TOGETHER WE DELIVER

Odessa North Congestion

August 17, 2012
Presentation to ERCOT Regional Planning Group
Austin, TX

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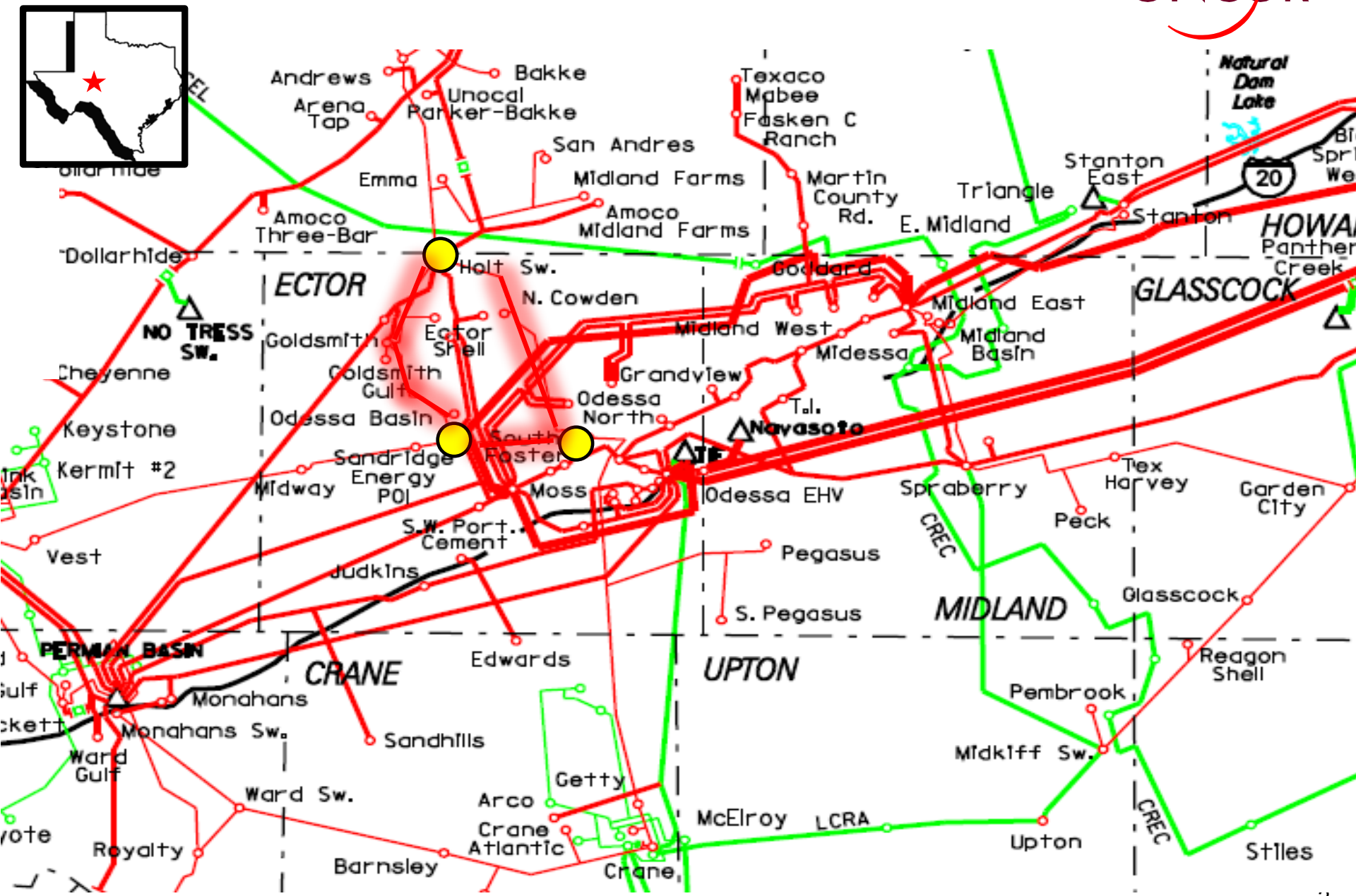
Odessa North Congestion

- **Meets ERCOT Planning Criteria Requirements**
- **Not a West Texas export / import issue**
- **Local limited capacity load pocket issue related to generation commitment and dispatch**
- **Load is mostly commercial / industrial**
  - Not weather sensitive

Geographic Location/Local System



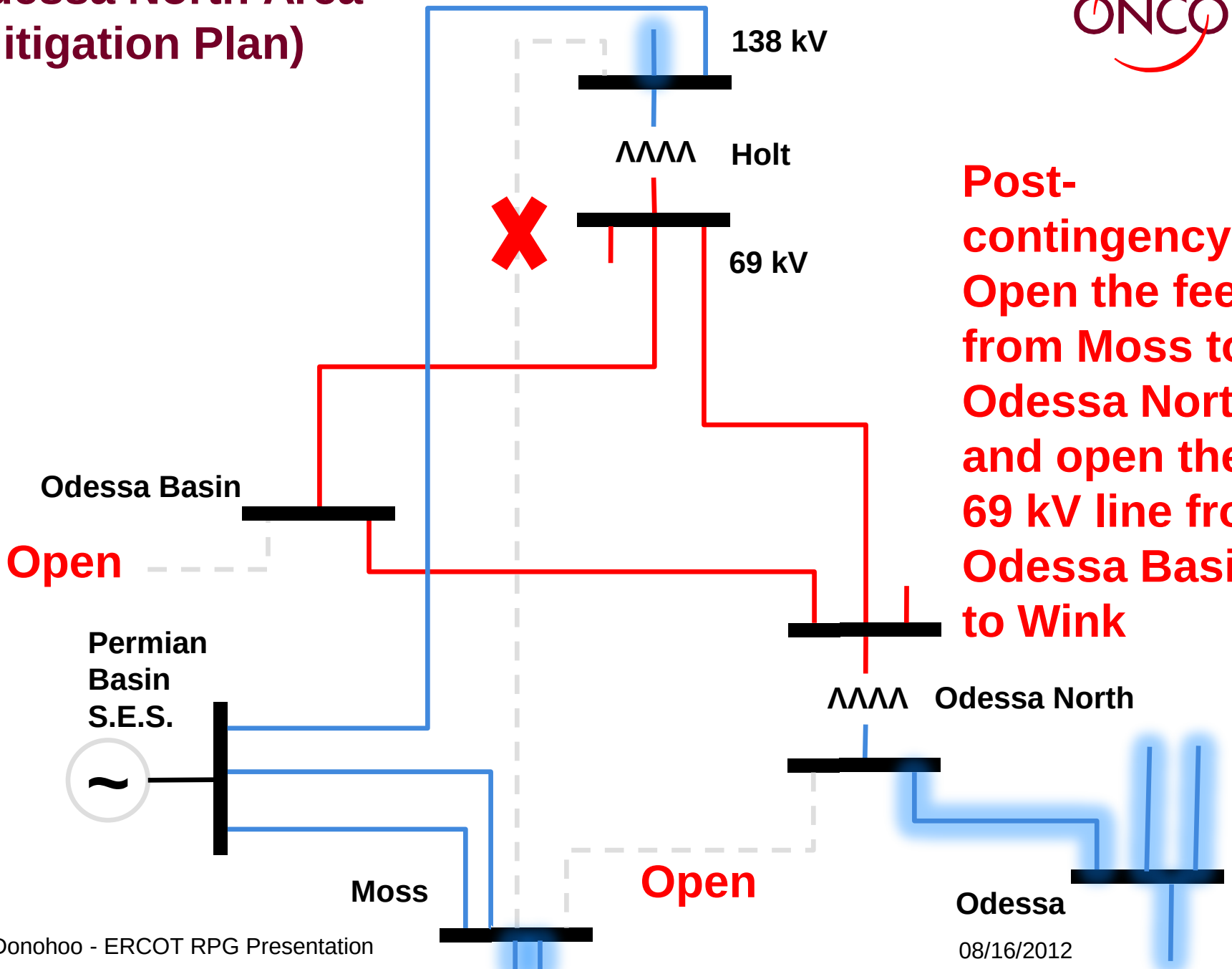
Interim Actions (Short Term) Underway

Several actions are underway to mitigate the issues until other longer term projects can be placed in service;

- **A Mitigation Plan (MP) was approved by ERCOT on July 18**

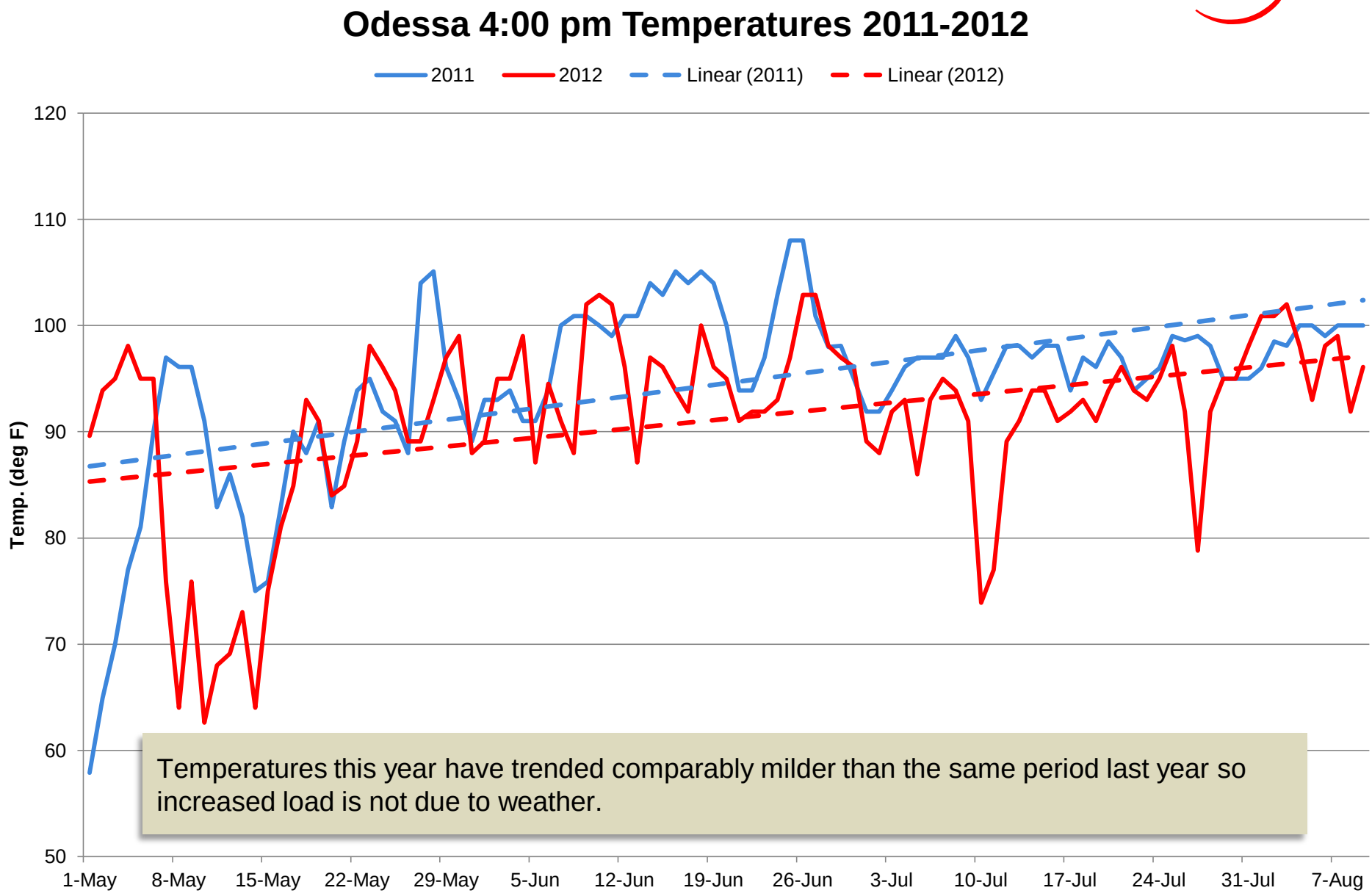
  Post-contingency, open the 138 kV feed from Moss to Odessa North and open the 69 kV line from Odessa Basin to Wink
- **Reviewing the state estimator with ERCOT to verify system and conditions which result in the reported congestion rent**
- **Installing online monitoring of top-oil and winding temperatures of the Odessa North auto in conjunction with possible increase in the emergency rating; operations and engineering are reviewing these options now with timing of actions to occur in August**
- **Temperature readings on the actual auto have indicated an opportunity to increase the auto rating**

Odessa North Area (Mitigation Plan)



Post-contingency; Open the feed from Moss to Odessa North and open the 69 kV line from Odessa Basin to Wink

Comparably Milder Temperatures in Odessa



Load Growth Top 25 Stations

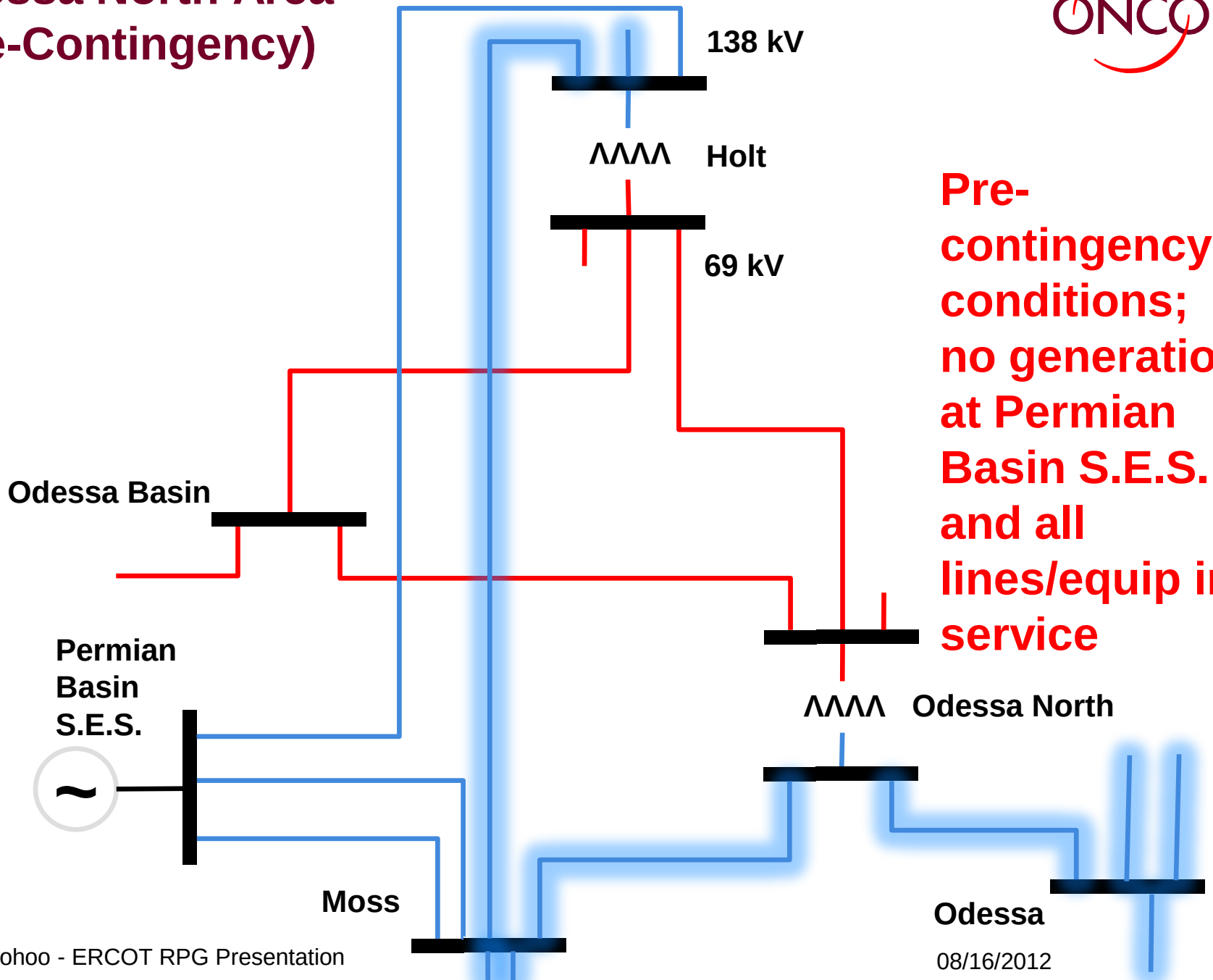
Highlighted loads seen by Odessa North auto post-contingency

Buses	Substations	Voltage (kV)	Power Factor	2011 Actuals (kW)	2012 Forecast (kW)	%Increase
1359	ACKCHEV_9	69	1.00	66	950	1339%
1207	CRANATLC_9	69	0.45	350	1,749	400%
1217	GLASCOCK_9	69	-0.95	3,455	8,100	134%
1357	BIGCRMWD_T9	69	0.83	262	610	133%
1266	MIDFARMS_9	69	0.89	5,080	11,185	120%
1274	FULERTON_9	69	-0.96	4,063	7,957	96%
1295	WICKETT_9	69	-0.99	7,715	14,357	86%
1252	VEST_9	69	-0.99	3,032	4,130	36%
1352	CHALK_9	69	0.99	10,935	14,818	36%
1263	EMMA_9	69	0.97	3,946	5,214	32%
1227	MIDLGULF_9	69	0.89	3,138	3,980	27%
1218	GARDCITY_9	69	1.00	4,337	5,428	25%
1270	FRNKLCTY_9	69	0.99	8,482	10,419	23%
1238	ROYALTY_9	69	0.82	5,353	6,549	22%
1075	WINKSS_9	69	0.96	6,326	7,505	19%
1296	NORTHWRD_9	69	0.91	1,550	1,823	18%
1253	MIDWAY_9	69	0.99	17,053	19,788	16%
1358	KNOTT_9	69	0.96	350	400	14%
1229	STANTON_9	69	0.99	9,618	10,867	13%
1203	BARNSLEY_9	69	0.95	6,748	7,448	10%
1232	CRANEHUM_9	69	0.80	100	110	10%
1246	WINKBASN_9	69	0.94	6,000	6,595	10%
1198	CRANE_9	69	0.99	15,284	16,725	9%
1239	COYANOSA_9	69	-0.99	7,909	8,609	9%
1259	NTCOWDEN_9	69	0.97	13,709	14,794	8%

Odessa North 138/69 kV Auto Congestion

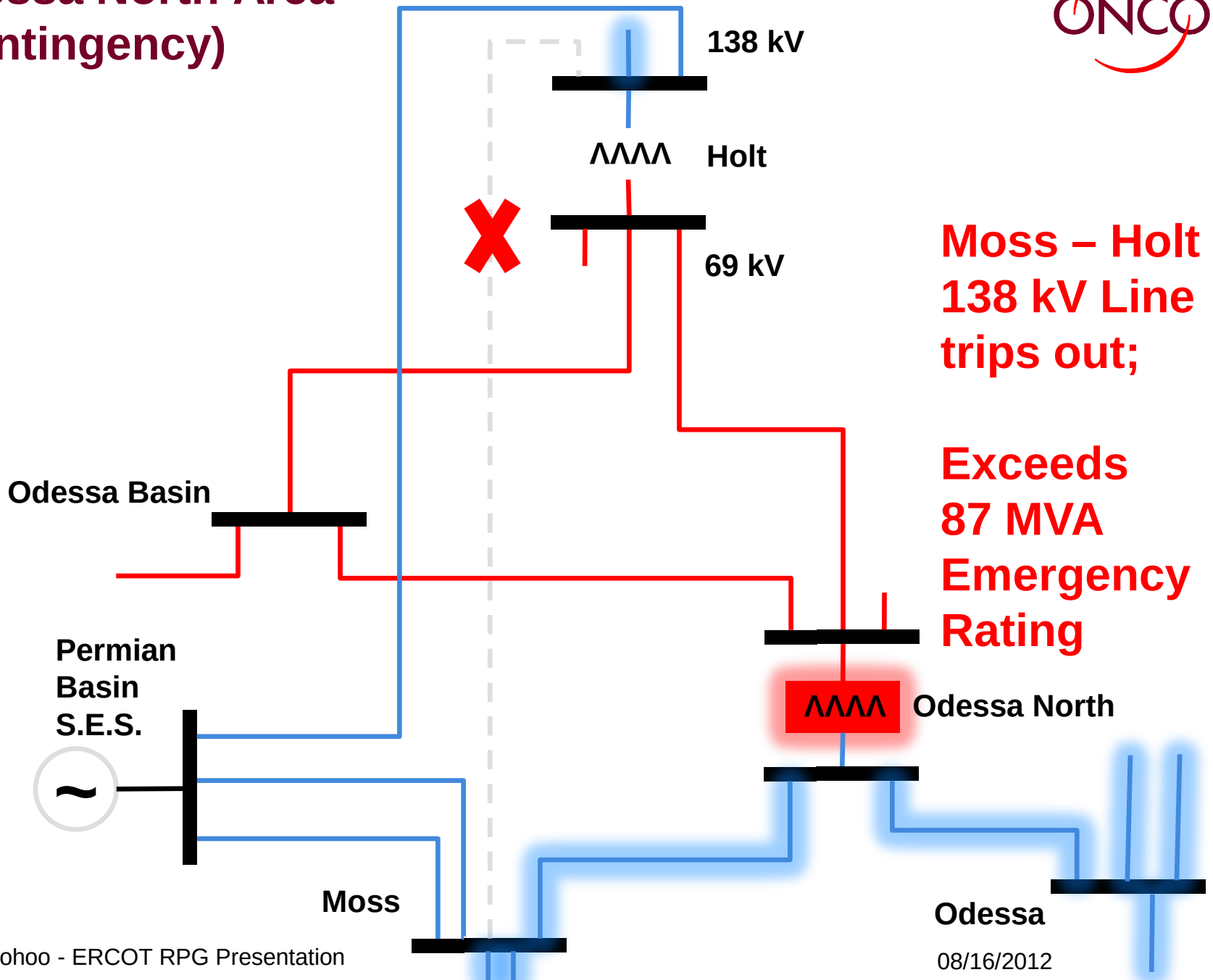
- **Congestion at the Odessa North 138/69 kV Autotransformer occurs post-contingency with no generation at Permian Basin S.E.S. and low wind generation west of Odessa**
- **Under these conditions the Odessa North Auto loads 105% - 109% over its 87 MVA emergency rating; 120% - 123% of 76 MVA normal rating**
  - These ratings are greater than the 75 MVA nameplate rating and have been determined based upon actual cooling and transformer test data
- **July 10 the Holt – Moss 138 kV line tripped and loading on the Odessa North Auto approached the 87 MVA emergency rating before operator actions were taken to mitigate**
- **This overload does not occur in base planning studies (2012 Summer) because ERCOT cases include adequate generation at Permian Basin S.E.S. and wind up to 13% of installed capacity**
- **The actual use of the generators at Permian Basin S.E.S. appears to not match the planning assumptions**
- **Load growth due to oil & natural gas exploration, processing, and other businesses has increased loading on the transmission system**

Odessa North Area (Pre-Contingency)



Pre-contingency conditions; no generation at Permian Basin S.E.S. and all lines/equip in service

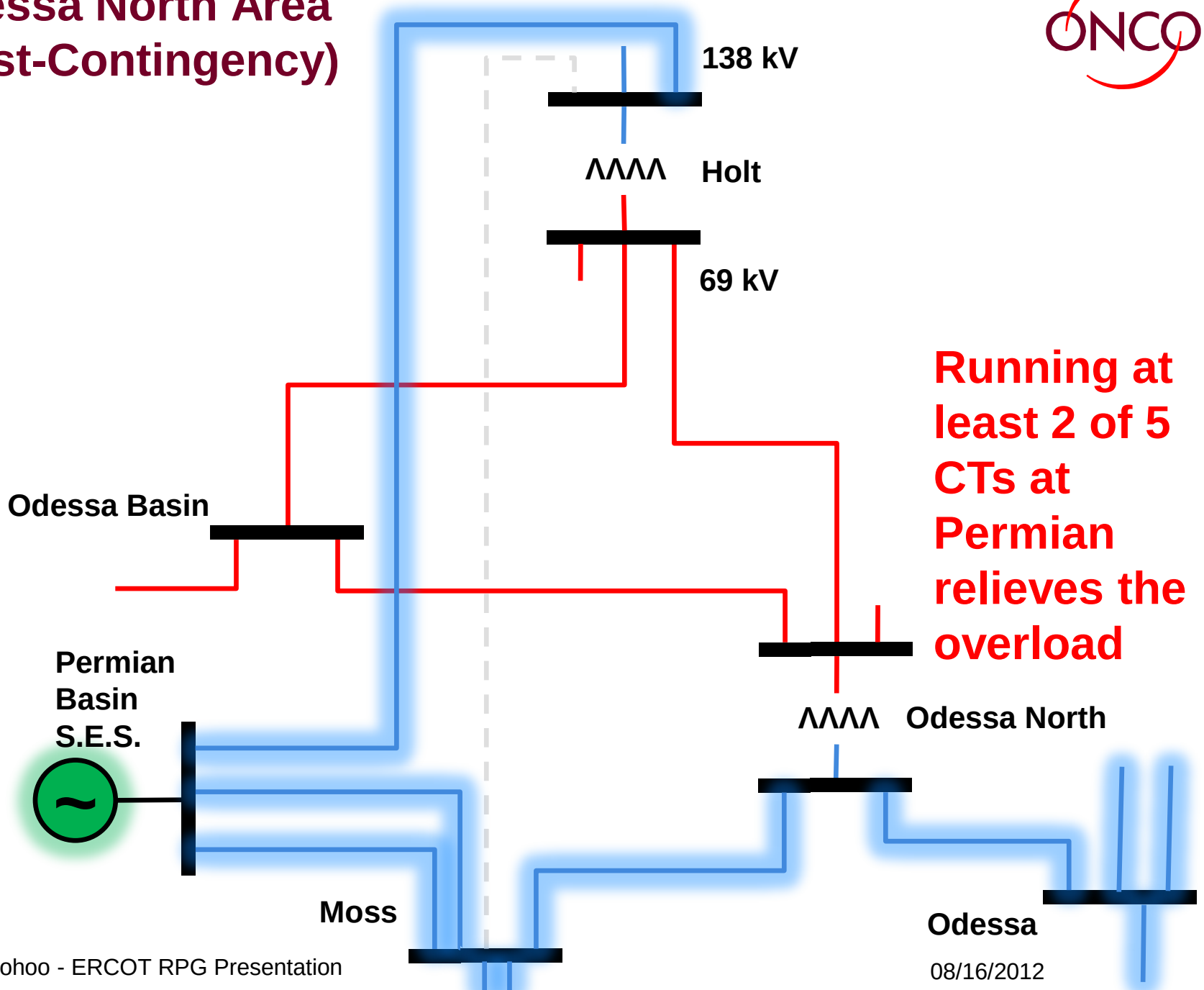
Odessa North Area (Contingency)



Moss – Holt 138 kV Line trips out;

Exceeds 87 MVA Emergency Rating

Odessa North Area (Post-Contingency)



Running at least 2 of 5 CTs at Permian relieves the overload

Planning & Operations Differences

- **This is not a reliability problem, running generation at Permian Basin S.E.S prevents overloading the Odessa North auto**
  - Meets planning criteria requirements
- **The congestion results from the contingency loss of Amoco North Cowden Tap – Moss 138 kV Line when CTs are off at Permian Basin S.E.S. and wind generation is low west of Odessa**
- **Base cases include generation at Permian Basin S.E.S. and about 13% wind generation in the SSWG cases due to the dispatch being economic according to production costs but actual use and desired gen plan scheduling of the units varies**
- **This is not a weather sensitivity issue, planning at the 50th, 75th, 90th or other percentile would not have accounted for the gap in generation being planned for at Permian Basin S.E.S.**
- **Most of the load in the area is not weather sensitive and load growth has increased 20% compared to same period last year**

Planned Projects (Longer Term) Solutions

2011 Extended 138 kV from Holt to Goldsmith and converted to 138 kV

2012 Converting 69 kV load to 138 kV

2013 Extending 138 kV line into Holt Switch and extending it from Goldsmith Substation to Goldsmith South Substation to transfer 20 – 30 MW from the 69 kV and on to the 138 kV

Sharyland transfer 150 MW from SPP back into the ERCOT system

2014 Rebuilding Odessa North Switch to Goldsmith South Substation 69 kV line as a double-circuit 138 kV and 69 kV line to create an Odessa North Switch to Holt Switch 138 kV line

2018 Add 345 kV source into Midland Farms – Texaco Mabee – Paul Davis Area

West Texas 2011

West Texas 2012

West Texas 2013 (Including Sharyland Transfer)

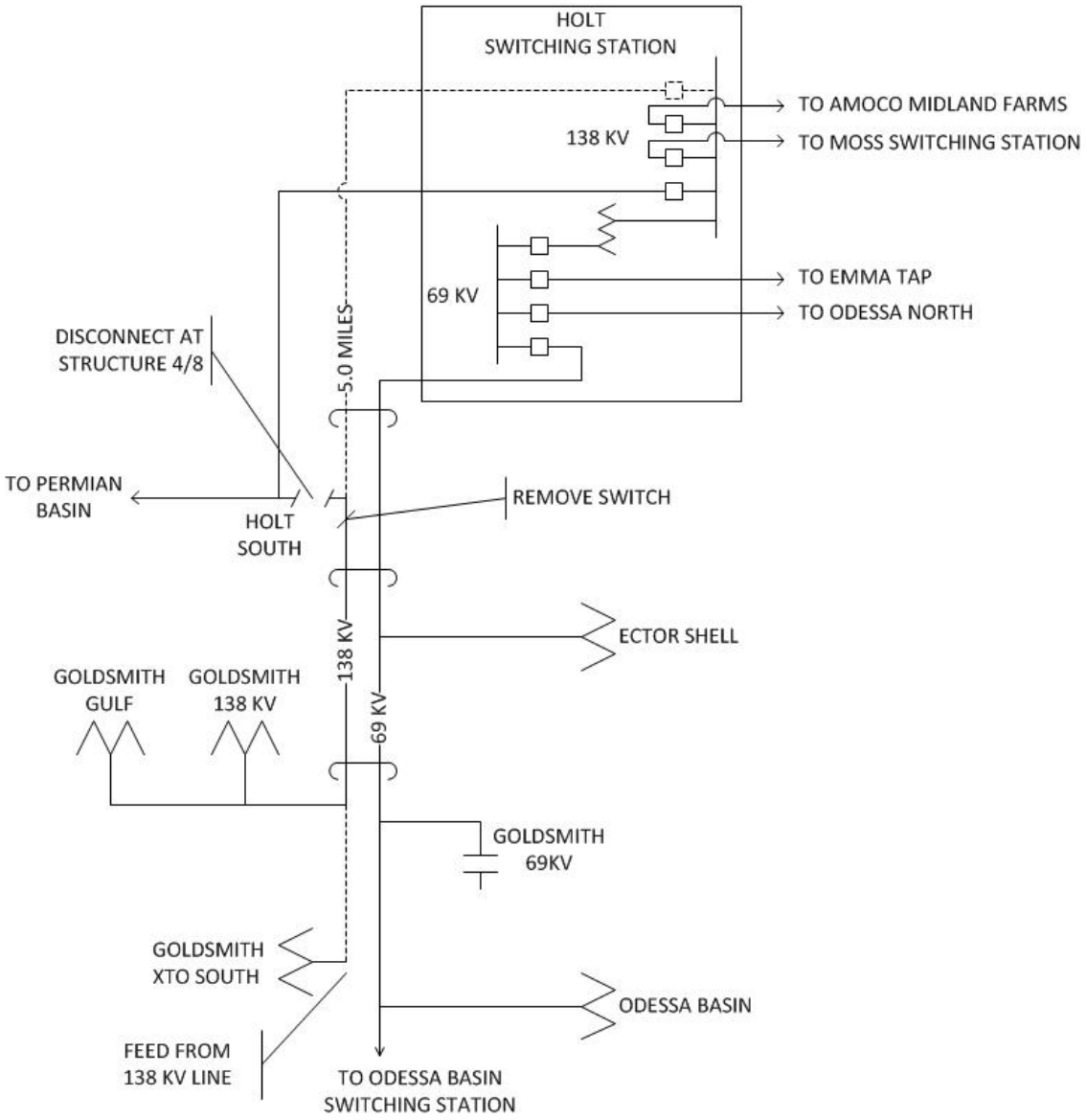
West Texas 2014

Oncor Solutions

- **Include no generation at each plant site in planning studies**
  - Zero MW and Mvar
  - Reasonable variation in generation
- **Study full generation at each mothball plant site in planning studies**
- **Examining other low capacity networks that may create limitations**
- **Examine contingency loading levels that exceed 90% of rating in addition to 100% of rating**
- **Incorporating ways to monitor load growth outside of normal load forecasting methods**

Questions / Discussion

Holt – Goldsmith 138 kV Line



Odessa North – Goldsmith 138 kV Line