TOGETHER WE DELIVER

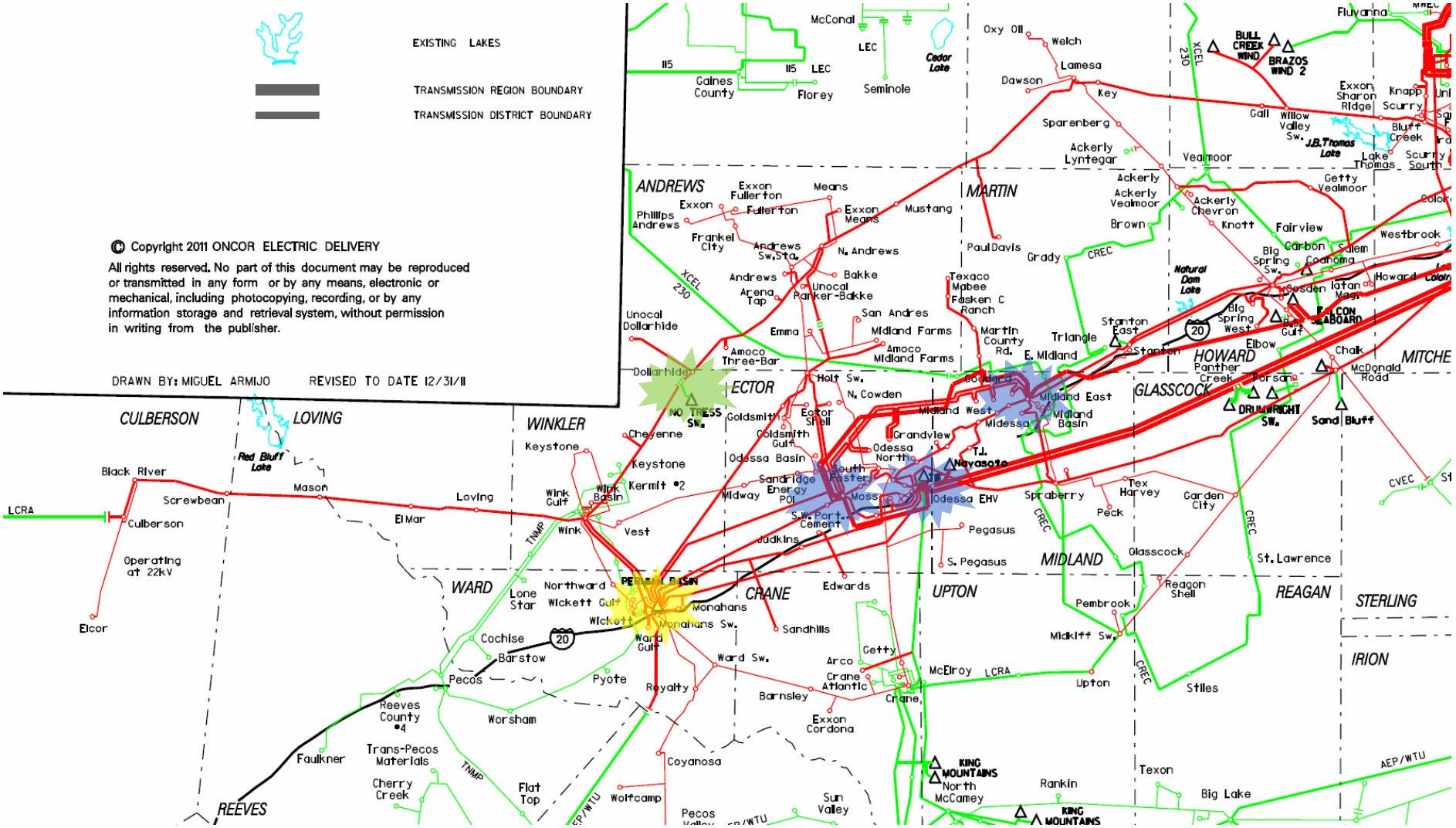
ODESSA CONGESTION UPDATE

October 12, 2012
Presentation to ERCOT Regional Planning Group
Austin, TX

Kenneth A. Donohoo, PE
Director, System Planning
Distribution and Transmission

Oncor Electric Delivery Company LLC

WEST TEXAS


EXISTING LAKES
TRANSMISSION REGION BOUNDARY
TRANSMISSION DISTRICT BOUNDARY
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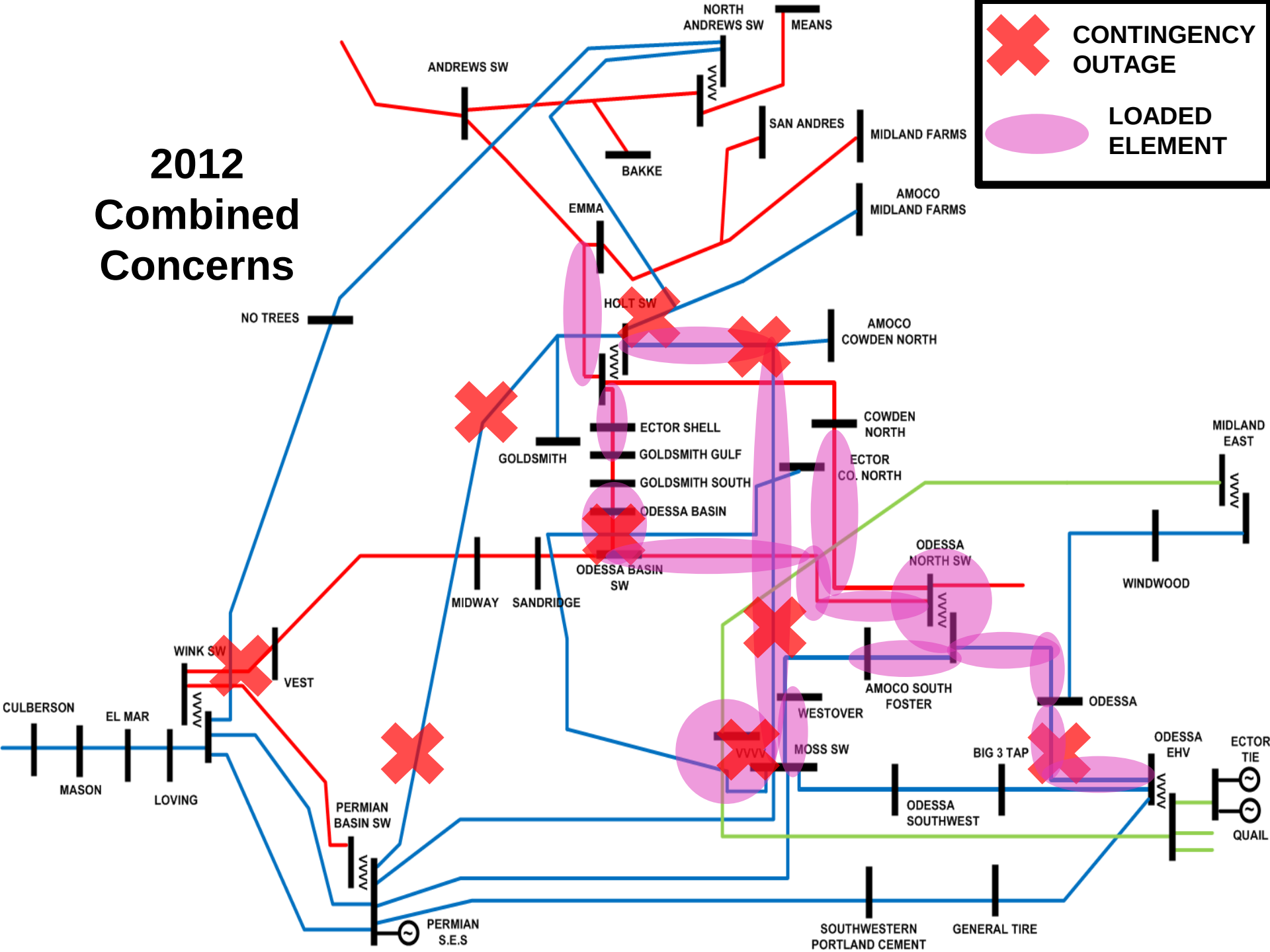
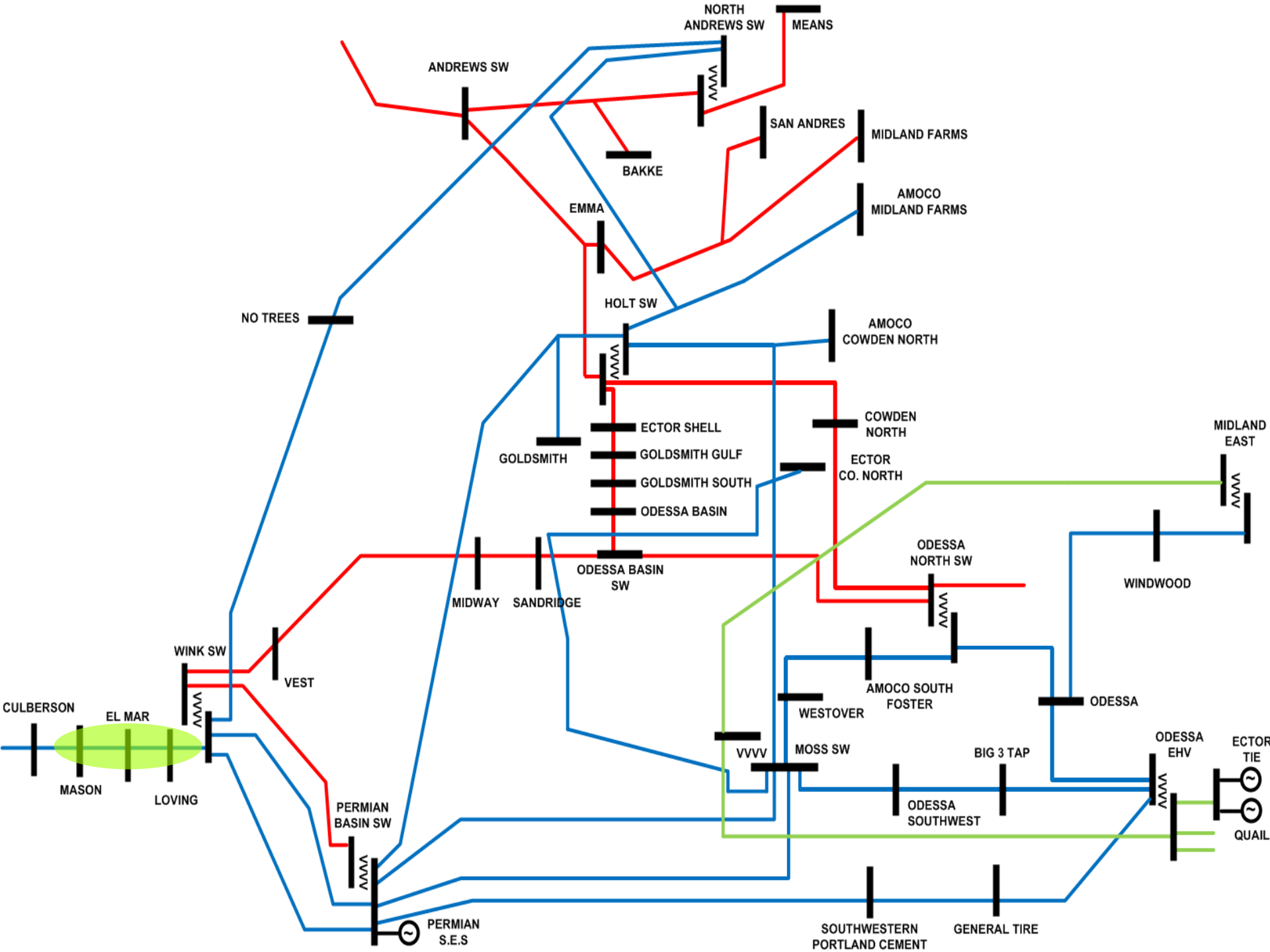
DRAWN BY: MIGUEL ARMIJO
REVISED TO DATE 12/31/11
CULBERSON
LOVING
WINKLER
ANDREWS
MARTIN
HOWARD
GLASSCOCK
ECTOR
CRANE
UPTON
MIDLAND
WARD
REAGAN
IRION
STERLING
REEVES
Red Bluff Lake
Black River
Screwbean
Culberson
Operating at 22kV
Elcor
LCRA
Mason
Loving
ElMar
Wink
Vest
Keystone
Cheyenne
Kermit #2
Wink Gulf
Wink Basin
Goldsmith
Goldsmith Gulf
Ector Shell
Odessa Basin
Sandridge Energy POI
Midway
Judkins
Odessa North
Odessa EHV
Moss
Grandview
Midland West
Midland East
Midland Basin
Midkiff Sw.
Pegasus
S. Pegasus
Spraberry
Tex Harvey
Garden City
Peck
Glasscock
St. Lawrence
Reagon Shell
Pembrook
Upton
Stiles
McElroy
Crane Atlantic
Crane
Getty
Arco
Barnsley
Exxon Cordona
Royalty
Ward Gulf
Ward Sw.
Monahans
Monahans Sw.
Wicket
Wicket Gulf
Lone Star
Northward
Edwards
Sandhills
Cochise
Barstow
Pecos
Pyote
Worsham
Reeves County #4
Trans-Pecos Materials
Faulkner
Cherry Creek
Flat Top
Wolfcamp
Coyanosa
Sun Valley
Rankin
North McCamey
Texon
Big Lake
KING MOUNTAINS
TNMP
AEP/WTU
CREC
XCEL 230
Andrews
Andrews Sw.Sta.
N. Andrews
Arena Tap
Bakke
Unocal Parker-Bakke
Unocal Dollarhide
Dollarhide
Emma
San Andres
Midland Farms
Amoco Three-Bar
Amoco Midland Farms
Holt Sw.
N. Cowden
NO TRESS SW.
Exxon Andrews
Exxon Fullerton
Fullerton
Phillips Andrews
Frankel City
Means
Exxon Means
Mustang
Texaco Mabee
Fasken C Ranch
Martin County Rd.
E. Midland
Triangle
Stanton East
Stanton
Big Spring West
Big Spring Sw.
Natural Dam Lake
Elbow
Chalk
Forsan
Panther Creek
McDonald Road
Sand Bluff
DRUMWRIGHT SW.
Paul Davis
Grady
Brown
Ackerly Lyntegar
Ackerly
Ackerly Vealmoor
Ackerly Chevron
Vealmoor
Getty Vealmoor
Knott
Fairview
Westbrook
Carbon
Coahoma
Salem
Howard
Colorado
Sparenberg
Key
Dawson
Oxy Oil
Welch
Lamesa
Gail
Willow Valley Sw.
J.B. Thomas Lake
Lake Thomas
Bluff Creek
Scurry South
Exxon Sharon Ridge
Knapp
Scurry
BULL CREEK WIND
BRAZOS WIND 2
Fluvanna
Galnes County
Florey
LEC
Seminole
Cedar Lake
McConal
115
XCEL 230
CREC
CVEC


2012
Combined
Concerns
CONTINGENCY OUTAGE
LOADED ELEMENT
NORTH ANDREWS SW
MEANS
ANDREWS SW
SAN ANDRES
MIDLAND FARMS
BAKKE
AMOCO MIDLAND FARMS
EMMA
HOLT SW
NO TREES
AMOCO COWDEN NORTH
ECTOR SHELL
COWDEN NORTH
GOLDSMITH
GOLDSMITH GULF
ECTOR CO. NORTH
GOLDSMITH SOUTH
ODESSA BASIN
MIDLAND EAST
ODESSA BASIN SW
ODESSA NORTH SW
MIDWAY
SANDRIDGE
WINDWOOD
WINK SW
VEST
AMOCO SOUTH FOSTER
WESTOVER
ODESSA
CULBERSON
EL MAR
MOSS SW
BIG 3 TAP
ODESSA EHV
ECTOR TIE
MASON
LOVING
PERMIAN BASIN SW
ODESSA SOUTHWEST
QUAIL
PERMIAN S.E.S
SOUTHWESTERN PORTLAND CEMENT
GENERAL TIRE


NORTH ANDREWS SW
MEANS
ANDREWS SW
SAN ANDRES
MIDLAND FARMS
BAKKE
AMOCO MIDLAND FARMS
EMMA
HOLT SW
NO TREES
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SOUTHWESTERN PORTLAND CEMENT
GENERAL TIRE

ACTIONS & IMPROVEMENTS (Completed & Underway)

2011

Rebuild Holt South – Goldsmith 69 kV Line as Double-Circuit 138 & 69 kV Line and Convert Goldsmith to 138 kV Jun 2011

2012

Inspected Odessa North 138/69 kV Autotransformer and Critical Contingency Lines Aug 2012

Installed Online Temperature Monitoring and Auxiliary Oil Cooling on the Odessa North 138/69 kV Autotransformer Rating to 99 MVA (Nameplate 75 MVA) Sep 2012

Implemented Changes in System Configuration to Limit Flow through the Odessa North Autotransformer Sep 2012

Upgraded Terminal Equipment on Moss – Westover 138 kV Line Sep 2012

Upgraded Terminal Equipment Odessa North – Holt 69 kV Line Sep 2012

Upgraded Terminal Equipment Odessa North – Cowden North 69 kV Line Sep 2012

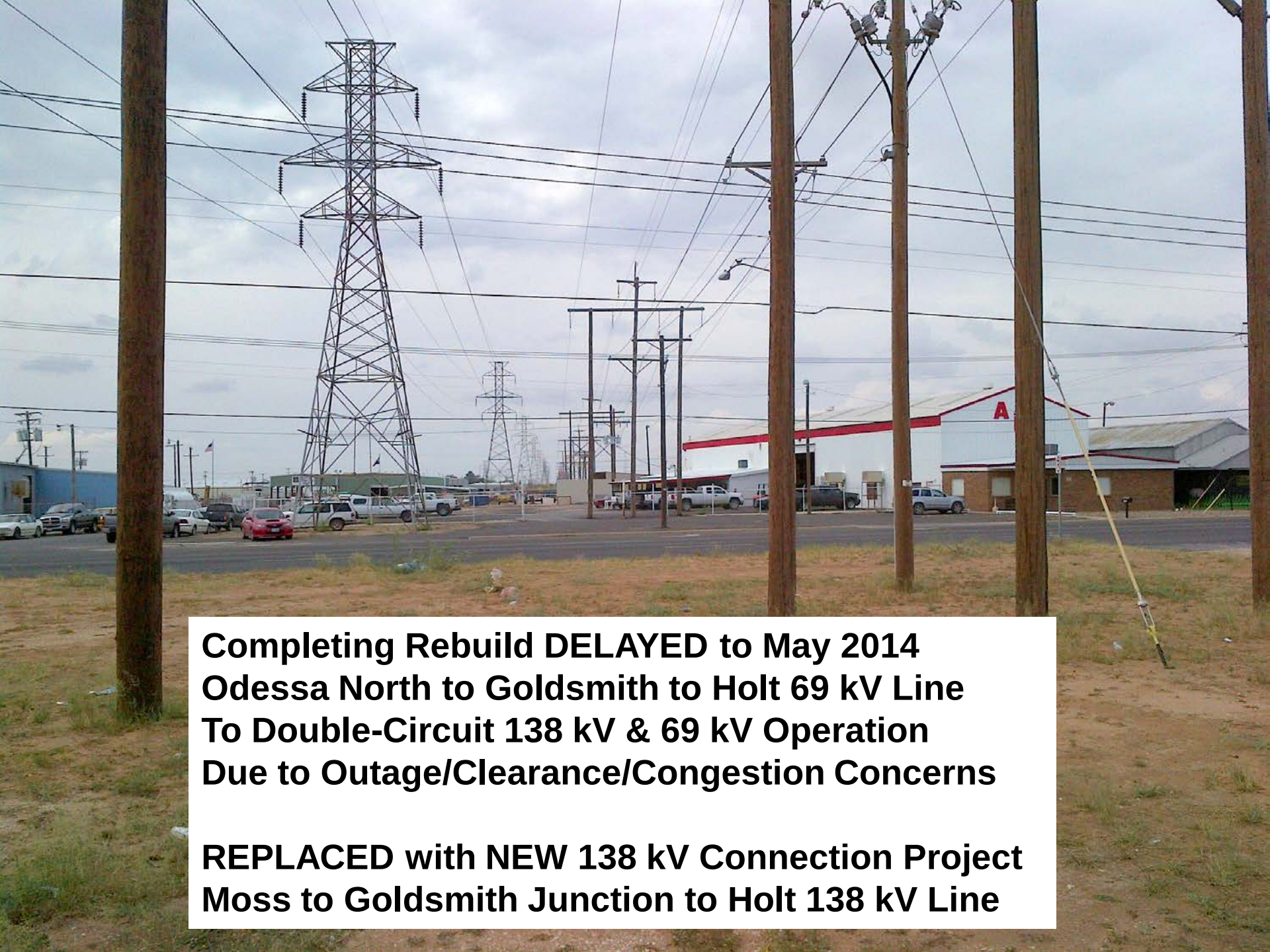
Increased Emergency Rating of Switches at Judkins on Permian Basin – Odessa EHV 138 kV Line Sep 2012

Convert Goldsmith Gulf to 138 kV Approx 12 MW Oct 2012

Replace Odessa North 138 kV/69 kV Autotransformer with 100 MVA Nameplate (Rated 125 MVA Emergency) Nov 2012

Increase rating (operating temp) of Moss – Holt 138 kV Line Dec 2012

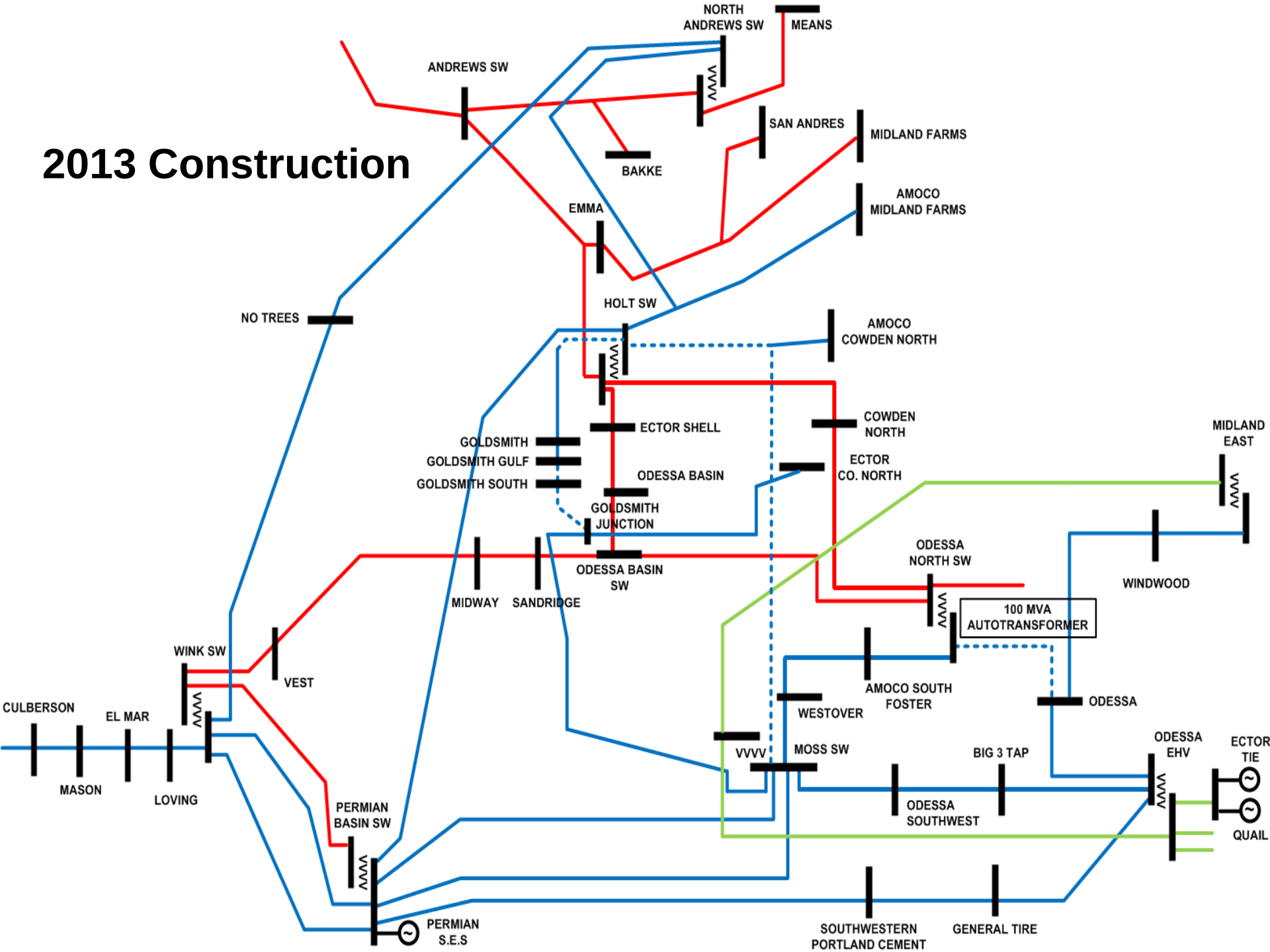
Increase rating (operating temp) of Moss – Odessa EHV 138 kV Line Dec 2012



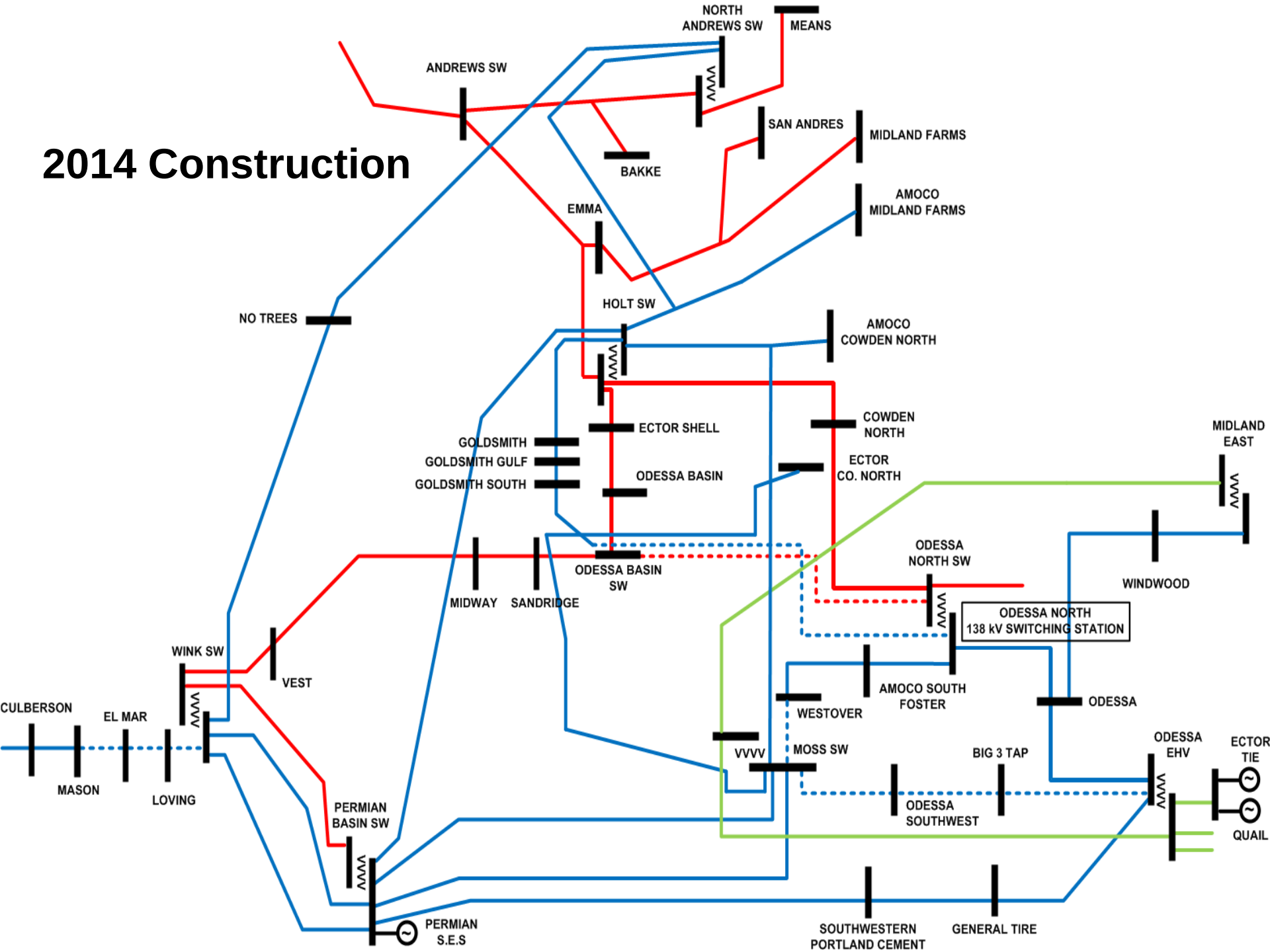
Completing Rebuild DELAYED to May 2014
Odessa North to Goldsmith to Holt 69 kV Line
To Double-Circuit 138 kV & 69 kV Operation
Due to Outage/Clearance/Congestion Concerns

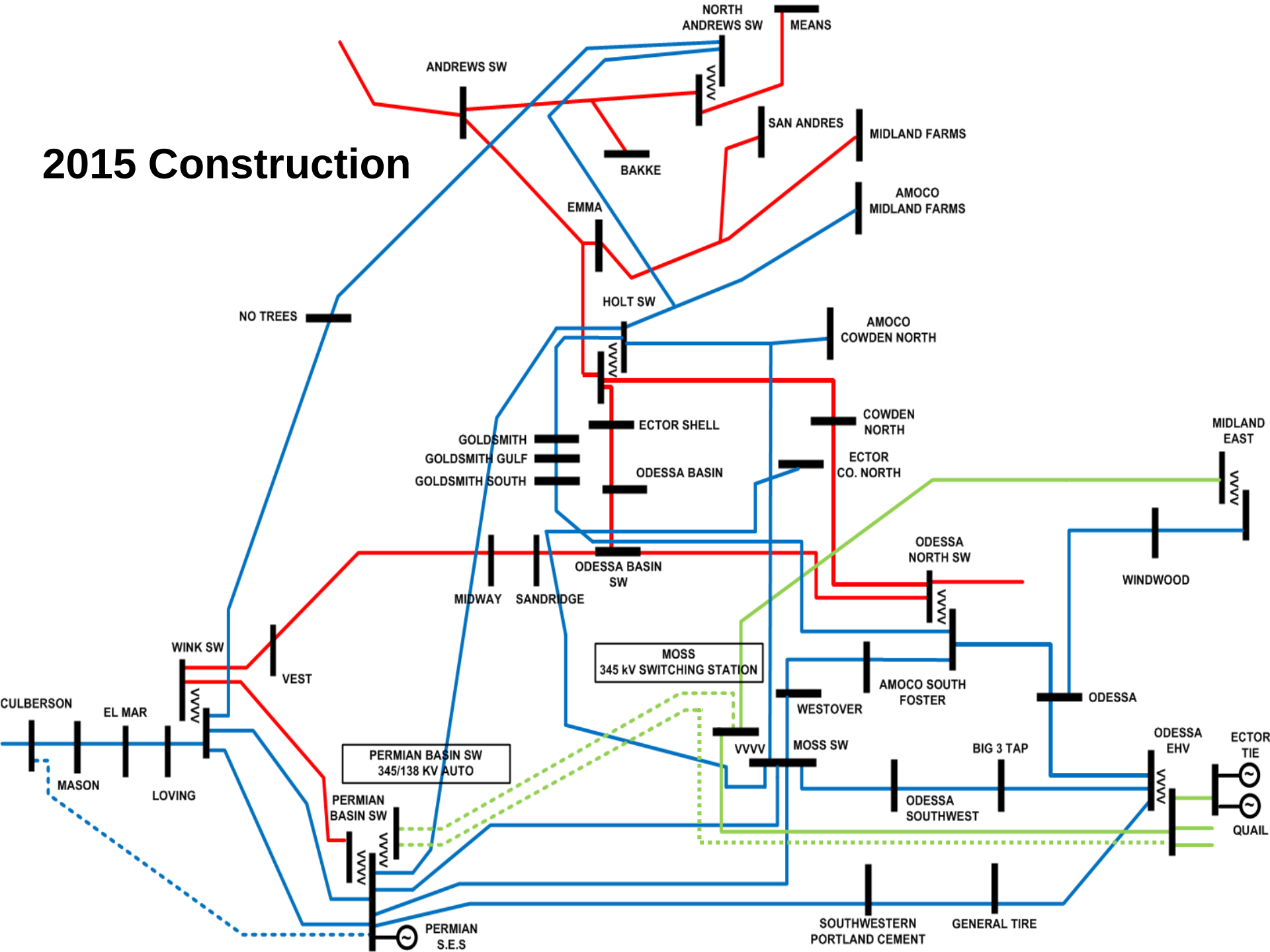
REPLACED with NEW 138 kV Connection Project
Moss to Goldsmith Junction to Holt 138 kV Line

2013 Construction



2014 Construction




2015 Construction
NORTH ANDREWS SW
MEANS
ANDREWS SW
SAN ANDRES
MIDLAND FARMS
BAKKE
AMOCO MIDLAND FARMS
EMMA
HOLT SW
NO TREES
AMOCO COWDEN NORTH
ECTOR SHELL
COWDEN NORTH
GOLDSMITH
GOLDSMITH GULF
GOLDSMITH SOUTH
ODESSA BASIN
ECTOR CO. NORTH
MIDLAND EAST
ODESSA NORTH SW
WINDWOOD
ODESSA BASIN SW
MIDWAY
SANDRIDGE
WINK SW
VEST
MOSS 345 kV SWITCHING STATION
AMOCO SOUTH FOSTER
WESTOVER
ODESSA
CULBERSON
EL MAR
MASON
LOVING
PERMIAN BASIN SW 345/138 KV AUTO
MOSS SW
BIG 3 TAP
ODESSA EHV
ECTOR TIE
PERMIAN BASIN SW
ODESSA SOUTHWEST
QUAIL
PERMIAN S.E.S
SOUTHWESTERN PORTLAND CEMENT
GENERAL TIRE

LONGER TERM CONGESTION RELIEF PROJECTS

2013

Create New 138 kV circuit from Moss to Goldsmith Junction to Holt by:

- **Rebuilding Goldsmith – Goldsmith South 69 kV Line as Double-Circuit 138 & 69 kV Line and Converting Goldsmith South to 138 kV Approx 31 MW Mar 2013**
- **Complete Holt – Goldsmith 138 kV Connection May 2013**
- **Rebuilding Goldsmith South – Goldsmith Junction 69 kV Line as a Double-Circuit 138 & 69 kV Line Jun 2013**
- **Connecting Goldsmith Junction to Moss – Ector County North 138 kV Line Jun 2013**

Upgrade Odessa – Odessa North 138 kV Line Dec 2013

Upgrade Moss–Holt 138 kV Line - Dec 2013

2014

Add 345 kV Breakers at Moss Switching Station May 2014

Establish Odessa North 138 kV Switching Station May 2014

Rebuild Odessa North – Goldsmith Junction 69 kV Line as a Double-Circuit 138 & 69 kV Line May 2014 (disconnect from Moss – Ector County North 138 kV Line)

Upgrade Moss – Westover 138 kV Line May 2014

Upgrade Odessa EHV – Big 3 Tap – Odessa Southwest – Moss 138 kV Line Dec 2014

LONGER TERM CONGESTION RELIEF PROJECTS

2015

Construct Permian Basin – Culberson 138 kV Line (RPG Review & CCN Required) May 2015

Construct Moss – Permian Basin Double-Circuit 345 kV Line (RPG Review & CCN Required) May 2015

Construct Odessa EHV – Moss (connect to one Permian Basin circuit) 345 kV Circuit on Existing Structures May 2015

Add Additional 345 kV Breakers at Moss Switching Station to support new circuit to Permian Basin May 2015

Establish 345 kV Switching Station and Install 600 MVA 345/138 kV Autotransformer at Permian Basin May 2015

Under Consideration

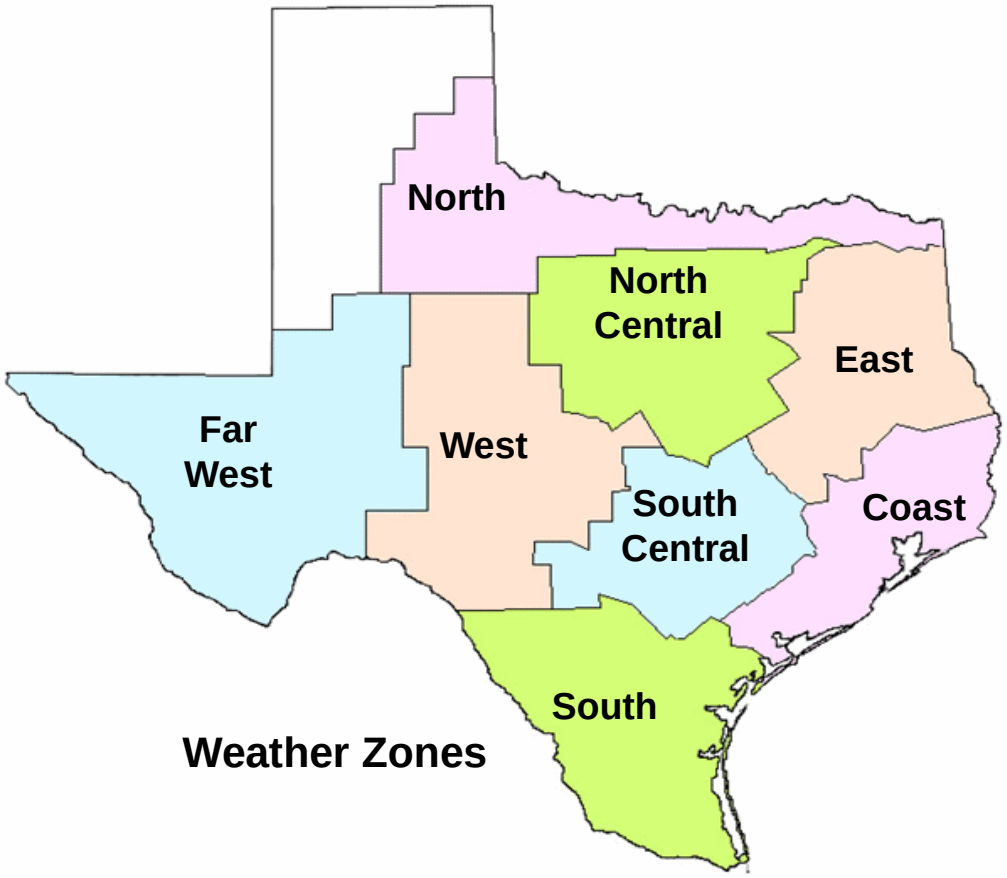
Upgrades to Address Issues in North Andrews and Odessa North Areas

New 345/138 kV Station North of Midland, East of Holt

Dynamic Reactive Device Andrews/Holt Area (dynamic studies needed)

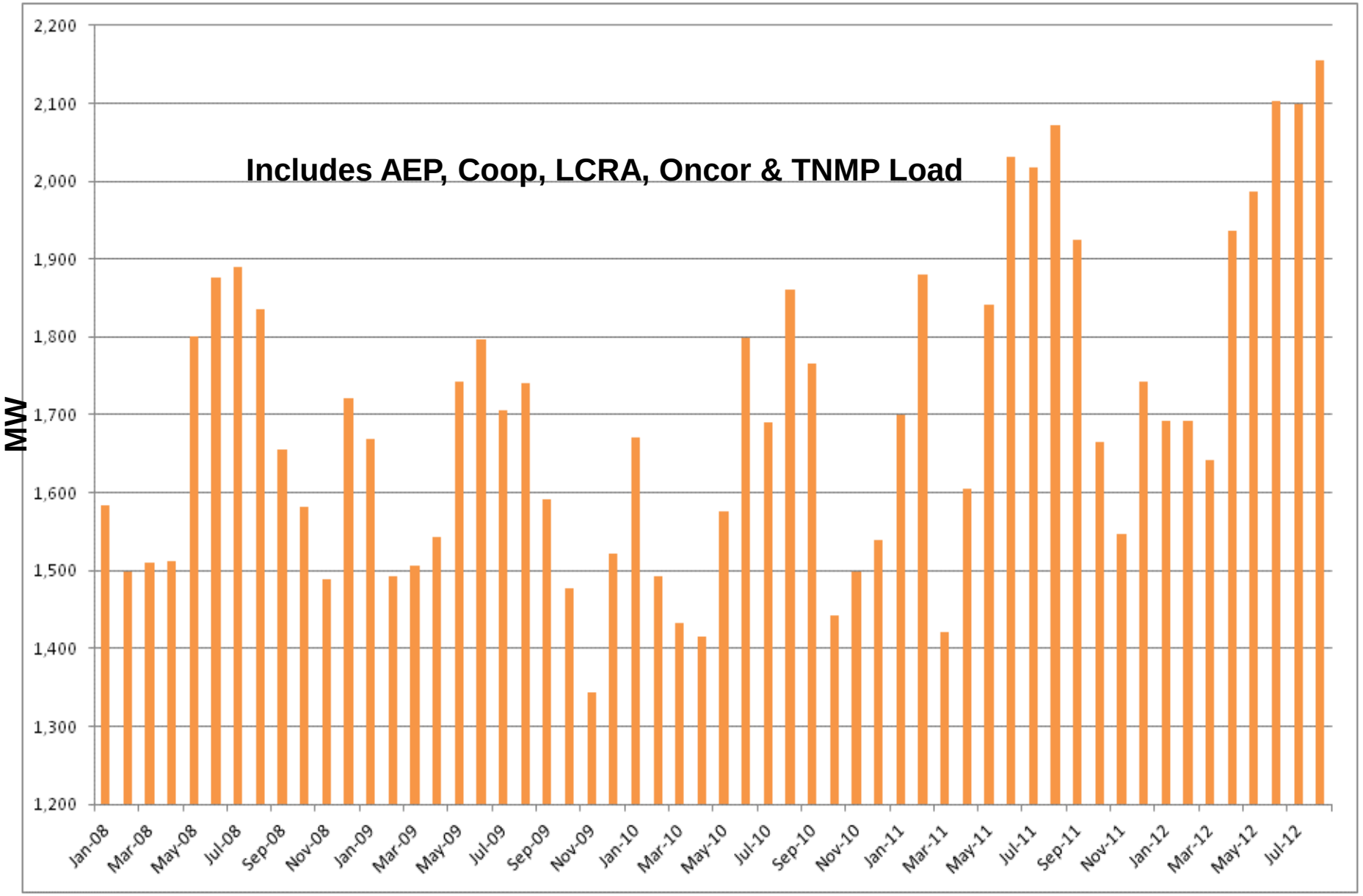
New 345/138 kV Station South of Midland Odessa

ERCOT Zones

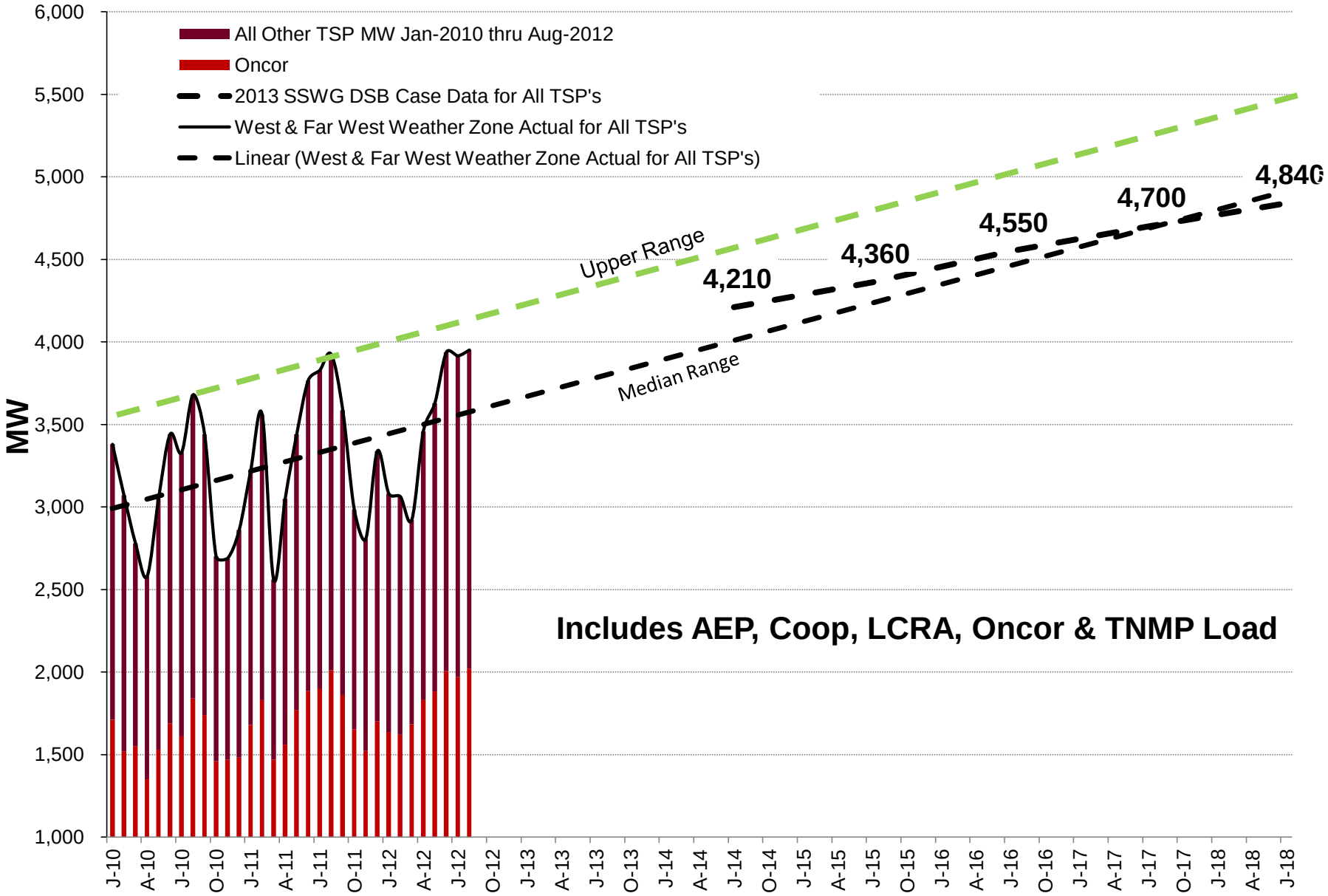

North
North Central
East
Far West
West
South Central
Coast
South
Weather Zones


Load Zones
North
West
Houston
South

FAR WEST TEXAS WZONE ACTUAL PEAK LOAD



WEST & FAR WEST TEXAS WZONE LOAD DATA



MAJOR POINTS

We have done an EXCELLENT job hooking up new load in West Texas

Maintenance outages and schedule clearances are problematic

New 345 kV facilities currently under construction increases security and supports service to load

Quick upgrades of existing facilities along with new additions are needed to meet customer demand and market changes

Additional 345/138 kV autotransformer capacity is needed and should be spread out in the area

Motor load and voltage control issues creating need for dynamic reactive devices

Congestion Issues showing up in other areas…

Questions / Discussion