



2015 RTP Update

January, 2015



Outline

- ❖ 2015 RTP Overview
- ❖ 2015 RTP Scope
- ❖ 2015 RTP Input Assumptions
- ❖ Next steps

2015 RTP Overview: Cases studied

- ❖ Summer peak reliability basecase for years 2016, 2018, 2020, and 2021
- ❖ Off-peak (min load) reliability basecase for 2018
- ❖ Sensitivity cases for summer peak cases of years 2016 and 2020
- ❖ Sensitivity cases for off-peak case for 2018.

2015 RTP Overview: Analysis

- ❖ SCOPF
- ❖ Contingency analysis (Single event)
- ❖ Multiple element contingency analysis
 - ❖ G(generator)-1+N-1
 - ❖ X(transformer)-1+N-1
 - ❖ N-1-1 and cascade analysis
- ❖ Short circuit analysis
- ❖ Analysis of sensitivity cases
- ❖ Economic analysis

RTP Scope

- ❖ RTP scope and process document and responses to comments are posted on the RPG meeting page
- ❖ Outstanding items on the RTP Scope document
 - ❖ Details regarding short circuit analysis
 - ❖ Details regarding sensitivity cases
- ❖ Noteworthy updates from 2014 scope
 - ❖ Updated performance criteria per TPL-001-4
 - ❖ Dynamic ratings to be used in reliability analysis

Dynamic Ratings in Reliability Analysis

| Weather Zone | 90 th percentile temperature (°F) |
|---------------|--|
| Coast | 102.4 |
| East | 106.2 |
| Far West | 110.4 |
| North Central | 108.4 |
| North | 109.0 |
| South Central | 105.5 |
| South | 104.0 |
| West | 107.3 |

- ❖ 90th percentile temperature for each weather zone was derived based on 30 years of temperature data (1984-2013)
- ❖ Temperature data based on historical data from ERCOT databases

RTP Load by weather zone

- ❖ RTP weather zone load based on the ‘higher-of’ SSWG summer peak weather zone load and ERCOT 90th percentile load forecast
- ❖ Zones where ERCOT 90th percentile forecast is higher are presented in red font

| Year | Coast | East | North | North Central | South Central | South | West | Far West | NCP Total |
|------|--------|-------|-------|---------------|---------------|-------|-------|----------|-----------|
| 2016 | 26,084 | 2,771 | 1,749 | 26,300 | 13,094 | 6,540 | 2,257 | 3,124 | 81,920 |
| 2018 | 26,883 | 2,822 | 1,803 | 27,003 | 13,803 | 6,913 | 2,314 | 3,453 | 84,994 |
| 2020 | 27,522 | 2,894 | 1,848 | 27,690 | 14,479 | 7,284 | 2,390 | 3,656 | 87,763 |
| 2021 | 27,766 | 2,921 | 1,764 | 28,034 | 14,845 | 7,470 | 2,429 | 3,764 | 88,993 |

Note: Weather zone loads expressed in MW

Next steps

- ❖ Create and publish RTP reliability start cases
- ❖ Conduct N-1 SCOPF and contingency analysis
- ❖ Post contingency definitions and resulting violations
- ❖ Corrective action plans such as transmission upgrades or additions will be tested in collaboration with respective transmission owners
- ❖ Create and post N-1 Secure case
- ❖ Conduct G-1+N-1 and X-1+N-1 screen and identify corrective action plans to address violations

Questions?



Appendix



SSWG load

- ❖ Load based on October 2014 SSWG Data Set B cases
- ❖ Includes self served load, does not include losses

| Year | Coast | East | North | North Central | South Central | South | West | Far West | NCP Total |
|------|--------|-------|-------|---------------|---------------|-------|-------|----------|-----------|
| 2016 | 26,084 | 2,771 | 1,749 | 24,695 | 13,094 | 6,397 | 2,257 | 3,124 | 80,171 |
| 2017 | 26,446 | 2,795 | 1,766 | 24,968 | 13,447 | 6,475 | 2,280 | 3,322 | 81,499 |
| 2018 | 26,883 | 2,822 | 1,803 | 25,322 | 13,803 | 6,792 | 2,314 | 3,453 | 83,191 |
| 2019 | 27,228 | 2,849 | 1,826 | 25,604 | 14,131 | 6,802 | 2,352 | 3,565 | 84,356 |
| 2020 | 27,522 | 2,894 | 1,848 | 25,910 | 14,479 | 7,078 | 2,390 | 3,656 | 85,777 |
| 2021 | 27,766 | 2,921 | 1,764 | 26,314 | 14,845 | 7,222 | 2,429 | 3,764 | 87,024 |

Note: Weather zone loads expressed in MW

ERCOT 90th percentile load forecast

❖ Includes self served load, does not include losses

| Year | Coast | East | North | North Central | South Central | South | West | Far West | NCP Total |
|------|--------|-------|-------|---------------|---------------|-------|-------|----------|-----------|
| 2016 | 23,133 | 2,347 | 1,573 | 26,300 | 11,977 | 6,540 | 2,015 | 2,715 | 76,601 |
| 2017 | 23,335 | 2,354 | 1,563 | 26,654 | 12,060 | 6,728 | 2,035 | 2,832 | 77,561 |
| 2018 | 23,537 | 2,360 | 1,554 | 27,003 | 12,141 | 6,913 | 2,054 | 2,949 | 78,511 |
| 2019 | 23,739 | 2,367 | 1,544 | 27,348 | 12,221 | 7,099 | 2,074 | 3,065 | 79,456 |
| 2020 | 23,937 | 2,373 | 1,534 | 27,690 | 12,300 | 7,284 | 2,094 | 3,181 | 80,393 |
| 2021 | 24,141 | 2,380 | 1,525 | 28,034 | 12,378 | 7,470 | 2,114 | 3,297 | 81,338 |

Note: Weather zone loads expressed in MW

Wind dispatch output levels

| Weather Zone | Basecase | Dispatch Not to exceed |
|---------------|----------|------------------------|
| Coast | 1% | 4% |
| East | - | - |
| North | 3% | 8% |
| North Central | 1% | 3% |
| South Central | 2% | 4% |
| Southern | 10% | 18% |
| West | 3% | 7% |

- ❖ Dispatch based on confidence-percentile analysis
- ❖ Hours with high loads were selected (Hours were ERCOT load higher than 95th percentile)
- ❖ Wind output levels in the basecase based on 15th percentile output levels, but not to exceed levels based on 25th percentile level

New generation per PG 6.9 requirements

| Project Name | In-service Date | Capacity Added* (MW) | Fuel | County | TDSP | Weather Zone |
|--------------------------------------|-----------------|----------------------|------|--------------|-------------|--------------|
| Baytown Chiller | 6/1/2015 | 270 | Gas | Chambers | Centerpoint | COAST |
| PHR Peakers | 11/30/2015 | 390 | Gas | Galveston | Centerpoint | COAST |
| Panda Temple 2 G | 8/1/2015 | 790 | Gas | Bell | Oncor | NORTH |
| Antelope Station | 6/1/2016 | 359** | Gas | Hale | Sharyland | NORTH |
| Goldsmith Peakers | 6/1/2015 | 341 | Gas | Ector | Oncor | WEST |
| Keechi Wind 138 kV Joplin | 1/5/2015 | 102 | Wind | Jack | BRAZOS | NORTH |
| Grandview Phase II (Conway Windfarm) | 10/1/2015 | 389 | Wind | Carson | Shalyland | NORTH |
| Jumbo Road Wind | 4/15/2015 | 300 | Wind | Castro | Sharyland | NORTH |
| Route66 Wind | 8/15/2015 | 150 | Wind | Randall | Sharyland | NORTH |
| Spinning Spur Wind Three | 5/31/2015 | 194 | Wind | Oldham | Sharyland | NORTH |
| Midway Wind | 12/28/2016 | 161 | Wind | San Patricio | AEP | SOUTH |
| Cameron County Wind | 9/1/2015 | 165 | Wind | Cameron | STEC | SOUTH |
| Patriot (Petronilla) Wind | 8/15/2015 | 178 | Wind | Nueces | AEP | SOUTH |
| Sendero Wind | 8/31/2015 | 78 | Wind | Jim Hogg | AEP | SOUTH |
| Los Vientos III | 3/31/2015 | 200 | Wind | Starr | AEP | SOUTH |
| Javelina Wind | 12/31/2015 | 250 | Wind | Zapata | AEP | SOUTH |
| Los Vientos V | 12/15/2015 | 200 | Wind | Starr | AEP | SOUTH |
| Los Vientos IV | 12/31/2015 | 200 | Wind | Starr | AEP | SOUTH |
| Mesquite Creek W | 3/31/2015 | 211 | Wind | Borden | WETT | WEST |
| South Clay Windfarm | 6/15/2015 | 200 | Wind | Clay | ONCOR | WEST |
| Stephens Ranch Wind Energy Phase b | 4/1/2015 | 165 | Wind | Borden | WETT | WEST |
| Green Pastures W | 2/17/2015 | 300 | Wind | Knox | AEP | WEST |
| Rattlesnake Wind Ph 1 | 9/1/2015 | 211 | Wind | Glasscock | WETT | WEST |
| Longhorn Energy Center | 12/31/2015 | 361 | Wind | Briscoe | Sharyland | WEST |
| South Plains Wind I | 7/31/2015 | 200 | Wind | Floyd | Sharyland | WEST |
| South Plains II | 12/1/2015 | 150 | Wind | Floyd | Sharyland | WEST |
| Wake Wind | 11/1/2015 | 299 | Wind | Dickens | WETT | WEST |
| Briscoe Wind | 12/31/2015 | 150 | Wind | Briscoe | Sharyland | WEST |

*Based on Generator Interconnection data

**Capacity not available to ERCOT throughout summer

