications procedures
  - Other alternatives

