

July 2023 ERCOT Monthly Operations Report Public

Reliability and Operations Subcommittee Meeting

September 7, 2023

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# Report Highlights

* The unofficial ERCOT peak demand was 82,939 MW for the month of July on 7/31/2023 HE 17:00; this was 2,791 MW more than the previous July record of 80,148 MW set on 7/20/2022 HE 17:00, and 2,152 MW greater than the previous all time record of 80,787 MW set on 6/27/2023 HE 18:00.
* A PVGR Generation Record of 13,446 MW was set on 07/27/2023 at 15:09.
* There were 7 frequency events**.**
* There were 6 instances where ERCOT Contingency Reserve Service was released.
* There were 4 OCN’s issued due to extreme hot weather forecasted in North Central and South Central weather zones
* There was 1 Watch issued for HRUC failure
* There were 39 HRUC commitments.
* There were 31 days on the North Edinburg to Lobo GTC, 24 days on the Nelson Sharpe to Rio Hondo GTC, 5 days on the West Texas Export GTC, 20 days on the Valley Export GTC, and 12 days on the North to Houston GTC. There was no activity on the remaining GTCs during the month.

# Frequency Control

## Frequency Events

The ERCOT Interconnection experienced 7 frequency events, which resulted from units tripping. The shortest event duration was 03:59 and the longest was 13:18.

A summary of the frequency events is provided below. The reported frequency events meet one of the following criteria: Delta Frequency is 60 mHz or greater; the MW loss is 350 MW or greater; resource trip event triggered ECRS deployment. Frequency events that have been identified as Frequency Measurable Events (FME) for purposes of BAL-001-TRE-2 analysis are highlighted in blue. When analyzing frequency events, ERCOT evaluates PMU data according to industry standards. Events with an oscillating frequency of less than 1 Hz are inter-area, while higher frequencies indicate local events. Industry standards specify that damping ratio for inter-area oscillations should be 3.0% or greater. For the frequency events listed below, the ERCOT system met these standards and transitioned well after each disturbance. In the case of negative delta frequency, the MW Loss column could refer to load loss.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date and Time** | **Delta Frequency** | **Max/Min Frequency** | **Duration of Event** | **PMU Data**  | **MW Loss** | **Load** | **IRR** | **Inertia** |
| **(Hz)** | **(Hz)** | **Oscillation Mode (Hz)** | **Damping Ratio** | **(MW)** | **%**  | **(GW-s)** |
| 7/2/2023 5:02:48 | 0.065 | 59.945 | 00:13:18 | 0.66 | 14% | 420 | 45,872 | 12% | 328,755 |
| 7/6/2023 21:05:09 | 0.107 | 59.899 | 00:08:10 | 0.64 | 11% | 751 | 62,436 | 14% | 325,753 |
| 7/14/2023 6:23:50 | 0.078 | 59.934 | 00:04:52 | 0.87 | 16% | 451 | 55,550 | 21% | 304,048 |
| 7/16/2023 10:41:20 | 0.087 | 59.893 | 00:03:59 | 0.61 | 13% | 862 | 58,522 | 27% | 345,265 |
| 7/17/2023 7:56:09 | 0.054 | 59.931 | 00:07:21 | 0.56 | 10% | 549 | 53,429 | 36% | 335,117 |
| 7/21/2023 4:22:00 | 0.071 | 59.924 | 00:07:13 | 0.85 | 14% | 617 | 52,271 | 32% | 335,661 |
| 7/31/2023 18:35:48 | 0.050 | 59.905 | 00:07:23 | 0.62 | 12% | 437 | 82,072 | 20% | 386,881 |

(Note: All data on this graph encompasses frequency event analysis based on BAL-001-TRE-2.)



## ERCOT Contingency Reserve Events

There were 6 events where ERCOT Contingency Reserve MWs were released to SCED. The events highlighted in blue were related to frequency events reported in Section 2.1 above.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date and Time Released to SCED | Date and Time Recalled | Duration of Event | Maximum MWs Released | Comments |
| 07/06/2023 21:05:18 | 07/06/2023 21:12:38 | 00:07:20 | 724 | Unit Trip |
| 07/08/2023 19:57:57 | 07/08/2023 20:04:32 | 00:06:35 | 500 | Insufficient capability for forecasted 10min Ahead Net Load |
| 07/10/2023 19:21:08 | 07/10/2023 19:43:28 | 00:22:20 | 700 | Insufficient capability for forecasted 10min Ahead Net Load |
| 07/16/2023 10:41:30 | 07/16/2023 10:45:50 | 00:04:20 | 133 | Unit Trip |
| 07/31/2023 18:35:58 | 07/31/2023 18:44:06 | 00:08:08 | 809 | Unit Trip |
| 07/31/2023 19:35:58 | 07/31/2023 20:32:06 | 00:56:08 | 400 | Insufficient capability for forecasted 10min Ahead Net Load |

## Load Resource Events

None.

# Reliability Unit Commitment

ERCOT reports on Reliability Unit Commitments (RUC) monthly. 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.

There were 39 HRUC commitments.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Resource Location** | **# of Resources** | **Operating Day** | **Total # of Hours Committed** |  **Total MWhs**  | **Reason for Commitment** |
|  NORTH\_CENTRAL  | 1 | 07/01/2023 | 7 |  140.0  |  System Capacity  |
|  NORTH\_CENTRAL, SOUTH\_CENTRAL  | 8 | 07/05/2023 | 46 |  3,144.0  |  System Capacity  |
|  COAST, EAST, NORTH\_CENTRAL, SOUTH\_CENTRAL, SOUTHERN  | 9 | 07/08/2023 | 32 |  5,817.0  |  System Capacity  |
|  NORTH\_CENTRAL  | 1 | 07/09/2023 | 3 |  1,539.0  |  System Capacity  |
|  EAST, NORTH\_CENTRAL  | 8 | 07/10/2023 | 41 |  4,703.5  |  System Capacity  |
|  NORTH, NORTH\_CENTRAL  | 6 | 07/11/2023 | 30 |  2,759.0  |  System Capacity,  |
|  COAST, NORTH\_CENTRAL, SOUTH\_CENTRAL  | 4 | 07/13/2023 | 19 |  8,367.0  |  System Capacity  |
|  SOUTH\_CENTRAL, SOUTHERN  | 2 | 07/26/2023 | 18 |  4,980.0  |  System Capacity  |

# IRR, Wind, and Solar Generation as a Percent of Load

The graph below shows the maximum, minimum and average aggregate solar, wind and IRR output as a percentage of total ERCOT load when evaluated as 10-minute averaged intervals, over the past 13 months. Current wind and solar generation and penetration records are listed in the footnote below[[1]](#footnote-1). Maximum IRR penetration for the month was 49.2% on 07/12/2023 interval ending 09:10 and minimum IRR penetration for the month was 7.2% on 07/03/2023 interval ending 05:10.



During the hour of peak load for the month, hourly integrated wind generation was 7,443 MW and solar generation was 11,316 MW. The graph below shows the wind and solar penetration percentage during the hour of the peak load in the last 13 months.



Lastly, the graph below shows the minimum wind, solar and IRR output during the peak load hour as a percentage of the daily peak load for every day in the month.



# Largest Net-Load Ramps

The net-load ramp is defined as the change in net-load (load minus wind and PVGR generation) during the defined time horizon. Such a variation in net-load needs to be accommodated in grid operations to ensure that the reliability of the grid is satisfactorily maintained. The largest net-load ramp during 5-min,

10-min, 15-min, 30-min and 60-min in July 2023 was 1,111 MW, 1,713 MW, 2,327 MW, 4,379 MW, and 8,128 MW, respectively. The comparison with respect to the historical values is given in the table below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Month and Year** | **5 min** | **10 min** | **15 min** | **30 min** | **60 min** |
| July 2014 | 1,074 MW | 1,424 MW | 1,713 MW | 2,809 MW | 5,392 MW |
| July 2015 | 905 MW | 1,257 MW | 1,688 MW | 3,075 MW | 5,843 MW |
| July 2016 | 863 MW | 1,660 MW | 1,885 MW | 3,390 MW | 5,900 MW |
| July 2017 | 880 MW | 1,243 MW | 1,756 MW | 3,048 MW | 5,738 MW |
| July 2018 | 1,399 MW | 1,779 MW | 2,202 MW | 3,572 MW | 6,698 MW |
| July 2019 | 1,120 MW | 1,699 MW | 2,291 MW | 3,561 MW | 6,546 MW |
| July 2020 | 1,399 MW | 1,779 MW | 2,291 MW | 3,572 MW | 6,698 MW |
| July 2021 | 859 MW | 1,464 MW | 1,804 MW | 3,352 MW | 6,132 MW |
| July 2022 | 1,284 MW | 1,822 MW | 2,413 MW | 4,376 MW | 7,867 MW |
| July 2023 | 1, 111 MW07/20/2023(IE 10:59) | 1,713 MW07/20/2023(IE11:05) | 2,327 MW07/20/2023(IE 11:09) | 4,379 MW07/29/2023(IE 12:10) | 8,128 MW07/29/2023(IE 12:05) |
| All Months in 2014-2023 | 1,647 MW05/25/2022(IE 17:06) | 2,506 MW1/12/2023(IE 17:16) | 3,583 MW04/29/2023(IE 19:19) | 6,640 MW04/29/2023(IE 19:34) | 12,352 MW04/29/2023(IE 19:50) |

# Congestion Analysis

## Notable Constraints

Nodal protocol section 3.20 specifies that ERCOT shall identify transmission constraints that are binding in Real-Time three or more Operating Days 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, including approved transmission upgrades from TPIT that may provide some congestion relief based on ERCOT’s engineering judgement. Rows highlighted in blue indicate the congestion was affected by one or more outages. For a list of all constraints activated in SCED, please see Appendix A at the end of this report.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Contingency Name** | **Overloaded Element** | **# of Days Constraint Binding** | **Congestion Rent** | **Transmission Project** |
|  |
| TWR(345) WAP-WLF64 & WAP-WLY72 | South Texas Project - Wa Parish 345kV | 12 | $19,328,283.45 |  |  |
| BEVO to BEVO LIN 1 | Hamilton Road - Maverick 138kV | 19 | $15,807,143.67 | Escondido to Hamilton Road 138 kV Line Rebuild Project (22RPG044) |  |
| Elmcreek-Sanmigl 345kV | Pawnee Switching Station - Calaveras 345kV | 25 | $14,326,320.96 | CSP San Antonio South Reliability Project (22RPG048) |  |
| Basecase | NE\_LOB GTC | 30 | $9,848,751.72 | The Lower Rio Grande Valley (LRGV) System Enhancement Project (21RPG017) will improve the NorthEd\_LoboGTC. |  |
| HICKS SWITCH to HICKS SWITCH LIN \_A | Hicks Switch - Alliance 345kV | 5 | $9,821,607.43 | Oncor\_MW\_RoanokeAreaProjects (21RPG008, MOD 70900) |  |
| DMTSW TO SCOSW 345 DBLCKT | Knapp - Scurry Chevron 138kV | 24 | $8,439,489.24 |   |  |
| COMFORT to CYPRESS CREEK LIN 1 | Raymond F Barker - Comfort 138kV | 5 | $5,764,692.65 |   |  |
| OASIS to MEADOW LIN A | Monsan Cogen - Petson 138kV | 15 | $5,273,309.39 | CNP\_22TPIT64941\_Ckt04\_Petson\_Monsan\_Upgrades (64941) |  |
| McCala-Hunter &Hillto 138kV | Rattler - Mccarty Lane 138kV | 5 | $4,612,230.63 | LCRATSC\_McCartyLane\_Rattler\_TL\_Upgrade (70204) |  |
| FOWLERTON to FOWLERTON LIN 1 | Laredo Vft North - Las Cruces 138kV | 29 | $3,999,543.63 | AEP\_TCC\_Laredo VFT North - Las Cruces 138 kV Line Rebuild (58008) |  |
| MGSES TO CCRSW 345 AND BTRCK TO MGSES 345 DBLCKT | Tonkawa Switch - Morgan Creek Ses 345kV | 15 | $3,587,555.07 |   |  |
| Basecase | WESTEX GTC | 4 | $3,414,062.05 |   |  |
| Rattlesnake Rd Switch to LAKE CREEK SES LIN \_A | St Johns Switch - Jewett 345kV | 18 | $2,800,951.07 |   |  |
| Berghe-Kendal 345kv & Welfar 138kv | Hunter - Purgatory Road 138kV | 1 | $2,776,221.31 |   |  |
| WHITE OAK TRX WO\_AT1 345/138 | Campbell - Addicks 138kV | 2 | $2,752,145.61 |   |  |
| Berghe-Kendal 345kv & Welfar 138kv | Cranes Mill - Sattler 138kV | 1 | $2,698,659.44 |   |  |
| COLETO CREEK to Euler LIN 1 | Coleto Creek - Rosata Tap 138kV | 25 | $2,590,155.39 | AEP\_TCC\_Add\_Rosata Station (6749), AEP\_TCC\_UpgradeColetoCreek-Rosata (20RPG014, MOD 50870) |  |
| COLETO CREEK to COLETO CREEK LIN 1 | Pawnee Switching Station - Tango 345kV | 19 | $2,476,983.13 |   |  |
| SALSW - HUTTO 345KV | Bell County - Salado Switch 138kV | 11 | $2,296,869.50 |   |  |
| AJO to AJO LIN 1 | Falfurrias - Premont 69kV | 7 | $2,136,323.35 |   |  |
| Zenith to TH WHARTON LIN A | Th Wharton - Zenith 345kV | 1 | $2,072,191.09 |   |  |
| Beasley to ORCHARD LIN A | Peters - Twinwood Mobile 138kV | 5 | $1,909,031.64 | CNP\_23TPIT62041\_New\_Distribution\_Sub\_Twinwood\_Ckt25 (62041) |  |
| Manual dbl ckt for NEDIN-BONILLA 345kV & RIOH-PRIM138kV | Burns Sub - Rio Hondo 138kV | 17 | $1,867,324.47 | STEC\_71930\_RioHondo\_Burns\_Upgrade (71930) |  |
| MILLER CREEK to MILLER CREEK LIN 1 | Marshall Ford - Paleface 138kV | 12 | $1,777,541.65 |   |  |
| KENDALL to COMFORT LIN 1 | Kerrville Stadium - Kendall 138kV | 4 | $1,507,113.93 |   |  |
| VENSW TO LIGSW 345 TRPLCKT 1 OF 3 | Cedar Hill Switch - Webb Sub 345kV | 1 | $1,376,629.64 |   |  |
| LON HILL to NELSON SHARPE LIN 1 | Nelson Sharpe 345kV | 16 | $1,367,043.75 |   |  |
| TWR(345) WAP-WLF64 & CCK-WLY72 | South Texas Project - Wa Parish 345kV | 1 | $1,343,219.75 |  |  |
| MAN\_DBL\_'CONSW-MGSES\_and\_CONSW-LNGSW\_345kV\_DBLCKT | Morgan Creek Ses - Navigation Sub 138kV | 6 | $1,215,530.53 | Oncor\_FW\_5436 Morgan Creek\_McDonald Rd 138 kV Line (23RPG011, MOD 5436) |  |
| FOWLERTON to FOWLERTON LIN 1 | Falfurrias - Premont 69kV | 10 | $1,153,635.05 |   |  |
| White Point to Angstrom & Lon Hill 345KV DOUBLE | Pawnee Switching Station - Tango 345kV | 11 | $902,067.64 |   |  |
| BLACKWATER DRAW SWITCH to DOUBLE MOUNTAIN SWITCH LIN 1 | Mackenzie Substation - Northeast Substation 115kV | 4 | $883,943.83 | LPL\_Fix Split Buses (65766) |  |
| BAKERSFIELD SWITCHYARD to Big HiLL LIN 1 | Palouse - Wolfcamp 138kV | 10 | $875,887.90 |   |  |
| Berghe-Kendal 345kv & Welfar 138kv | Blanco - Mountain Top 69kV | 3 | $801,994.07 |   |  |
| Basecase | N\_TO\_H GTC | 5 | $791,678.73 |   |  |
| Rns-Rtw & Sng-Tb 345kV | Th Wharton - Zenith 345kV | 7 | $742,236.53 |   |  |
| FORT LANCASTER to FORT LANCASTER LIN 1 | Palouse - Wolfcamp 138kV | 9 | $739,255.67 |   |  |
| Basecase | NELRIO GTC | 19 | $614,436.86 | The Lower Rio Grande Valley (LRGV) System Enhancement Project (21RPG017) will improve NelsonSharpe\_RioHondo GTC. |  |
| MOLINA - LOBO 138 & LOBO - CENIZO 345 | Pawnee Switching Station - Tango 345kV | 15 | $563,773.50 |   |  |
| KING RANCH GAS PLANT to FALFURRIAS LIN 1 | Falfurrias - Premont 69kV | 16 | $480,538.89 |   |  |
| Loss of DUKE (train) | Burns Sub - Rio Hondo 138kV | 4 | $476,630.61 |   |  |
| LAQUINTA to LOBO LIN 1 | Falfurrias - Premont 69kV | 25 | $449,784.02 |   |  |
| PH ROBINSON to MEADOW LIN A | Magnolia Tnp - Seminole Tnp 138kV | 7 | $444,347.89 |   |  |
| COLETO CREEK to VICTORIA LIN 1 | Coleto Creek - Victoria 138kV | 15 | $351,996.73 |   |  |
| CARTERVILLE to EINSTEIN LIN 1 | Rocky Road - Stiles 138kV | 9 | $334,357.25 | Oncor\_FW\_45693\_Rocky Road - Stiles 138 kV Line (45693) |  |
| ZORN - HAYSEN 345KV | Bergheim 138kV | 4 | $332,767.54 |   |  |
| MANUAL DOUBLE NVARO-LEG & OUTSW-LEG 345 KV | Stryker-Cherokee Poi - Stryker Creek Ses 138kV | 3 | $315,294.98 |   |  |
| AJO to AJO LIN 1 | Las Pulgas - Raymondville 2 138kV | 20 | $292,173.60 |   |  |
| LAQUINTA to LOBO LIN 1 | Bruni Sub 138kV | 24 | $283,628.36 |   |  |
| wett\_long\_draw to VEALMOOR - Sharyland Utilities LIN 1 | Willow Valley Switch - Gail Sub 138kV | 7 | $279,398.75 |   |  |
| FIREROCK TO BRNWD 138 AND FIREROCK TO BANGS 69 DBLCKT | Cottonwood Road Switch - Olney Pod 69kV | 4 | $270,318.74 |   |  |
| DUPONT SWITCH - INGLESIDE to DUPONT SWITCH - INGLESIDE LIN 1 | Dupont Switch - Ingleside - Lge 138kV | 6 | $258,021.32 |   |  |
| Big Hill - Schneeman Draw & Big Hill - Schneeman Draw 2 | Palouse - Wolfcamp 138kV | 5 | $246,506.73 |   |  |
| Koch Upriver - Tortuga & Lon Hill - Nueces Bay 138KV | Champlin - Weil Tract 138kV | 4 | $244,761.80 |   |  |
| WIRTZ to JOHNSON CITY LIN 1 | Marshall Ford - Paleface 138kV | 7 | $230,461.53 |   |  |
| MANUAL PRSSW-HWKSW 138 DBLCKT | Tenaska (Txu) - Toco Switch 138kV | 6 | $228,120.20 |   |  |
| PALODURO SUB to PEARSALL SWITCHING STATION LIN 1 | Pearsall Switching Station 138kV | 18 | $212,983.95 | STEC\_71319\_upgradePearsallStation (71319) |  |
| MADDUX to SAN ANGELO POWER STATION LIN 1 | Maddux - San Angelo Power Station 138kV | 12 | $188,279.32 |   |  |
| GRAHAM SES to RICE SWITCH LIN \_A | Anarene - Navy Kickapoo Switch 69kV | 3 | $173,352.50 |   |  |
| Elmcreek-Sanmigl 345kV | Magruder - Victoria 138kV | 3 | $141,362.58 |   |  |
| Bighil-Kendal 345kV | Hamilton Road - Maverick 138kV | 3 | $131,779.90 | Escondido to Hamilton Road 138 kV Line Rebuild Project (22RPG044) |  |
| Bighil-Kendal 345kV | Yellow Jacket - Treadwell 138kV | 5 | $130,010.11 |   |  |
| Basecase | VALEXP GTC | 14 | $109,582.51 | The Lower Rio Grande Valley (LRGV) System Enhancement Project (21RPG017) will improve this GTC. |  |
| Basecase | Stryker-Cherokee Poi - Stryker Creek Ses 138kV | 3 | $94,006.75 |   |  |
| ODLAW SWITCHYARD to ASPHALT MINES LIN 1 | Hamilton Road - Maverick 138kV | 5 | $76,339.21 | Escondido to Hamilton Road 138 kV Line Rebuild Project (22RPG044) |  |
| Manual dbl ckt for NEDIN-BONILLA 345kV & RIOH-PRIM138kV | Haine Drive - La Palma 138kV | 4 | $73,268.40 |   |  |
| PANCAKE to PANCAKE LIN 1 | Gustine - Hasse 69kV | 7 | $70,129.67 | BEPC\_TPIT1205\_HASSE\_GUSTINE (1205) |  |
| Bighil-Kendal 345kV | Hamilton Road - Maxwell 138kV | 6 | $60,604.01 | AEP\_TCC\_HamiltonRoad-Maxwell (20RPG022, MOD 61396) |  |
| FORT LANCASTER to FORT LANCASTER LIN 1 | Hamilton Road - Maxwell 138kV | 4 | $55,966.88 | AEP\_TCC\_HamiltonRoad-Maxwell (20RPG022, MOD 61396) |  |
| MANUAL DOUBLE NVARO-LEG & OUTSW-LEG 345 KV | Tradinghouse Ses - Four Brothers Switch 345kV | 5 | $54,120.70 |   |  |
| Manual for I\_DUPS - RESNIK & MCCAMPBE 2 138KV | Whitepoint - Rincon 138kV | 9 | $46,122.16 |   |  |
| KLEBERG AEP to KLEBERG AEP LIN 1 | Loyola Sub 138kV | 6 | $43,008.16 |   |  |
| MANUAL WIRTZ TO JOHNCI NEWE CONFIG 138KV | Marshall Ford - Paleface 138kV | 4 | $29,883.21 |   |  |
| Cagnon-Kendal 345 & Cico-Comfor 138 | Bergheim - Kendall 345kV | 3 | $24,963.38 | LCRATSC\_Bergheim\_FairOaksRanch\_Upgrade (61392), LCRATSC\_Kendall\_Welfare\_Upgrade (22RPG005, MOD 61406), LCRATSC\_BoerneSplit\_Welfare\_Upgrade (22RPG005, MOD 61404), LCRATSC\_Esperanza\_FairOaksRanch\_Upgrade (22RPG005, MOD 61400), LCRATSC\_Boerne\_Esperanza\_Upgrade (61402) |  |
| CCRSW TO SWESW 345 AND BTRCK TO MGSES 345 DBLCKT | Tonkawa Switch - Morgan Creek Ses 345kV | 3 | $16,904.01 |   |  |
| COMANCHE SWITCH (Oncor) to COMANCHE PEAK SES LIN \_A | Comanche Tap - Comanche Switch (Oncor) 138kV | 3 | $13,202.31 |   |  |
| CMNSW TO BRNWD 138 AND CMNSW TO SWTNVL 138 DBLCKT | Zephyr Bepc - Mercers Gap Sw 138kV | 3 | $12,978.77 |   |  |
| FT LANCASTER - FRIEND RANCH 138 & FT LANCASTER - ILLINOIS 138 | Hamilton Road - Maxwell 138kV | 3 | $8,174.41 | AEP\_TCC\_HamiltonRoad-Maxwell(20RPG022, MOD 61396) |  |
| MOUNTAIN TOP to JOHNSON CITY LIN 1 | Marshall Ford - Paleface 138kV | 6 | $3,049.09 |   |  |

## Generic Transmission Constraint Congestion

There were 31 days on the North Edinburg to Lobo GTC, 24 days on the Nelson Sharpe to Rio Hondo GTC, 5 days on the West Texas Export GTC, 20 days on the Valley Export GTC, and 12 days on the North to Houston GTC. 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

None

## Congestion Costs for Calendar Year 2023

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** | **Overloaded Element** | **# of 5-min SCED** | **Estimated Congestion Rent (2023)** |
| MAN\_DBL\_MDSSW-ODEHB\_and\_CONSW-QALSW\_345kV\_DBLCKT | Midessa South Sw 138kV | 11605 | $79,014,288.16 |
| Basecase | WESTEX GTC | 14342 | $50,145,846.48 |
| SKYWEST to SKYWEST LIN 1 | Consavvy Switch - Cottonfield Sub 138kV | 2909 | $45,341,291.63 |
| Basecase | NE\_LOB GTC | 26910 | $44,880,858.32 |
| SKYWEST to SKYWEST LIN 1 | South Midland - Consavvy Switch 138kV | 10282 | $41,928,489.30 |
| Elmcreek-Sanmigl 345kV | Pawnee Switching Station - Calaveras 345kV | 7394 | $38,782,643.49 |
| BEVO to BEVO LIN 1 | Hamilton Road - Maverick 138kV | 4036 | $27,937,170.03 |
| BLACKWATER DRAW SWITCH to DOUBLE MOUNTAIN SWITCH LIN 1 | Mackenzie Substation - Northeast Substation 115kV | 8057 | $26,883,266.17 |
| Manual\_SGL\_CONSW-MDSSW\_345kV\_SglCkt | Quail Switch - Odessa Ehv Switch 345kV | 3594 | $26,545,479.50 |
| TWR(345) WAP-WLF64 & WAP-WLY72 | South Texas Project - Wa Parish 345kV | 3543 | $24,915,145.23 |
| Basecase | PNHNDL GTC | 7932 | $24,476,704.55 |
| MAN\_DBL\_CONSW-MDSSW\_and\_CONSW-QALSW\_345kV\_DBLCKT | Morgan Creek Ses - Forest Creek And Sand Bluff Wind Farms 138kV | 2616 | $21,174,926.89 |
| Manual dbl ckt for NEDIN-BONILLA 345kV & RIOH-PRIM138kV | Burns Sub - Rio Hondo 138kV | 8553 | $18,877,473.67 |
| Co-op Substation to Co-op Substation LIN 1 | Erskine Substation - Mackenzie Substation 69kV | 3817 | $18,467,803.12 |
| CRLNW TO LWSSW 345 DBLCKT | Ti Tnp - South Tnp 138kV | 2519 | $17,238,444.46 |
| Basecase | BEARKT GTC | 17532 | $16,857,909.26 |
| Austro-Daffin&Dunlap-Decker 138kV | Mcneil - Mcneil Aen 138kV | 1518 | $16,784,057.61 |
| SALSW TO KLNSW 345 DBLCKT | Harker Heights South - Killeen Switch 138kV | 7501 | $16,387,758.98 |
| BEALS CREEK SUB to BEALS CREEK SUB LIN \_A | Big Spring West - Stanton East 138kV | 15758 | $16,282,649.10 |
| MGSES TO CCRSW 345 AND BTRCK TO MGSES 345 DBLCKT | Tonkawa Switch - Morgan Creek Ses 345kV | 4281 | $15,027,566.69 |

# System Events

## ERCOT Peak Load

The unofficial ERCOT peak load for the month was 82,939 MW and occurred on 7/31/2023, during hour ending 17:00.

## 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.

There were no PMU events outside of those reported in section 2.1.

## DC Tie Curtailment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Date** | **DC Tie** | **Curtailing Period** | **# of Tags Curtailed** | **Initiating Event** | **Curtailment Reason[[2]](#footnote-2),[[3]](#footnote-3)** |

## TRE/DOE Reportable Events

* None

## New/Updated Constraint Management Plans

There was 1 modified CMP: MP\_2021\_02

## New/Modified/Removed RAS

None.

## New Procedures/Forms/Operating Bulletins

|  |  |  |
| --- | --- | --- |
| **Date** | **Subject** | **Bulletin No.** |
| 07/31/2023 | Reliability Risk Desk Operating Procedure V1 Rev 32 | 1095 |
| 07/31/2023 | Shift Supervisor Desk V1 Rev 90  | 1096 |

# Emergency Conditions

## OCNs

|  |  |
| --- | --- |
| **Date and Time** | **Message** |
| Jul 10, 2023 09:30CPT | ERCOT issued an OCN for the extreme hot weather with forecasted temperatures to be above 103°F in the North Central and South Central weather zones, from Wednesday, July 12, 2023 until Sunday, July 16, 2023. |
| Jul 14, 2023 10:30CPT | ERCOT issued an OCN for the extreme hot weather with forecasted temperatures to be above 103°F in the North Central and South Central weather zones, from Monday, July 17, 2023 until Friday, July 21, 2023. |
| Jul 21, 2023 10:00CPT | ERCOT issued an OCN for the extreme hot weather with forecasted temperatures to be above 103°F in the North Central and South Central weather zones, from Monday, July 24, 2023 until Friday, July 28, 2023. |
| Jul 27, 2023 10:00CPT | ERCOT issued an OCN for the extreme hot weather with forecasted temperatures to be above 103°F in the North Central and South Central weather zones, from Saturday, July 29, 2023 until Wednesday, August 02, 2023. |

## Advisories

|  |  |
| --- | --- |
| **Date and Time** | **Message** |
| N/A | N/A |

## Watches

|  |  |
| --- | --- |
| **Date and Time** | **Message** |
| Jul 22, 2023 16:50CPT | ERCOT issued a WATCH for HRUC failure for HE 18:00 |

## Emergency Notices

None.

# 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** |
| AEP TEXAS COMPANY (TDSP) | 0 |
| BRAZOS ELECTRIC POWER CO OP INC (TDSP) | 0 |
| BROWNSVILLE PUBLIC UTILITIES BOARD (TDSP) | 0 |
| BRYAN TEXAS UTILITIES (TDSP) | 0 |
| CENTERPOINT ENERGY HOUSTON ELECTRIC LLC (TDSP) | 1 |
| CITY OF AUSTIN DBA AUSTIN ENERGY (TDSP) | 0 |
| CITY OF COLLEGE STATION (TDSP) | 0 |
| CITY OF GARLAND (TDSP) | 0 |
| CPS ENERGY (TDSP) | 0 |
| DENTON MUNICIPAL ELECTRIC (TDSP) | 0 |
| ELECTRIC TRANSMISSION TEXAS LLC (TDSP) | 0 |
| ERCOT | 1 |
| LCRA TRANSMISSION SERVICES CORPORATION (TDSP) | 4 |
| LONE STAR TRANSMISSION LLC (TSP) | 0 |
| ONCOR ELECTRIC DELIVERY COMPANY LLC (TDSP) | 1 |
| PEDERNALES ELECTRIC CO OP INC (TDSP) | 0 |
| RAYBURN COUNTRY CO OP DBA RAYBURN ELECTRIC (TDSP) | 0 |
| SHARYLAND UTILITIES LP (TDSP) | 0 |
| SOUTH TEXAS ELECTRIC CO OP INC (TDSP) | 0 |
| TEXAS MUNICIPAL POWER AGENCY (TDSP) | 0 |
| TEXAS-NEW MEXICO POWER CO (TDSP) | 0 |
| WIND ENERGY TRANSMISSION TEXAS LLC (TSP) | 0 |

# Appendix A: Real-Time Constraints

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Year | Month of the Year | Contingency Name | Overloaded Element | From Station | To Station | Count of Days |
| 2023 | 7 | BASE CASE | NE\_LOB | n/a | n/a | 30 |
| 2023 | 7 | DELMSAN5 | PAWNEE\_SPRUCE\_1 | PAWNEE | CALAVERS | 29 |
| 2023 | 7 | SLOBSA25 | LARDVN\_LASCRU1\_1 | LARDVNTH | LASCRUCE | 29 |
| 2023 | 7 | SLAQLOB8 | FALFUR\_PREMON1\_1 | FALFUR | PREMONT | 28 |
| 2023 | 7 | SLAQLOB8 | BRUNI\_69\_1 | BRUNI | BRUNI | 27 |
| 2023 | 7 | SCO2EUL8 | COLETO\_ROSATA1\_1 | COLETO | ROSATA | 26 |
| 2023 | 7 | DWHILON5 | PAWNEE\_TANGO1\_1 | TANGO | PAWNEE | 26 |
| 2023 | 7 | DMTSCOS5 | 6437\_\_F | SCRCV | KNAPP | 25 |
| 2023 | 7 | BASE CASE | NELRIO | n/a | n/a | 24 |
| 2023 | 7 | SDIMBEV8 | HAMILT\_MAVERI1\_1 | HAMILTON | MAVERICK | 24 |
| 2023 | 7 | SGRICOL5 | PAWNEE\_TANGO1\_1 | TANGO | PAWNEE | 22 |
| 2023 | 7 | SN\_SAJO5 | LASPUL\_RAYMND1\_1 | LASPULGA | RAYMND2 | 20 |
| 2023 | 7 | BASE CASE | VALEXP | n/a | n/a | 20 |
| 2023 | 7 | SVEAW\_L5 | 6217\_\_A | WLVSW | GAILS | 20 |
| 2023 | 7 | DMOLLO58 | PAWNEE\_TANGO1\_1 | TANGO | PAWNEE | 20 |
| 2023 | 7 | SBATPEA8 | PEARSALL\_69\_4 | PEARSALL | PEARSALL | 19 |
| 2023 | 7 | SVICCO28 | COLETO\_VICTOR2\_1 | COLETO | VICTORIA | 19 |
| 2023 | 7 | DMGSBTR5 | 6036\_\_A | TKWSW | MGSES | 19 |
| 2023 | 7 | SRRDLCS5 | 235\_\_A | SJNSW | JEWET | 19 |
| 2023 | 7 | SBENS\_M8 | BENTS\_FRTER\_1C\_1 | S\_MISSIN | RAILROAD | 18 |
| 2023 | 7 | SBENS\_M8 | BENTS\_FRTER\_1C\_1 | RAILROAD | S\_MISSIN | 18 |
| 2023 | 7 | SKINFAL8 | FALFUR\_PREMON1\_1 | FALFUR | PREMONT | 18 |
| 2023 | 7 | SN\_SLON5 | N\_SHARPE\_XF1 | N\_SHARPE | N\_SHARPE | 18 |
| 2023 | 7 | MHARNED5 | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 17 |
| 2023 | 7 | DWPWFWP5 | STPWAP39\_1 | STP | WAP | 17 |
| 2023 | 7 | SMDOOAS5 | MSNPET04\_A | PET | MSN | 17 |
| 2023 | 7 | MCONLNG5 | 6471\_\_C | MGSES | NAVIG | 16 |
| 2023 | 7 | SLOBSA25 | FALFUR\_PREMON1\_1 | FALFUR | PREMONT | 15 |
| 2023 | 7 | SMADSAP8 | MADDUX\_SAPOWE2\_1 | MADDUX | SAPOWER | 15 |
| 2023 | 7 | DSTPANS5 | PAWNEE\_TANGO1\_1 | TANGO | PAWNEE | 15 |
| 2023 | 7 | DMGSBIT5 | 6036\_\_A | TKWSW | MGSES | 14 |
| 2023 | 7 | DWPWFCK5 | STPWAP39\_1 | STP | WAP | 13 |
| 2023 | 7 | SMOUMIL8 | 231T323\_1 | PALEPE | MARSFO | 12 |
| 2023 | 7 | MRESMCM8 | RINCON\_WHITE\_2\_1 | WHITE\_PT | RINCON | 12 |
| 2023 | 7 | SMOUJOH8 | 231T323\_1 | PALEPE | MARSFO | 12 |
| 2023 | 7 | DSALHUT5 | 1710\_\_C | BELCNTY | SALSW | 12 |
| 2023 | 7 | BASE CASE | N\_TO\_H | n/a | n/a | 12 |
| 2023 | 7 | SGARBAT8 | RKYROAD\_STILES\_1 | RCKYROAD | STILES | 12 |
| 2023 | 7 | SMOUMIL8 | 231T323\_1 | MARSFO | PALEPE | 12 |
| 2023 | 7 | SPOTPAN9 | GUS\_HAS\_1 | HAS | GUSTINE | 11 |
| 2023 | 7 | SWIRJOH8 | 231T323\_1 | PALEPE | MARSFO | 11 |
| 2023 | 7 | SBIGSCH5 | PALOUS\_WOLFCA1\_1 | PALOUSE | WOLFCAMP | 11 |
| 2023 | 7 | SWIRJOH8 | 231T323\_1 | MARSFO | PALEPE | 11 |
| 2023 | 7 | SPOTPAN9 | GUS\_HAS\_1 | GUSTINE | HAS | 11 |
| 2023 | 7 | SN\_SAJO5 | FALFUR\_PREMON1\_1 | FALFUR | PREMONT | 10 |
| 2023 | 7 | SFTLMES8 | PALOUS\_WOLFCA1\_1 | PALOUSE | WOLFCAMP | 10 |
| 2023 | 7 | SKLELOY8 | LOYOLA\_69\_1 | LOYOLA | LOYOLA | 10 |
| 2023 | 7 | DRNS\_TB5 | THWZEN71\_A | ZEN | THW | 9 |
| 2023 | 7 | SBEAOR8 | PT\_TWM25\_A | PT | TWM | 8 |
| 2023 | 7 | SLOBSA25 | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 8 |
| 2023 | 7 | SLOBSA25 | ASHERT\_CATARI1\_1 | CATARINA | ASHERTON | 8 |
| 2023 | 7 | DMCCHIL8 | 725T725\_1 | MCCALA | RATTLE | 8 |
| 2023 | 7 | SBRAUVA8 | HAMILT\_MAVERI1\_1 | HAMILTON | MAVERICK | 8 |
| 2023 | 7 | SVICCOL8 | COLETO\_VICTOR1\_1 | COLETO | VICTORIA | 8 |
| 2023 | 7 | SMDOPHR5 | G138\_10B\_1 | SEMINOLE | MAGNO\_TN | 8 |
| 2023 | 7 | MCONLNG5 | 6095\_\_D | LMESA | JPPOI | 7 |
| 2023 | 7 | DCENREV5 | PAWNEE\_TANGO1\_1 | TANGO | PAWNEE | 7 |
| 2023 | 7 | MCONLNG5 | RKYROAD\_STILES\_1 | RCKYROAD | STILES | 7 |
| 2023 | 7 | STANPAW5 | CALLIC\_LON\_HI1\_1 | LON\_HILL | CALLICOA | 7 |
| 2023 | 7 | SSTLEIN8 | CRTVLE\_EINSTEN\_1 | EINSTEIN | CRTRVLLE | 7 |
| 2023 | 7 | SLGEI\_D8 | I\_DUPS\_LGE1\_1 | I\_DUPSW | LGE | 7 |
| 2023 | 7 | SLGEI\_D8 | I\_DUPS\_LGE1\_1 | LGE | I\_DUPSW | 7 |
| 2023 | 7 | DCENRI35 | PAWNEE\_TANGO1\_1 | TANGO | PAWNEE | 7 |
| 2023 | 7 | SCOMCYP8 | 122T122\_1 | COMFOR | RAYBAR | 6 |
| 2023 | 7 | SCRTEIL8 | RKYROAD\_STILES\_1 | RCKYROAD | STILES | 6 |
| 2023 | 7 | MPRSHWK8 | 1535\_\_B | TNSKA | TCOSW | 6 |
| 2023 | 7 | DVICCO89 | COLETO\_VICTOR1\_1 | COLETO | VICTORIA | 6 |
| 2023 | 7 | SRAYRI38 | HAINE\_\_LA\_PAL1\_1 | LA\_PALMA | HAINE\_DR | 6 |
| 2023 | 7 | DBIGKEN5 | HAMILT\_MAXWEL1\_1 | MAXWELL | HAMILTON | 6 |
| 2023 | 7 | SHCKRNK5 | 106\_\_A | HCKSW | ALLNC | 6 |
| 2023 | 7 | DCENRO58 | 904T485\_1 | FRONTERA | GOODWIN | 6 |
| 2023 | 7 | DSWECCR5 | 6036\_\_A | TKWSW | MGSES | 5 |
| 2023 | 7 | DFRIILL8 | HAMILT\_MAXWEL1\_1 | MAXWELL | HAMILTON | 5 |
| 2023 | 7 | SBONNED5 | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 5 |
| 2023 | 7 | DCOLFA59 | PAWNEE\_TANGO1\_1 | TANGO | PAWNEE | 5 |
| 2023 | 7 | DLEGOUT5 | 505\_\_B | FBRSW | THSES | 5 |
| 2023 | 7 | MHARNED5 | HAINE\_\_LA\_PAL1\_1 | LA\_PALMA | HAINE\_DR | 5 |
| 2023 | 7 | MMGSCON5 | 6471\_\_C | MGSES | NAVIG | 5 |
| 2023 | 7 | DZORHAY5 | BERGHE\_AT1L | BERGHE | BERGHE | 5 |
| 2023 | 7 | DKOCNUE8 | CHAMPL\_WEIL\_T1\_1 | WEIL\_TRC | CHAMPLIN | 5 |
| 2023 | 7 | BASE CASE | WESTEX | n/a | n/a | 5 |
| 2023 | 7 | SALLHCK5 | 107\_\_A | HCKSW | RNKSW | 5 |
| 2023 | 7 | SCOMKEN8 | 115T123\_1 | KENDAL | KERRST | 5 |
| 2023 | 7 | DSTEXP12 | BLESSI\_LOLITA1\_1 | LOLITA | BLESSING | 5 |
| 2023 | 7 | DBIGSCH5 | PALOUS\_WOLFCA1\_1 | PALOUSE | WOLFCAMP | 5 |
| 2023 | 7 | DBIGKEN5 | TREADW\_YELWJC1\_1 | TREADWEL | YELWJCKT | 5 |
| 2023 | 7 | DCMNCMN8 | 660\_\_B | MGPSW | ZEPHYR | 5 |
| 2023 | 7 | SKOCBUZ8 | 6217\_\_A | WLVSW | GAILS | 5 |
| 2023 | 7 | MCONLNG5 | 14040\_\_A | PCTSW | DEWTP | 4 |
| 2023 | 7 | DVICVI89 | COLETO\_VICTOR2\_1 | COLETO | VICTORIA | 4 |
| 2023 | 7 | SILLFTL8 | HAMILT\_MAXWEL1\_1 | MAXWELL | HAMILTON | 4 |
| 2023 | 7 | SMV\_PAR8 | RIOHND\_ERIOHND\_1 | MV\_RIOHO | RIOHONDO | 4 |
| 2023 | 7 | DCAGCO58 | 415T415\_1 | MILLER | HENLY | 4 |
| 2023 | 7 | XWO58 | ADKCB\_21\_A | ADK | CB | 4 |
| 2023 | 7 | SLOBSA25 | CATARI\_PILONC1\_1 | PILONCIL | CATARINA | 4 |
| 2023 | 7 | DELMSAN5 | MAGRUD\_VICTOR2\_1 | VICTORIA | MAGRUDER | 4 |
| 2023 | 7 | SBWDDBM5 | LPLMK\_LPLNE\_1 | LPLMK | LPLNE | 4 |
| 2023 | 7 | DLEGOUT5 | 1255\_\_B | SCSES | STCKY | 4 |
| 2023 | 7 | DSALKLN5 | 630\_\_B | KLNSW | HHSTH | 4 |
| 2023 | 7 | DMTSCOS5 | 6437\_\_A | KNAPP | BCKSW | 4 |
| 2023 | 7 | SLOBSA25 | CATARI\_PILONC1\_1 | CATARINA | PILONCIL | 4 |
| 2023 | 7 | BASE CASE | 1255\_\_B | SCSES | STCKY | 4 |
| 2023 | 7 | MWIRJO28 | 231T323\_1 | PALEPE | MARSFO | 4 |
| 2023 | 7 | DGRMGRS8 | 6830\_\_B | CRDSW | OLNEY | 4 |
| 2023 | 7 | MHARNED5 | LASPUL\_RAYMND1\_1 | LASPULGA | RAYMND2 | 4 |
| 2023 | 7 | DCC1DUKE | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 4 |
| 2023 | 7 | SRICGRS8 | 6840\_\_B | NVKSW | ANARN | 4 |
| 2023 | 7 | DCAGCI58 | 255T279\_1 | PIPECR | MEDILA | 3 |
| 2023 | 7 | SCMNCPS5 | 651\_\_B | CMNSW | CMNTP | 3 |
| 2023 | 7 | DKENNO89 | COLETO\_ROSATA1\_1 | COLETO | ROSATA | 3 |
| 2023 | 7 | DCAGCO58 | 656T656\_1 | KENDAL | BERGHE | 3 |
| 2023 | 7 | SSIEMOL8 | LARDVN\_LASCRU1\_1 | LARDVNTH | LASCRUCE | 3 |
| 2023 | 7 | SVANRAY8 | RAYBURN\_69\_2 | RAYBURN | RAYBURN | 3 |
| 2023 | 7 | SWHILON5 | GILA\_MAYO1\_1 | GILA | MAYO | 3 |
| 2023 | 7 | SW\_GW\_L5 | 15060\_\_B | VEALMOOR | KOCHTAP | 3 |
| 2023 | 7 | DLEGOUT5 | 235\_\_A | SJNSW | JEWET | 3 |
| 2023 | 7 | XCAG158 | CAGNON\_MR4H | CAGNON | CAGNON | 3 |
| 2023 | 7 | SBTPBNT8 | MYRA\_VAL\_1 | MYRA | VALYVIEW | 3 |
| 2023 | 7 | DBERWE58 | 587T587\_1 | MOUNTO | BLANCO | 3 |
| 2023 | 7 | DAUSDUN8 | 608T608\_1 | GIDEON | BASTCI | 3 |
| 2023 | 7 | SHAYZO25 | 6T227\_1 | HAYSEN | ZORN | 3 |
| 2023 | 7 | BASE CASE | RAMBLER\_GENTIE\_1 | RAMBLER | TWINBU | 3 |
| 2023 | 7 | SW\_GODE5 | 15060\_\_B | VEALMOOR | KOCHTAP | 3 |
| 2023 | 7 | SSANFOW5 | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 3 |
| 2023 | 7 | SPAWCAL5 | COLETO\_ROSATA1\_1 | COLETO | ROSATA | 3 |
| 2023 | 7 | DBIGKEN5 | HAMILT\_MAVERI1\_1 | HAMILTON | MAVERICK | 3 |
| 2023 | 7 | SDI2DIL9 | DILLEYSW\_69A1 | DILLEYSW | DILLEYSW | 3 |
| 2023 | 7 | DGRMGRS8 | OLN\_FMR2 | OLN | OLN | 3 |
| 2023 | 7 | DGRSPKR5 | 6377\_\_A | BRTSW | ORANS | 3 |
| 2023 | 7 | SMGPBRN8 | 670\_\_A | BRNWD | BRNSO | 3 |
| 2023 | 7 | DBERWE58 | MOUNTO\_AT1 | MOUNTO | MOUNTO | 3 |
| 2023 | 7 | DHJWFCK5 | STPWAP39\_1 | STP | WAP | 3 |
| 2023 | 7 | MDKLRGP5 | 651\_\_B | CMNSW | CMNTP | 2 |
| 2023 | 7 | DCENFAL5 | PAWNEE\_TANGO1\_1 | TANGO | PAWNEE | 2 |
| 2023 | 7 | SSPUASP8 | GIRA\_T\_SPUR1\_1 | SPUR | GIRA\_TAP | 2 |
| 2023 | 7 | SN\_SLON5 | HOLLY4\_SOUTH\_1\_1 | HOLLY4 | SOUTH\_SI | 2 |
| 2023 | 7 | DBIGKEN5 | MADDUX\_TREADW1\_1 | MADDUX | TREADWEL | 2 |
| 2023 | 7 | STANPAW5 | MELONC\_RINCON1\_1 | RINCON | MELONCRE | 2 |
| 2023 | 7 | BASE CASE | RANDAD\_ZAPATA1\_1 | RANDADO | ZAPATA | 2 |
| 2023 | 7 | DCC3\_NED | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 2 |
| 2023 | 7 | SBENRAI8 | BENTS\_FRTER\_1C\_1 | S\_MISSIN | RAILROAD | 2 |
| 2023 | 7 | DYELHE89 | KATEMC\_MASN1\_1 | MASN | KATEMCY | 2 |
| 2023 | 7 | SLOBSA25 | BRUNI\_69\_1 | BRUNI | BRUNI | 2 |
| 2023 | 7 | DELMSAN5 | COLETO\_ROSATA1\_1 | COLETO | ROSATA | 2 |
| 2023 | 7 | DWAP\_JN5 | BI\_WAP50\_A | WAP | BI | 2 |
| 2023 | 7 | SALIKIN8 | FALFUR\_PREMON1\_1 | FALFUR | PREMONT | 2 |
| 2023 | 7 | DVICEDN8 | LOOP\_VICTORIA\_1 | VICTORIA | L\_463S | 2 |
| 2023 | 7 | DWISALV8 | MYRA\_VAL\_1 | MYRA | VALYVIEW | 2 |
| 2023 | 7 | DNAVOUT5 | 1250\_\_J | PLSTH | LKVEW | 2 |
| 2023 | 7 | DFERGRM8 | 34T267\_1 | SANDMO | CTECBU | 2 |
| 2023 | 7 | DCC3\_NED | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 2 |
| 2023 | 7 | SSTLEST8 | CRTVLE\_EINSTEN\_1 | EINSTEIN | CRTRVLLE | 2 |
| 2023 | 7 | DTRSENT5 | 1255\_\_B | SCSES | STCKY | 2 |
| 2023 | 7 | DWHICOT5 | FARMLAND\_LONGD\_1 | FARMLAND | W\_LD\_345 | 2 |
| 2023 | 7 | STANPAW5 | MELONC\_SEADRF1\_1 | MELONCRE | SEADRFTC | 2 |
| 2023 | 7 | DLEGOUT5 | 1250\_\_J | PLSTH | LKVEW | 2 |
| 2023 | 7 | SSCLWF18 | 6840\_\_B | NVKSW | ANARN | 2 |
| 2023 | 7 | SFORYEL8 | MASNPH\_MASN1\_1 | MASN | MASNPHT | 2 |
| 2023 | 7 | DWHILON5 | MELONC\_SEADRF1\_1 | MELONCRE | SEADRFTC | 2 |
| 2023 | 7 | SCENLOB5 | PAWNEE\_TANGO1\_1 | TANGO | PAWNEE | 2 |
| 2023 | 7 | DLEGOUT5 | 2310\_\_C | NVARO | RCHLD | 2 |
| 2023 | 7 | SNATBEA8 | 6144\_\_A | BSPRW | STASW | 2 |
| 2023 | 7 | DNUEGIL8 | CHAMPL\_WEIL\_T1\_1 | WEIL\_TRC | CHAMPLIN | 2 |
| 2023 | 7 | SNORKEN8 | MAGRUD\_VICTOR2\_1 | VICTORIA | MAGRUDER | 2 |
| 2023 | 7 | DCREALN5 | 715\_\_A | CRLNW | CRLJL | 2 |
| 2023 | 7 | SSEAMEL8 | GRETA\_REFUGI1\_1 | REFUGIO | GRETA | 1 |
| 2023 | 7 | SSCLWF18 | NVKSW\_FMR1 | NVKSW | NVKSW | 1 |
| 2023 | 7 | XVI2C89 | VICTORIA\_69A2 | VICTORIA | VICTORIA | 1 |
| 2023 | 7 | SWHILON5 | WHITE\_PT\_XFL1 | WHITE\_PT | WHITE\_PT | 1 |
| 2023 | 7 | SGILTRI8 | 211T147\_1 | GILLCR | MCNEIL\_ | 1 |
| 2023 | 7 | DTHSLCS5 | 282\_\_A | LHLSW | LCSES | 1 |
| 2023 | 7 | DZORHAY5 | 415T415\_1 | MILLER | HENLY | 1 |
| 2023 | 7 | DCAGCO58 | 583T583\_1 | BANDER | MASOCR | 1 |
| 2023 | 7 | SCENLOB5 | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 1 |
| 2023 | 7 | SGRICOL5 | CALLIC\_LON\_HI1\_1 | LON\_HILL | CALLICOA | 1 |
| 2023 | 7 | SDIMBEV8 | ESCOND\_GANSO1\_1 | GANSO | ESCONDID | 1 |
| 2023 | 7 | STANPAW5 | LON\_HI\_ORNGRO1\_1 | LON\_HILL | ORNGROV | 1 |
| 2023 | 7 | SBTPBNT8 | SPR\_VALY\_1 | VALYVIEW | SPR | 1 |
| 2023 | 7 | SZENTH35 | THWZEN71\_A | ZEN | THW | 1 |
| 2023 | 7 | XFO2R89 | TIELINE2\_1 | FORMOSA | FORMOSA | 1 |
| 2023 | 7 | DLEGOUT5 | 1250\_\_F | LKVEW | LLTSW | 1 |
| 2023 | 7 | DNAVOUT5 | 1250\_\_F | LKVEW | LLTSW | 1 |
| 2023 | 7 | STRSSCS5 | 1255\_\_B | SCSES | STCKY | 1 |
| 2023 | 7 | DTHSLCS5 | 281\_\_A | THSES | LHLSW | 1 |
| 2023 | 7 | SCMNCPS5 | 651\_\_C | CMNTP | SHILO | 1 |
| 2023 | 7 | XOK2L58 | 6856\_\_B | SMOUR | BMRTN | 1 |
| 2023 | 7 | XSPU89 | ASPM\_SWEN1\_1 | ASPM | SWEN | 1 |
| 2023 | 7 | SBTECHB5 | BTE\_AT-1 | BTE | BTE | 1 |
| 2023 | 7 | SBTECH25 | BTE\_AT-2 | BTE | BTE | 1 |
| 2023 | 7 | SWRDYN8 | DA\_WC\_89\_A | WC | DA | 1 |
| 2023 | 7 | SGODTAN5 | NCARBI\_SEADRF1\_1 | SEADRFTC | NCARBIDE | 1 |
| 2023 | 7 | DBIGKEN5 | ORNT\_REDCRE1\_1 | REDCREEK | ORNT | 1 |
| 2023 | 7 | SCRMSAR8 | ORNT\_REDCRE1\_1 | REDCREEK | ORNT | 1 |
| 2023 | 7 | DLONWAR5 | PAWNEE\_TANGO1\_1 | TANGO | PAWNEE | 1 |
| 2023 | 7 | DABPAB98 | SOUTHA\_VINSON1\_1 | SOUTHABI | VINSON | 1 |
| 2023 | 7 | DNAVOUT5 | 1255\_\_B | SCSES | STCKY | 1 |
| 2023 | 7 | DCAGCO58 | 450T450\_1 | HENLY | DRIPSP | 1 |
| 2023 | 7 | DCAGCI58 | 51T376\_1 | FERGUS | GRANMO | 1 |
| 2023 | 7 | DZORHAY5 | 51T376\_1 | FERGUS | GRANMO | 1 |
| 2023 | 7 | DBERWE58 | 617T617\_1 | PURGRO | SATTLE | 1 |
| 2023 | 7 | DCC1DUKE | CATARI\_PILONC1\_1 | CATARINA | PILONCIL | 1 |
| 2023 | 7 | DCENREV5 | CATARI\_PILONC1\_1 | CATARINA | PILONCIL | 1 |
| 2023 | 7 | SSTRBES8 | FALFUR\_PREMON1\_1 | FALFUR | PREMONT | 1 |
| 2023 | 7 | SBATPEA8 | FRI\_PEAR\_1 | PEARSALL | FRIOTOS | 1 |
| 2023 | 7 | SCO2EUL8 | KENEDS\_ROSATA1\_1 | ROSATA | KENEDSW | 1 |
| 2023 | 7 | SCOLPAW5 | MAGRUD\_VICTOR2\_1 | VICTORIA | MAGRUDER | 1 |
| 2023 | 7 | DABPAB98 | POTOSI\_VINSON1\_1 | VINSON | POTOSI\_T | 1 |
| 2023 | 7 | XRNK58 | RNKSW\_MR1L | RNKSW | RNKSW | 1 |
| 2023 | 7 | SIOLKEI8 | RPR\_GIBC\_1 | RPR | GIBCRK | 1 |
| 2023 | 7 | SFTLMES8 | SANTAR\_WOLFCA1\_1 | WOLFCAMP | SANTARIT | 1 |
| 2023 | 7 | DWISALV8 | SPR\_VALY\_1 | VALYVIEW | SPR | 1 |
| 2023 | 7 | DAUSLOS5 | 190T152\_1 | WINCHES | GIDEON | 1 |
| 2023 | 7 | DPRSVLS5 | 389\_\_A | WDDSW | MNSES | 1 |
| 2023 | 7 | DNAVOUT5 | 505\_\_B | FBRSW | THSES | 1 |
| 2023 | 7 | DBERBO58 | 587T587\_1 | MOUNTO | BLANCO | 1 |
| 2023 | 7 | DROMASP5 | 6377\_\_A | BRTSW | ORANS | 1 |
| 2023 | 7 | DCPSST58 | 651\_\_B | CMNSW | CMNTP | 1 |
| 2023 | 7 | SSCLWF28 | 6840\_\_B | NVKSW | ANARN | 1 |
| 2023 | 7 | DDELGA58 | 904T485\_1 | FRONTERA | GOODWIN | 1 |
| 2023 | 7 | BASE CASE | ADKCB\_21\_A | ADK | CB | 1 |
| 2023 | 7 | DCENRI35 | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 1 |
| 2023 | 7 | SNWEWES8 | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 1 |
| 2023 | 7 | SGODTAN5 | CALLIC\_LON\_HI1\_1 | LON\_HILL | CALLICOA | 1 |
| 2023 | 7 | SEULTUL8 | COLETO\_ROSATA1\_1 | COLETO | ROSATA | 1 |
| 2023 | 7 | SMIDLO28 | FALFUR\_PREMON1\_1 | FALFUR | PREMONT | 1 |
| 2023 | 7 | SBE2ASH8 | HAMILT\_MAVERI1\_1 | HAMILTON | MAVERICK | 1 |
| 2023 | 7 | SFORYEL8 | HEXT\_MASONS1\_1 | MASONSW | HEXT | 1 |
| 2023 | 7 | SOBWAP5 | OB\_WAP98\_A | WAP | OB | 1 |
| 2023 | 7 | SOBWA2P5 | OB\_WAP99\_A | WAP | OB | 1 |
| 2023 | 7 | SWHILON5 | WHITE\_PT\_XFH1 | WHITE\_PT | WHITE\_PT | 1 |
| 2023 | 7 | XWHT58 | WHTNY\_MR2L | WHTNY | WHTNY | 1 |
| 2023 | 7 | BASE CASE | X5\_ALAMO1\_1 | OCI\_ALM1 | X5 | 1 |
| 2023 | 7 | DLWSRNK5 | 1060\_\_Q | RNKSW | PVPOI | 1 |
| 2023 | 7 | DCDHMCS8 | 3160\_\_A | CDCSW | OKCLS | 1 |
| 2023 | 7 | SLCSTH25 | 505\_\_B | FBRSW | THSES | 1 |
| 2023 | 7 | DCC1DUKE | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 1 |
| 2023 | 7 | SCOMHA38 | HAMILT\_MAXWEL1\_1 | MAXWELL | HAMILTON | 1 |
| 2023 | 7 | XVIC89 | MAGRUD\_VICTOR2\_1 | VICTORIA | MAGRUDER | 1 |
| 2023 | 7 | SSCLWF28 | NVKSW\_FMR1 | NVKSW | NVKSW | 1 |
| 2023 | 7 | SFT\_BAL8 | STMBOA\_WINT1\_1 | STMBOAT | WINT | 1 |
| 2023 | 7 | XFO3R89 | TIELINE1\_1 | FORMOSA | FORMOSA | 1 |
| 2023 | 7 | DAUSLOS5 | 155T217\_1 | BELLSO | PT | 1 |
| 2023 | 7 | DBERWE58 | 254T331\_1 | SATTLE | CRANMI | 1 |
| 2023 | 7 | DBERWE58 | 415T415\_1 | MILLER | HENLY | 1 |
| 2023 | 7 | DEVRHLS8 | 6640\_\_A | FHLSW | BRNAV | 1 |
| 2023 | 7 | DMOLLO58 | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 1 |
| 2023 | 7 | DMOLLO58 | CATARI\_PILONC1\_1 | CATARINA | PILONCIL | 1 |
| 2023 | 7 | SPITFOR8 | FRPHIL\_GILLES1\_1 | GILLES | FRPHILLT | 1 |
| 2023 | 7 | DPHRAL58 | MSNPET04\_A | PET | MSN | 1 |
| 2023 | 7 | DGIBZEN5 | SNGXGC75\_1 | GIBCRK | SNG | 1 |
| 2023 | 7 | DSALHUT5 | 270\_\_A | KNBSW | TMPSW | 1 |
| 2023 | 7 | SBOMJC25 | 35020\_\_B | GRVSW | GRSES | 1 |
| 2023 | 7 | DBERWE58 | 531T531\_1 | HUNTER | PURGRO | 1 |
| 2023 | 7 | DBYRBOW5 | 6011\_\_B | RILEY | FSHSW | 1 |
| 2023 | 7 | DCDHTVW5 | 6200\_\_D | SHRSW | PRKRW | 1 |
| 2023 | 7 | XBOM58 | 6558\_\_B | FSHSW | WFALS | 1 |
| 2023 | 7 | SZEPCMN8 | 670\_\_A | BRNWD | BRNSO | 1 |
| 2023 | 7 | SPEBTRU8 | 940\_\_C | ENWSW | WXHCH | 1 |
| 2023 | 7 | SCENLOB5 | CATARI\_PILONC1\_1 | CATARINA | PILONCIL | 1 |
| 2023 | 7 | SPITFOR8 | FRPHIL\_MASN1\_1 | FRPHILLT | MASN | 1 |
| 2023 | 7 | DCOLFA59 | GODDAR\_TANGO1\_1 | GODDARD | TANGO | 1 |
| 2023 | 7 | SRAYRI28 | HAINE\_\_LA\_PAL1\_1 | LA\_PALMA | HAINE\_DR | 1 |
| 2023 | 7 | SLOBSA25 | LASCRU\_MILO1\_1 | LASCRUCE | MILO | 1 |
| 2023 | 7 | SPAWCAL5 | MAGRUD\_VICTOR2\_1 | VICTORIA | MAGRUDER | 1 |
| 2023 | 7 | DWHILON5 | MELONC\_RINCON1\_1 | RINCON | MELONCRE | 1 |
| 2023 | 7 | XRN2K58 | RNKSW\_MR2L | RNKSW | RNKSW | 1 |
| 2023 | 7 | XVIC89 | VICTORIA\_69A1 | VICTORIA | VICTORIA | 1 |
| 2023 | 7 | DTRIASH8 | 211T147\_1 | GILLCR | MCNEIL\_ | 1 |
| 2023 | 7 | DLEGOUT5 | 506\_\_A | SAMSW | FBRSW | 1 |
| 2023 | 7 | DVENLIG5 | 530\_\_A | WEBBS | CDHSW | 1 |
| 2023 | 7 | MCONLNG5 | 6046\_\_A | MGSES | FLCNS | 1 |
| 2023 | 7 | DCAGCI58 | 656T656\_1 | KENDAL | BERGHE | 1 |
| 2023 | 7 | DCOMKER8 | 77T121\_1 | COMFOR | CYPRCR | 1 |
| 2023 | 7 | SBRAUVA8 | ESCOND\_GANSO1\_1 | GANSO | ESCONDID | 1 |
| 2023 | 7 | SFORGIL8 | FRPHIL\_GILLES1\_1 | GILLES | FRPHILLT | 1 |

1. Current Wind Generation Record: 27,044 MW on 05/29/2022 at 22:36 | Current Wind Penetration Record: 69.15% on 04/10/2022 at 01:43

 Current Solar Generation Record: 13,446 MW on 07/27/2023 at 15:09 | Current Solar Penetration Record: 32.93% on 04/30/2023 at 09:24 [↑](#footnote-ref-1)
2. All DC Tie Curtailments are posted publicly on the ERCOT Market Information System. See that posting for additional details for the event(s) in question. [↑](#footnote-ref-2)
3. See DC Tie Operating Procedure (<http://www.ercot.com/mktrules/guides/procedures>) for more details. [↑](#footnote-ref-3)