

December 2017 ERCOT Monthly Operations Report

Reliability and Operations Subcommittee Meeting

February 1st, 2018

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# Report Highlights

* The unofficial ERCOT peak for December was 54,424 MW.
* There were six frequency events in December. PMU data indicates the ERCOT system transitioned well in each case.
* There were no instances where Responsive Reserves were deployed.
* There was one RUC commitment in December.
* The level of reportable SCED congestion decreased in December. This congestion was mostly due to forced and planned outages as well as high wind output. There were 34 instances over 31 days on the Generic Transmission Constraints (GTCs) in December. There was one day on the Valley Import GTC, 22 days on the Panhandle GTC and 11 days on the Nelson Sharpe – Rio Hondo GTC in December. There was no activity on the remaining GTCs during the Month.
* There were seven DC Tie curtailments (Tags) in December.

# Frequency Control

## Frequency Events

The ERCOT Interconnection experienced six frequency events in December, all of which resulted from Resource trips. The average event duration was approximately 0:06:12.

When analyzing frequency events, ERCOT evaluates PMU data according to industry standards. Events with an oscillating frequency of less than 1 Hz are considered to be inter-area, while higher frequencies indicate local events. Industry standards specify that damping ratio for inter-area oscillations should be 3.0% or greater. All events listed below indicate the ERCOT system met these standards and transitioned well after each disturbance.

Reported frequency events will include both frequency events where frequency was outside the range of 60±0.1 Hz as well as those determined to be Frequency Measurable Events (FME) as defined by BAL-001-TRE-1. Delta Frequency is defined as the difference between the pre-perturbation and post-perturbation frequency. The Duration of Event is defined as the time it takes for the frequency to recover to lesser/greater of the frequency at the time of the frequency event (t(0) or “A-point”) for low/high-frequency events, respectively. Further details on FMEs can be found in the MIS posted BAL-001-TRE-1 PDCWG Unit Performance reports. A summary of the frequency events is provided below:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date and Time** | **Delta Frequency** | **Max/Min Frequency** | **Duration of Event** | **PMU Data** | **MW Loss** | **Load** | **Wind** | **Inertia** |
| **(Hz)** | **(Hz)** | **Oscillation Mode (Hz)** | **Damping Ratio** | **(MW)** | **%**  | **(GW-s)** |
| 12/5/2017 12:05 | 0.024 | 59.91 | 0:05:14 | No PMU Report Created | 294  |  38,698  | 16% |  213,234  |
| 12/7/2017 20:42 | 0.039 | 59.93 | 0:15:36 | 0.62 | 12% | 707  |  52,403  | 8% |  290,342  |
| 12/17/2017 11:54 | 0.017 | 59.91 | 0:02:14 | No PMU Report Created | 173  |  38,388  | 6% |  213,204  |
| 12/25/2017 22:27 | 0.059 | 59.91 | 0:06:09 | No PMU Report Created | 358  |  37,725  | 26% |  218,182  |
| 12/29/2017 13:07 | 0.044 | 59.93 | 0:06:07 | No PMU Report Created | 428  |  43,181  | 21% |  252,028  |
| 12/30/2017 11:05 | 0.010 | 59.93 | 0:01:50 | No PMU Report Created | 266  |  39,827  | 9% |  266,217  |

 (Note: frequency events highlighted in blue have been identified as FMEs per BAL-001-TRE-1 and the Performance Disturbance Compliance Working group. PMU reports are typically generated when frequency drops below 59.9, but PMU data is available for other events.)

 Currently, the Critical Inertia Level for ERCOT is approximately 100,000 MW-s (Source: [link](http://www.ercot.com/content/wcm/key_documents_lists/77622/06.__Inertia_Background_for_ROS.pptx))



(Note: All data on this graph encompasses frequency event analysis based on BAL-001-TRE-1.)

## Responsive Reserve Events

There were no events where Responsive Reserve MWs were released to SCED in December.

## Load Resource Events

There was one Load Resource deployment in December. This was a manual deployment conducted in lieu of firm load shed.

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **Total LRs Deployed** | **Total LR RRS Responsibility (MW) of Deployed LRs** | **LR Response (MW)** |
| **12/07/2017** | **1** | **5.2** | **5.2** |

# Reliability Unit Commitment

ERCOT reports on Reliability Unit Commitments (RUC) on a monthly basis. Commitments are reported grouped by operating day and weather zone. The total number of hours committed is the sum of the hours for all the units in the specified region. Additional information on RUC commitments can be found on the MIS secure site at Grid 🡪 Generation 🡪 Reliability Unit Commitment.

There were no DRUC commitments in December.

There was one HRUC commitment in December.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Resource Location** | **# of Resources** | **Operating Day** | **Total # of Hours Committed** | **Total MWhs** | **Reason for Commitment** |
| Coast | 1 | 12/6/2017 | 6 | 210 | Voltage Support |

# Wind Generation as a Percent of Load



# Congestion Analysis

The number of congestion events experienced by the ERCOT system decreased in December. There were 34 instances over 31 days on the Generic Transmission Constraints (GTCs) in December.

## Notable Constraints for December

Nodal protocol section 3.20 specifies that ERCOT shall identify transmission constraints that are active or binding three or more times within a calendar month. As part of this process, ERCOT reports congestion that meets this criterion to ROS. In addition ERCOT also highlights notable constraints that have an estimated congestion rent exceeding $1,000,000 for a calendar month. These constraints are detailed in the table below. Rows highlighted in blue indicate the congestion was affected by one or more outages. For a list of all constraints activated in SCED for the month of December, please see Appendix A at the end of this report.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Contingency Name** | **Overloaded Element** | **# of Days Constraint Active** | **Congestion Rent** | **Transmission Project** |
|
| Basecase | PNHNDL GTC | 22 | $12,510,749.35 | South Plains RPG Proposal & Panhandle Loop (5180, 5208) |
| Cagnon-Calavers&Braunig 345k | Skyline - Elmcreek 345kV | 2 | $10,747,600.62 | LCRA TSC CPS Energy RPG Project (4473,4844) |
| Hillctry-Marion 345kV | Skyline - Elmcreek 345kV | 2 | $9,884,257.28 | LCRA TSC CPS Energy RPG Project (4473,4844) |
| FREIHEIT to CLEAR SPRINGS LIN 1 | Henne - Zorn 138kV | 2 | $4,382,585.31 |   |
| Elmcreek-Sanmigl 345kV | Pawnee Switching Station - Calaveras 345kV | 11 | $4,155,434.23 |   |
| CRLNW-LWSSW 345kV | Ti Tnp - West Tnp 138kV | 5 | $3,819,306.94 |   |
| Cagnon-Calavers&Braunig 345k | Kenedy Switch - Coleto Creek 138kV | 4 | $3,326,760.84 | Coleto Creek to Tuleta: New 138 kV Line (16TPIT0034)? But for different contingency |
| NORTH PHARR to POLK AVENUE LIN 1 | North Mcallen - West Mcallen 138kV | 2 | $3,107,463.34 | Pharr 138 kV loop & Stewart Road: Construct 345 kV cut in (4493,5604) |
| Jewet-Sng 345kV | Btu\_Jack\_Creek - Twin Oak Switch 345kV | 20 | $2,727,404.19 | Houston Import Project (4458) |
| Basecase | Yucca Drive Switch - Gas Pad 138kV | 8 | $2,727,005.69 | Solstice to Permian Basin: Rebuild 138 kV line (5257) |
| Entpr-Trses & Mlses-Scses 34 | Herty North Switch - Nacogdoches Se 138kV | 5 | $2,485,402.23 |   |
| Cagnon-Calavers&Braunig 345k | Pawnee Switching Station - Calaveras 345kV | 7 | $2,357,321.13 |   |
| Cagnon-Calavers&Braunig 345k | Pawnee Switching Station 345/138kV | 5 | $2,093,217.25 |   |
| BARRILLA TRX FMR1 138/69 | Yucca Drive Switch - Gas Pad 138kV | 2 | $1,774,407.64 | Solstice to Permian Basin: Rebuild 138 kV line (5257) |
| Cdhsw-Wtrml & Dessw 345kV | Seagoville - Kleberg Tap 138kV | 2 | $1,312,238.27 |   |
| CLEAR SPRINGS TRX CLEASP\_AT1 345/1 | Clear Springs 345/1kV | 1 | $1,293,823.63 | LCRA TSC CPS Energy RPG Project (4473,4844) |
| SCHERT-CIBOLO 138kV | E C Mornhinweg - Parkway Lcra 138kV | 1 | $1,260,700.22 | LCRA TSC CPS Energy RPG Project (4473,4844) |
| Castrvll-Razorbac&Txresrch 1 | Hondo Creek Switching Station - Moore Switching Station 138kV | 1 | $1,110,416.22 | Pearsall to Palo Duro 138 kV line upgrade (3821) |
| DANEVANG SWITCHING STATION to BLES | Blessing 138/69kV | 4 | $1,103,623.83 |   |
| Barrilla to Solstice 138 KV | Alamito Creek - Paisano 69kV | 1 | $1,071,545.84 | Far West Texas Project (5440, 5445, 5530 and 5539) |
| SAN MIGUEL 345\_138 KV SWITCHYARDS | San Miguel Gen 345/1kV | 11 | $1,014,017.98 | San Miguel 345/138 kV autotransformer replacements (5218) |
| NORTH EDINBURG TRX NEDIN\_3\_1 345/1 | Burns Sub - Rio Hondo 138kV | 5 | $670,043.67 |   |
| Asphalt Mines to Blewett (3) | Hamilton Road - Maverick 138kV | 12 | $667,351.53 | Brackettville to Escondido (5206) |
| Elmcreek-Stp 345kv | Blessing - Lolita 138kV | 4 | $644,981.32 |   |
| BAKKE TAP to AMOCO MIDLAND FARMS T | Emma Tap - Holt Switch 69kV | 5 | $634,535.34 |   |
| Bbses-Jewet 345kV | Trinidad Ses - Richland Chambers 345kV | 3 | $571,806.50 |   |
| ROCK ISLAND to GLIDDEN LCRA LIN 1 | Glidden Lcra 138/69kV | 10 | $545,975.37 |   |
| JARDIN to DILLEY SWITCH AEP LIN 1 | Dilley Switch Aep - Cotulla Sub 69kV | 6 | $434,186.12 | Rebuild Dilley to Cotulla (5222) |
| KLEBERG AEP to LOYOLA SUB LIN 1 | Loyola Sub 138/69kV | 7 | $429,910.71 |   |
| Zorn-Marion & Cleasp 345kV | Henne - Zorn 138kV | 6 | $414,693.92 |   |
| Colorado to Sheridan (2)138/ | Glidden Lcra 138/69kV | 9 | $344,981.49 |   |
| COLETO CREEK GEN COLETOG1 | Blessing - Lolita 138kV | 4 | $216,039.52 |   |
| Toksw-Gibcrk & Jk\_Ck 345kV | Jewett - Singleton 345kV | 7 | $183,197.32 | Houston Import Project (4458) |
| Riohondo-Nedin 345kV&Harlnsw 138kV | Burns Sub - Rio Hondo 138kV | 6 | $173,378.45 |   |
| LAQUINTA to LOBO LIN 1 | Bruni Sub 138/69kV | 5 | $133,153.27 |   |
| PLUM to FLATONIA LIN 1 | Fayetteville - Frelsburg 138kV | 5 | $128,418.39 | Fayette Area Upgrades (5286) |
| FRIEND RANCH to SONORA LIN 1 | Sonora 138/69kV | 5 | $127,266.09 |   |
| Coleto Creek to Lon Hill 345 | Warburton Road Switching Station - Victoria 138kV | 3 | $122,290.64 |   |
| Basecase | NELRIO GTC | 11 | $94,203.44 | AEPSC LRGV Area Transmission Improvements RPG Project  |
| MOULTON SOUTH to MOULTON LIN 1 | Flatonia - Hallettsville 138kV | 3 | $91,390.74 | Flatonia - Hallettsville Transmission Line Upgrade (5276) |
| Re Roserock Solar Plant to F | Barrilla - Fort Stockton Switch 69kV | 9 | $85,117.58 | Far West Texas Project (5440, 5445, 5530 and 5539) |
| Elmcreek-Sanmigl 345kV | Pawnee Switching Station - Calaveras 345kV | 11 | $68,350.65 |   |
| COMANCHE SWITCH (Oncor) TRX CMNSW\_ | Hasse 138/69kV | 5 | $66,510.81 |   |
| Elmcreek-Sanmigl 345kV | Pettus - Normanna 69kV | 3 | $58,780.76 |   |
| Indian Mesa Nwp to Indian Me | Live Oak Aep - Santiago 138kV | 4 | $56,432.88 |   |
| COLETO CREEK to VICTORIA LIN 1 | Coleto Creek - Victoria 138kV | 5 | $40,939.03 | Coleto Creek to Tuleta: New 138 kV Line (16TPIT0034) |
| CALAVERAS to PAWNEE SWITCHING STAT | Kenedy Switch - Coleto Creek 138kV | 4 | $16,598.78 | Coleto Creek to Tuleta: New 138 kV Line (16TPIT0034) |
| BOSQUE SWITCH to ELM MOTT LIN 1 | Bosque Switch - Rogers Hill Bepc 138kV | 9 | $15,232.96 |   |
| BRACKETTVILLE to HAMILTON ROAD LIN | Hamilton Road - Maverick 138kV | 4 | $14,577.55 | Brackettville to Escondido (5206) |
| Alamito Creek to Barrilla (2 | Pig Creek - Solstice 138kV | 3 | $12,222.61 | Solstice to Permian Basin: Rebuild 138 kV line (5257) |
| Bronco to ALPINE LIN 1 | Pig Creek - Solstice 138kV | 3 | $11,858.36 | Solstice to Permian Basin: Rebuild 138 kV line (5257) |
| BARNEY DAVIS to RODD FIELD LIN 1 | Airline Aep - Cabaniss 138kV | 3 | $10,010.89 | Airline to Westside: Reconductor 138 kV line (5173) |
| Bighil-Kendal 345kV | Rocksprings - Friess Ranch 69kV | 3 | $2,248.31 |   |
| Basecase | Pig Creek - Solstice 138kV | 5 | $1,658.61 | Solstice to Permian Basin: Rebuild 138 kV line (5257) |
| Gail Sub to Key Sub (3)138/1 | Buzzard Draw Switch - Gunsight Switch 138kV | 3 | $1,456.93 |   |

## Generic Transmission Constraint Congestion

There was one day on the Valley Import GTC, 22 days on the Panhandle GTC and 11 days on the Nelson Sharpe – Rio Hondo GTC in December. There was no activity on the remaining GTCs during the Month.

Note: This is how many times a constraint has been activated to avoid exceeding a GTC limit, it does not imply an exceedance of the GTC occurred or that the GTC was binding.

## Manual Overrides for December

None.

## Congestion Costs for Calendar Year 2017

The following table represents the top twenty active constraints for the calendar year based on the estimated congestion rent attributed to the congestion. ERCOT updates this list on a monthly basis.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Contingency** | **Binding Element** | **# of 5-min SCED Intervals** | **Estimated Congestion Rent** | **Transmission Project** |
| Basecase | PNHNDL GTC | 34,218 | 139,697,025.21 | South Plains RPG Proposal & Panhandle Loop (5180, 5208) |
| HCKSW-ALLNC&RNKSW 345kV | Blue Mound - Wagley Robertson 138kV | 10,545 | 73,403,975.05 | Saginaw 345/138 kV auto (6273) |
| Jewet-Sng 345kV | Btu\_Jack\_Creek - Twin Oak Switch 345kV | 23,934 | 68,251,271.16 | Houston Import Project (4458) |
| Rns-Rtw & Sng-Tb 345kv | Singleton - Zenith 345kV | 18,729 | 67,694,933.06 | Houston Import Project (4458) |
| NORTH PHARR to POLK AVENUE LIN 1 | North Mcallen - West Mcallen 138kV | 2,688 | 35,391,269.55 | Pharr 138 kV loop & Stewart Road: Construct 345 kV cut in (4493,5604) |
| Rns-Rtw & Sng-Tb 345kv | Singleton - Zenith 345kV | 9,538 | 33,061,259.86 | Houston Import Project (4458) |
| CRLNW-LWSSW 345kV | Carrollton Northwest - Lakepointe Tnp 138kV | 7,057 | 25,711,686.00 | Upgrade existing NW Carrollton - LakePointe 138 kV Line (5488) |
| White\_Pt-Mccampbe&Hecker 138 | Whitepoint - Rincon 138kV | 1,352 | 24,325,582.27 | Upgrade existing NW Carrollton - LakePointe 138 kV Line (5488) |
| HCKSW-ALLNC&RNKSW 345kV | Wagley Robertson - Summerfield 138kV | 1,632 | 22,995,433.32 | Saginaw 345/138 kV auto (6273) |
| Victoria-V\_Dupsw 138kV | Formosa - Lolita 138kV | 3,180 | 19,360,543.73 |  |
| NORTH PHARR to PHARR Magic Valley | North Mcallen - West Mcallen 138kV | 703 | 15,031,152.13 | Pharr 138 kV loop & Stewart Road: Construct 345 kV cut in (4493,5604) |
| Hecker\_White\_Pt 138kv | Whitepoint - Rincon 138kV | 1,447 | 14,822,421.12 | Melon Creek: Build new (2979) |
| Nedin-Mv\_Wedn4&Mv\_Palm4 138k | Azteca Sub - Se Edinburg 138kV | 1,675 | 13,608,219.01 | Azteca Sub - SE Edinburg - Pharr and North Edinburg - McColl Road 138-kV terminal equipment upgrade. (2017 RTP S2) |
| Elmcreek-Sanmigl 345kV | Pawnee Switching Station - Calaveras 345kV | 1,272 | 12,995,151.01 |  |
| Jewet-Sng 345kV | Gibbons Creek - Singleton 345kV | 2,429 | 12,177,961.20 | Houston Import Project (4458) |
| Jewet-Sng 345kV | Gibbons Creek - Twin Oak Switch 345kV | 334 | 10,861,578.84 | Houston Import Project (4458) |
| Cagnon-Calavers&Braunig 345k | Skyline - Elmcreek 345kV | 119 | 10,747,600.62 | LCRA TSC CPS Energy RPG Project (4473,4844) |
| Hillctry-Marion 345kV | Skyline - Elmcreek 345kV | 202 | 9,885,586.41 | LCRA TSC CPS Energy RPG Project (4473,4844) |
| White\_Pt-Hecker&I\_Dupsw 138k | Whitepoint - Rincon 138kV | 761 | 9,477,211.29 | Melon Creek: Build new (2979) |
| NORTH EDINBURG TRX 1382 345/138 | North Edinburg 345/1kV | 434 | 8,304,991.43 | Pharr 138 kV loop & Stewart Road: Construct 345 kV cut in (4493,5604) |

# System Events

## ERCOT Peak Load

The unofficial ERCOT peak load for the month was 54,424 MW and occurred on December 31st during hour ending 19:00.

## Load Shed Events

None.

## Stability Events

None.

## Notable PMU Events

ERCOT analyzes PMU data for any significant system disturbances that do not fall into the Frequency Events category reported in section 2.1. The results are summarized in this section once the analysis has been completed.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Date and Time** | **Duration of Oscillation** | **Dominant Oscillation Mode** | **Oscillation Signals** | **Max Peak to Peak Oscillation** |
| **Event 1:** 12/1/2017 9:41 | 4 Hrs 15 Mins | 0.24 Hz  |  Voltage Magnitude,Reactive Power | ~1.4 KV,~7.5 MVArs |
| **Event 2:**12/7/2017 5:40 | 2 Hrs 20 Mins | 1.0 – 1.1 Hz | Current Magnitude,Real Power | ~30 Amps,~20 MW |
| **Event 3:** 12/19/2017 11:48 | 0 Hrs 16 Mins | 0.63 Hz  | Voltage Magnitude,Current Magnitude,Reactive Power | ~1.2 kV,~14 Amps,~9 MVAr |
| **Event 4:**12/25/2017 3:00 & 7:2112/27/20721:07 | 1 Hr 17 Min,2 Hrs 4 Min,1 Hr 52 Min | 0.14 Hz |  Voltage Magnitude,Current Magnitude,Reactive Power | ~0.7 kV,~10 Amps,~10 MVArs |

## DC Tie Curtailment

There were seven DC Tie curtailments (Tags) in December.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Date**  | **DC Tie** | **Curtailing Period** | **# of Curtailments (Tags)** | **Curtailment Reason** |
| 12/11/2017 | Eagle Pass | HE17 | 4 | Forced extension of a planned outage on the Eagle Pass DC Tie |
| 12/18/2017 | South | HE09 – HE14 | 3 | Forced extension of a planned outage on the South DC Tie (DC\_L) |

## TRE/DOE Reportable Events

* CPS submitted a DOE OE-417 report on December 07, 2017 for Loss of electric service to more than 50,000 customers for 1 hour or more.
* Formosa submitted a NERC EOP-004 report on December 29, 2017 Reportable Event Type: Physical threat to a facility.
* AEP submitted a NERC EOP-004 report on December 29, 2017 Reportable Event Type: Physical threat to a facility.

## New/Updated Constraint Management Plans

MP\_2013\_27 was updated based on Oncor and AEP feedback. This plan was developed to address possible high voltage scenarios near the East HVDC Tie.

## New/Modified/Removed RAS

On 12/20/17, the Mitchell Bend RAS trigger conditions were modified.

## New Procedures/Forms/Operating Bulletins

ERCOT has revised the following procedure manuals, effective December 28, 2017.

|  |  |
| --- | --- |
| **Procedure Title** | **POB** |
| [Real](http://www.ercot.com/content/wcm/pobs/134275/Power_Operations_Bulletin_805.doc) Time Desk | [818](http://www.ercot.com/content/wcm/pobs/144642/Power_Operations_Bulletin_818.doc) |
| Reliability Risk Desk | [819](http://www.ercot.com/content/wcm/pobs/144645/Power_Operations_Bulletin_819.doc) |
| Reliability Unit Commitment Desk | [820](http://www.ercot.com/content/wcm/pobs/144648/Power_Operations_Bulletin_820.doc) |
| Resource Desk | [821](http://www.ercot.com/content/wcm/pobs/144651/Power_Operations_Bulletin_821.doc) |
| Shift Supervisor Desk | [822](http://www.ercot.com/content/wcm/pobs/144654/Power_Operations_Bulletin_822.doc) |
| Transmission and Security Desk | [823](http://www.ercot.com/content/wcm/pobs/144657/Power_Operations_Bulletin_823.doc) |

# Emergency Conditions

## OCNs

|  |  |
| --- | --- |
| **Date and Time** | **Description** |
| 12/28/17 09:58 | At 10:00, ERCOT is issuing an OCN for a potential extreme cold weather system approaching the ERCOT region from 01/01/18 to 01/02/18. |

##  Advisories

|  |  |
| --- | --- |
| **Date and Time** | **Description** |
| 12/29/17 16:40 | At 17:00, ERCOT is issuing an Advisory for a potential extreme cold weather system approaching the ERCOT region from 01/01/18 to 01/02/18. |

## Watches

|  |  |
| --- | --- |
| **Date and Time** | **Description** |
| 12/11/17 15:55 | At 16:00, ERCOT is issuing a Transmission Watch for the Eagle Pass DC Tie (DC\_S) due to a force extension of a planned outage. |
| 12/18/17 08:04 | At 07:45, ERCOT is issuing a Transmission Watch for the Laredo DC Tie (DC\_L) due to a forced extension of a planned outage.  |
| 12/31/17 12:44 | At 13:00, ERCOT is issuing a Watch for a potential extreme cold weather system approaching the ERCOT region from 01/01/18 to 01/03/18. |

## Emergency Notices

|  |  |
| --- | --- |
| **Date and Time** | **Description** |
| 12/07/17 16:12 | ERCOT is issuing a Transmission Emergency for Far West Texas due to Voltage Stability. |
| 12/07/07 22:16 | ERCOT is issuing a Transmission Emergency due to expected cascading condition in the San Antonio area which is in the CPSB service area. |

# Application Performance

## TSAT/VSAT Performance Issues

None.

## Communication Issues

None.

## Market System Issues

None.

# Model Updates

The Downstream Production Change (DPC) process allows ERCOT to make changes in the on-line Network Operations Model without loading a completely new model. The purpose of this process is to allow for reliable grid operations as system conditions change between designated Network Operations Model database loads. The DPC process is limited in scope to just those items listed below, with equipment ratings updates being the most common. ERCOT has seen a rise in the use of the DPC process to make on-line updates to the Network Operations Model in recent years, instead of through the standard Network Operations Model Change Request process.

* Static Line ratings (Interim Update)
* Dynamic Line ratings (non-Interim Update)
* Autotransformer ratings (non-Interim Update)
* Breaker and Switch Normal status (Interim Update)
* Contingency Definitions (Interim Update)
* RAP and RAS changes or additions (Interim Update)
* Net Dependable and Reactive Capability (NDCRC) values (Interim Update)
* Impedance Updates (non-Interim)

|  |  |
| --- | --- |
| **Transmission Operator** | **Number of DPCs** |

|  |  |
| --- | --- |
| ONCOR | 15 |
| ERCOT | 5 |
| AEP | 2 |
| TMPA | 2 |
| CENTERPOINT | 1 |

#

# Appendix A: Real-Time Constraints

The following is a complete list of constraints activated in SCED for the month of December. Full contingency descriptions can be found in the Standard Contingencies List located on the MIS secure site at Grid 🡪 Generation 🡪 Reliability Unit Commitment.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Contingency** | **Constrained Element** | **From Station** | **To Station** | **# of Days Constraint Active** |
| BASE CASE | PNHNDL | n/a | n/a | 22 |
| DJEWSNG5 | JK\_TOKSW\_1 | TOKSW | JK\_CK | 20 |
| SBRAUVA8 | HAMILT\_MAVERI1\_1 | HAMILTON | MAVERICK | 12 |
| DELMSAN5 | PAWNEE\_SPRUCE\_1 | PAWNEE | CALAVERS | 11 |
| BASE CASE | NELRIO | n/a | n/a | 11 |
| XSA2N58 | SANMIGL\_ATAH | SANMIGL | SANMIGL | 11 |
| DELMSAN5 | PAWNEE\_SPRUCE\_1 | CALAVERS | PAWNEE | 11 |
| SROCGL28 | GLIDDE\_AT2 | GLIDDE | GLIDDE | 10 |
| SWCSBOO8 | BARL\_FTSW1\_1 | BARL | FTSW | 9 |
| SROCGL18 | GLIDDE\_AT2 | GLIDDE | GLIDDE | 9 |
| SBOSELM5 | 1030\_\_B | BOSQUESW | RGH | 9 |
| SWCSBOO8 | BARL\_FTSW1\_1 | FTSW | BARL | 9 |
| BASE CASE | 6332\_\_A | YUCSW | GASPAD | 8 |
| DCAGBRA5 | PAWNEE\_SPRUCE\_1 | CALAVERS | PAWNEE | 7 |
| SKLELOY8 | LOYOLA\_69\_1 | LOYOLA | LOYOLA | 7 |
| DTOKJK\_5 | 260\_A\_1 | JEWET | SNG | 7 |
| DRIOHAR5 | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 6 |
| SJARDIL8 | DIL\_COTU\_1 | DILLEYSW | COTULAS | 6 |
| DCLEZOR5 | 89T204\_1 | ZORN | HENNE | 6 |
| SVICCO28 | COLETO\_VICTOR2\_1 | COLETO | VICTORIA | 5 |
| SSONFRI8 | SONR\_69-1 | SONR | SONR | 5 |
| SLAQLOB8 | BRUNI\_69\_1 | BRUNI | BRUNI | 5 |
| DENTSCS5 | 1170\_\_A | NCDSE | HNRSW | 5 |
| SPLUFLA8 | 154T176\_1 | FAYETT | FRELSB | 5 |
| BASE CASE | NWF\_NOTSW\_1 | NWF | NOTSW | 5 |
| DCRLLSW5 | 588\_A\_1 | LWSVW | LWVTI | 5 |
| BASE CASE | PIGCRE\_SOLSTI1\_1 | SOLSTICE | PIGCREEK | 5 |
| SBAKHL48 | 6596\_\_F | HLTSW | EMATP | 5 |
| XNED358 | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 5 |
| DCAGBRA5 | PAWNEE\_XF1 | PAWNEE | PAWNEE | 5 |
| XCMN58 | HAS\_XFM2 | HAS | HAS | 5 |
| SDANBLE8 | BLESSING\_69A1 | BLESSING | BLESSING | 4 |
| SBRAHAM8 | HAMILT\_MAVERI1\_1 | HAMILTON | MAVERICK | 4 |
| UCOLCOL1 | BLESSI\_LOLITA1\_1 | BLESSING | LOLITA | 4 |
| DELMTEX5 | BLESSI\_LOLITA1\_1 | BLESSING | LOLITA | 4 |
| SINDRIO8 | LVOK\_SANTIA1\_1 | SANTIAGO | LVOK | 4 |
| DCAGBRA5 | COLETO\_KENEDS1\_1 | COLETO | KENEDSW | 4 |
| SPAWCAL5 | COLETO\_KENEDS1\_1 | COLETO | KENEDSW | 4 |
| SRODB\_D8 | AIRLIN\_CABANI1\_1 | AIRLINE | CABANISS | 3 |
| SKEYWLV8 | 6137\_\_A | GUNSW | BUZSW | 3 |
| BASE CASE | RANDAD\_ZAPATA1\_1 | RANDADO | ZAPATA | 3 |
| SMOUFLA8 | 144T132\_1 | FLATON | HALLET | 3 |
| DBIGKEN5 | FRIR\_ROCKSP1\_1 | FRIR | ROCKSPRS | 3 |
| SBROALP9 | PIGCRE\_SOLSTI1\_1 | PIGCREEK | SOLSTICE | 3 |
| SCOLLON5 | VICTO\_WARBU\_1A\_1 | VICTORIA | WARBURTN | 3 |
| DELMSAN5 | NORMAN\_PETTUS1\_1 | PETTUS | NORMANNA | 3 |
| DBBSJEW5 | 31\_\_A | RCHBR | TRSES | 3 |
| SCHYWIN8 | 6100\_\_F | NOTSW | DHIDE | 3 |
| SBROALP9 | PIGCRE\_SOLSTI1\_1 | SOLSTICE | PIGCREEK | 3 |
| SALMBA28 | PIGCRE\_SOLSTI1\_1 | SOLSTICE | PIGCREEK | 3 |
| SMDLODE5 | ODEHV\_MR2H | ODEHV | ODEHV | 2 |
| SHLDBRN8 | HAS\_XFM2 | HAS | HAS | 2 |
| DSNG\_TB5 | SNGZEN99\_A | SNG | ZEN | 2 |
| SPIGSOL8 | TNAF\_TNFS\_1 | TNAF | 16TH\_ST | 2 |
| DCDHWTR5 | 1750\_\_B | SGOVL | KLBTP | 2 |
| DCRLLSW5 | 591\_\_A | LKPNT | CRLNW | 2 |
| SMDOPHR5 | G138\_10C\_1 | FRDSWOOD | SEMINOLE | 2 |
| SCRDLOF9 | BOW\_FMR1 | BOW | BOW | 2 |
| DVICV\_D8 | FORMOS\_LOLITA1\_1 | LOLITA | FORMOSA | 2 |
| DCALCAG5 | PAWNEE\_SPRUCE\_1 | CALAVERS | PAWNEE | 2 |
| DRNS\_TB5 | SNGZEN99\_A | SNG | ZEN | 2 |
| SPOLPHA8 | GCB\_100\_1 | N\_MCALLN | W\_MCALLN | 2 |
| DBWNKLN5 | HAS\_XFM2 | HAS | HAS | 2 |
| DFERSTA8 | 38T365\_1 | WIRTZ | FLATRO | 2 |
| SCOLPAW5 | COLETO\_KENEDS1\_1 | COLETO | KENEDSW | 2 |
| SENSEN28 | 940\_\_C | ENWSW | WXHCH | 2 |
| DCAGBRA5 | P4\_E5\_1\_1 | ELMCREEK | SKYLINE | 2 |
| DHILMAR5 | P4\_E5\_1\_1 | ELMCREEK | SKYLINE | 2 |
| SNORODE5 | PIGCRE\_SOLSTI1\_1 | SOLSTICE | PIGCREEK | 2 |
| XYU189 | 16TH\_WRD2\_1 | WOODWRD2 | 16TH\_ST | 2 |
| XBAR89 | 6332\_\_A | YUCSW | GASPAD | 2 |
| SFRECLE8 | 89T204\_1 | ZORN | HENNE | 2 |
| SSPUASP8 | ROTN\_WOLFGA1\_1 | WOLFGANG | ROTN | 2 |
| DHKBCRL5 | 588\_A\_1 | LWSVW | LWVTI | 1 |
| DGREBOW5 | 6560\_\_B | MRKLY | RICSW | 1 |
| XCLE58 | CLEASP\_AT2H | CLEASP | CLEASP | 1 |
| DELMSAN5 | COLETO\_KENEDS1\_1 | COLETO | KENEDSW | 1 |
| DDILCOT8 | DIL\_COTU\_1 | COTULAS | DILLEYSW | 1 |
| DAUSSND5 | HWRDLN\_1 | HWRDTP | HWRDLN | 1 |
| SNADRIC8 | NAD\_ELCM\_1 | NADAS | ELCMPOS | 1 |
| XYU189 | RIOPEC\_WOODW21\_1 | RIOPECOS | WOODWRD2 | 1 |
| BASE CASE | VALIMP | n/a | n/a | 1 |
| DGIBSNG5 | 260\_A\_1 | JEWET | SNG | 1 |
| SLOPCOM8 | 505T505\_1 | CLEASP | GERONI | 1 |
| SECTPBS8 | 6345\_\_B | GNTSW | SPRTP | 1 |
| DB\_DAIR8 | AIRLIN\_CABANI1\_1 | AIRLINE | CABANISS | 1 |
| XBAR89 | ALPINE\_PAIS1\_1 | PAIS | ALPINE | 1 |
| SN\_SLON5 | CELANE\_KLEBER1\_1 | CELANEBI | KLEBERG | 1 |
| SPIGSOL8 | FTST\_69T1 | FTST | FTST | 1 |
| SAPACAD8 | G69\_F2\_1 | CHOCTAP | CHOCTAW | 1 |
| SILLFTL8 | HAMILT\_MAXWEL1\_1 | MAXWELL | HAMILTON | 1 |
| XN\_S58 | N\_SHARPE\_PS3 | N\_SHARPE | N\_SHARPE | 1 |
| STNAFTS8 | PIGCRE\_SOLSTI1\_1 | SOLSTICE | PIGCREEK | 1 |
| STRCWTR5 | TRSES\_MR4L | TRSES | TRSES | 1 |
| DWAPHLJ5 | 155T217\_1 | BELLSO | PT | 1 |
| XDES258 | 1750\_\_B | SGOVL | KLBTP | 1 |
| SDESCDH5 | 2360\_\_A | TRSES | NVARO | 1 |
| DNAVLEG5 | 31\_\_A | RCHBR | TRSES | 1 |
| DEMSSAG8 | 6260\_\_C | EMSES | EMMCP | 1 |
| SN\_SLON5 | AIRLIN\_CABANI1\_1 | AIRLINE | CABANISS | 1 |
| SBARSOL8 | ALMC\_PAIS1\_1 | ALMC | PAIS | 1 |
| DELMSAN5 | BLESSI\_LOLITA1\_1 | BLESSING | LOLITA | 1 |
| SBRAUVA8 | EAGLHY\_ESCOND1\_1 | EAGLHYTP | ESCONDID | 1 |
| SN\_SAJO5 | FALFUR\_PREMON1\_1 | FALFUR | PREMONT | 1 |
| DFPPHOL5 | FAYETT\_AT2L | FAYETT | FAYETT | 1 |
| SHACPB38 | IH20\_IHT1 | IH20 | IH20 | 1 |
| XLEO84 | KARNES\_KENEDS1\_1 | KENEDSW | KARNESCI | 1 |
| DMCARIO8 | PIGCRE\_SOLSTI1\_1 | SOLSTICE | PIGCREEK | 1 |
| DELMSAN5 | SAR\_FRAN\_1 | FRANKC | SARGNTS | 1 |
| SLCLAN8 | SAR\_FRAN\_1 | FRANKC | SARGNTS | 1 |
| DJEWSNG5 | 256\_A\_1 | TOKSW | GIBCRK | 1 |
| DBBSJEW5 | 30\_\_A | BBSES | RCHBR | 1 |
| DCMTBNB8 | 6265\_\_A | EMSES | MRSDO | 1 |
| SCAGKEN5 | 75T243\_1 | KENDAL | COMFOR | 1 |
| SFTSBAR9 | ALMC\_PAIS1\_1 | ALMC | PAIS | 1 |
| XBAR89 | ALMC\_PAIS1\_1 | ALMC | PAIS | 1 |
| DELMSAN5 | BEEVIL\_NORMAN1\_1 | NORMANNA | BEEVILLE | 1 |
| BASE CASE | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 1 |
| DMLSENT5 | ELKTN\_MR3L | ELKTN | ELKTN | 1 |
| SBRACAG5 | N5\_R5\_1 | CALAVERS | CAGNON | 1 |
| SPIGSOL8 | RIOPEC\_WOODW21\_1 | WOODWRD2 | RIOPECOS | 1 |
| DWTRTRC5 | TRSES\_MR4L | TRSES | TRSES | 1 |
| DMTSCOS5 | 6474\_\_A | SUNSW | MGSES | 1 |
| SMGIENW8 | 943\_\_A | ENWSW | ENSSW | 1 |
| SPIGSOL8 | BARL\_FTSW1\_1 | BARL | FTSW | 1 |
| SGILNU78 | GILA\_HIWAY\_1\_1 | GILA | HIWAY\_9 | 1 |
| DVICV\_D8 | GREENL\_WEAVER1\_1 | WEAVERRD | GREENLK | 1 |
| SODLBRA8 | HAMILT\_MAVERI1\_1 | HAMILTON | MAVERICK | 1 |
| SBRNCMP8 | HLD\_FMR1 | HLD | HLD | 1 |
| SV3CAG8 | MHONDOCR\_1 | MOORE | HONDOCK | 1 |
| DCAGCO58 | PAR\_TRI\_CNTY\_1 | PARKWA | F5 | 1 |
| DCOTDMT5 | VERS\_69\_1 | VERS | VERS | 1 |
| SRCHTRS5 | 31\_\_A | RCHBR | TRSES | 1 |
| SKINFAL8 | FALFUR\_PREMON1\_1 | FALFUR | PREMONT | 1 |
| BASE CASE | LGD\_SANTIA1\_1 | LGD | SANTIAGO | 1 |
| SN\_SLON5 | LOYOLA\_69\_1 | LOYOLA | LOYOLA | 1 |
| SYOACUE8 | LULING\_AT1 | LULING | LULING | 1 |
| DCIBSCH8 | 581T581\_1 | ECMORN | PARKWA | 1 |
| SALMBA28 | BARL\_FTSW1\_1 | BARL | FTSW | 1 |
| XLO2N58 | LON\_HILL\_381H | LON\_HILL | LON\_HILL | 1 |
| DCASTXR8 | MHONDOCR\_1 | MOORE | HONDOCK | 1 |
| SN\_SLON5 | N\_SHARPE\_PS3 | N\_SHARPE | N\_SHARPE | 1 |
| SSPUMW18 | ROTN\_WOLFGA1\_1 | WOLFGANG | ROTN | 1 |
| SWCSBOO8 | 6332\_\_A | YUCSW | GASPAD | 1 |
| DMTSCOS5 | 6437\_\_F | SCRCV | KNAPP | 1 |
| SCAGKEN5 | 74T148\_1 | COMFOR | CICO | 1 |
| SMGIENW8 | 921\_\_D | ENSSW | TRU | 1 |
| SBARSOL8 | ALPINE\_PAIS1\_1 | PAIS | ALPINE | 1 |
| BASE CASE | KARNES\_KENEDS1\_1 | KENEDSW | KARNESCI | 1 |